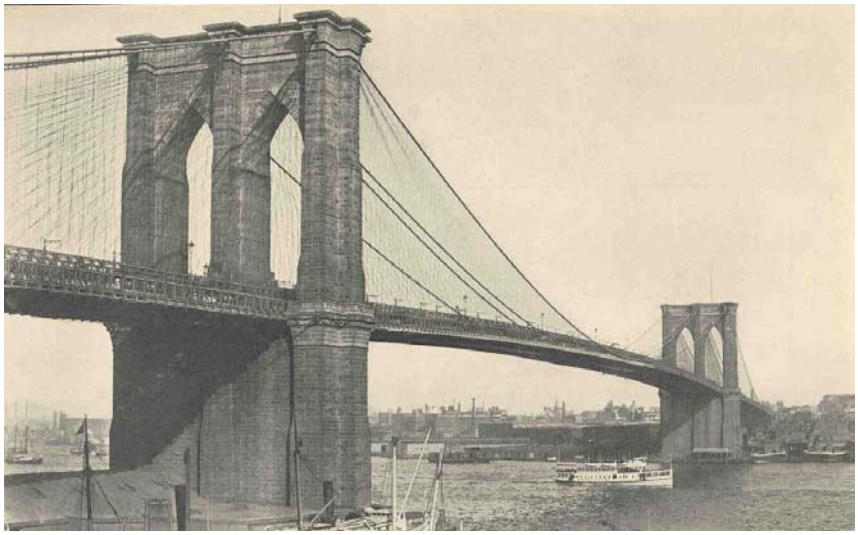
East River Bridges

A $2.8 billion reconstruction program is underway to rehabilitate all four East River crossings. In 2002, these bridges carried some 467,080 vehicles per day. In 2002, working in coordination with the NYPD and other law enforcement agencies, the Division implemented enhanced security measures on these bridges. This work is ongoing.

BROOKLYN BRIDGE

The Brooklyn Bridge carried some 121,145 vehicles per day in 2002. The $467 million reconstruction commenced in 1980 with Contract #1, will continue with Contract #6, currently in the design phase and scheduled for completion in 2012, and will end with a seismic retrofit of the bridge, slated for completion in 2013. Work completed on the bridge to date includes reconditioning of the main cables, replacement of the suspenders and cable stays, rehabilitation of the stiffening trusses, and the replacement of the suspended spans deck. The next work scheduled for the bridge is a project to replace the existing travelers with a state of the art technology system. Construction is scheduled to begin in the spring of 2005 and conclude in the spring of 2007.



Brooklyn Bridge in 1909

Pedestrian Vibration Study

The major blackout of August 14, 2003 forced City officials to close the bridge to vehicular traffic and open the entire bridge to pedestrians. During this mass exodus, several pedestrians reported that the bridge was vibrating and thus causing them great anxiety. At the request of the Office of Emergency Management, an emergency inspection of the bridge was performed that evening as a result of these complaints of “swaying”; no structural problems were found. DOT decided to retain a consulting firm to study the effects of pedestrian induced vibration for this bridge.

Based on the results of this study, the consultant will prepare a report with its findings and recommendations. All necessary instruments have been installed on the bridge to measure

ambient bridge vibrations. A controlled test will be performed in early 2004. This $400,000 study is expected to be complete in summer 2004.

Brooklyn Bridge (Credit: Michele N. Vulcan)

MANHATTAN BRIDGE

The youngest of the three suspension bridges that traverse the East River, the Manhattan Bridge carries some 306,152 commuters – 66,152 vehicles and 240,000 mass transit riders - between Manhattan and Brooklyn daily. It was designed by Leon Moisseiff and completed in 1909. The bridge supports a subway transit line upon which four different train lines operate.

Manhattan Bridge (Credit: Yuliy Zak)

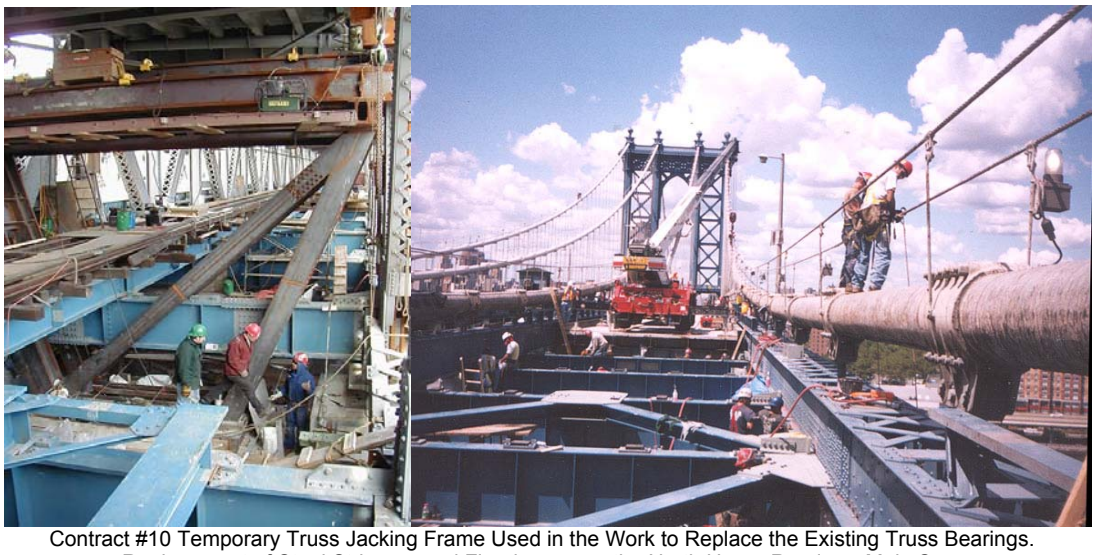
The $730 million reconstruction commenced in 1982 with Contract #1, and continues with Contract #10 (currently in construction), and Contract #11, currently in the design phase and

scheduled for completion in 2007. This work will be followed by Contract #14 to rewrap the cables and replace the suspenders. Completion is expected in 2011. The reconstruction will end with a seismic retrofit of the bridge (Contract #15), slated for completion in 2012. Work completed on the bridge to date includes reconstruction and painting of the south spans, installation of a truss stiffening system to reduce twisting, restoration of the historic arch, colonnades and Manhattan Plaza structures, and the reconstruction of the south walkway. The reopening of the south walkway is notable in that it marks the first time in 40 years that pedestrians and bicyclists have access across the bridge between Brooklyn and downtown Manhattan.

Engineers Sudhakar Pallaki and Abdur Razzaq and Consultants
Inspecting the Travelers to be Rehabilitated under Contract #11
(Credit: Jagtar Khinda)

Contract #10

Begun in March 2001, and scheduled for completion in July 2004, **Contract #10** will bring the following improvements: rehabilitation of the north main span; refurbishment of the approach spans, tunnels and truss bearings; installation of a dedicated bicycle way on the bridge's north side, and painting.



Contract #10 Temporary Truss Jacking Frame Used in the Work to Replace the Existing Truss Bearings. Replacement of Steel Stringers and Floorbeams on the North Upper Roadway Main Span.

Contract #10 Installing a New End Frame on the Main Span Side of the Brooklyn Tower. Painting Containment Structures on the Cables of the Manhattan Approach Span.

The Manhattan Bridge bicycle path was closed in the 1960's because it fell into such disrepair that it became unsafe. On May 16, 2001, Commissioner Weinshall cut the ribbon for a new 6,000-foot long pedestrian and bicycle path. This lane, along the south side of the bridge, is designed for pedestrians, but temporarily serves cyclists too, until they get their own lane on the north side in two years. Upon completion, the restored south walkway and north bikeway will reflect the original design of the bridge.

Construction of the New Bikeway Approach Ramp in Manhattan

The scope of work includes a new Intelligent Transportation System (ITS). The ITS, providing coverage from Bowery Street in Manhattan to Tillary Street in Brooklyn, will consist of Closed Circuit Televisions (CCTV), and Variable Message Signs (VMS). This will provide full coverage for the Manhattan Bridge upper and lower roadways, including the south walkway and north bikeway. Ranging radar detectors will determine the volume and occupancy of the traffic on the bridge, and the CCTV will be utilized to confirm any incident. Operators at the Traffic Management Center in Long Island City will obtain data and video from the ITS. This will enhance the management of traffic on the bridge and its vicinity and improve response to incidents. A total of 19 cameras and 7 VMS will be installed on the bridge.

The north lane of the lower roadway was closed to traffic in June 2001 for use as a construction staging area. At the same time, the south lane of the lower roadway was reopened to traffic. Subway service was restored to the south tracks on July 22, 2001. On that same day, service was temporarily discontinued on the north tracks until February 22, 2004.

Effective August 1, 2002, the bridge's north upper roadway was closed for a scheduled 12-month period, and the north lane of the lower roadway was reopened during peak hours. The roadway was re-opened to traffic on June 1, 2003, 61 days ahead of schedule, thus earning the contractor a $3 million incentive.

Contract #10 Removing an Existing North Upper Roadway Floorbeam on the Main Span of the Bridge. Installing the New Grid Deck for the North Upper Roadway on the Brooklyn Side Span.

Preparing the Brooklyn Elevated Structure Grid Deck for Concrete Placement. Placing Concrete on the Manhattan Side Span Grid Deck of the North Upper Roadway.

