

2016 NYC DOT Bridges & Tunnels Annual Condition Report

NEW YORK CITY DEPARTMENT OF TRANSPORTATION DIVISION OF BRIDGES 2016 BRIDGES AND TUNNELS ANNUAL CONDITION REPORT



Bridge Painting Crew Pausing During the Removal of Graffiti From the Plaques on the Williamsburg Bridge in October 2016 – Bridge Painters John Gallagher and Joice White, Deputy Director of In-House Painting Earlene Powell, Bridge Painters Samuel Tejada and Konstantinos Issidoridis, Supervisor Bridge Painter Goncalo Lima, and Bridge Painter Steven Walsh in Front.. (Credit: Sammy Miraglia)

Bill de Blasio, Mayor

Polly Trottenberg, Commissioner

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Strategic and Agency Services**

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Cover Photograph

Project progress in 2016: Repairing the current Mill Basin Bridge in March, Civil Engineer Tiffany Wong on the protective shielding of the Brooklyn Bridge in May (Credit: Andrew Hoang), erecting steel of the new Mill Basin Bridge in July, exposing the old decking of the Trans-Manhattan Expressway Connector Ramp in January, cleaning the stone walls of the Highland Park Pedestrian Bridge in August, and installing formwork at Harlem River Drive at 127th Street in October.

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A Message from the Commissioner



Dear Friends,

On behalf of the many dedicated men and women who staff the Division of Bridges, I am pleased to present the 2016 Edition of the New York City Department of Transportation's Annual Bridges and Tunnels Condition report as mandated under the New York City Charter. This report provides DOT with an opportunity to display the many innovations and improvements that the Division of Bridges achieved in 2016.

DOT focuses on equitable service delivery through its maintenance of critical transportation infrastructure and its commitments to safety and mobility for all New Yorkers. DOT focuses on providing all its services, including bridge maintenance, in an equitable manner.

The Division of Bridges includes 818 hard working professionals who manage the City's Capital Bridge Program, conduct bridge inspections and monitoring, and keep the entire bridge network in a state of good repair. Our inventory includes the iconic East River Bridges, Harlem River Bridges, the Belt Parkway Bridges and pedestrian bridges and elevated roadways across the five boroughs.

DOT conducts regular maintenance of its bridges to prevent decay. Regular maintenance and strategic repairs can extend the useful life of our structures, increase the interval between major rehabilitation projects, and save money over the long term. This life cycle approach to maintaining our assets also increases safety and protects against unplanned bridge closures that can disrupt the street network.

To underscore the critical importance of infrastructure investment, City, State, and Federal governments contributed more than \$5 billion to bridge reconstruction over the past years. As a result, all of our 794 bridges are rated "Fair" or above.

Several large bridge rehabilitation contracts kicked off in the summer of 2016. The Westchester Avenue Bridge, over the Hutchinson River Parkway in the Bronx, has been a persistent target of bridge strikes from trucks exceeding height limits. This \$42 million rehabilitation will provide additional clearance. The reconstruction contract for Park Avenue Tunnel in Manhattan, funded at \$28 million, also began this past summer.

The Ed Koch - Queensboro Bridge, built in 1909, carries an extraordinary daily volume of over 174,000 cars and trucks between Manhattan and Queens. This is the busiest of the East River bridges. Design is well underway for the total replacement of the Ed Koch - Queensboro's upper roadways—including the superstructure, approach roadways, barriers, and utilities—at an estimated cost of \$315 million. The agency is working closely with the MTA-NYCT to coordinate all bridge contract work with the L train tunnel closure. This effort includes scheduling pre-construction activities and complex off-site deck panel fabrication during the periods of the major tunnel closure.

The present construction plan limits traffic closures to one lane for the duration of the contract and additional single lane closures only during off-peak periods.

