



Opening the Cranston Canyon

Safety and Congestion Improvements to Route 37 and I-295



FFY2020 BUILD GRANT APPLICATION
RHODE ISLAND DEPARTMENT OF TRANSPORTATION (RIDOT)
2 Capitol Hill, Providence, RI

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Project Information:

Field Name	Response
Project Name	Opening the Cranston Canyon
Project Description	High-traffic corridor project to repair five structurally deficient bridges, make safety improvements and mitigate congestion along Route 37 and I-295 in Cranston, Rhode Island.
Urban/Rural	Urban
Urbanized Area	Providence, RI-MA
Capital or Planning	Capital
Project Type	Road – Bridge Repair/Replacement
Primary Project Location Zip Code	02920
Project Previously Submitted?	No
Prior BUILD/TIGER Funds Awarded to Project?	No, but RIDOT received a \$20 million TIGER FY2017 Discretionary Grant for the Route 37 Corridor Safety Sweep, which is repairing bridges along the eastbound side of Route 37. This application's project limits are for the westbound side of Route 37 and I-295.
FY20 INFRA Application?	No
Amount Requested	\$25,000,000
Total Project Cost	\$85,000,000
Total Federal Funding	\$68,000,000
Total Non-Federal Funding	\$17,000,000
Tribal Government?	No
Tribal Benefits?	N/A
Private Corporation Involvement	No
Private Corporation Name(s)	N/A
TIFIA/RRIF?	No
Department Financing Program?	No



May 18, 2020

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Dear BUILD Evaluation Team:

In March 2018, Rhode Island Department of Transportation (RIDOT) received a \$20 million TIGER grant for the [Route 37 Corridor Safety Sweep](#), a project that is now transforming the eastern side of a busy commercial corridor in Cranston, Rhode Island.

The much-needed award, however, only provided investment to improve one direction of Route 37. RIDOT now seeks to complete the effort and make much-needed safety improvements to the Route 37 / I-295 Interchange, repair more than 47,000 square feet of structurally deficient bridge deck and mitigate a constant source of peak hour congestion.

RIDOT is requesting \$25 Million in grant assistance from the Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grant program to accelerate the “Opening the Cranston Canyon” corridor safety improvement project, an \$85 Million effort which will repair five structurally deficient bridges, eliminate dangerous conflicting movements and mitigate congestion along Route 37 and I-295 in Cranston.

Improving a vital commercial corridor that serves as one of the state’s few East-West evacuation routes in the event of a coastal emergency, this project will produce favorable long-term benefits, address structural deficiencies to bring critical highway assets up to a state of good repair, improve traffic safety, aid economic growth, and generate considerable travel time savings for both commuters and freight traffic.

Among the improvements proposed in the grant are:

- Rebuilding six structures in Bridge Group 51B totaling more than 47,000 square feet;
- Creating a third lane on I-295 North with new pavement and minor widening, to treat as an auxiliary lane from Route 37 to the top of the hill (out of what’s known locally as the “Cranston Canyon,” a rush hour commuter congestion nightmare);
- Carrying that third lane northbound to Plainfield Pike where the current Bridge Group 16A is under way;
- Shifting the Route 37 East Ramp to I-295 North from the high-speed lane to the right lane, improving safety and reducing conflicting movements;
- Repositioning the I-295 North ramp to Route 37 West to eliminate a conflicting weave;
- Widening the Route 37 West Ramp to I-295 to improve sight lines and reduce crashes; and
- Restriping the final stretch of Route 37 West approaching Natick Avenue to calm traffic and reduce speed-related crashes.

Despite the transportation system’s vital role in supporting the state’s \$50 billion economy, Rhode Island’s transportation assets have been plagued by underinvestment for decades. As a result, the state reported the worst bridge conditions in the country. Rhode Island continues to be [ranked 50th out of 50 states](#) in terms of bridge condition, with the largest percentage (22.3 percent) of structurally deficient bridges.

In 2016 the state passed landmark [RhodeWorks legislation](#), with a goal of 90 percent bridge sufficiency by 2025, concurrent to 23 C.F.R. § 490.11(a), requiring the total percentage of bridge deck areas classified as Structurally Deficient must not exceed 10 percent.

Four years later, signs of progress related to the imp of the RhodeWorks program can be seen all around the state. In the heart of Providence, the largest project in RIDOT history -- the Route 6/10 Interchange – continues to make exceptional progress. Meanwhile, bridge replacements and repairs, safety improvements, and pavement projects as well as other transit projects are ongoing throughout Rhode Island.

RIDOT has removed 82,131 square feet of "Poor" bridge deck space into "Good" condition, and the Department is currently tracking 59 capital projects in active construction as of the end of the second quarter of FFY 2020.

During the second quarter of FFY 2020, RIDOT continued collecting tolls at the first five truck-only tolling locations and began collecting tolls at three new locations on Interstate 95, including Warwick, Providence and Pawtucket. Revenues from the first eight toll sites have been consistent and on-target with projections.

Truck tolls and formula funding are still not enough. According to the FHWA Bridge Replacement Unit Costs breakdown figures from 2018, Rhode Island needs [more than \\$685 million to repair the 88 structurally deficient NHS bridges](#) in that year's inventory.

While state revenues are significantly impacted by the ongoing COVID-19 crisis, RIDOT continues to maintain essential services such as road and bridge maintenance and construction, road repair, debris removal, sweeping operations, and pothole repair. RIDOT construction teams are on site in order to keep active projects on time and on budget as much as possible.

The RIDOT team pledges to continue an unprecedented effort to bring the state's surface transportation infrastructure to a state of good repair, with all the hard work and dedication the department has shown through its proven track record.

To that end, securing BUILD funding would allow RIDOT to accelerate the Canyon Corridor Safety Improvement project, reducing congestion in an area known for chronic bottlenecks, improve public safety, and repair structurally deficient bridges in Rhode Island.

Thank you for your consideration.
Sincerely,

A handwritten signature in blue ink, appearing to read "Peter Alviti Jr.", with a stylized, cursive script.

Peter Alviti Jr., P.E.
Director
Rhode Island Department of Transportation

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I. Project Description

The area of I-295 in Rhode Island known as the “Cranston Canyon” has been the bane of commuters for a long time. A [2015 article in The Providence Journal](#) listed it among the seven worst traffic spots in Rhode Island.

“Hands down - 295 South near Hartford Avenue down toward the ‘canyon’ Phenix Ave area - during the morning commute is consistently the worst driving I have ever encountered,” one reader wrote to the publication. “It is chronically backed up for a good portion of the day and when it’s not, traffic still fails to ever go above 40 mph due to such a steep incline. Four lanes merge into two, and there’s not enough shoulder room for heavy tractor trailers to use the breakdown lane.”

The public has often asked why The Rhode Island Department of Transportation (RIDOT) could not convert the breakdown lane in the canyon into a travel lane. Now, the Department is ready to do just that.



FIGURE 1 -- ROUTE 37 WEST RAMP TO I-295 NORTH

RIDOT is applying for \$25 Million in grant assistance from the Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grant program to accelerate the “Opening the Cranston Canyon” corridor safety improvement project, an \$85 Million effort to repair five structurally deficient bridges, improve safety and mitigate congestion along Route 37 and I-295 in Cranston, Rhode Island.

The Cranston Canyon project was selected from the 10-year Transportation Improvement Program (TIP) for its magnitude and project readiness. Route 37 Westbound is home to some of the largest remaining portions of deficient bridge deck area in the state, and the improvements proposed in this application would be a key factor in the Department’s ongoing pursuit of 90 percent bridge sufficiency by 2025. The 47,000 square feet of bridge deck included in this project represents nearly 2 percent of the Poor deck area remaining on Rhode Island’s National Bridge Inventory (NBI) structures.

The Department has been examining the needs of the assets included in the project and evaluating its environmental impacts since 2019. The \$25 million requested in this application is the missing piece for this \$85 million project, a key component without which construction will not be possible in the near term.

In addition to making a big impact on bridge sufficiency, the project improves safety on a key freight corridor in a densely populated area and would complete bridge work on the RI-37 corridor. The project will improve a vital commercial hub that serves as one of the state’s few east-west evacuation routes in the event of a coastal emergency, producing favorable long-term benefits by addressing structural deficiencies and state of good repair work, improving traffic safety, aiding economic growth and mitigating congestion.



FIGURE 2 -- RHODE ISLAND ROUTE 37 (RED)

Originally constructed in the late 1960s, the RI-37 corridor carries roughly 60,000 vehicles on a daily basis, providing critical connections to RI-2, RI-51, US-1, I-295, and I-95. Located just a few miles from both the capital city of Providence and T.F. Green Airport in Warwick, RI-37 is an essential component of the freight and highway networks. The Proposed Action outlined in this application will improve the critical RI-37 / I-295 corridor by:

- Rebuilding six structures in Bridge Group 51B, totaling more than 47,000 square feet of deck space;
- Creating a third lane at I-295 North with new pavement and minor widening, to treat as an auxiliary lane from Route 37 to the top of a large hill;

- Extending that third lane northbound to Plainfield Pike where construction on Bridge Group 16A is already under way;
- Improving the Route 37 Eastbound Ramp to I-295 Northbound by replacing a dangerous high-speed lane approach with a much safer right-hand lane on-ramp;
- Redesigning the I-295 North ramp to Route 37 to eliminate a conflicting weave with accelerating and thru traffic; and

Widening the Route 37 West ramp to I-295 North to improve sight lines, reduce crashes, and provide a means for off-alignment construction.