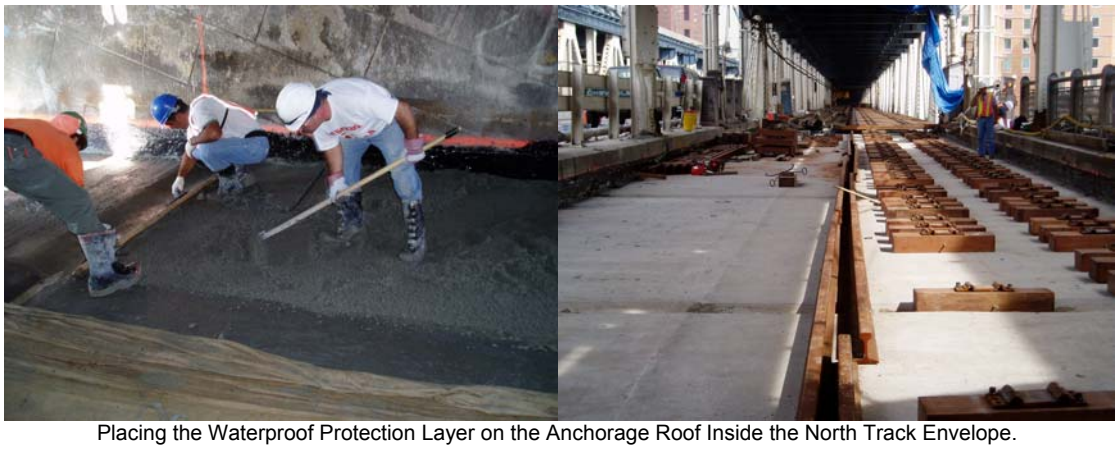
Placing and Finishing Concrete on the Grid Deck of the Brooklyn Elevated Structure.

Placing the Microsurfacing Overlay on the Main Span. Placing the Asphalt Overlay on the Brooklyn Approach Span.

A Notice to Proceed for the additional work for NYCT on the bridge's north side tracks was issued to the contractor with a start date of September 9, 2002.

Installation of New Floorbeams & Stringer Panels for the Subway Support Steel

Full access to the north tracks, originally scheduled in the MOU for January 11, 2004, was given to NYCT on December 15, 2003. Power to the third rail was energized on January 16. NYCT is expected to restore revenue service on the north tracks on February 22, 2004.



Placing the Waterproof Protection Layer on the Anchorage Roof Inside the North Track Envelope.
Installation of New Ties for the North Subway Track.

During 2003, the replacement of truss C and D bearings on the approach spans in Brooklyn and Manhattan was completed. Also, permanent maintenance platforms below the North and South subway tracks on the approach spans were installed.

Torquing the Bolts for the Installation of the Upper Laterals for the Truss Stiffening System.
Installation of a Permanent Maintenance Platform Under the Bridge on the Brooklyn Approach Span.

These upgrades will not only restore the structural integrity of the Manhattan Bridge, but will also allow it to carry an increasing number of pedestrians and bicyclists. This will reduce automobile congestion and its related air pollution in New York City.

QUEENSBORO BRIDGE

At the time of its completion in March 1909, the Queensboro Bridge (popularly referred to as the 59th Street Bridge), was the longest continuous cantilever-truss bridge in the world. While its starring role in the hierarchy of bridges has since been eclipsed by longer and larger structures, the Queensboro Bridge's importance to the mobility and unity of New York City remains undimmed. The bridge was designated as a national landmark on November 23, 1973. The $690 million reconstruction commenced in April 1981 with Contract #1, continues with Contract #6, which began on October 31, 2003,and is scheduled for completion in early 2006, and will end with a seismic retrofit of the bridge, slated for completion in 2011. The work on this vital link between Manhattan and the outer boroughs will enable this 75,000-ton workhorse to better provide the citizens and commerce of New York City with a second century of reliable, prosperous transport. The Queensboro Bridge carried some 176,419 vehicles per day in 2002.

Queensboro Bridge (Credit: Peter Basich)

Contract #6

Contract #6, which began on October 31, 2003, will include the following: condition investigation of the eyebar heads and pins, replacement of the protective screening and the aviation warning lights, drainage improvements, rehabilitation of the overhead sign structures in Manhattan, the upgrading of roadway lighting (by replacing all low-pressure sodium lights on the bridge and ramps with high-pressure sodium lights), cleaning and miscellaneous repairs of the anchor piers, the geometric improvement of Crescent Street, bikeway and walkway improvement, and repair of the south upper roadway concrete overfill and overlay, the promenade platform, the traveler platform, and the underside of the 59th Street overpass. The work will also include the rehabilitation of the Sanitation Department area's arch infill, and modifications to the maintenance facility beneath the Manhattan approach plaza. In addition, the kiosk in the plaza on the Manhattan side of the bridge will be restored. This small historical structure is in an advanced state of disrepair and has been damaged by repeated vehicular impacts. This $35 million project is expected to be complete in early 2006.

Views of the Queensboro Plaza Kiosk

Proposed Rehabilitation of the Arch Infill for the Sanitation Department

WILLIAMSBURG BRIDGE

The largest of the three suspension bridges that traverse the East River, the Williamsburg Bridge carries some 203,364 daily commuters – 103,364 in vehicles and 100,000 via mass transit - on eight traffic lanes, two heavy rail transit tracks, and a pedestrian footwalk, between Manhattan and Brooklyn. The bridge supports a subway transit line upon which three different train lines operate (J, M, and Z). The $989 million reconstruction commenced in 1983 with Contract #1, continues with Contract #8, which began in March 2003 and is scheduled for completion in 2006, and will end with a seismic retrofit of the bridge, slated for completion in 2011.

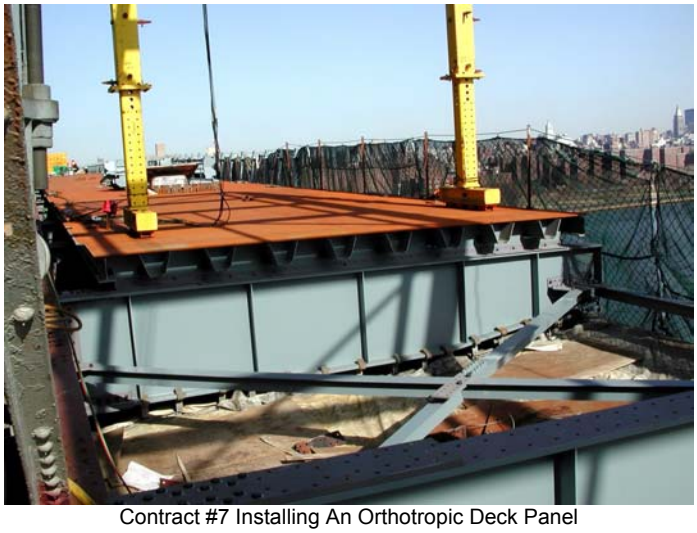

Williamsburg Bridge

In order to minimize disruption to the riding public and ensure that traffic is maintained across the bridge, the rehabilitation of the Williamsburg Bridge was divided into several contracts. In the contracts completed to date, all four main cables have been completely rehabilitated, the south and north roadways of the bridge have been replaced and the BMT subway structure across the bridge was completely reconstructed.

Williamsburg Bridge Subway Structure

Contract #7

In April 2003, the New York Association of Consulting Engineers selected the Reconstruction of the North Roadways of the Williamsburg Bridge (Contract #7) for an Engineering Excellence Award. This reconstruction work was a mirror image of the completed reconstruction work on the south roadways. It included the complete replacement of the main bridge deck with a steel orthotropic deck system and the construction of new structures on both the Manhattan and Brooklyn approaches. This $202.8 million contract included provisions for financial incentives to ensure that the project was completed within the scheduled roadway closure period, thereby minimizing the impact the closures had on the public.



Contract #7 Installing An Orthotropic Deck Panel

Work on the north roadway substructure (pile foundations, piers and columns), began in early 2000. All four lanes that constitute the north roadways of the bridge were closed to traffic on January 29, 2001 for demolition and reconstruction.

Contract #7

The two lanes on the north outer roadway were completed and reopened to traffic on December 10, 2001, 50 days ahead of schedule. This allowed four travel lanes into Manhattan during the morning rush hour, and four lanes into Brooklyn during the afternoon rush hour. In addition, Manhattan-bound truck traffic was restored to the two outer roadway lanes, decreasing the demand at both the Manhattan Bridge and the Queens Midtown Tunnel. The contractor earned $100,000 per day (for a maximum of 50 days) in incentive payments for early completion.

The north outer roadway reopening was complemented by the State Department of Transportation's early reopening of the Marcy Avenue connector ramp from the Brooklyn-Queens Expressway to the Williamsburg Bridge. This is the first time in the State's history that a segmented highway bridge was built using technology suited to situations requiring rapid construction with minimal traffic and community impacts.

The north inner roadway was re-opened to traffic on June 10, 2002, 50 days ahead of schedule, thus earning the contractor a $5 million incentive. The opening ceremony was presided over by Mayor Bloomberg and Commissioner Weinshall.

Contract #7 Replacing the North Inner Roadway Deck & Erecting the Footwalk

During construction, the Department maintained pedestrian/bike access across the bridge. The south footpath/bikeway remained open at all times. During Contract #7, DOT constructed a new Manhattan approach ramp and north footpath/bikeway. The new footpath/bikeway has one common access point for pedestrians and cyclists in Manhattan at Clinton Street, which leads to a crossover before the main span of the bridge to enable people to access either the north or south paths. The north path is open to both pedestrians and bicyclists and leads to an access point at Washington Park in Brooklyn. The south path is dedicated to pedestrians and leads to an access point at Bedford Avenue. Completion of the new north walkway also means that, for the first time ever, the bridge is accessible to wheelchair users and meets the requirements of the Americans with Disabilities Act.

Contract #7 Bikeway Steel Erection & Rebar Installation

Contract #7 was substantially completed on December 12, 2002. The newly completed pedestrian walkway opened to traffic at 3:00 PM on this day.