In Brooklyn, we are studying how to rehabilitate and reconstruct the 21 interconnected bridge structures that carry the Brooklyn Queens Expressway from Atlantic Avenue to Sands Street, including the “triple cantilever” stacked section of highway completed in 1948, topped by the iconic Brooklyn Heights Promenade. With no reconstruction work in recent history, the triple cantilever is in need of major repair with many components experiencing significant deterioration. These structures serve as Brooklyn’s only interstate and one of the most heavily traveled roads in New York City. At peak hours, 18% of the Brooklyn Queens Expressway traffic is trucks, which the surrounding street network could not serve. In addition to replacing this crumbling infrastructure, the proposed project will eliminate substandard conditions and bring the roadway up to current safety standards by building wider lanes and full width safety shoulders. To reduce the project’s cost by as much as \$100 million and its duration by nearly two years, DOT hopes to use the design-build procurement approach. In 2016, we hired consultants to conduct an extensive inspection of the structure, at a cost of \$8.1 million. This inspection, now complete, evaluated areas typically not accessible during the biennial NYSDOT inspections. The inspections concluded that while load ratings for the most part are acceptable, the rehabilitation/replacement project must begin now to ensure long-term safety and avoid service disruptions in the next 10-12 years.

In 2017, we will see more significant repair work for our bridge structures in greatest need including Unionport Bridge in the Bronx, Broadway Bridge over the Harlem River, and the Henry Hudson Parkway over 72nd Street.

The Unionport Bridge carries the Bruckner Expressway over Westchester Creek, is a movable bridge, one of 24 that New York City maintains and operates. The new bridge will include a widened structure and ensure a long life span. It will include a complete replacement of the movable leaf and approach spans, providing six 12-foot traffic lanes, 10-foot shoulders, and a 5-foot sidewalk and 10-foot bike lane on the south side of the bridge. There will be a new control house, new utilities, new machinery, new fender system, new street lightings and signals.

The overall State of Good repair program continues on the Brooklyn Bridge, the most iconic bridge in our inventory. On July 2, 2014, a summer thunderstorm resulted in a collapse of a portion of the granite fascia walls at Prospect Street and Washington Street in Brooklyn. During the removal of the material and the subsequent complete inspection of all of the granite walls, additional areas were identified that were compromised. All of the loose and unsecured stone was removed to a staging area for possible reinstallation. The \$20 million repair project is scheduled to begin in late 2017, and includes the removal and replacement of the remaining masonry cladding at the walls and abutments including the removal and resetting of capstones, the removal and replacement of sidewalks along the walls, and the repair of spalls on walls as necessary. During the design phase, the original stone quarry from the 1800’s that sourced granite for the original construction was located and was confirmed as remaining in operation. Where possible all existing granite will be reused and where new granite is needed, as much as possible it will be sourced from this quarry.

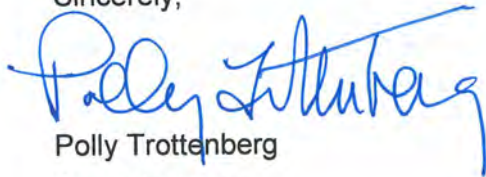
Many other accomplishments are outlined in the pages ahead, but there is even more important work to be done. The Independent Budget Office recently reported that a significant number of bridges are now rated at the low end of “Fair”, meaning their need for rehabilitation is fast approaching. All of the East River Bridges are well over 100

years old, requiring continual care and attention. The remaining network of over 700 bridges serving neighborhoods across the city are subject to the continuing effects of heavy traffic and rough winters with long cycles of ice, snow, rain, sleet and de-icing activities. Aside from the East River and Movable Bridges, a replacement program of 16 bridges per year needs to be in place to maintain a 50 year life cycle. The current average life of our bridges exceeds 70 years. For New York City to create jobs and opportunities for our residents, and maintain its competitiveness with other leading global cities, we need to invest in our infrastructure.

Currently DOT is required to use the traditional design-bid-build process, which can be particularly time consuming and costly on large infrastructure projects. To help speed up our capital process, DOT is continuing to pursue authorization from New York State to use design-build contracting, a method of project delivery in which design and construction services are procured under one contract. By overlapping the design and construction phases, design-build increases the accountability of contractors and shortens the delivery schedule, thereby reducing schedule and budget risk for the asset owner. This approach typically achieves a time savings of one to two years when compared to the traditional procurement process. DOT estimates that use of design-build could achieve savings of nearly \$250 million across nine bridge projects.