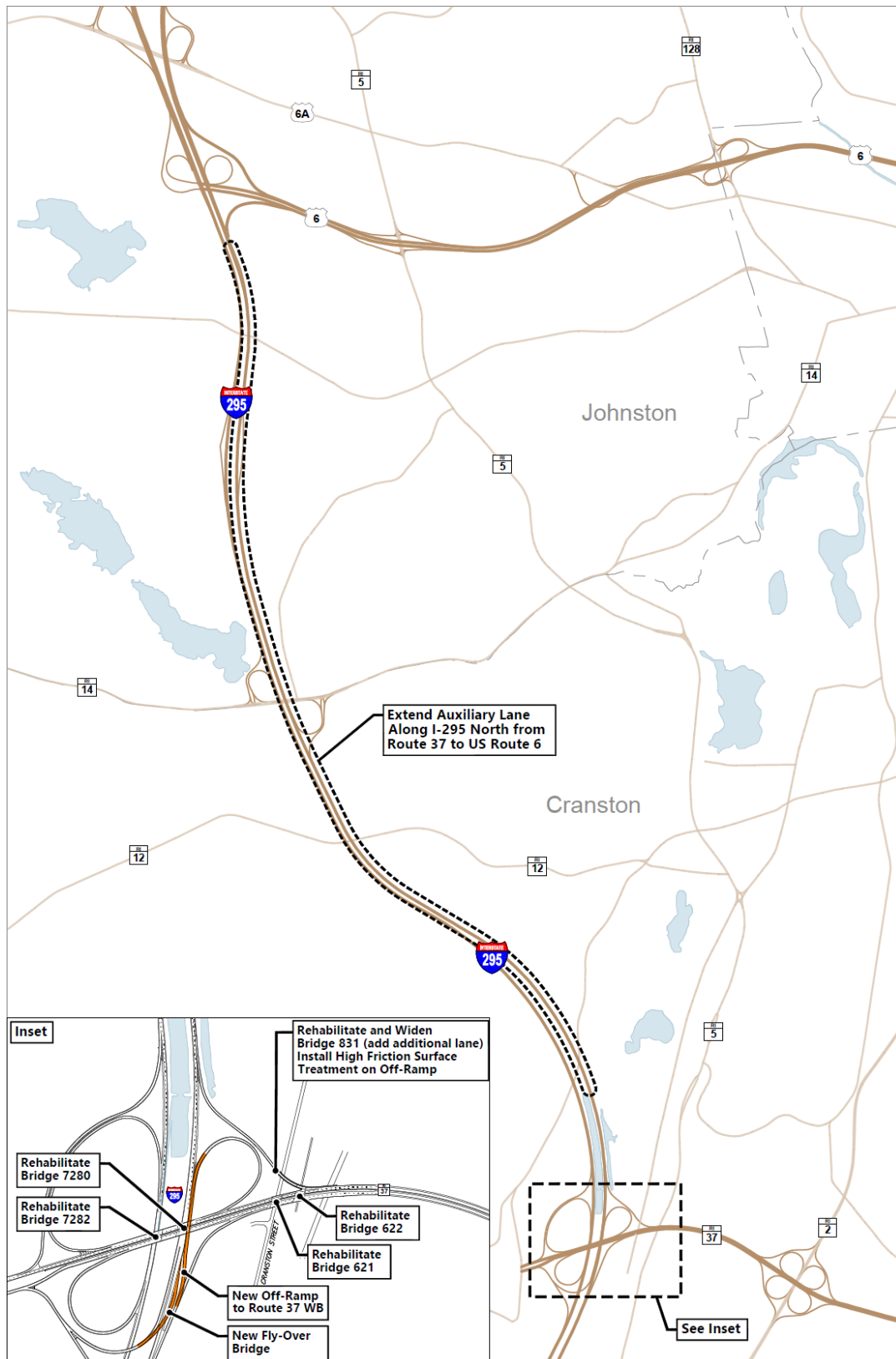
Although a 2017 TIGER grant covered a substantial portion of the Route 37 corridor, a significant amount of work remains, including the Canyon project's projected repair of more than 47,000 square feet of structurally deficient bridge deck, and much-needed safety improvements to the Route 37 / I-295 Interchange.

The Proposed Action will complete a full rehabilitation of the Route 37 corridor, work which directly aligns with the primary selection criteria outlined in the Notice of Funding Opportunity (NOFO) for the FFY20 BUILD program. This project will:

- 1. Foster a safe transportation system for the movement of goods and people** by installing additional lanes and high-friction surface treatments to eliminate 15 crashes annually;
- 2. Bring six (6) bridges up to a state of good repair**, repairing more than 47,000 square feet of deficient bridge deck in pursuit of the Department's primary objective, codified in RhodeWorks, to reach 90% bridge sufficiency by 2025;
- 3. Support economic competitiveness** by creating construction jobs in Rhode Island and improving system reliability for workers and freight traffic;
- 4. Promote environmental sustainability** by reducing congestion-related emissions and minimizing adverse impacts to local waterways; and
- 5. Improve the quality of life for Rhode Island residents** by improving access to essential services located on major routes throughout central Rhode Island, including RI-2, RI-37, and I-295.

The acceleration of effort to Open the Cranston Canyon will support the objectives both USDOT and RIDOT, improving access to critical infrastructure for all of Southern New England.

FIGURE 3 -- SUMMARY OF PROPOSED IMPROVEMENTS



The Bridges in the Route 37 / I-295 Corridor Must be Repaired

This project aims to bring five bridges deemed to be in Poor condition and one bridge rated at Fair condition into a state of good repair. These six bridges account for 47,215 sq. ft. of bridge deck area, 93 percent of which is accounted for by the five Poor-rated bridges.

According to inspection reports filed in 2018 and 2019, these bridges suffer from numerous issues, shown by figures in this section, including:

- Exposed and debonded rebar;
- Heavy rust and section loss in steel supports;
- Undermining of masonry plates exposing critical supports to rust;
- Isolated spalling; and
- Significant holes and gaps in deck with daylight visible from below.

Bridge 072801 accounts for the largest amount of deck area in this cluster at 12,368 sq. ft. During the bridge's most recent October 2019 inspection RIDOT identified isolated hollow areas with spalls and exposed rebar. As evidenced by Figure 3, the undermining of concrete is hazardous to steel girder supports. Similar deficiencies have been noted in the other bridge inspection reports. Bridge 072821 (11,021 sq. ft.) has similar spalling and leakage flaws in addition to several hollow haunches over the roadway.

Figures 5 and 6 illustrate the extent to which Bridge 062201's 9,752 sq. ft of deck surface and its supports are in Poor condition. Figure 5 shows a 12-foot long full-depth hole with a width of 4 inches and an adjacent 6-foot x 0.75-inch wide crack identified in the bridge deck in a September 2019 inspection.

Figure 6 shows that Bridge 062201 also has extensive tracts of exposed and debonded rebar with spalling and undermining on bridge bearings.

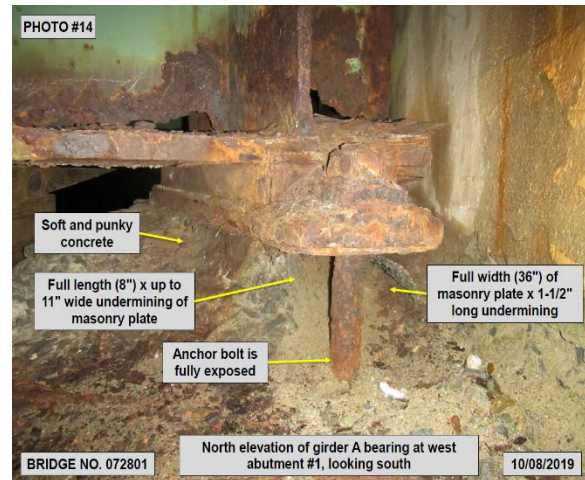


FIGURE 4 -- GIRDER A, BRIDGE 72801

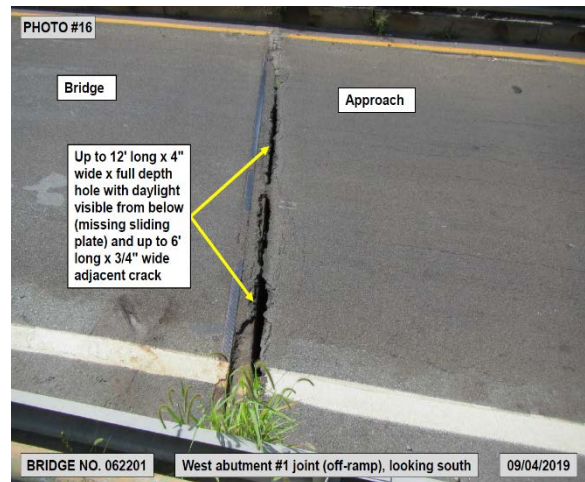


FIGURE 5 -- HOLE ON BRIDGE 622

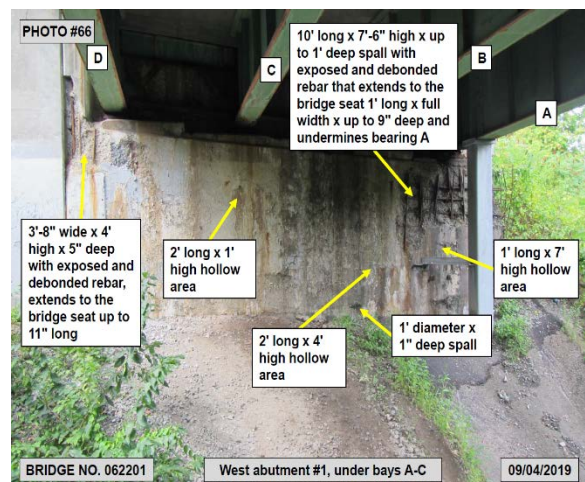


FIGURE 6 -- WEST ABUTMENT, BRIDGE 622

traffic moving northbound on I-295 through the interchange must navigate accelerating and decelerating drivers in both existing travel lanes.

To address this issue, the project will shift the ramp to the right side of I-295 North and add an additional travel lane to facilitate deceleration for traffic exiting to RI-37 East (Exit 3A) or West (Exit 3B). The auxiliary lane will be maintained on I-295 all the way to the Route 6 interchange, about 5 miles north. This additional lane will generate significant travel time benefits, increasing average speeds in the network from 30 to 53 miles per hour during the afternoon peak period.

Because Bridge 062001 and its companion bridges must be addressed, this project presents the ideal opportunity to shift this ramp, disturbing the area only once to generate two positive outcomes. As the Technical Feasibility section will detail, this project will employ strategic phasing schemes to minimize traffic delays and work zone closure impacts.