Contract #8

Contract #8 began on March 3, 2003, and is scheduled to finish in February 2006. This $173 million project will see the rehabilitation of the tower bearings, the truss system, the steel structure of all eight towers, and the north comfort station houses, the replacement or adjustment of the cable suspenders, the installation of maintenance travelers (inspection platforms) under the main span, as well as painting of the stiffening trusses. Architectural work will include the restoration of decorative lights and the Brooklyn granite stone monument. Work inside the anchorage houses on both the Manhattan and Brooklyn sides will include the construction of new stairs, a hoisting system, ventilation and lighting, and oiling platforms. The project will also include the installation of an Intelligent Transportation System (ITS).

Painting of the south side stiffening trusses, which began on June 1, 2003, was completed on September 6, 2003. Painting of the north side stiffening trusses, which began on September 6, 2003, was completed on November 25, 2003. Steel replacement on both the main and intermediate towers, as well as on the upper and lower chords of the main span trusses began in 2003 and will continue through 2005.


Contract #8 North Stiffening Truss Containment Erection and Removal


Contract #8 South Truss Bottom Chord Rehabilitation. .Degreasing the Brooklyn Main Tower Saddle Bearing.


Contract #8 Manhattan Main Tower Member Replacement. Manhattan Main Tower South Pier Platform Erection.

Contract #8 Manhattan Main Tower
Temporary Platform Erection

Such improvements will not only restore the structural integrity of the Williamsburg Bridge, but will also allow it to carry an increasing number of pedestrians and bicyclists, thereby reducing automobile congestion and its concomitant air pollution in New York City.

Movable Bridges

As NYCDOT completes reconstruction work on the East River Bridges, more attention is being devoted to other key City-owned bridges, such as the movable bridges. Building on the success of the East River Bridge projects, the Department is implementing many of the innovative concepts originated during the rehabilitation of East River Bridges on these other major reconstruction projects.

BELT PARKWAY BRIDGE OVER MILL BASIN (BROOKLYN)

When the Mill Basin Bridge was constructed during the first half of the 20th century, New York City's inland waterways were among the most heavily navigated thoroughfares in the country. However, as maritime traffic in New York City steadily decreased since the mid-1960s, the need for movable bridges lessened as well. In 1941, during its first full year of operation, the Mill Basin Bridge was opened 3,100 times; by 1953, that figure decreased to 2,173; by 2003, the number of openings declined further to a total of only 173 openings.

In addition, significant and costly traffic congestion results from the operation of this outmoded drawbridge. In 2002, the Mill Basin Bridge carried 142,105 vehicles per day. The average opening and closing time for the bridge (and others like it) is ten minutes. Thus, this structure's operation has a negative and significant effect on the efficiency of New York City's vehicular traffic flow.

In 2003, on a New York State-mandated scale from 1 to 7, this bridge had a condition rating of 3.31, or "fair." While the bridge is not in any immediate danger of structural failure, its reconstruction is required in order to maintain mobility and public safety on this vital artery.

The bridge is a 14 span structure, consisting of a double leaf steel bascule span. The substructure is made of reinforced concrete abutments and piers supported on precast concrete or timber piles.

Mill Basin Bridge

Under the Department's current proposal, the Mill Basin Bridge will be replaced with a new, 11 span, high-level, fixed bridge with a pre-stressed concrete superstructure and reinforced concrete substructure on piled footings. The bridge will be constructed next to the existing structure so as to maintain traffic during the construction period. It will feature three lanes of vehicular traffic, as well as a 12-foot wide shoulder in each direction. A new sidewalk/bicycleway will be also be added, and the stopping sight distance for the bridge and approach roadway will be improved.

Currently in its final design phase, the reconstruction of the Mill Basin Bridge is scheduled to start in fall 2007, and to last approximately 4 years. The new bridge will be constructed off-line while maintaining three traffic lanes in each direction and a bike/pedestrian path on the eastbound side on the existing bridge during construction. The existing bridge will be demolished after the new bridge is fully opened to vehicular traffic.

As an interim measure, beginning in September 2001, part of the existing deck grating (approximately 20 plated-over panels) of the bridge was replaced. All work was done at night, and progressed through the spring of 2002. During the winter and spring of 2002, Division ironworkers returned to the bridge to resecure surface mounted roadway plates which were covering holes in the grating. Since the plates are susceptible to loosening as a result of vehicle tire impacts, it was decided to recess each plate. This task was completed by the end of 2002. The resumption of the grating replacement work is currently on hold.

HAMILTON AVENUE BRIDGE OVER THE GOWANUS CANAL

The Hamilton Avenue Bridge opened in 1942. In 2002, the bridge carried 60,075 vehicles per day. The $44 million reconstruction of this landmark bridge will use the "float out the old/float in the new" technique. The new bascule spans with trunion towers will be shop-assembled and tested off-site, then will be floated in and erected on the rehabilitated piers. This will reduce the roadway closure time for the construction of each span from 14 months to only 2 months. Other reconstruction work will include: the rehabilitation and seismic retrofitting of the existing piers; the replacement of all electrical and mechanical and control equipment; the removal and replacement of the approach slabs of both sides of the bridge; the rehabilitation of the backwalls and abutments; and the renovation and extension of the bridge operator house.

The bridge's appearance will also be enhanced artistically. A permanent new lighting art structure will be installed on the bridge buildings that will be viewable by pedestrians, motorists, mariners and the general public as part of the Percent For Art Program administered under the Department of Cultural Affairs.

Preparing a Mock-up of the Sculpture for Installation (Credit: Gholamali Mozaffari)

Installing the Mock-up of the Hamilton Avenue Light Sculpture (Credit: Gholamali Mozaffari)

In Stage I, the Manhattan-bound span will be closed from July 1, 2007 to August 31, 2007, and it will be replaced. In Stage 2, the Brooklyn-bound span will be closed from July 1, 2008 to August 31, 2008, and it will be replaced. Each of these two main stages of the contract includes an incentive for early completion of $25,000 of per day with a cap of $300,000. There is a disincentive of $25,000 for each day the contractor is late in finishing a stage with no limit to the amount of penalty. The project is scheduled for construction between March 2005 and January 2009.

MACOMBS DAM BRIDGE OVER THE HARLEM RIVER (BRONX/MANHATTAN)

The Macombs Dam Bridge, which has one of the longest swing spans in the world, was opened in 1895. In 2002, the bridge carried 18,878 vehicles per day. The $145 million reconstruction of this landmark bridge includes the West 155th Street viaduct, the west approach plaza over the Harlem River Drive and Seventh Avenue, the swing span over the Harlem River, the deck and camelback trusses over Metro-North Railroad and Conrail, the Major Deegan interchange (consisting of the east approach and four ramps), and the Jerome Avenue viaduct. Each of the three stages of the contract included an incentive for early completion of $50,000 of per day with a cap of $2 million. There was a disincentive of $100,000 for each day the contractor would be late in finishing a stage with no limit to the amount of penalty. The rehabilitation work will not only strengthen the structure, it will also return the bridge's appearance to its turn of the century grandeur.

East View of Macombs Dam Bridge Swing Span and Camelback Truss (Credit: Hani Faouri)

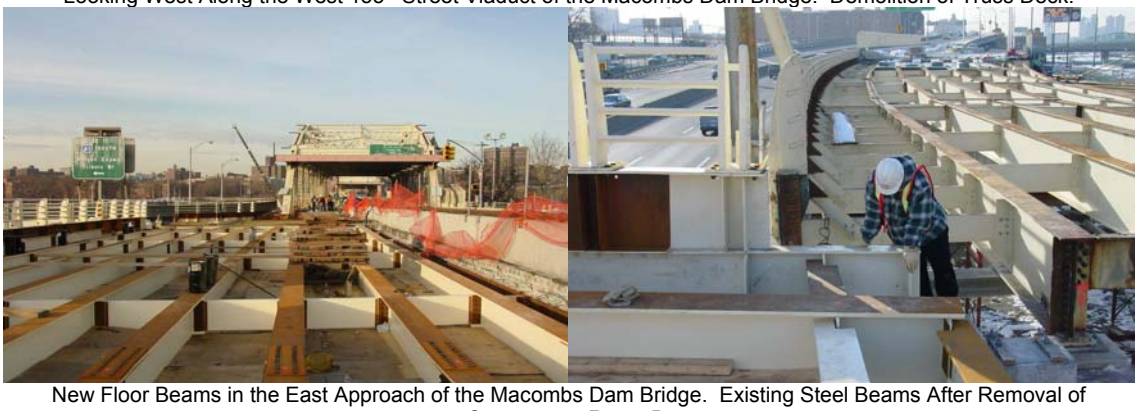
As part of this project, the historic John Hooper Fountain, which dates from 1894, was fully rehabilitated in 2000. After studying detailed old photographs, the globe and weather vane were recast and replicated. Cast aluminum was used with high impact glazing similar to the lanterns installed in Central Park in the 1980's. Just east of the fountain, a garden of rose bushes was added for the community's pleasure. Other additions included a new paved island, new curbs, and a steel fence. Bollards were installed at the western end of the island to protect the fountain from vehicular traffic.

The first stage of construction was completed on March 31, 2001. It included the installation of structural components, as well as the deck replacement of the northern one-third area of the bridge and the West 155th Street viaduct. This milestone date was met even though 31 calendar days were lost from the work period due to the post season play of the New York Yankees. Essentially twelve months' worth of work was compressed into the five worst weather months of the year.

The second stage of construction began on November 2, 2001, after the conclusion of World Series play at Yankee Stadium. It consisted of the installation of structural components as well as the deck replacement of the middle one-third area of the bridge. This stage was completed on February 20, 2002, 39 days ahead of schedule.

