

NYCDOT Bridges & Tunnels Annual Condition Report 2010



**NEW YORK CITY DEPARTMENT OF TRANSPORTATION
DIVISION OF BRIDGES
2010 BRIDGES AND TUNNELS ANNUAL CONDITION REPORT**



Work Platforms for Cable Rewrapping on Cable C of the Manhattan Bridge and Painting Containment and Shielding on the Brooklyn Bridge in August 2010.
(Credit: Bojidar Yanev)

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Cover Photograph

New Willis Avenue Bridge Swing Span Passing Under the Queensboro Bridge on July 26, 2010.
(Credit: Judith Berdy - Roosevelt Island Historical Society)

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A Message from the Commissioner



Dear Friends,

On behalf of the many dedicated professionals who staff the Division of Bridges, it is my pleasure to present the 2010 Edition of the New York City Department of Transportation's Annual Bridges and Tunnels Condition Report, as mandated under New York City's Charter. This report provides DOT with an opportunity to display the many achievements, innovations and improvements that were realized by the Division of Bridges during the 2010 calendar year.

The City's bridges are safe and in their best condition in generations. Our bridges are extremely well managed, they are being rebuilt and upgraded by experts and are subject to one of the strongest inspection systems in the United States. We have a very strong bridge capital investment program, which has turned overall City bridge conditions around and will continue to bring more bridges into good repair. DOT has been an early adopter of high-tech bridge monitoring equipment and techniques, and DOT's Division of Bridges is now further enhancing its inspection capabilities with additional technology and expertise.

The Division of Bridges includes 741 DOT employees who manage the City's capital bridge program and conduct bridge inspections, monitoring and maintenance. Our bridges include, among many others, the notable East River and Harlem River Bridges, the Belt Parkway Bridges, and pedestrian bridges and elevated roadways located City-wide.

In the summer of 2010, the Division replaced the 109-year-old Willis Avenue Bridge. Replacing the bridge meant more than just the replacement of the bridge span itself. DOT took the opportunity to fix alignment problems on the Manhattan side of the bridge, eliminate the open grating deck, and create a direct connection to the northbound Major Deegan Expressway in the Bronx. The new bridge features wider travel lanes with shoulders and a broader, combined pedestrian and bicycle path on the north side. The bridge was also built to withstand earthquakes and is expected to have a lifespan of over 100 years. Traffic began flowing across it on October 2. Work will continue on the remaining parts of the new bridge for the next two years, during which time the removal of the existing bridge will be completed, the adjoining roadways will be restored, and the remaining parts of the existing bridge will be removed.

The \$175 million rehabilitation of the Staten Island Ferry Ramps is the largest project in New York City that is fully funded by the American Recovery and Reinvestment Act (ARRA), the stimulus package created by the federal government in 2009. While visible work on the ramps only began in 2010, this is a Design Build project started in the summer of 2009.

Over the next three years, the Division will completely rehabilitate seven access ramps at the St. George Ferry Terminal and demolish and replace the North Ramp, which provides access to parking lots and Richmond County Bank Ballpark. The project includes repairing structural steel and removing ramp decks and repainting steel structures to bring the ageing ramps into a state of good repair. The existing bus gates and canopies will be rehabilitated, brightening the platforms where commuters wait for buses and improving safety and circulation with new walkways separating pedestrians from vehicle traffic. A protected bikeway and bicycle parking facility will improve access for those arriving on two wheels.

The City has been at the forefront of utilizing new technology to assist us in the monitoring of our bridges. In November 2010, a cable research project moved to its final phase as sensors were installed

on Cable D of the Manhattan Bridge. A unique magnetic flux field test was conducted on the cable. The method was developed by Japanese researchers specifically for this test. Its purpose is to estimate the amount of healthy steel in the cable without exposing the wires. The data collection from the instruments in the cable is expected to continue through 2011 and to provide conclusive information about non-invasive technology suitable for monitoring of suspension cables.

Preventive maintenance is essential to preserve the City's multi-billion dollar investment in its bridges. These steel and concrete structures must be protected from the stresses of weather, traffic, deterioration and neglect. In the last year alone, 15,457 square feet of concrete were used to renew sidewalks, curbs, and road decks; some 8,802 cubic yards of debris were removed; 1,853 bridge drains were cleaned; and crews eliminated 4,115,377 square feet of graffiti. DOT crews also eliminated 683 safety flag conditions that presented clear vehicle or pedestrian traffic hazards. Also, in the Department's ongoing attempts to minimize construction disruptions, we consistently used incentive and disincentive clauses in contracts to reward contractors who finish work early and penalize contractors who finish work late.

The Division's proud tradition of design and engineering excellence was recognized with awards from various entities:

- The American Council of Engineering Companies of New York's Gold Award for the reconstruction of the Hamilton Avenue Bridge over the Gowanus Canal.
- *New York Construction Magazine* selected the Brooklyn Bridge renovation project (Contract #6) and the Staten Island Ferry ramp project as two of the top 25 project starts in the Tri-State Region in 2009.
- The Public Design Commission's Design Award for the construction of the East 111th Street and West 181st Street Pedestrian Bridges.