This project will also include two other critical safety improvements. First, the ramp linking Route 37 West to I-295 will be widened, with a second lane built off-alignment on the inside curve of the existing ramp. Currently a chokepoint prone to accidents, the Route 37 West to I-295 North interchange will be reconfigured to carry two full lanes, providing drivers with more space to exit Route 37 and enter I-295 more safely. In addition, the proposed construction phasing will allow the ramp to remain open during the complete construction period, rather than closing the ramp completely to do bridge repairs beneath it.

Second, just beyond the I-295 North exit ramp, this project will restripe Route 37 West approaching the signal at Natick Avenue to drop a lane, calming traffic exiting a high-speed limited access roadway and entering arterials and local roads. This improvement will visually transform the final segment of Route 37 West, encouraging drivers to reduce their speed at an earlier point and reducing the number of crashes resulting from failure to anticipate the oncoming signal.

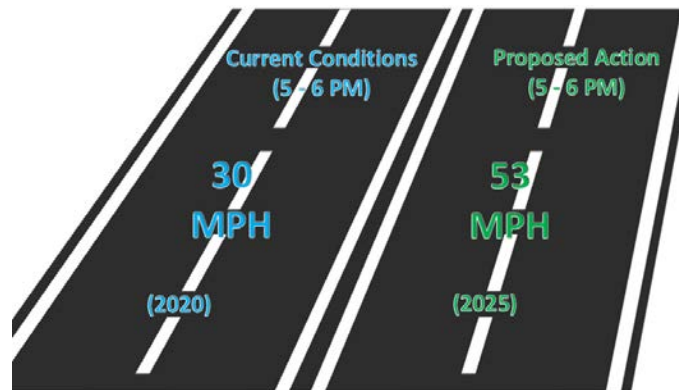


FIGURE 10 -- ESTIMATED SPEED IMPROVEMENT, PEAK HOUR

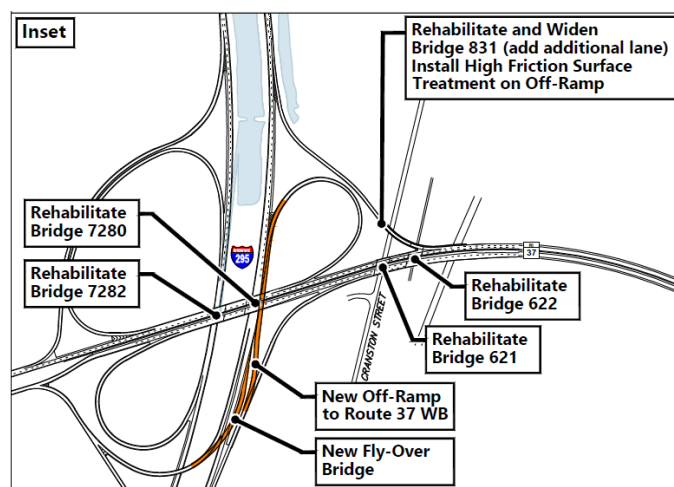


FIGURE 11 -- PROPOSED RAMP AND BRIDGE IMPROVEMENTS SUMMARY

II. Project Location

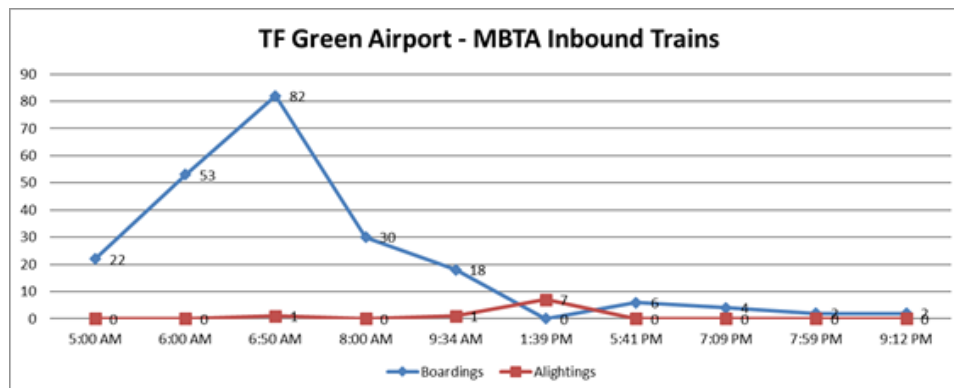
The “Opening the Cranston Canyon” project is in the geographical center of Rhode Island. All six bridges scoped to be repaired are in the City of Cranston, the second largest city in Rhode Island (behind Providence), with a population of more than 81,000. The estimated population density within a 2-mile radius of this project is 2,561 per square mile. This location is within the Providence, RI-MA Urbanized Area, as defined in the 2010 Census.

Route 37 begins at Natick Avenue in Cranston at the merge with RI-2, continuing to the RI-37W interchange with I-295, traveling northbound 4 miles to Route 14, Plainfield Pike, in Cranston, Rhode Island.

These routes provide connections to the MBTA Commuter Rail station and the air terminal at the T.F. Green International Airport in Warwick, just a few miles from the project area. A year ago, approximately 5,500 travelers departed from T.F. Green per day, and during the time of COVID-19 travel suspensions the airport sustained 27 scheduled daily departures, mostly from key carrier Southwest Airlines.

RIDOT notes that during the previous four quarters, on average 187 passengers boarded the TF Green station on peak trains inbound. Nearly 100% are destined for Boston.

FIGURE 12 -- TRAINS LEAVING TF GREEN BOUND FOR BOSTON, AM PEAK



State Route 2 is a large commercial center that includes the John O. Pastore Center, a 300-acre complex of more than 100 state-managed institutions and facilities, including the Department of Behavioral Healthcare, Developmental Disabilities and Hospitals (BHDDH), Department of Labor and Training (DLT), Department of Corrections (DOC), and the Division of Motor Vehicles (DMV.) More than 2,300 state workers commute to this complex by car each day, and thousands of visitors access it via all modes of transportation, including RIPTA buses, daily.

Located near to Route 37 is Garden City Center which has 500,000 square feet of retail and office space and is home to sixty retail stores, nine restaurants, and twenty-six offices. Chapel View center, which also borders Route 37, is another expanding mixed-use property with forty-five

different types of commercial business including retail stores, office spaces, restaurants, and condominiums.

The centerpiece of the project is Bridge Group 51B, located at the I-295 and RI-37 interchange, which includes the Cranston Street Ramp (Bridge #083101), Cranston Park RR (Bridge# 062201), Cranston Street (Bridge #062101), Cranston Park East (Bridge #072801), Cranston Park West (Bridge #072821) and Cranston Park Ramp (Bridge #062001.) All require major rehabilitation work, superstructure, and/or total bridge replacement.

The limits of the project extend north into the Town of Johnston to the interchange of I-295 and US-6. Throughout that five-mile stretch of interstate, this project will install an additional travel lane, which will serve to mitigate congestion during peak hours and reduce conflicting movements that emerge in the low-speed lane from accelerating and decelerating traffic. When the project is complete, it will provide a seamless link to US-6, which is currently undergoing its own transformation as a result of the 6/10 Interchange Project, the largest in RIDOT's history.

III. Grant Funds, Sources, and Uses of Project Funds

Project Budget

The "Opening the Cranston Canyon" project has an estimated all-in cost of \$85 million, including the completion of environmental review, design, construction, soft costs, and contingencies. The figures below provide a breakdown of the anticipated costs by phase, and element, and source.

FIGURE 13 -- PROJECT BUDGET BY PHASE

Task	Federal Fiscal Year (FFY)	Base Cost (\$M)	Contingency (\$M)	Total Cost (\$M)
Design and Preliminary Engineering	2021	\$ 1.750	\$ 0.250	\$ 2.000
Notice-to-Proceed & Construction Initiation	2022	\$ 3.250	\$ 0.500	\$ 3.750
Construction Phase 1	2022-2023	\$ 29.147	\$ 2.588	\$ 31.735
Construction Phase 2	2024	\$ 20.140	\$ 1.789	\$ 21.929
Construction Phase 3	2025	\$ 22.517	\$ 2.000	\$ 24.517
Project Closeout	2026	\$ 0.900	\$ 0.169	\$ 1.069
Subtotal		\$ 77.704	\$ 7.296	\$ 85.000

FIGURE 14 -- PROJECT BUDGET BY ELEMENT

Element	Base Cost (\$M)	Contingency (\$M)	Total Cost (\$M)
Design and Preliminary Engineering	\$ 1.750	\$ 0.250	\$ 2.000
Notice-to-Proceed & Construction Initiation	\$ 3.250	\$ 0.500	\$ 3.750
Bridge 062001--Preservation	\$ 3.190	\$ 0.223	\$ 3.413
Bridge 062101--Major Rehab	\$ 8.118	\$ 0.568	\$ 8.686
Bridge 062201--Major Rehab, Widening	\$ 11.294	\$ 0.791	\$ 12.085
Bridge 072801--Major Rehab	\$ 8.790	\$ 0.615	\$ 9.405
Bridge 072821--Major Rehab	\$ 8.702	\$ 0.609	\$ 9.311
Bridge 083101--Major Rehab	\$ 5.620	\$ 0.393	\$ 6.013
Ramp Realignment and Improvements, Route 37 East to I-295 North	\$ 14.090	\$ 1.384	\$ 15.474
Widening I-295, Route 37 to Route 6	\$ 12.000	\$ 1.793	\$ 13.793
Project Closeout	\$ 0.900	\$ 0.169	\$ 1.069
Subtotal	\$ 77.704	\$ 7.296	\$ 85.000

FIGURE 15 -- PROJECT BUDGET BY FUNDING SOURCE SHARE

Task	Federal/State Share (%)	Federal Share (\$M)	State Share (\$M)	Total Budget (\$M)
Design and Preliminary Engineering	80/20	\$ 1.600	\$ 0.400	\$ 2.000
Notice-to-Proceed & Construction Initiation	80/20	\$ 3.000	\$ 0.750	\$ 3.750
Construction Phase 1	80/20	\$ 25.388	\$ 6.347	\$ 31.735
Construction Phase 2	80/20	\$ 17.543	\$ 4.386	\$ 21.929
Construction Phase 3	80/20	\$ 19.614	\$ 4.903	\$ 24.517
Project Closeout	80/20	\$ 0.855	\$ 0.214	\$ 1.069
Subtotal		\$ 68.000	\$ 17.000	\$ 85.000

Previously Incurred Expenses

RIDOT has committed resources to this project since Early 2020. Professional consultants have also assisted in the design and development of the project. To date, RIDOT has spent approximately \$1 million on preliminary design, traffic analysis, and environmental review.