The third and final stage of construction began on October 7, 2002. Work included replacement of the structural deck, and rehabilitation of the superstructure steel and the concrete substructure members on the southern portion of the bridge. In addition, truss members in both the swing span and camelback portions of the bridge were reinforced. This stage was completed on March 31, 2003. Concluding items will include necessary paint work, installation and testing of electrical and mechanical systems, and additional steel repairs of the 155th Street viaduct. Expected completion of the project is the end of 2004.

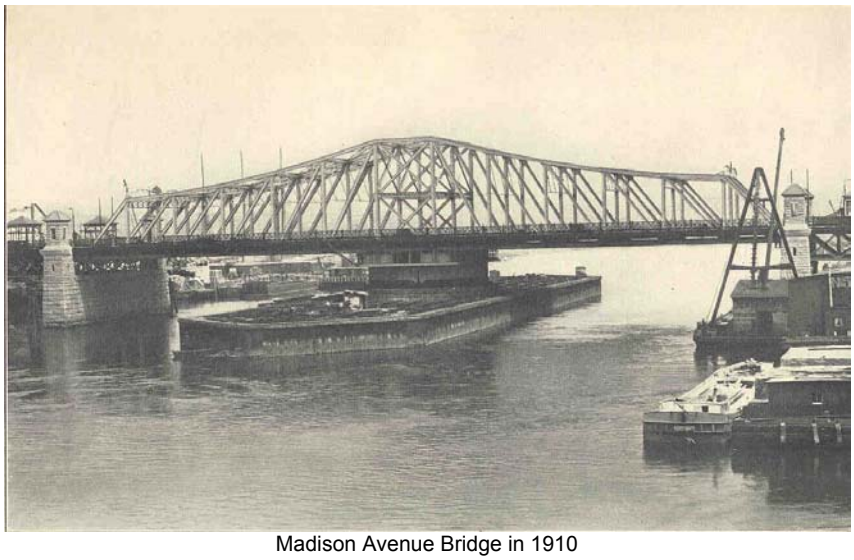
Looking West Along the West 155th Street Viaduct of the Macombs Dam Bridge. Demolition of Truss Deck.



New Floor Beams in the East Approach of the Macombs Dam Bridge. Existing Steel Beams After Removal of Concrete on Ramp B.

MADISON AVENUE BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN)

This rehabilitation project, which began in 1994, was substantially completed in August 2003. The work included rehabilitating the swingspan and approaches, and replacing the bridge's barriers, handrails, fencing, mechanical and electrical systems. The bridge's electrical system was vandalized in August 2000. Both submarine cables and most of the bridge wiring had to be replaced. More than $2.5 million in damage was done by the vandals for the salvage value of the copper wiring they removed. A temporary drive was installed to make the bridge operational. In late June 2002, the bridge was successfully partially opened utilizing the interim drive machinery, except for the end lifts. This was the first time the bridge had opened under its own power in several years. The remaining tasks include work on the Bronx approach traffic signals and the submarine cable. A contract to install the final mechanical system and to complete a seismic upgrade is expected to be in effect in 2010.



Madison Avenue Bridge in 1910

METROPOLITAN AVENUE BRIDGE OVER ENGLISH KILLS (BROOKLYN)

This bridge is a double leaf bascule constructed in 1931. The five span structure carries four lanes of traffic over the English Kills. A $30.7 million rehabilitation project began in October 2003. The estimated construction duration will be 36 months with approximately 16 months lead time. The project's scope of work includes rehabilitation of the existing bridge superstructure, substructure, and approaches, replacement of the existing mechanical and electrical systems for the bascule span, and reconstruction of the Bridge Operator House.

Onsite construction will be carried out in three stages. Incentives and disincentives are tied to the completion of Stage I and Stage II and the opening of each half of the bridge to traffic. The maximum project incentive is $900,000. There is no maximum value associated with the disincentives. Construction is expected to be complete in mid-2007.

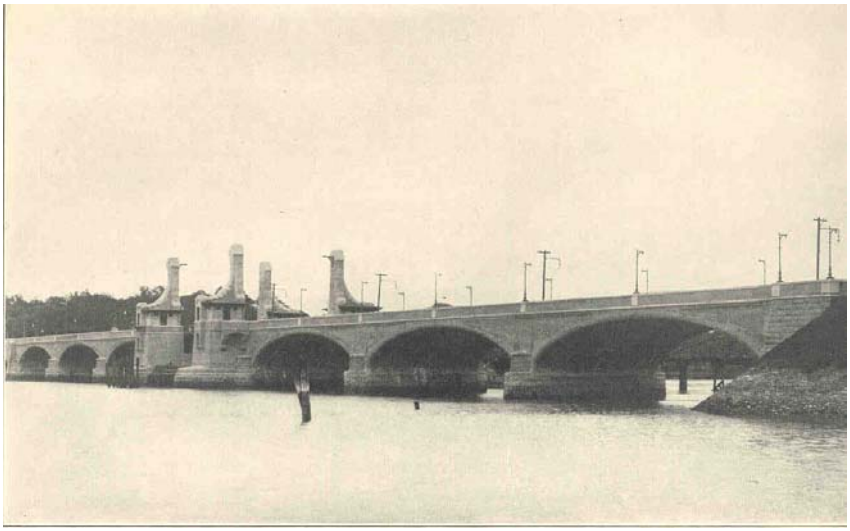
Previous Metropolitan Avenue Bridge in 1903

Metropolitan Avenue Bridge

SHORE ROAD BRIDGE OVER THE HUTCHINSON RIVER (BRONX)

This bridge, built in 1908, was originally called the Pelham Parkway Bridge over Eastchester Bay. The $5 million interim rehabilitation of the existing bridge superstructure and substructure will enable the Department to keep it operational for a period of 10 years while a new bridge is being designed and built adjacent to the existing bridge. The existing bridge will be demolished once the new bridge is in service. The rehabilitation project began in April 2001, and all traffic lanes were reopened to traffic on April 24, 2002, three days earlier than scheduled. The interim rehabilitation of this bridge was substantially completed on June 17, 2002.

As of the end of 2003, various alternatives for the new bridge were being evaluated for further design. The project to construct a new Shore Road Bridge is scheduled for construction between August 2011 and November 2015.



Shore Road Bridge in 1909

THIRD AVENUE BRIDGE OVER THE HARLEM RIVER (BRONX/MANHATTAN)

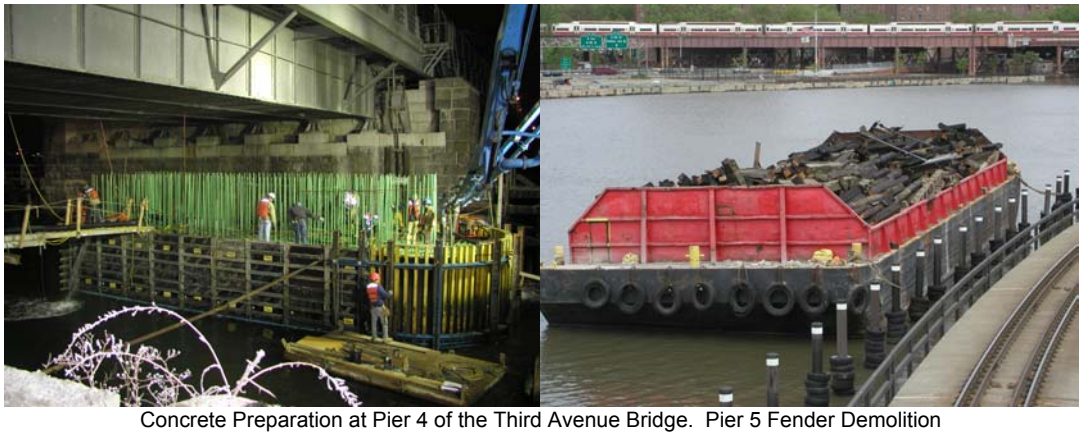
The Third Avenue Bridge carried some 58,949 vehicles per day in 2002. The bridge was built in 1899 and was last rehabilitated in the 1950's. The design of the approximately $120 million reconstruction project of this rim bearing swing bridge was completed in October 2000. Construction began in July 2001. Reconstruction will include complete replacement of the approaches and the swing span. Elimination of the center median on the main span will greatly improve the traffic flow on the bridge. This bridge will use a center spherical roller thrust bearing for supporting the span and for seismic loads. The bearing will be the largest of this type made for this purpose. The existing pivot pier will also be reinforced for seismic loads. The approximate design loading is 7,000,000 lbs. vertical and 2,400,000 lbs. horizontal. A temporary bridge, adjacent to the current one, will be in place for five months to maintain two lanes of traffic into Manhattan while the swing span is being replaced.

If the roadway is completed five months ahead of schedule, the contractor will receive a maximum incentive of $5 million. As a disincentive, the contractor will be penalized from $25,000 to $37,500 each day the milestone date is exceeded with no set maximum penalty. Completion of the project is scheduled for fall 2005.

Third Avenue Bridge

The contractor drilled new shafts for the swing span rest piers, which will eventually support the new swing span, currently being fabricated and erected in Alabama. The new swing span is anticipated to set sail for the bridge site from Alabama in spring 2004 and is expected to be floated into final position in fall 2004. A temporary fixed bridge will be erected to carry the traffic across the Harlem River while the existing swing span is floated-out and the new swing span is floated-in.

Two north lanes and the Third Avenue approach are currently under reconstruction. Once opened to traffic, the two south lanes along with Bruckner Boulevard approach will be demolished and reconstructed in 2004.



Concrete Preparation at Pier 4 of the Third Avenue Bridge. Pier 5 Fender Demolition

Third Avenue Bridge Ramp Construction

Third Avenue Bridge Stairway Demolition. Working on the River to Construct a Temporary Platform.