New York City has a rich tradition of bridge design, construction, maintenance and administration. The Department of Transportation appreciates the importance of its duties and responsibilities, and the Division of Bridges is proud to shoulder the task of maintaining and rehabilitating our city's vital bridge infrastructure.

Sincerely,



Janette Sadik-Khan
Commissioner

Inventory

In calendar year 2010, the inventory of bridges under the jurisdiction of the Division increased to 787. NYCDOT owns, operates, and/or maintains 757 non-movable bridges, 25 movable bridges, and five tunnels. Over the past 10 years, there has been a decline in the number of bridges rated “Poor,” and an increase in the number of bridges rated “Very Good,” as shown below.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Poor	9	8	4	6	4	3	3	3	4	4
Fair	459	451	429	456	458	456	459	455	456	462
Good	196	202	209	212	210	210	215	213	209	207
Vgood	88	94	111	116	118	118	111	116	116	113
Closed							1	1	1	1
	752	755	753	*790	790	787	789	788	786	787

* In 2004, 32 Department of Parks and Recreation structures, 1 Department of Education structure, and 7 Division of Ferries structures were absorbed into the inventory. 30 of these additions (22 from Parks, 6 from Ferries, and the 1 from Education) were rated “Fair,” which accounted for the increase in Fair rated bridges. 1 of the Parks additions was rated “Poor.” It has since been closed.

† In 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 2010, 96 of the Parks bridges accounted for 20.8% of the “Fair” rated structures.

The City has four bridges that were rated “poor” after their last inspections. A poor rating means that there are components of the bridge that must be rehabilitated; it does not mean that the bridge is unsafe. If a bridge was deemed unsafe, it would be closed. The term “structural deficiency” is an engineering term-of-art used by the Federal government to indicate a defect requiring corrective action. According to the FHWA, “structurally deficient” means there are elements of the bridge that need to be monitored and/or repaired. The fact that a bridge is “deficient” does not imply that it is likely to collapse or that it is unsafe. It means they must be monitored, inspected, and maintained.” Because we use the New York State rating system, we do not use that term and instead use the terms “very good”, “good”, “fair” and “poor”. As with the Federal term, the terms “fair” and “poor” describe the condition of bridge elements and whether they are functioning as designed. Although these elements are not considered hazardous, the ratings are used to determine whether the elements require repair or rehabilitation. Again, any bridge deemed unsafe would be shut to the public. As this document goes to press, three “poor” rated bridges are in construction and the final design phase of the fourth has been suspended until such time as funding is available.

The four City bridges that are rated “poor” include the Bruckner Expressway Bridge Northbound over Amtrak and CSX in the Bronx. The October 4, 2005 fire on the bridge weakened its members. The immediate results of the fire were addressed by in-house forces, and repairs requiring immediate attention were handled by the When and Where contractor. The replacement of the bridge’s northbound superstructure and the southbound deck, are being performed under a Design-Build contract. A Notice to Proceed was issued to the contractor with a start date of October 27, 2008. Construction is expected to be complete in September 2011.

The second is a pedestrian bridge at 78th Street over the FDR Drive. The columns on this bridge have been shored and there is shielding under the concrete to protect against spalling. A Notice to Proceed for the project was issued to the contractor with a start date of July 12, 2010. The bridge was closed to pedestrians on October 19, 2010. Construction is expected to be complete in August 2011.

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The third bridge is the Hill Drive Bridge (Terrace Bridge) over Prospect Park Lake. Repairs requiring immediate attention are performed by the When and Where contractor. This bridge is closed to vehicular traffic.

The fourth bridge is the Brooklyn Bridge. It was given a "poor" rating during its last inspection because there are certain elements of the bridge that need to be rehabilitated. While the main spans are in good condition, the decks on both the Manhattan and Brooklyn ramps to the bridge are aging and will be replaced during a rehabilitation project that began on January 19, 2010. It should be noted that of the 75 spans of the bridge, only 6 spans contribute to the low condition rating. None of them are among the three suspended spans (i.e. between the anchorages).

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 clauses are another contract provision used in some reconstruction projects that is 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 spray trucks, six 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 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 2009-2010, a total of 45,740 gallons of potassium acetate and 133 tons of sodium acetate were applied on the roadways of all four East River Bridges.

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

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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 final design is now complete. The construction work is expected to commence in June 2011, and to be complete in March 2015.

2010 Awards

In 2010, the outstanding work of the Division was recognized by the receipt of several awards.

In March 2010, the American Council of Engineering Companies of New York selected the reconstruction of the Hamilton Avenue Bridge over the Gowanus Canal for a Gold Award in the structural systems category in its 2010 Engineering Excellence Awards. This project was substantially completed in April 2009.

In June 2010, *New York Construction Magazine* selected the Brooklyn Bridge renovation project (Contract #6) and the Staten Island Ferry ramp project as two of the top 25 project starts in the Tri-State Region in 2009.

In July 2010, the Public Design Commission presented the Department of Design and Construction, the Department of Transportation and the Department of Parks & Recreation with a Design Award for the construction of the East 111th Street and West 181st Street Pedestrian Bridges – (East 111th Street over the FDR Drive and West 181st Street over the northbound lanes of Henry Hudson Parkway), in its 28th annual Excellence in Design Awards.

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.