Future Eligible Costs

The future eligible cost of the Opening the Cranston Canyon project is estimated to be \$85 million. The current Rhode Island State Transportation Improvement Plan (STIP) includes \$53.75 million in future funds to support the project over federal fiscal years (FFY) 2020 to 2025.

Federal funds will support 80 percent of the cost of this project, a combination of BUILD Grant funds (\$25 million, or 29.4 percent) and federal formula funds (\$43 million, or 50.6 percent). The remaining 20 percent (\$17 million) will be financed by state match funds. The Project Scope, Schedule, and statement of work section describes the costs of each specific construction phase in additional detail.

Without BUILD grant support, it is unlikely that this project can be completed as described in this application. BUILD funding will enable swift, targeted intervention to complete the rehabilitation of this critical corridor, but without it, all six bridges included in this project will continue to deteriorate until they eventually need to be replaced at the lowest possible cost. That requirement would preclude RIDOT from including the safety improvements and traffic mitigation components outlined in the project description, which would effectively lock in the existing system deficiencies for decades to come. For this reason, the only way to ensure that the Route 37 corridor is completely repaired and transformed is to secure the requested BUILD support and act quickly to execute this project.

IV. Selection Criteria

Primary Selection Criteria

Safety

This project includes several roadway improvements which will provide greater safety and faster travel time along the Route 37/I-295 corridor. These improvements are expected to eliminate more than 15 crashes each year, generating a total safety benefit of more than \$1 million annually.

Among the issues this project would address:

- 1. Queueing and Congestion along I-295 North between Route 37 and Route 6** - The project will add a much-needed travel lane to the highly congested I-295 North area along the “ledge” of the Cranston Canyon, where 185 incidents occur annually, leading to a 24 percent reduction in crashes. As a result, northbound traffic on I-295 will

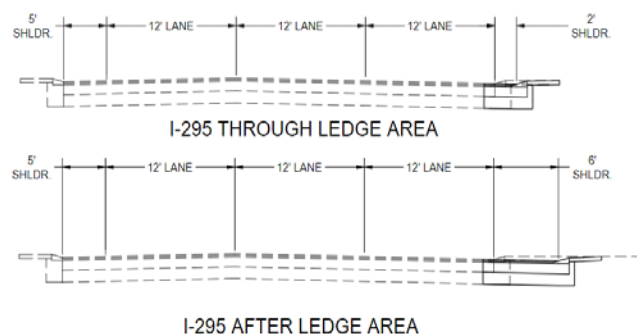


FIGURE 16 -- LANE EXPANSION AT CRANSTON CANYON

have three, 12-foot travel lanes available, while maintaining adequate shoulder for a breakdown lane.

2. **Lane Departure Crashes Due to Horizontal Curve: Route 37 Westbound to I-295 Northbound** – The countermeasure—installing a high-friction surface treatment—is expected to prevent 4 crashes annually, a 34 percent reduction. This area was the site of a [2014 incident that killed a 19-year-old woman](#).
3. **Bridge condition** – Five of the six bridges that encompass the “Opening the Cranston Canyon” project is in Poor condition; the sixth, in fair. One bridge, the Cranston Park RR Bridge, has a posted weight limit. Repairing these six bridges now will prevent further deterioration and eliminate the chances of a full closure for any of the structures, all of which carry traffic on or over the interstate system.



FIGURE 17 -- WEIGHT LIMIT, CRANSTON PARK RR BRIDGE

State of Good Repair

Although there is no national standard for a State of Good Repair, RIDOT has developed asset-specific definitions in coordination with the FHWA within its 2019 Transportation Asset Management Plan (TAMP). To facilitate this process, RIDOT inspects bridge assets on a regular basis according to their National Bridge Inventory (NBI) rating. According to FHWA, Rhode Island’s bridges rank worst in the nation. 22.21% of Rhode Island’s 1,162 bridges are rated as being in Poor condition. This includes 22.3% of the state’s 779 NBI bridges.

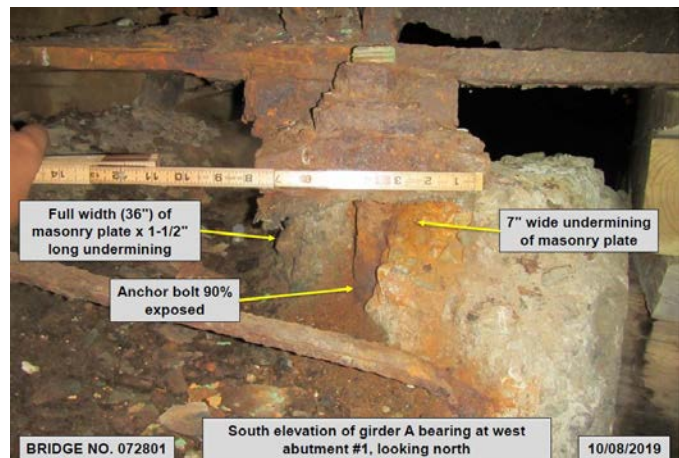


FIGURE 18 -- DAMAGE TO THE CRANSTON PARK EAST BRIDGE

All six bridges in the project area were built in 1969 and are now crumbling under increased vehicle volumes and freight demands. Five of the six; the Cranston Street Ramp, Cranston Park RR bridge, Cranston Street bridge, Cranston Park East and Cranston Park West bridges are rated Poor. The sixth, the Cranston Park Ramp, is rated Fair, which in keeping with RIDOT’s [TAMP](#) will be repaired before costs escalate as the bridge deteriorates.

Economic Competitiveness

Rhode Island is traversed by the I-95 interstate highway corridor, which with I-195 and I-295, comprise 70 miles of interstate highway serving as connectors between New York City, Boston, Western Massachusetts, Hartford, Connecticut, and Cape Cod.

According to the state's [2016 Freight Plan](#), two areas of the "Opening the Cranston Canyon" project are among the top 10 "Critical Urban Freight Corridors" in Rhode Island.

Route	Start point	Endpoint	Length
RI-102	RI-146	Lapham Farm Rd	7.4
RI-146	RI/MA Line	I-95	15.8
US-6	RI-116	I-295	3.5
US-6	I-295	I-95	5
RI-99	RI-122	RI-146	2.7
US-1A	Henderson St	Ernest St	1.2
Oxford St	US-1A	Eddy St	0.3
Eddy St	Oxford St	Ernest St	0.6
Ernest St	Eddy St	US-1A	0.3
Thurbers Ave	Eddy St	US-1A	0.3
RI-37	I-295, Exit 3A	US-1	2.5
US-1	RI-37, Exit 5B	T.F. Green Airport Connector Rd	1.3
Airport Rd	US-1	Commerce Dr	0.8
RI-2	I-95	RI-401	0.3
RI-104	RI-2	RI-4	0.4
RI-4	RI-402	US-1	6.7
RI-403	US-1	Commerce Park Rd	1
US-1	RI-4	RI-108	7.6
RI-138	US-1	Newport	8.7
RI-138	RI-2	US-1	6.6
Davisville Rd	RI-403	Thompson Rd	1.7
Total Urban Miles			74.7

Source: Rhode Island Statewide Planning

FIGURE 19 -- RI CRITICAL FREIGHT CORRIDORS

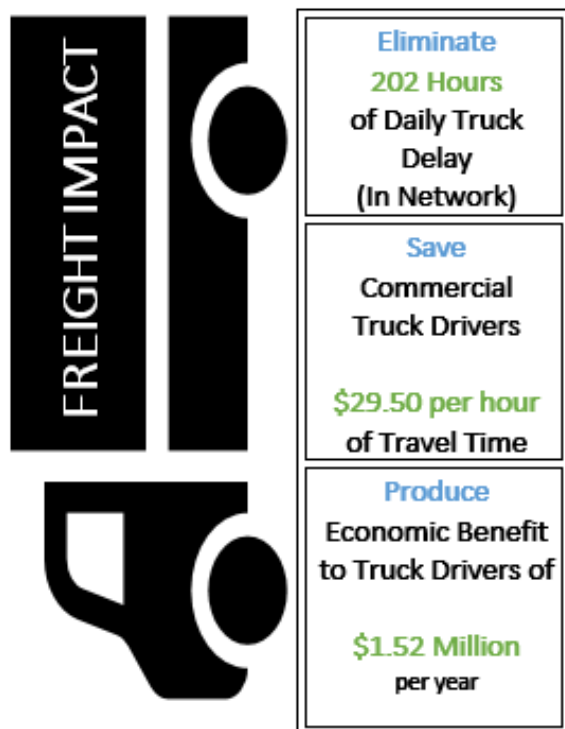


FIGURE 20 – ESTIMATED FREIGHT BENEFITS

Environmental Sustainability

With the improved traffic flow on the I-295/RI-37 corridor will come fewer vehicle emissions and greater air quality. This results in a decrease of pollutants across the project area. CO₂ is expected to decrease by 2,084 tons per year, NO_x will decrease by 0.3 tons per year, VOC decrease by 0.7

Congestion mitigation along the heavily traveled I-295/RI-37 commercial corridor – a western bypass highway utilized by large tractor trailers – will have a direct impact on the distribution of goods to the rest of the state, and improved road and bridge conditions will improve freight travel efficiency.

In addition, the congestion mitigation components of the project are expected to improve system reliability, reducing freight delay times by nearly 90 percent through the corridor over the next thirty years. With nearly 3,000 trucks traveling through the network on a daily basis, this project is expected to generate more than \$1.52 million annually in economic benefits to freight drivers and proprietors over the lifecycle of the project.

Lastly, the significant investment in the local area is also expected to create jobs both directly and indirectly, as detailed in the Benefit-Cost Analysis section.

tons per year, and PM2.5 will decrease by 0.3 tons per year. Over the life of the corridor, this project will generate more than \$5.48 million in cumulative emissions benefits.