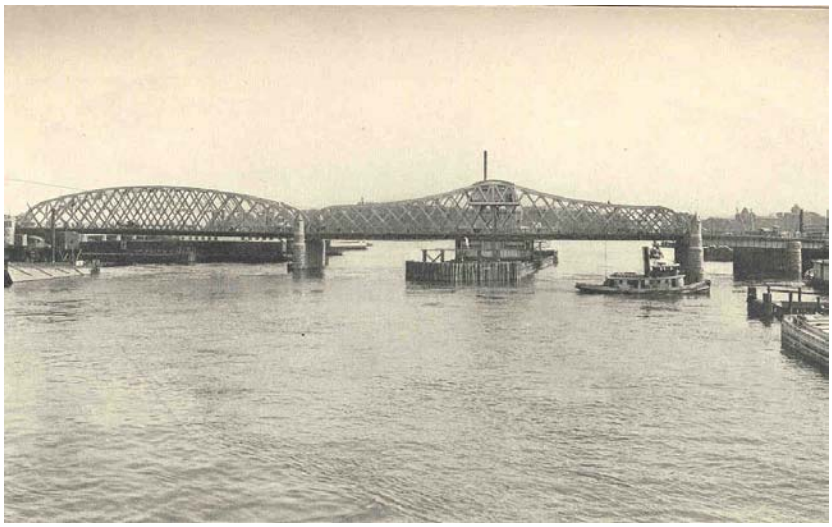
Drill Rig Installing the Third Avenue Bridge Manhattan Rest Pier Shaft from the Existing Bridge Deck. The Rebar Assembly and Staging Area are in the Foreground. Drill Rig Excavating the Drilled Shaft at the Center Pivot Pier.

Auger Excavation of the Drilled Shaft at the Third Avenue Bridge Manhattan Rest Pier From the existing Bridge Deck.
Lifting the Drilled Shaft Reinforcement Cage for Placement.

Third Avenue Bridge Rebar Cage Assembly and Staging Area.
Constructing Drilled Shafts for the New Center Pivot Pier Foundation Adjacent to the Existing Pivot Pier.

WILLIS AVENUE BRIDGE OVER THE HARLEM RIVER (BRONX/MANHATTAN)

Measuring 3,212 feet in length and opened to traffic on August 23, 1901, the Willis Avenue Bridge remains one of New York City's most heavily traveled bridges. The bridge is a bowstring truss swing bridge which spans the Harlem River, and connects Manhattan's First Avenue and 125th Street to Willis Avenue and 132nd Street in the Bronx. Engineered by Thomas C. Clarke, the bridge was designed to relieve traffic congestion on the Third Avenue Bridge.



Willis Avenue Bridge in 1909

A major hub between the FDR Drive in Manhattan, the Major Deegan Expressway and the Bruckner Expressway in the Bronx, the Willis Avenue Bridge carried approximately 73,435 vehicles per day in 2002. Ten local and interstate bus lines use the bridge as a principal route from New York City to points throughout the northeastern United States.

Because of substandard curves which are present on the structure's approaches, the Willis Avenue Bridge has been one of the City's most accident-prone crossings. Between 1992 and 1994, there were 809 vehicular accidents on the bridge, for an average of 269 per year. Under the Department's proposed reconstruction program, these substandard curves will be eliminated.

Because of the advanced age and condition of the Willis Avenue Bridge, the City of New York proposes to replace the existing bowstring truss swing bridge with a new swing span bridge constructed just to the south of the existing bridge. Elimination of the center median on the main span will greatly improve the traffic flow on the bridge. Due to begin in March 2007, this project is slated for completion in March 2012.

Willis Avenue Bridge

145th STREET BRIDGE OVER THE HARLEM RIVER (BRONX/MANHATTAN)

In 2002, the 145th Street Bridge carried approximately 35,796 vehicles per day. This makes it one of the most essential routes for vehicles and pedestrians traveling between Manhattan and the Bronx. Vehicles, which cross this rim bearing swing bridge each day between the two boroughs, include buses, trucks and cars.

Scheduled for construction between July 2004 and September 2007, the 145th Street Bridge Reconstruction project will include the complete replacement of the swing span and six approach spans, seismic retrofitting, partial reconstruction of substructures and the reconstruction of the approach roadways. The design for the bridge utilizes elements pre-fabricated off-site so as to allow a very quick replacement of the existing bridge in 3 stages totaling 18 months. Traffic will only be impacted for the 15-month period of March 16, 2006 to June 18, 2007.

These upgrades will restore the structural integrity and extend the useful life of the 145th Street Bridge.

145th Street Bridge

FLOAT OUT/FLOAT IN

A technique referred to as “float out the old/float in the new” is being incorporated into replacement schemes for many movable bridges. Under this scheme, the old spans are floated out in their entirety and the new spans are floated in. Having the new spans constructed off-site and barged to the project allows for quick and efficient replacement of the removed span. Current projects that will incorporate this technique are: Third Avenue Bridge, 145th Street Bridge, Hamilton Avenue Bridge, Borden Avenue Bridge, and Grand Street Bridge.

THREE TUNNEL PROJECT

Rehabilitation work continued on the Battery Park Underpass, and the Park Avenue and First Avenue tunnels in Manhattan. The contract includes the rehabilitation of the mechanical and electrical systems, as well as the ventilation, fire, lighting and drainage systems. This project, (particularly the Battery Park Underpass, which was used as a route to remove debris), was greatly impacted by the World Trade Center disaster, and the subsequent default of the electrical subcontractor. The project is scheduled for completion in summer 2004.

BRIDGE SEISMIC DESIGN AND RETROFITTING

The seismic retrofitting of bridges in New York City is part of the inspection and rehabilitation program mandated by Congress and administrated by the FHWA through the local authorities. During the period of 1993 to 1996, four major bridge owners in the New York City area (NYCDOT, NYSDOT, MTA, and the Port Authority of New York and New Jersey) retained seismologists to study hard rock seismic ground motions. The rock motions generated by these studies differed from each other and from the AASHTO spectrum as modified by NYSDOT. The differences were such that the resulting retrofit costs varied widely, depending upon which motions were adopted. To resolve this issue, NYCDOT, in association with NYSDOT and the FHWA, retained Weidlinger Associates to assemble an expert panel to develop recommendations for rock motions that would be adopted uniformly by the New York City region. The panel consisted of a team of six internationally recognized experts in the fields of seismology, geology, earthquake engineering, ground motion, and geotechnical studies. There were several brainstorming workshops held in New York, where the senior officials from NYCDOT, NYSDOT, and the FHWA provided their input to the panel members. NYCDOT also invited other city agencies to participate in the process.

The expert panel came up with definitive recommendations regarding rock motions, time histories, ground motions and bridge performance criteria to be used for critical, essential or other bridges undergoing structural analyses. The panel detail findings are described in the report entitled "New York City, Seismic Hazard Study and its Applications, Final Report, December 1998." This report is now extensively used by NYCDOT, NYSDOT, the FHWA, their consultants, and other agencies in the New York area for bridge projects. Thus, NYCDOT's leading role and efforts to establish ground motion standards have brought uniformity in seismic design to the New York City area. This will result in savings in bridge retrofit costs.

In 1997, the Division began a unique project aimed at conducting a seismic evaluation and subsequent retrofit of the Macombs Dam and 145th Street Bridges over the Harlem River. Intended to develop schemes for the strengthening of the unreinforced masonry piers on these movable bridges. The project's findings may be applied to other NYC bridges that have similar masonry substructures.

The 1998 Seismic Design Criteria generated by NYCDOT and adopted by all local bridge entities includes a requirement that it be revisited every 3-4 years. A panel of seismologists prepared a report to update the existing 1998 criteria. This report was reviewed by NYCDOT, NYSDOT, FHWA, and also by a few consultants working on NYCDOT projects. A meeting was held on November 13, 2002, and was attended by NYCDOT, NYSDOT, and FHWA. It was unanimously agreed to continue to follow the existing 1998 seismic design until at least the next review.

WATERWAY STUDY

In 1999, the Department procured the services of an engineering firm to undertake a comprehensive study of the City's 25 movable bridges. The surrounding areas, land use, maritime laws, regulations and other factors were considered to assist the Department of Transportation in providing justification to the U.S. Coast Guard for permission to either convert certain of these movable bridges to fixed structures, or to modify their status to reduce the number of bridge openings. Such conversions would save the City annual operation and maintenance costs.

DOT received permission from the Coast Guard and reclassified the Roosevelt Island Bridge to fixed status in March 1999. This change resulted in a total estimated saving of $38,000 to the

City because of reduced operating costs for this bridge. However, in June 2001, the Coast Guard rescinded its permission, citing construction activity and security concerns.

In April 1999, DOT proposed that the Wards Island Bridge be converted to fixed bridge status. The Coast Guard indicated that there was an excellent chance that this change in status would be successful. However, because of clearance needed for construction equipment to be used for planned reconstruction projects on several Harlem River bridges, including Third Avenue, Willis Avenue, and 145th Street, it was decided to delay conversion of the Ward's Island Pedestrian Bridge to fixed bridge status until all reconstruction projects are completed. DOT estimates completion in Fiscal 2012.

By the end of 2001, DOT advanced the waterway study to the point that we were able to identify those bridges that are realistic candidates to be converted to fixed status. Those bridges are the Borden Avenue and Hunters Point Avenue Bridges over Dutch Kills, the Grand Street Bridge over Newtown Creek, and the Bruckner Expressway over the Bronx River. The Grand Street Bridge is anticipated to be the first to be converted, beginning in Fiscal 2006. The next phase of this study will involve researching right-of-way, legal, and community impact issues. This phase will begin when the Coast Guard agrees to allow the permit process to proceed. This is expected sometime in the first half of Fiscal Year 2005.