DOT is committed to preserving all of the City's bridges; they are crucial links in our transportation network and support millions of multi-modal trips each day. The Agency has a rich tradition of bridge design, construction, maintenance and administration, and will continue to use its resources and attract additional funds to provide safe spans that meet the needs of all 8.4 million New Yorkers.

Sincerely,



Polly Trottenberg

Commissioner

Inventory

In calendar year 2016, the inventory of bridges under the jurisdiction of the Division increased to 794. NYCDOT owns, operates, and/or maintains 765 non-movable bridges, 24 movable bridges, and five tunnels. Over the past 10 years, there has been a decline to zero in the number of bridges rated “Poor,” and an increase in the number of bridges rated “Good,” as shown below.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Poor	3	3	4	4	3	1	1	0	0	0
Fair	459	455	456	462	459	460	456	456	458	461
Good	215	213	209	207	215	212	217	221	228	224
Vgood	111	116	116	113	109	114	114	111	102	107
Closed	1	1	1	1	1	1	1	1	1	2
	789	788	786	787	787	788	789	789	789	794

¹In 2009, the newly “Poor” rated Hill Drive Bridge in Prospect Park was closed to vehicular traffic. In 2009, 93 of the Parks bridges accounted for 20.4% of the “Fair” rated structures. In 2013, 100 of the Parks bridges accounted for 21.9% of the “Fair” rated structures.

²In 2014, 104 of the Parks bridges accounted for 22.8% of the “Fair” rated structures.

³The bridge ratings reflected here are the ratings from the 2015 annual report with the exception of the bridges inspected by in-house NYCDOT forces (pedestrian bridges). The NYS bridge condition rating system is being converted to a federal system developed by AASHTO and there is no current acceptable formula to translate the results of inspections performed in 2016 into the traditional NYS ratings. The condition ratings will be updated in the 2017 annual report.

NYCDOT has no bridges rated “poor.”

Contract Acceleration

Acceleration measures are a contract provision used in some reconstruction projects that is implemented through a contract pay item. This contract provision provides a mechanism to implement measures to accelerate the contractor’s work to maintain critical path milestones. This provision does not apply to measures undertaken by the contractor to make up for time it lost in the progress schedule. Only the NYCDOT representative invokes this provision when the contract schedule is compromised due to unforeseen conditions during construction that are out of the contractor’s control, and when it is deemed in the City’s interests to accelerate.

Incentive and disincentive (I/D) clauses are another contract provision used in some reconstruction projects that are implemented through a contract pay item. Under this provision, the contractor is compensated a certain amount of money for each day if the identified work in a critical milestone is completed ahead of schedule and is assessed a deduction for each day the contract overruns the allocated time. The amounts for the I/D clauses are based upon such items as traffic safety, maintenance and road user delay costs, Resident Engineering & Inspection (REI) expenses and cost of traffic enforcement agents. These amounts are implemented in accordance with guidelines established by Federal Highway Administration (FHWA).