Quality of Life

The Route 37 / I-295 corridor connects thousands of Rhode Islanders to essential services in Rhode Island, as well as shopping and recreation areas. Relieving congestion and improving traffic safety through the corridor will aid travel to and from essential destinations for Rhode Islanders. A Hurricane Evacuation Route for the cities of Cranston and Warwick, the project area is a critical access point near the border of Rhode Island's second- and third-largest cities, less than four miles from:

- T.F. Green International Airport, the 3rd-busiest airport in New England serving 4 million passengers annually;
- Multiple health care centers, including Kent Hospital;
- Garden City Center, the Rhode Island Mall, and the Warwick Mall, three of Southern New England's largest shopping centers;
- The Roger Williams Park Zoo in Providence; and
- The Narragansett Bay waterfront.

Secondary Selection Criteria

Innovation

Innovative Technologies

This project is being completed through a "Design-Build" procurement process. RIDOT will issue a Request for Proposals (RFP) encouraging potential applicants to be as creative and innovative as possible in their proposals. This process will ensure the use of multiple innovative techniques for each category listed below.

While the Cranston Canyon project is underway, it is essential to ensure that this highway stretch remains open for travel. The project will include innovative phasing techniques to minimize lane and ramp closures during construction. The Department is granting the relevant construction teams with the authority to make decisions as to how to properly utilize these technologies to keep the highway portion under construction moving as efficiently as possible, while also completing the project safely and effectively.

Innovative Project Delivery

It is anticipated that the project will utilize concurrent permitting and environmental review to accelerate the project's delivery. RIDOT expects that a Categorical Exclusion (CE) will be needed for this project. The project management team will utilize both concurrent review and approvals with the appropriate regulatory agencies to establish a project management plan with

detailed scheduling to ensure that the appropriate milestones are met. Additionally, the project management plan will conduct early pre-application consultations to properly integrate the environmental review, permitting and design. RIDOT does not anticipate permitting delays.

The construction phasing and traffic conditions will be monitored via RIDOT's Transportation Management Center (TMC), the state's hub of Intelligent Transportation Systems (ITS) and communication resources. Under the TMC Rhodeways program, road-side cameras are utilized to identify incidents on the highways and variable message signs provide real-time drive-time information to motorists. All construction phases will be monitored at the TMC.

Innovative Financing

This project will be financed by a combination of state and federal funding sources. The financing structure is straightforward: the requested BUILD grant will approximately 29.4 percent of the necessary funds to complete the project, while other state and federal sources will provide the remaining 70.6 percent.

This project is a necessary and prominent element of the RhodeWorks program, which is focused on providing the correct treatment to the right projects at the right time with the finite assets allocated to do so. Due to the multiple congestion and traffic safety issues created by the current structure of the Cranston Canyon bridges, this project needs to be addressed as soon as possible. The only way in which this project can be completed immediately is with the assistance of the BUILD Grant, which will generate two vital benefits:

1. The accelerated timeline proposed in this document will prevent unnecessary and expensive maintenance costs that would be generated by the no-build alternative for this project, incurred to preserve six aging structures that will require total replacement within the next few years; and
2. By accelerating this project's timeline, the Department can free up additional funding in future years to achieve the underlying goal of the RhodeWorks Program: achieving and maintaining a state of good repair on all of Rhode Island's bridges.

It should also be noted that the RhodeWorks program is a case study in innovative financing techniques and is a key driver of the Department's 10-Year Plan. The electronic tolling network, currently under construction, consists of 13 gantries that automatically toll certain large commercial vehicles. The proposed project is an important component of the RhodeWorks program, and a timely completion will help ensure that freight traffic flows freely throughout the state, aiding the collection of future toll revenues to support other projects.

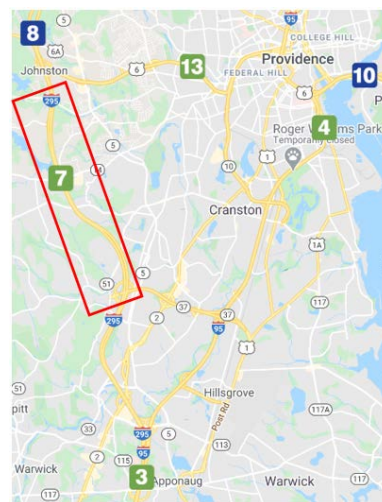


FIGURE 21 -- TOLL LOCATIONS
NEAR PROJECT AREA

Asset Management Innovation

Once again, this project is a crucial component of RhodeWorks, the basis for RIDOT's Ten-Year Plan and cornerstone of the Rhode Island STIP, implementing an asset management approach to achieving the desired state of good repair in a cost-effective manner. This approach accounts for lifecycle costs, including the future costs of allowing assets to further deteriorate. RhodeWorks is the basis for RIDOT's State Transportation Improvement Plan.

Principles of asset management and the sound management of lifecycle costs require the rehabilitation and redevelopment of this structure. The current state of the structure requires constant monitoring and frequent repairs, at the expense of using limited funding for other repairs and replacements to achieve a state of good repair for other projects in Rhode Island.

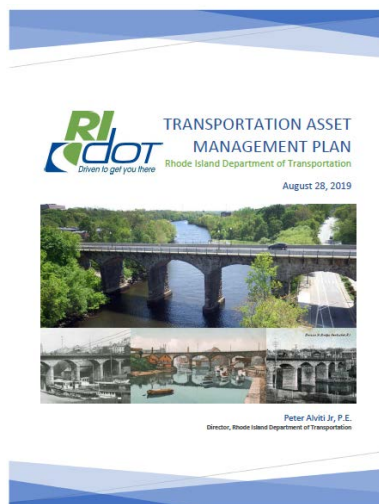


FIGURE 22 -- [RIDOT TAMP](#)

Partnership

The parties engaged as part of the project and subsequent BUILD application include federal, state, and local officials; RIDOT; the City of Cranston; the Town of Johnston; and the Federal Highway Administration (FHWA).

RIDOT is the lead applicant for this BUILD Grant and tasked with completing the project outlined herein. The Department will also coordinate with local officials to mitigate the possible impacts of construction on city streets and traffic flows.

FHWA will act as a monitoring entity in the process, ensuring that the necessary steps are taken leading up to and during construction to guarantee that the applicable guidelines are being followed.

V. Environmental Risk Review

Technical Feasibility

The major project milestones are as follows:

- | | |
|------------------------------------------------------|---------------------------|
| • Complete Preliminary Engineering and NEPA Process: | September 30, 2020 |
| • Advertise Project for Design-Build Procurement: | October 31, 2020 |
| • Select Design-Build Team and Award Contract: | February 28, 2021 |
| • Notice-to-Proceed to Design-Build Team: | May 31, 2021 |
| • Construction Begins: | April 30, 2022 |
| • Substantial Completion: | August 31, 2025 |

Engineering Design Studies and Activities

RIDOT is commissioning a design contract to advance the project through preliminary engineering. This effort will advance all elements of the project design (including but not limited to, highway, structural, traffic, drainage, utilities) to a level enough for RIDOT to advertise the project as a design-build contract. This includes plans, specifications, and estimates to a level equivalent to a 10 percent design review submission under a conventional design-build procurement approach. The selected consultant will also support RIDOT in the preparation and submission of permit applications, modifications, and extensions to the authorities having jurisdiction over the work.

Development of Design Criteria and Basis of Design

As stated in the Project Description section, this project is designed to address the crumbling bridge infrastructure and problematic ramp configuration at the Route 37 / I-295 interchange. The deteriorated condition of the six bridges in this project are the focus of these improvements, and the design outlined here aims to take advantage of the bridge work to install safety and traffic flow improvements as well. The basis for the design of this project is the need to correct the existing problems with the design of the RI-37 / I-295 interchange and restore six critical bridges to a state of good repair.

Basis for Cost Estimate

As shown in the Project Budget section, RIDOT estimates that the total future cost of this project will be \$85 million. This figure includes estimated future costs of design, construction, and contingencies.

Project Scope, Schedule, and Statement of Work

The “Opening the Cranston Canyon” project calls for repairing six bridges along I-295/RI-37 Corridor, shifting a left-lane on-ramp from RI-37 East to I-295 North, widening the ramp linking RI-37 West to I-295 North, and widening I-295 from the RI-37 interchange north to Route 6. Each phase of the proposed project is described in detail throughout this section.

Phase 1: Bridge Repair and Ramp Modifications

During the first phase of construction, traffic on Route 37 will be shifted to the inside lanes in both directions, allowing outside lane repairs to begin on bridges 072801, 072821, 62101, and 62201.

On the ramp linking Route 37 West to I-295 North, which is supported by bridges 062201 and 083101, off-alignment construction will begin on new inside lanes. Traffic on the ramps will remain open and unimpeded during Phase 1, after which traffic will be shifted onto the newly constructed inside lane so that repairs can begin under the outside lane during Phase 2.