BRIDGE CLASSIFICATION

The Coast Guard regulations, which govern the operation of the City's movable bridges, define the owner's responsibility to the mariner by classifying a bridge as "open on demand" or "open on advance notice." An "on demand" bridge provides an immediate opening to any vessel wishing to pass the bridge. An "advance notice" bridge opens after the mariner requests an opening several hours in advance. "On demand" bridges must be staffed at all times. "Advance notice" bridges are staffed only when necessary. DOT redesigned the work process in order to reduce personnel costs to the City and improve the delivery of services to the maritime community.

In October 2000, the Department implemented the United States Coast Guard-approved changes, establishing a four-hour notice for the Harlem River bridges, and a two-hour notice for the remaining "advance notice" bridges. The "on demand" classification remains for three bridges. The revised advance notice requirements allowed the formation of mobile crews with overlapping responsibilities, meeting the mariners' needs and, in some instances, improving service by providing two mobile crews to expedite a vessel's travel along a waterway.

The reduction in planned personnel will save approximately $884,000 annually. In addition, bridge operational capabilities, general maintenance, and debris and snow removal have been enhanced through the more efficient utilization of existing personnel.

The remaining task is the conversion of the three remaining bridges to "on demand" status. This will be achieved by the replacement of two of the bridges with new bridges built with higher clearances, thereby reducing the number of times the bridges must be opened.

Summary of Vessel Openings 1989 - 2003

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Brdn Ave. (Q)	39	218	282	107	141	0	0	105	15	0	3	0	28	0	0
Brdwy (B/M)	0	0	12	3	10	6	7	24	7	2	0	6	27	83	49
Brcknr Expwy (Estrn Blvd) (B)	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Brcknr Expwy (Unnprt Brdg) (B)	676	745	743	635	554	594	431	386	363	257	345	385	420	332	300
Carroll St. (K)	243	552	517	627	669	704	432	245	142	110	174	102	80	124	186
Grand St. (K/Q)	162	610	419	549	224	254	239	189	37	23	24	17	50	19	10
Grnpoint Ave. (K/Q)	371	1390	1014	860	587	549	498	557	626	669	787	688	641	659	738
Hmltn Ave. (K)	1475	1597	1466	1331	1300	1336	1246	1191	1157	996	982	933	832	946	824
Hntrs Point Ave. (Q)	30	157	264	106	141	0	0	113	15	0	1	0	36	0	0
Htchnsn River Pkwy (B)	59	30	8	0	0	0	37	31	32	75	46	5	120	30	5
Macombs Dam (B/M)	2	0	0	0	0	6	5	13	3	0	0	0	0	0	0
Mdsn Ave. (B/M)	4	9	3	1	5	5	0	0	0	0	0	0	0	0	0
Metrpltn Ave. (K)	694	351	301	356	225	310	272	407	423	448	513	279	366	339	342
Mill Bsn (K)	480	699	867	879	1151	1250	954	903	628	591	433	336	317	142	173
Pulaski (K/Q)	527	577	584	426	224	239	206	195	291	332	383	276	208	308	599
Rsvlt Islnd (M/Q)	0	2	0	0	0	0	0	0	0	4	0	58	48	125	63
Shore Rd (Pelham Pky) (B)	2180	2457	1968	1996	2138	2222	2190	2167	2158	2274	2162	2168	2222	1897	1910
Union St. (K)	728	574	502	547	657	713	432	236	144	103	144	85	101	62	24
Ward's Isnd Pdstrn (M)	6	0	0	0	2	0	1	0	2	1	0	0	279	0	0
Willis Ave. (B/M)	8	9	15	6	8	18	24	17	9	0	4	4	40	0	7
3rd Ave. (B/M)	3	7	3	1	7	19	20	18	9	0	2	1	1	0	0
3rd St. (K)	762	638	410	549	663	732	432	256	149	112	157	178	117	212	152
9th St. (K)	986	1082	864	984	927	836	0	0	0	0	192	513	808	733	547
145th St. (B/M)	4	0	2	0	0	9	24	24	3	0	0	1	6	0	0
W.207th St. (B/M)	0	0	0	0	1	6	4	12	7	2	0	6	14	4	6
TOTAL	**9439**	**11707**	**10244**	**9963**	**9634**	**9808**	**7454**	**7089**	**6220**	**5999**	**6352**	**6041**	**6761**	**6015**	**5935**

Roadway Bridges

INNOVATIONS

Innovations in the design and construction of Roadway Bridges continued in 2003. The continued use of weathered steel for bridges over railroads eliminates expensive costs involved in maintenance painting. Where feasible, the continued use of precast elements in bridge reconstruction reduces construction duration and the resulting negative impacts on the traveling public.

Stainless steel clad rebars and galvanized steel rebars, to reduce concrete deck deterioration, are being utilized in pilot projects such as the Congress Street Bridge over the Brooklyn-Queens Expressway, and the East Third Street Bridge over the Bay Ridge LIRR.

ANDREWS AVENUE BRIDGE OVER LIRR (QUEENS)

The Andrews Avenue Bridge was built in 1937. A Notice to Proceed for the $3.7 million replacement of this bridge was issued to the contractor with a start date of August 4, 2003. The bridge will be completely closed beginning in winter 2004 for nine months. The new bridge, designed by the Division's In-House Design Section, will accommodate two 3.6-meter traffic lanes and two 2.5-meter wide sidewalks to better serve the community. The existing four span bridge will be completely removed and replaced with a single span concrete-filled grid deck with multiple weathering steel stringers and girders supported by precast modules for the abutments and wing walls. This will be the first use of this material in a NYCDOT bridge project. The proposed geometry of the south approach roadway requires the construction of a retaining wall at the edge of a soccer field, lumber yard, and other private properties, due to the rise in profile. The precast wall will require the excavation of only half a meter as compared to about two meters with the use of conventional cast-in-place concrete. The installation of these wall units can be done during the winter months in a relatively short time, and will greatly minimize the disturbance to the adjacent private properties. Precast wall units will also improve aesthetics of the playground and the area within the project limits. The use of precast concrete modules will give better quality concrete, and ease of installation will reduce the total construction time from 15 months to 9 months. This project is scheduled for completion in February 2005.

Rendering of New Andrews Avenue Bridge

ATLANTIC AVENUE BRIDGES (EB & WB) OVER EAST NEW YORK AVENUE (BROOKLYN)

The existing eastbound and westbound Atlantic Avenue bridges are on either side of the LIRR. Each is a two span steel multi-stringer structure, supported by a steel pier and reinforced concrete abutments. The NYCT structure overhead is partially supported by these bridges. The scope of work includes replacement of the roadway and sidewalks, repair of the bridge deck, and cleaning and painting of the exposed surface of the steel structure. In addition, the pavement, sidewalks and curbs of the East New York Avenue underpass and service roads will be replaced. A Notice to Proceed for the $4.2 million reconstruction of these bridges was issued to the contractor with a start date of September 9, 2002. The bridges were reconstructed in two stages. The eastbound Atlantic Avenue Bridge, which had been closed to vehicular and pedestrian traffic since October 22, 2002, was re-opened on June 11, 2003. The westbound Atlantic Avenue Bridge, which had been closed to vehicular and pedestrian traffic since June 12, 2003, was re-opened on October 17, 2003. The project is scheduled for completion in June 2004.

BELT PARKWAY BRIDGES OVER FRESH CREEK, GERRITSEN INLET, PAERDEGAT BASIN, ROCKAWAY PARKWAY, NOSTRAND AVENUE, AND BAY RIDGE AVENUE (BROOKLYN)

On a New York State-mandated scale from 1 to 7, five of these six bridges possess a condition rating of “fair” (3.001 – 4.999), and the sixth was rated “poor”. In 2003, the Fresh Creek Bridge was 3.27; the Gerritsen Inlet Bridge was 3.58; the Paedergat Basin Bridge was 2.90; the Rockway Parkway Bridge was 4.11; the Nostrand Avenue Bridge was 4.09; and the Bay Ridge Avenue Bridge was 3.81. While none of the bridges are in any immediate danger of structural failure, their reconstruction is required in order to maintain mobility and public safety on this vital artery.

Under the Department’s current proposal, the existing 5 span, 264.5 foot Fresh Creek Bridge will be replaced with a new 3 span, 309 foot bridge; the existing 11 span, 520 foot Gerritsen Inlet Bridge will be replaced with a new 3 span, 496 foot bridge; the existing 150 foot 4 span Rockaway Parkway Bridge will be replaced with a new single span 95 foot bridge; the existing 140 foot 3 span Nostrand Avenue Bridge will be replaced with a new single span 98 foot bridge; and the existing 58 foot single span Bay Ridge Avenue Bridge will be replaced with a new single span, 58 foot bridge. The stopping sight distance for the bridge and approach roadways will be improved except for the Bay Ridge Avenue Bridge, where it is not needed.

The reconstruction of the Fresh Creek Bridge, currently in its final design phase, is scheduled to start in winter 2007, and will last for approximately 3 years. The bridge and the approach roadways will be constructed in four stages, while maintaining three traffic lanes in each direction and a bike path on the eastbound side during construction.

The reconstruction of the Gerritsen Inlet Bridge, currently in its final design phase, is scheduled to start in fall 2007, and will last for approximately 3½ years. The bridge and the approach roadways will be constructed in four stages, while maintaining three traffic lanes in each direction and a bike/pedestrian path on the eastbound side during construction.

The reconstruction of the Rockaway Parkway Bridge, currently in its final design phase, is scheduled to start in spring 2008, and will last for approximately 3 years. The bridge and the approach roadways will be constructed in five stages, while maintaining three traffic lanes in each direction during construction.

The reconstruction of the Nostrand Avenue Bridge, currently in its final design phase, is scheduled to start in spring 2008, and will last for approximately 2½ years. The bridge and the approach roadways will be constructed in five stages, while maintaining three traffic lanes in each direction during construction.