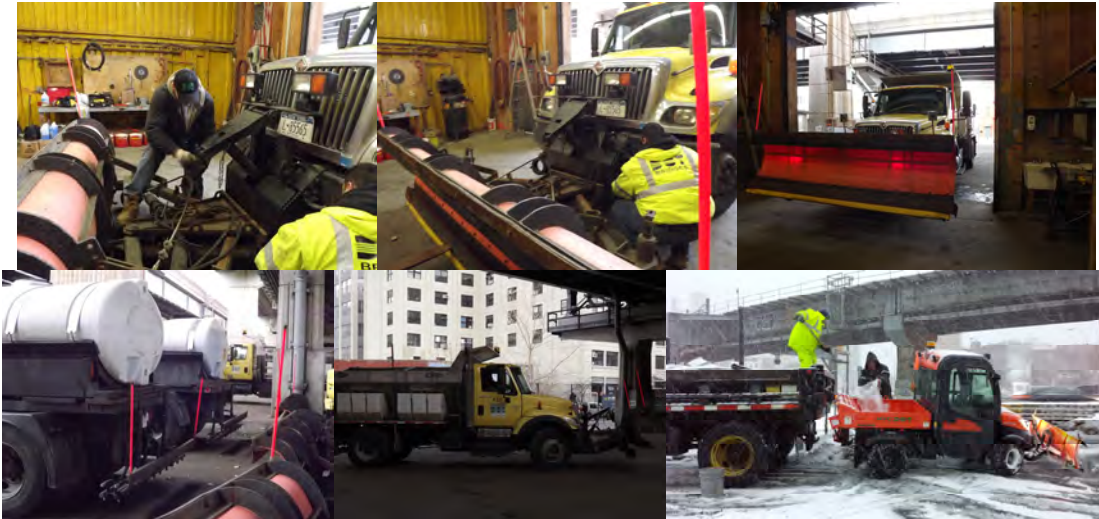
East River Bridges Anti-Icing Program

The Division’s Anti-Icing Program uses the liquid chemical potassium acetate and aggregate chemical sodium acetate. The anti-icing fleet consists of twenty-two application trucks, five plow trucks and several smaller plows. Ten of the spray trucks are combination spray/plow trucks with a 1,000 gallon tank capacity, and five are spray-spreader/plow trucks with a 360 gallon spray

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capacity, and a nine cubic yard spreader capacity. There are twenty chemical storage tanks, with a total storage capacity of 114,250 gallons.

In the winter of 2015 - 2016, a total of 7,750 gallons of potassium acetate and 109 tons of sodium acetate were applied on the roadways of all four East River Bridges.



Preparing the Plows and Spray Trucks. (Credit: Thomas Whitehouse) Loading Solid Chemical for Spot Applications on the Williamsburg Bridge Walkway/Bicycle Path. (Credit: Paul Schwartz)

Marine Borer Remediation

In October 1999, the Department began a study to assess the present damage caused by marine borers as well as the potential for future damage at several waterfront DOT structures, including the supporting structures of the relieving platforms along the FDR and Harlem River Drives, and the timber piles and structures of the Carroll Street and Ocean Avenue bridges in Brooklyn. The underwater inspection of timber piles supporting the FDR Drive began on May 8, 2000. Inspection of the Brooklyn sites was conducted during the week of October 23, 2000. The inspections were completed in October 2000, and the Marine Borer Evaluation Report was published in June 2001. Using the results of the underwater inspections, preliminary plans were developed for the implementation of repairs and remediation measures to protect the structures from attack. These preliminary plans were completed in December 2001. An updated underwater inspection was performed within the limits of the proposed contract in 2009. The construction work commenced in April 2012, and was expected to be complete in August 2016. However, the construction activities will be extended to March 2017, due to site condition and change in scope.

2016 Awards

In 2016, the outstanding work of the Division was recognized by the receipt of several awards.

In March 2016, the American Council of Engineering Companies of New York selected the Manhattan Bridge Cables and Suspenders project (Contract #14) for a Diamond Award in the structural systems category in its 2016 Engineering Excellence Awards. In addition, the construction of the Belt Parkway Bridges over Paerdegat Basin was selected for a Platinum Award in the transportation category, and the Greenpoint Avenue protective coating project was selected for a Silver Award in the special projects category. The Agency also received an Award of Merit for their dedication to improving the infrastructure of New York City, including allocation of

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funds to bridge rehabilitation.

In April 2016, American Council of Engineering Companies selected the Manhattan Bridge Cables and Suspenders project (Contract #14) for a national Grand Award in its 2016 Engineering Excellence Awards.

In June 2016, in recognition of his outstanding contributions to the status of the civil engineering profession, Civil Engineer Jagtar Khinda was presented the Herbert Howard Government Civil Engineer of the Year award by the Metropolitan Section of the American Society of Civil Engineers.

The dedication and hard work of all members of the Division ensures that the Department is stronger than ever and more capable than ever to meet the challenges of maintaining a diverse and impressive bridge infrastructure.