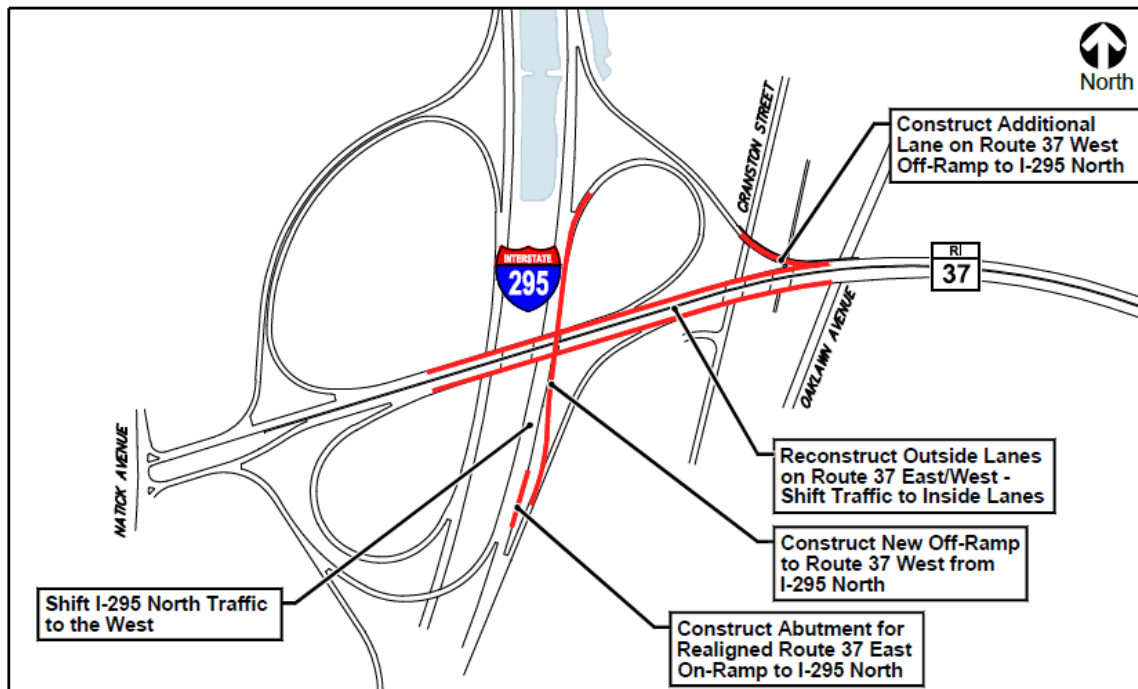


FIGURE 23-- PHASE 1 BRIDGE AND RAMP IMPROVEMENTS

Phase 1 will also include modifications to the existing off-ramp from I-295 North to Route 37 East, where a new split option lane will be installed to connect to Route 37 West. This will eliminate the need for a separate exit lane further north on I-295, eliminating a conflicting movement with the new travel lane.

Traffic on I-295 North will be shifted to the inside lane to allow work to the east of the interstate including some widening beneath bridge #072801 to accommodate the additional lane, and the construction of the east abutment to support the eventual flyover linking Route 37 East to I-295 North. Lastly, Phase 1 will include the first segment of the additional lane on I-295, beginning with a stretch from Route 51 to Route 12 (Scituate Avenue).

Phase 1 is expected to last one and a half construction seasons, beginning in the spring of 2022 and completing by the summer of 2023.

Phase 2: Inside Lane Repairs and Shoulder Closures

During Phase 2, construction on bridges 072801, 072821, 062101, and 062201 will continue, with traffic shifting to the newly reconstructed outside lanes on Route 37 in both directions so that the inside lanes can

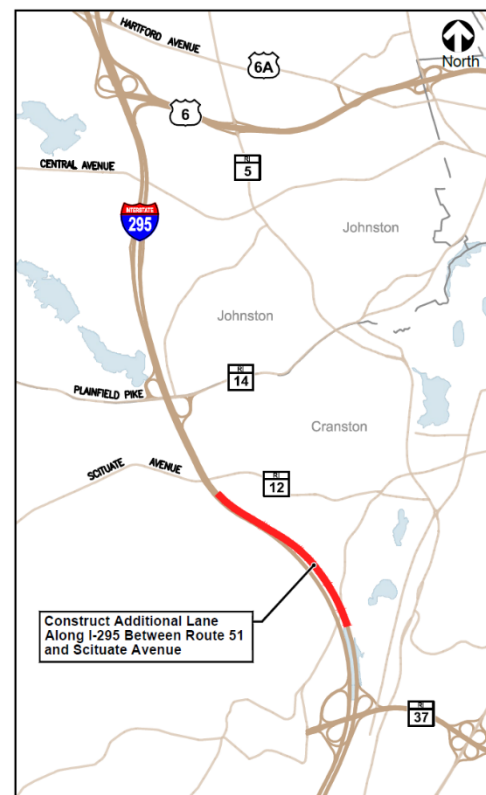


FIGURE 24 -- PHASE 1 WIDENING

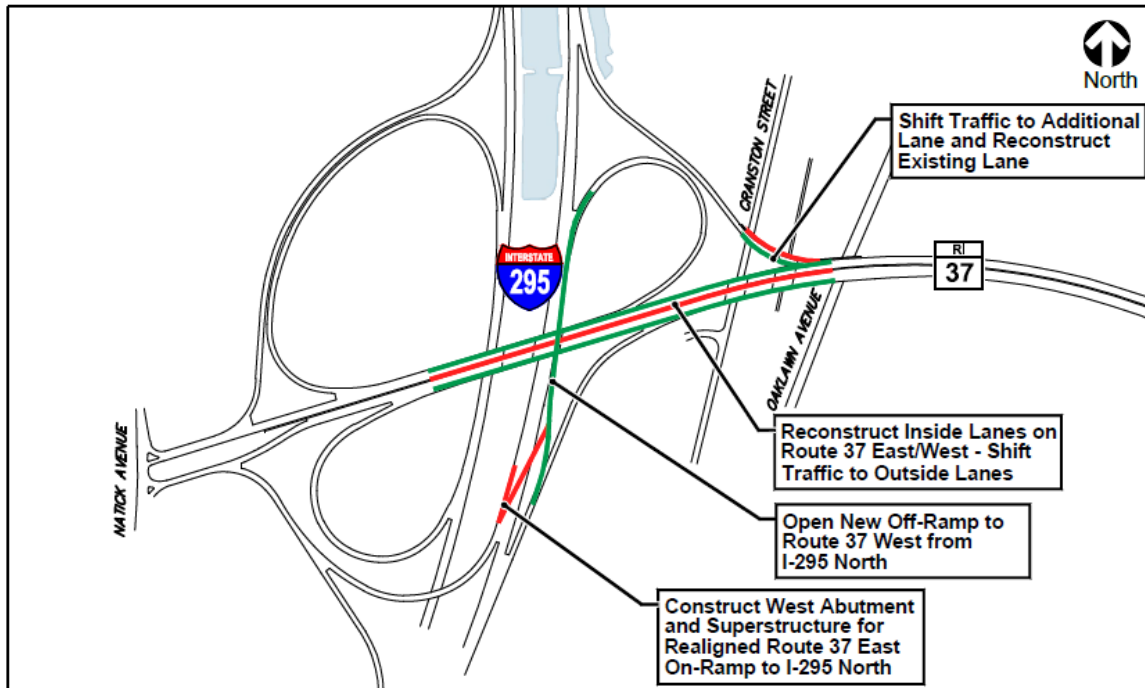


FIGURE 25 -- PHASE 2 BRIDGE AND RAMP IMPROVEMENTS

be repaired. On the ramp linking Route 37 West to I-295 North, traffic will shift onto the newly completed inside lane so that repairs to bridges 083101 and 062201 can begin beneath the outside lane.

The modified ramp linking I-295 to Route 37 East and West will be opened in Phase 2, preserving all movements in the existing design with safety improvements implemented. The shoulder on the eastern side of I-295 North will closed during Phase 2 while the west abutment and superstructure for the flyover linking Route 37 East to I-295 North are constructed. Temporary overnight detours and rolling roadblocks will be implemented as required to manage Northbound traffic on I-295.

Further north on I-295, construction of the additional travel lane will continue. With the segment from Route 51 to Route 12 completed in Phase 1, that segment will be opened to traffic and a second segment will be constructed from Route 12 to just north of the Route 14 (Plainfield Pike) interchange with I-295 North.

Phase 2 is expected to last one construction season, beginning in summer of 2023 and completing by summer of 2024.

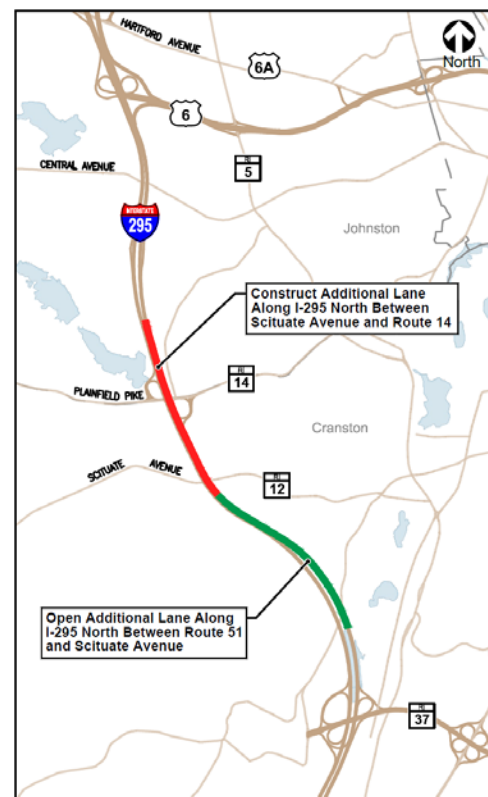


FIGURE 26 -- PHASE 2 WIDENING

Phase 3: Opening Bridges and Completing Tie-Ins

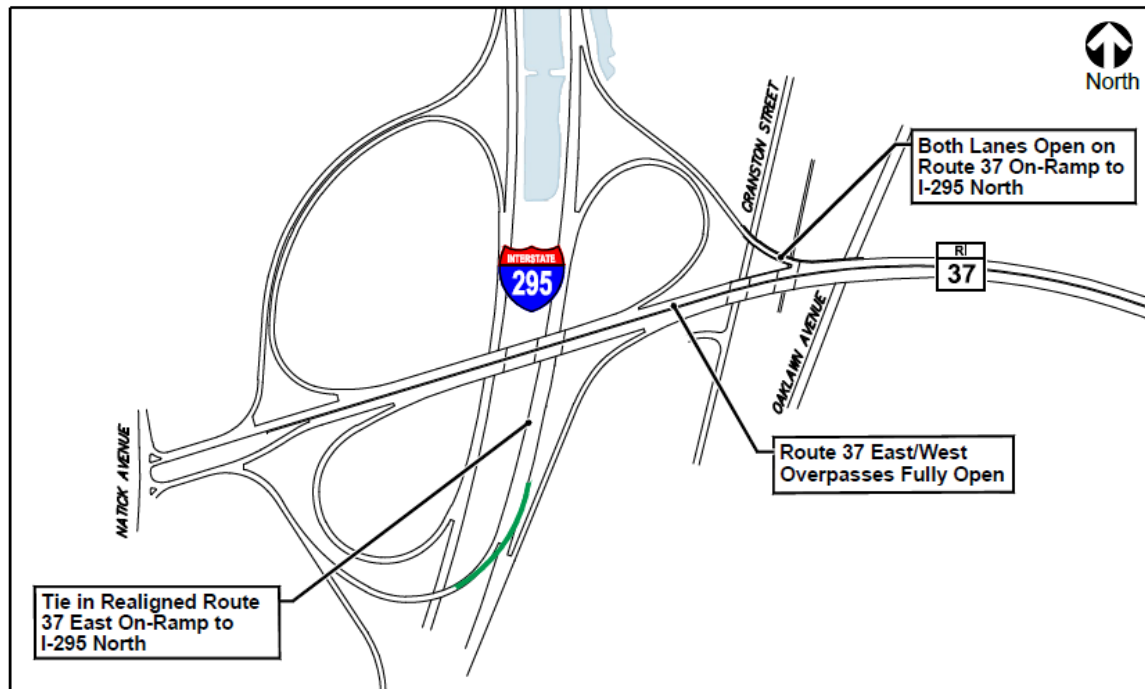


FIGURE 27 -- PHASE 3 BRIDGE AND RAMP IMPROVEMENTS

During Phase 3, all of the bridges on Route 37 will be completed and opened back up to traffic, with two lanes flowing freely in each direction. On the Route 37 West ramp to I-295 north, both lanes will be opened to traffic in their final configuration.