The reconstruction of the Bay Ridge Avenue Bridge, currently in its final design phase, is scheduled to start in spring 2008, and will last for approximately 1½ years. The bridge will be constructed in five stages, while maintaining three traffic lanes eastbound and two traffic lanes westbound during Stage I, and two traffic lanes in both directions during Stages II, III, IV, and V during construction.

The Paerdegat Basin Bridge will be replaced by a new bridge (with complete replacement of the superstructure and substructure). It will be constructed on a new off-line alignment conforming to current standards. The new split bridge will be within the right-of-way of the parkway. This project is scheduled to begin construction in the spring of 2007, and to last for approximately four years.

Paerdegat Basin Bridge

A computerized traffic simulation model is under development in connection with the Division's plans to reconstruct seven bridges on the Belt Parkway. This model will serve as a useful tool to establish the impact of construction on the travelling public and to help determine appropriate construction schedules. In addition, it will enable us to rapidly evaluate the impact of a variety of combinations of construction staging. The Division is currently examining two construction scenarios. The first one would be to construct Fresh Creek, Gerritsen Inlet, and Paerdegat Basin, along with Mill Basin, Nostrand Avenue, and Rockaway Parkway as a group. The second option would be to construct Fresh Creek, Paerdegat Basin, Mill Basin, and Rockaway Parkway as a first group, followed by Gerritsen Inlet and Nostrand Avenue as a second group. Construction duration would be 52 months for the first scenario and 94 months for the second.

BROOKLYN-QUEENS EXPRESSWAY (WB) OVER FURMAN STREET & BROOKLYN-QUEENS EXPRESSWAY (EB) OVER BROOKLYN-QUEENS EXPRESSWAY (WB) (BROOKLYN)

The project to replace the transverse expansion joints on the Brooklyn-Queens Expressway (BQE) in Brooklyn Heights between Orange & Joralemon Streets, is scheduled to begin in April 2004. The first (lower) cantilevered level carries the westbound vehicular traffic. The second (intermediate) cantilevered level carries the eastbound vehicular traffic, and the third (top)

cantilevered level supports the Brooklyn Heights promenade. This section of the BQE was originally constructed approximately 50 years ago and due to the aging process, the original joint material is no longer capable of preventing water from infiltrating the structural concrete. If this situation continues unabated, the concrete will become severely damaged due to the water's freeze/thaw action and its corrosive effect on the reinforcing steel. Installing new joint material will reestablish the watertight seals while allowing for the necessary expansion of the superstructure, thus extending the useful life of the structural concrete that supports the westbound and eastbound roadways of the BQE. There are a total of 100 joints; 50 joints on the first cantilevered level, and 50 joints on the second cantilevered level within the project limits. Each joint is 33½ feet in length for a total 3,350 feet of joint replacement. The work will be performed only during the nighttime hours of 12:01 AM to 5:00 AM under two lane closures, with the third lane open to traffic. At all other times, all three lanes in both the westbound and eastbound directions will be open to traffic. The project is expected to be complete in February 2005.

CLAREMONT PARKWAY BRIDGE OVER METRO NORTH RR (BRONX)

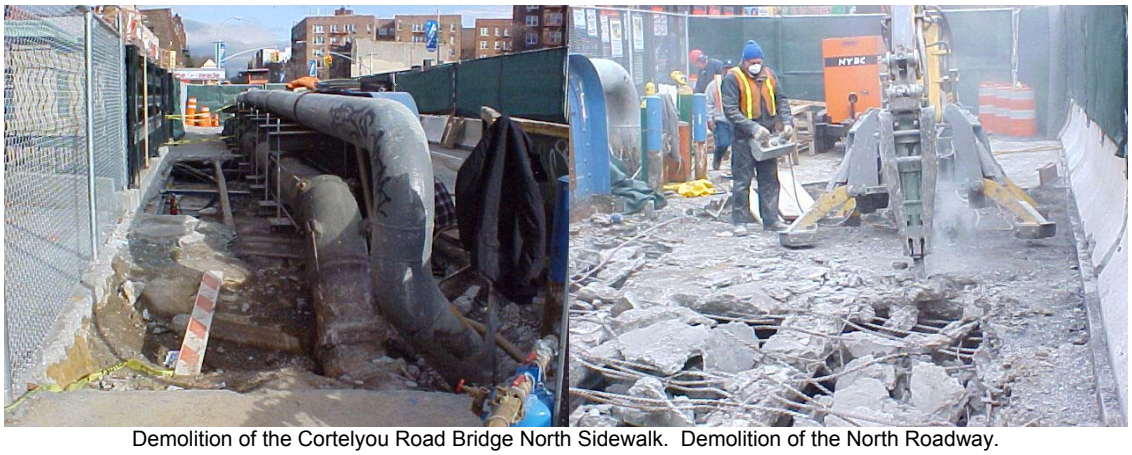
The Claremont Parkway Bridge was built in 1889, with major reconstruction in 1938. This project, currently in its final design phase, will include removal of the entire superstructure and approaches. The new bridge will consist of pre-stressed concrete box beams supporting a reinforced concrete deck and approach slab, concrete sidewalks and reinforced concrete parapet walls with protective fencing, and reconstructed approach roadways. A portion of both existing abutments will be removed to accommodate the new bridge profile. The utility work will include the installation of two new water mains, a gas main, and electrical conduits. The bridge will be constructed in four stages, with one traffic lane open in each direction at all times during construction. Construction is expected to begin in October 2004, and is expected to be complete by April 2006.

CONCOURSE VILLAGE AVENUE BRIDGE OVER METRO NORTH (BRONX)

This project will include demolishing the existing bridge deck, removing loose encasement on the structural members, localized steel repairs, and restoring the encasement. A new concrete deck will be installed, and new approach slabs, an east parapet, steel faced curbs, and concrete sidewalks will be built. The existing granite blocks will be repointed as necessary. The bridge will be reconstructed in four stages, with one 4.3 meter wide southbound lane maintained during construction. Construction is expected to begin in September 2004, and is expected to be complete in early 2006.

CORTELYOU ROAD BRIDGE OVER NYCT (BROOKLYN)

This $3.7 million project is being constructed in three stages. Two-way traffic will be maintained by providing one lane in each direction during construction, and no detours will be required. The existing bridge is a one span steel through-girder, floorbeam and steel stringer bridge with very short approach spans. Two steel column bents, rising out of the passenger platforms, support each end of the main span. The reconstruction will replace the existing deck slab and steel stringers with modified floorbeams and through-girders. Construction began in April 2002, and is expected to be complete in the spring of 2005.



Demolition of the Cortelyou Road Bridge North Sidewalk. Demolition of the North Roadway.

Excavation Behind the Abutments of the Cortelyou Road Bridge

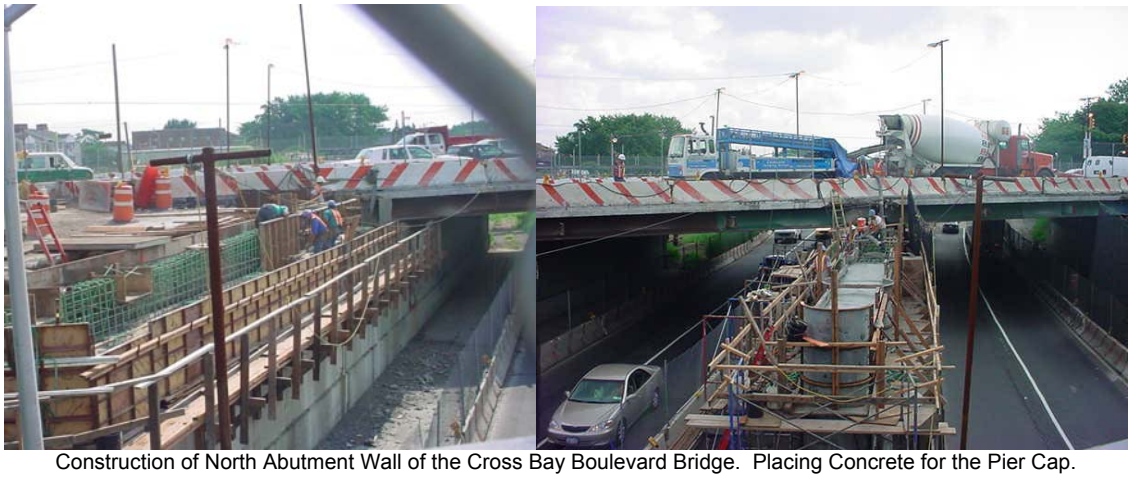
CROSS BAY BOULEVARD BRIDGE OVER CONDUIT BOULEVARD (QUEENS)

The bridge was built in 1949. A recent inspection by the Division revealed that the bridge has outlived its useful service life. The effects of age, weather and increased traffic volume have rendered reconstruction necessary. The bridge connects the communities of Howard Beach and Ozone Park, and provides seasonal access to the beaches at Gateway National Recreation Area and the Rockaways. The existing bridge structure consists of a two span reinforced deck slab, and carries four lanes of traffic in each direction. The new bridge structure will consist of a two span concrete grid deck and a concrete parapet wall with protective bridge fencing. It will carry the same lanes as before. The approach slabs, curb and sidewalk, median, roadbase, and guiderails will be replaced. New traffic signals, street lighting, traffic regulatory signs and thermoplastic stripping will be installed. Utilities such as the gas main, Con Edison, telephone, Fire Department and Time Warner will be installed across the bridge under the deck. Approximately 66 new trees will be planted as part of the landscaping improvement of this project.

The bridge will be constructed in five stages, with four lanes of traffic maintained southbound and three lanes of traffic northbound at all times. In addition, traffic enforcement agents are deployed to stream line the traffic during peak hours.