The new flyover linking Route 37 East to I-295 North will also be completed during this phase. To complete the tie-in from the flyover to the newly reconfigured ramps carrying I-295 North traffic to Route 37, the ramp will be closed for one week and a detour will be deployed for Northbound traffic on I-295 to access Route 37 East.

To the north in the Town of Johnston, the second segment of the additional lane will be opened to traffic and the final segment will be installed, stretching from Route 14 to the US Route 6 Interchange. At the end of this phase, all six bridges will be in state of good repair, the new configuration of ramps linking I-295 North to Route 37 will be fully operational, and there will be a new travel lane on I-295 from the Route 37 interchange to US Route 6. Phase 3 is expected to last one construction season, beginning in the summer of 2023 and completing by the summer of 2025.



FIGURE 28 -- PHASE 3 WIDENING

Environmental Permits and Reviews

RIDOT has completed a high-level evaluation of the proposed project and project scope in efforts to determine which environmental documentation is required to effectively and accurately evaluate the environmental impact of this project's construction and rehabilitation.

Following the provisions of the National Environmental Policy Act (NEPA), RIDOT's review has confirmed that a Categorical Exclusion (CE) is appropriate and necessary.

NEPA

Based on a preliminary review, the project is likely to qualify for a Categorical Exclusion (CE) as the project will not have significant individual or cumulative impacts to the interests protected by the National Environmental Policy Act (NEPA). The work included in this project most closely aligns with the following CE-eligible activities under 23 CFR § 771.117 (c):

- **Item 26:** Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes or parking lanes; and
- **Item 28:** Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.

Based on RIDOT's Noise Abatement Policy dated June 2, 2011, a noise study will be required for the project. The project includes the addition of a through traffic lane in two locations:

- The ramp from Route 37 West to I-295 North; and
- I-295 North from the Route 37 Interchange to the Route 6 Interchange.

The addition of a through traffic lane is considered a Type 1 project. Documentation of noise assessment may be required for an approval of a CE. Since the project is categorized as a Type 1 project, the project does not qualify as a programmatic CE. An individual approval from FHWA will be required.

It is anticipated that the project will occur within the operational right-of-way. It is anticipated that this project likely will not significantly impact social, economic, or sensitive environmental resources including, but not limited to, floodplains, wetlands, endangered species, wildlife habitat, historic and archaeological sites, parklands, air quality, noise, right-of-way, minority or low-income population, travel patterns, and environmental grounds.

Section 106

RIDOT's Cultural Resources Unit (CRU) has reviewed the project area for potential Section 106 mitigation issues. The CRU has identified two (2) known historic properties (archaeological sites) near the project area that are potentially eligible for the National Register: RI Site 628, and RI Site

2020. The CRU has also identified one cemetery—CR 103, the Alvin Warner Lot—and the project area is potentially sensitive for precontact and historic cultural resources.

The CRU has recommended that a Phase I archaeological survey be conducted in order to identify any historic properties within the Area of Potential effect. An archaeological survey would require coordination with the Tribal Historic Preservation Officer (THPO) from the Narragansett Indian Tribal Historic Preservation Office (NITHPO) and the issuance of an archaeological permit from the State Historic Preservation Officer (SHPO). If results of the Phase I archaeological survey indicate that additional archaeological survey work is required, the Section 106 process would either follow the standard procedure. If not, the project may be completed using the Section 106 Programmatic Agreement for Minor Transportation Projects.

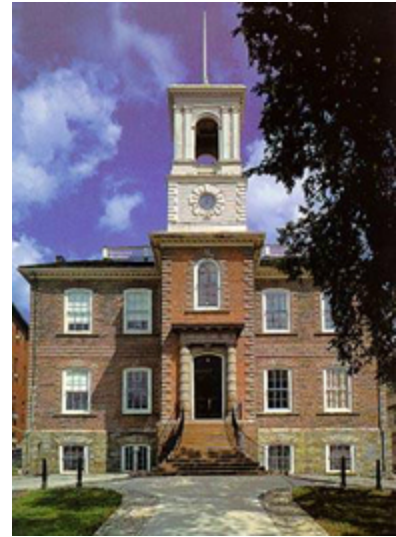


FIGURE 29 -- OLD STATE HOUSE,
RIHPHC HEADQUARTERS

Because the project as planned can anticipate coordination with several consulting parties, including the Narragansett Tribe, as well the potential for further archaeological survey, the project schedule outlined in this application anticipates a Standard Section 106 process.

Section 4(f)

William J. Flanders Park, a small playground featuring two youth baseball fields and restroom facilities, is located just north of the ramp linking Route 37 West to I-295 North. The lane that will be added to this ramp will be constructed on the ramp's south side, so it will have no impact on the park. In addition, Meshanticut State Park lies just east of I-295 North between Route 37 and Phenix Avenue (Route 51). The proposed lane addition to I-295 is not expected to have any impact on the park. In summary, RIDOT does not expect this project to have any Section 4(f) impacts.

Reviews, Approvals, and Permits by Other Agencies

The project will be required to follow the requirements from the Stormwater Consent Decree among RIDOT, USDOJ, and USEPA in coordination with Stormwater Management, Design, and Installation rules. The project will also coordinate with key stakeholders to manage interactions with Natural Heritage Areas near the I-295 interchange with Route 6 and prime farmland adjacent to the project areas. In addition, the following approvals or permits may be required:

- Rhode Island Dept. of Environmental Management (RIDEM) Water Quality Certification;
- Army Corp of Engineers Application (may include Programmatic General Permit (PGP)); and
- RIDEM RIPDES Construction General Permit (due to an anticipated soil disturbance >1 acre).

RIDOT and its scoping consultants have begun the process of reviewing utility coordination requirements in the project area. The figure below summarizes the locations and limits of utilities which will be addressed accordingly during design and construction.

FIGURE 30 -- SUMMARY OF UTILITIES IN THE PROJECT AREA

Type	Utility Company	Location/Utility Investigation Level
Phone	Verizon - Underground	<u>Bridge Nos. 062101 & 083101</u> - Buried beneath Cranston Street.
Cable	Cox	<u>Bridge Nos. 062101 & 083101</u> - Aerial wires along Cranston Street under the bridges. <u>Bridge Nos. 072801, 072821 & 083101</u> - Underground feed for RIDOT traffic cameras nearby. <u>Buried Service</u> - Adjacent to the right lane of I-295 northbound from Exit 6 (RI-14 Exit) to approximately 1/2 mile north of the exit which transitions to aerial above RI-14. <u>Aerial Service</u> - On the bridge carrying I-295 over RI-14 (#073201).
Fiber	OSHEAN	<u>Tolling Site No. 7</u> - On I-295 at I-295 Exit 7 to RI 14. <u>Tolling Site No. 8A, B, C & D</u> - On I-295 at I-295 Exit to US 6 & 6A.
Fiber	AT&T Fiber Optic	<u>Bridge No. 062201</u> - There is a buried service under and parallel to the Washington Secondary Trail.
Fiber	Crown Castle	Aerial facilities, Phenix Avenue bridge (#072901) over I-295.
Gas	National Grid - Gas	<u>Bridge Nos. 062101 & 083101</u> - 6" polyethylene pipe, Cranston St. The bridge carrying RI-12 (Scituate Avenue) over I-295 (#073101) also carries a pipe.
Electric	National Grid - Electric	<u>Bridge Nos. 062101 & 083101</u> - Aerial service above both bridges. <u>Aerial Facilities</u> -- Along and above the bridge carrying Phenix Avenue (#072901) over I-295.
Sewer	Narragansett Bay Commission	<u>Buried 12" Diameter PVC Pipe</u> - Along Route 6 under I-295.
Water	Providence Water Supply	<u>Bridge Nos. 62101 & 083101</u> - 8" Asbestos-Cement (Transite) pipe in Cranston Street near the bridges.
RIDOT	RIDOT Electrical	<u>Bridge No. 062001</u> - National Grid (NG) lighting conduit in the south parapet. <u>Bridge No. 062101</u> - NG lighting conduits in the center barrier of RI-37 in the EB highspeed lane. Overhead utilities running south to north under the bridge in front of Abutment # 2. <u>Bridge Nos. 062201, 072801, and 072821</u> - NG lighting conduits in the center barrier of RI-37. Conduits and handholes on EB highspeed lane. Light bases on and conduits in the north and south parapets. Utility conduit in Bay C of Bridge 072821. <u>Bridge No. 083101</u> - Overhead utilities running south to north under the bridge in front of Abutment # 2 and lighting conduit in the west parapet wall.
Transit	RIPTA	Route No. 30 runs along RI-5 (Oaklawn Avenue) under RI-37 which is less than 1/4 mile from Bridge Nos. 062101, 062201 & 083101. No bus routes run on RI-37, I-295 or other local roads below the bridges.

As design progresses, this project will aim to limit adverse impacts on the surrounding area as much as possible and reduce permitting requirements to streamline project delivery.

Discussions with DOT Field Office Regarding Compliance

RIDOT will work closely with FHWA-RI throughout the development and review process to ensure that the project meets all federal requirements and proceeds on-schedule.

Public Engagement

RIDOT will provide multiple opportunities for the general public to comment on the project details as the project moves forward. In accordance with Federal Highway policy, as listed in 23 CFR 771.105(c), “Public involvement and a systematic interdisciplinary approach are essential parts of the development process.” These requirements will be followed carefully by the Department, with support from FHWA and the relevant community stakeholders. The Department will continue to engage with local stakeholders throughout the life of this project.

State and Local Approvals

Aside from the permitting approvals listed in the prior section, no additional planning approvals are required for this project at this time.

Right-of-Way

All right-of-way required to complete this project is either owned by the State already, or in use for transportation purposes.

Federal Transportation Requirements Affecting State and Local Planning

This project is included in the Statewide Transportation Improvement Program for FFY2018-2027 with mixed funding sources. The project will secure all necessary federal approvals before construction begins.

Assessment of Project Risks and Mitigation Strategies

The most significant risk to this project is the disruption of northbound traffic flows on I-295 and traffic flows in both directions on RI-37. During peak hours, I-295 is frequently utilized as an alternate route by commuters who run into traffic on I-95, and Route 37 is a key connector to both portions of the interstate as well as local roads and principal arterials.

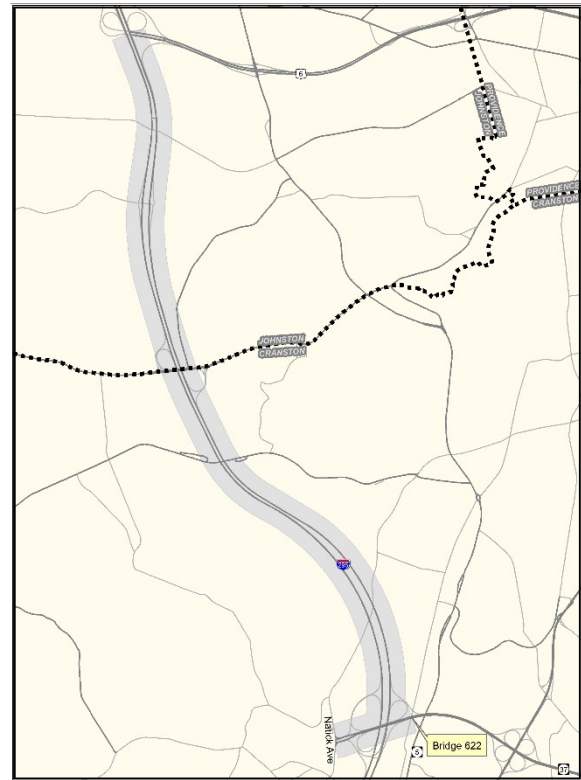


FIGURE 31 -- MAP OF PROJECT LIMITS

As described in the Project Scope, Schedule, and Statement of work section, this project will utilize off-alignment construction in all three phases to limit the number of lane shifts and ramp closures. Over three and a half construction seasons, one ramp is scheduled to be fully closed for a total of one week. In addition, lane shifts will be limited as much as possible, and the construction of additional travel lanes on I-295 to the north of the Route 37 interchange will progress concurrently with the bridge work, which should help to reduce bottlenecking during construction by opening up the corridor.

A second potential risk is the NEPA completion timeline. To accelerate this project, RIDOT is working on NEPA development, preliminary engineering, and the development of a Request for Proposals (RFP) for a design-build team concurrently, with the RFP scheduled to advertise in the fall of 2020. RIDOT is confident that the NEPA process can be completed before then, but if it cannot, RIDOT will include language in the RFP stating that Final Design cannot begin until NEPA is complete. The Department has had success with this approach to NEPA risk mitigation in the past, most notably in the development of the Washington Bridge Rehabilitation and Redevelopment project which was awarded \$25 Million in BUILD grant funds in November 2019. The project is proceeding on time and on-budget.

VI. Benefit-Cost Analysis

The Opening the Cranston Canyon Project has a favorable Benefit-Cost Ratio of 3.26 and a net present value (NPV) of \$203.03 million. Therefore, it is a cost-effective investment. RIDOT's analysis has indicated substantial benefits from this project in the areas of public safety, emissions, travel time savings, and job creation. In addition to the above, this project will bolster RIDOT's efforts to pursue its goal of achieving 90 percent bridge sufficiency by 2025.

The following figures summarize the overall benefits and costs of this project. The benefit-cost analysis (BCA) for this project assumes a 7% discount rate with an alternative yearly discount rate of 3%. Calculations for both are shown.

FIGURE 32 -- PROJECT BENEFIT-COST SUMMARY

Benefit Evaluation Period (Years, post-substantial completion)	30
Primary Discount Rate:	7%
Alternative Discount Rate:	3%
Present Value Benefit (7%):	\$ 292,835,798.62
Present Value Cost (7%):	\$ 89,802,031.88
Project Benefit-Cost Ratio (7%):	3.26
Net Present Value (NPV) (7%)	\$ 203,033,766.74

FIGURE 33 -- PROJECT BENEFIT-COST DETAIL

Present Day Total Foregone Cost Savings (Development and Construction Years Only):	\$162,240,000.00
Present Day Total Job Creation Benefits (Development and Construction Years Only):	\$7,470,527.49
Sub-Total Average Annual Benefit w/ INFRA (Development and Construction Years Only):	\$21,213,815.94
Present Day <u>Total</u> Future Benefit (Safety, Travel Time, Emissions):	\$1,065,673,660.29
Sub-Total <u>Average Annual</u> Benefit, Post Build w/ INFRA (Post-Substantial Completion):	\$35,522,455.34
Present Day Total Construction Costs:	\$77,704,000.00
Present Day Work Zone Impact Cost:	\$33,655,976.78
Sub-Total Average Annual <u>Cost</u> w/ INFRA (Construction Years Only) *:	\$13,919,997.10
Present Day <u>Total</u> Future Maintenance and Operations Costs:	\$11,862,500.00
Sub-Total <u>Average Annual</u> Cost, Post Build w/ INFRA (Post-Substantial Completion):	\$395,416.67

Safety Benefits

This project aims to correct three major safety issues: congestion along I-295 North, lane departure crashes on Route 37 approaching I-295, and high-to-low speed transition crashes on Route 37 West approaching Natick Avenue.

The installation of an additional travel lane through the canyon will reduce congestion-related queueing, eliminating a significant number of possible injury crashes and reducing crashes overall by an estimated 24 percent. The addition of a high-friction surface on the approach from Route 37 West to I-295 North is expected to reduce crashes by approximately 35 percent, including fatalities, and the widening of the same ramp will ease traffic flows through the corridor and improve visibility. Finally, restriping and signing the last segment of Route 37 West will encourage earlier deceleration, reducing speeds approaching the signal at Natick Avenue.

The total annual safety benefit derived from this project is estimated to be approximately \$2.15 million per year.

Emissions Benefits

Improvements to traffic safety and operations will allow daily vehicle hours traveled (VHT) to decrease from a weighted average hourly delay per vehicle of 0.068 hours to 0.009 hours. This

savings of 0.059 hours per vehicle drives increase average speed and decreases emission rates proportionally to that speed increase and congestion alleviation. In turn, the cost impact resulting from an increase to vehicle miles traveled (VMT) driven by increase speeds is offset by the cost-alleviation of reduced congestion and higher speeds.

CO2, VOC, PM10, and PM2.5 emissions will all decrease annually. The weighted average annual savings of this project is estimated to exceed \$176,000 per year.

Travel Time Savings

RIDOT anticipates that improvements made by this project will alleviate traffic congestion and improve traffic flow through I-295 in the Cranston Canyon. Traffic analyses conducted for this application indicate that the network has a usual congestion index of 1.40, indicating that commuters are stuck in traffic for 40 percent longer than they would be under free-flowing conditions.

In the first year of completion (2025), the baseline improvements will be **\$13.4 million under the proposed action condition**. The following year, 2026, marks the first full accrual period of time-travel savings and benefits. Over 30 years, time travel savings are anticipated to increase. The total travel time cost savings derived by this project amount to **\$863.49 million, with average yearly benefits of \$28.78 million**.

Job Creation Benefits

Opening the Cranston Canyon will provide direct and indirect boons to job creation. RIDOT anticipates 1,105 job-years resulting from this project with the creation of 58 new jobs. The net value of job creation benefits is expected to be **\$7.47 million**.

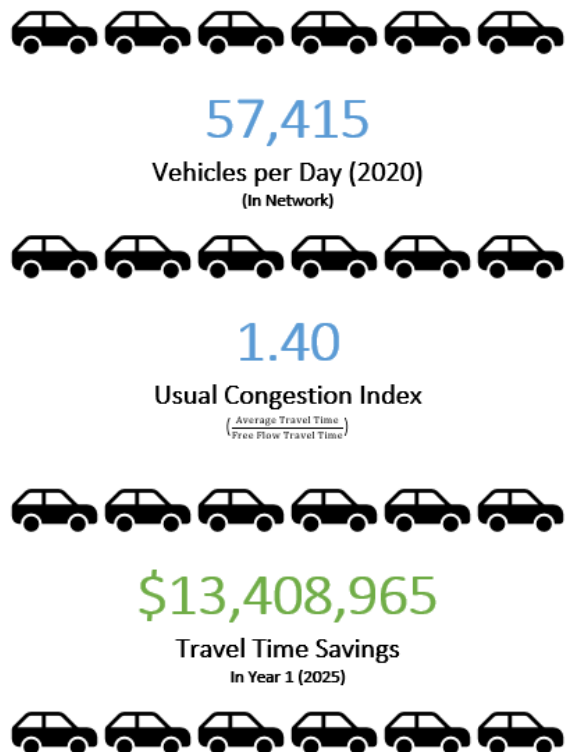


FIGURE 34 -- SUMMARY OF TRAFFIC FLOW IMPROVEMENT PROJECTIONS