A Notice to Proceed for the $8.75 million reconstruction of this bridge was issued to the contractor with a start date of July 15, 2002. Effective October 10, 2002, the left lane in each

direction on Conduit Avenue at Cross Bay Boulevard was closed to traffic for a period of two years. Installation of both the east and west temporary pedestrian bridges at Cross Bay Boulevard over North and South Conduit Boulevard was completed in December 2002. The project is expected to be complete by September 2004.



Construction of North Abutment Wall of the Cross Bay Boulevard Bridge. Placing Concrete for the Pier Cap.

Placing Concrete for the Grid Deck of the Cross Bay Boulevard Bridge

EAST TREMONT AVENUE BRIDGE OVER METRO NORTH RR (BRONX)

This $3 million project began in June 2001. The bridge superstructure was completely replaced, including the steel girders, bearings, concrete decks, sidewalks, parapets and fencing. The abutment, bridge seat, and back wall were reconstructed, and gas and water mains were replaced. The work was completed in three stages, with one lane of vehicular traffic maintained in each direction during construction. The reconstruction of this bridge was substantially completed and it was re-opened to traffic on July 30, 2003. The contractor was assessed liquidated damages for completing the project 49 days behind schedule.

East Tremont Avenue Bridge Before Reconstruction. New ECS Conduits.

East Tremont Bridge After Reconstruction

GLENMORE AVENUE, PITKIN AVENUE, SUTTER AVENUE, AND LIBERTY AVENUE BRIDGES OVER LIRR BAY RIDGE (BROOKLYN)

This $12 million project will reconstruct four bridges over the LIRR tracks in Bay Ridge. A Notice to Proceed for the reconstruction of the Glenmore Avenue, Pitkin Avenue, and Sutter Avenue Bridges over LIRR Bay Ridge was issued to the contractor with a start date of January 14, 2003. The reconstruction of Liberty Avenue over LIRR Bay Ridge will commence after the completion of these bridges. Glenmore Avenue, Sutter Avenue, and Liberty Avenue will be fully closed to pedestrian as well as vehicular traffic during construction. The Pitkin Avenue bridge will be constructed in two stages. One traffic lane in each direction and one sidewalk will be open at all times during construction. The project is expected to be complete in September 2005.

GRAND AVENUE BRIDGE OVER CONRAIL (QUEENS)

A Notice to Proceed for the $2.4 million reconstruction of this bridge was issued to the contractor with a start date of September 16, 2002. The superstructure was replaced with high strength weathering steel girders, and a high performance concrete deck. The abutments were repaired, and the approach roadways reconstructed. New water mains, electric and telephone conduits were installed. The project was substantially completed in November 2003, four months ahead of schedule.

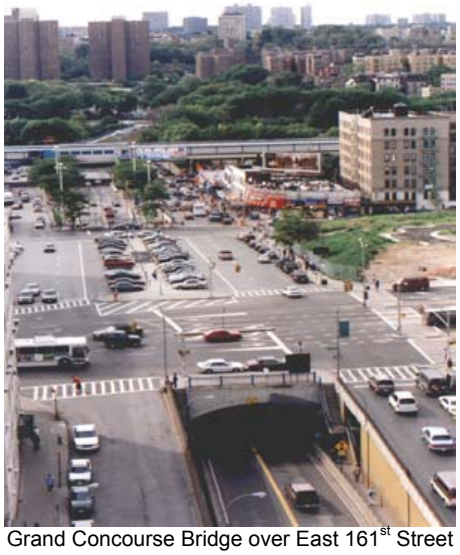
Demolition of the Grand Avenue Bridge. Erection of New Structural Steel.

Placing Concrete for the New Grand Avenue Bridge Deck. Paving the Asphalt on the New Approach Slabs.

New Grand Avenue Bridge

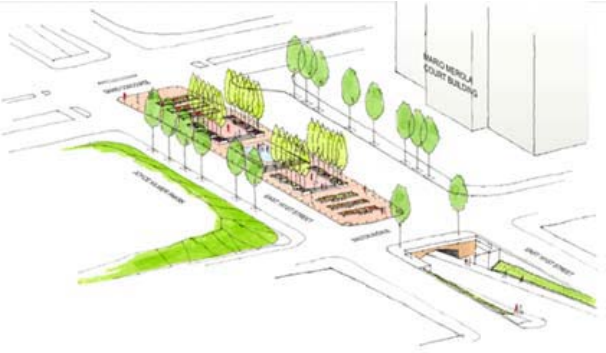
GRAND CONCOURSE BRIDGE OVER EAST 161st STREET (BRONX)

This project, currently in the final design stage, will include the rehabilitation of the Lou Gehrig Plaza and the reconstruction of the Grand Concourse from East 161st Street to East 166th Street, as well as landscaping improvements. In addition, artwork will be included under the Percent For Art Program administered by the Department of Cultural Affairs. The underpass and its approaches will be closed to traffic during the Yankees' off season only. Two traffic lanes in each direction will be maintained at the Grand Concourse during construction. Construction of the bridge is scheduled to begin in November 2005, and is expected to be complete by November 2008.



Grand Concourse Bridge over East 161st Street

Existing Lou Gehrig Plaza



Rendering of New Plaza

Existing Grand Concourse

Rendering of New Grand Concourse

GUN HILL ROAD BRIDGE OVER METRO NORTH RR (BRONX)

A recent inspection by the Division revealed that the superstructure of the bridge has outlived its useful service life. The effects of age and weather have rendered reconstruction necessary. This project will include the removal of the existing superstructure and the top portion of the existing concrete abutments, and the construction of new approach slabs, roadway, and sidewawlks. The work will also include replacing the water and gas mains, as well as other utilities, erecting new steel girders, installing new utility supports, placement of a new reinforced concrete deck, constructing new concrete parapets with pedestrian fencing. The bridge will be reconstructed in three stages, with two lanes of traffc maintained during construction. Construction is expected to begin in October 2004, and is expected to be complete in October 2007.

HARLEM RIVER DRIVE AT EAST 127th STREET (MANHATTAN)

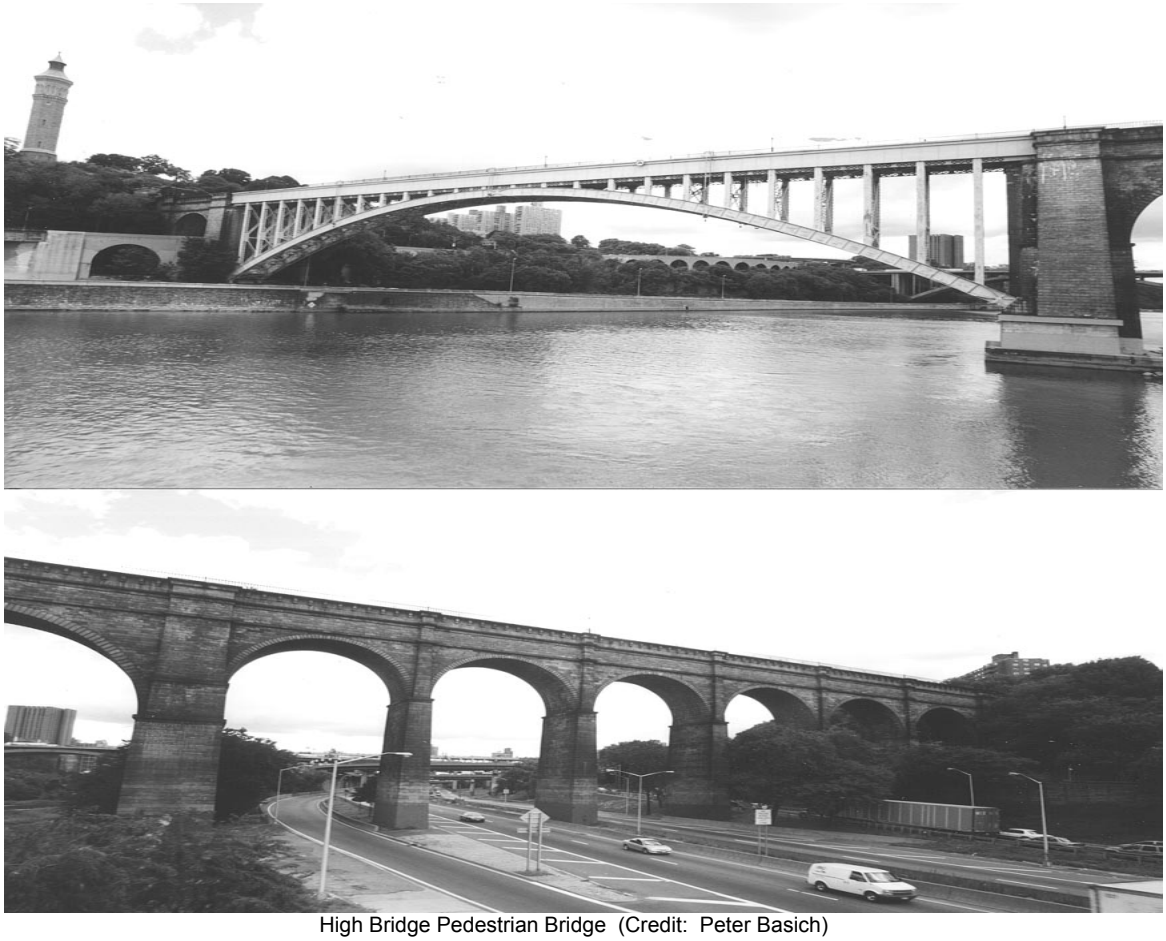
This project, currently in its preliminary design phase, involves the replacement of the existing 11 span bridge and the construction of a flyover ramp over the Third Avenue Bridge, in addition to various highway improvements. It eliminates a major weaving problem between the southbound Harlem River Drive traffic destined for the Second Avenue exit and the Third Avenue Bridge exit ramp; allows at-grade access for a future Park/Promenade to be developed by the Department of Parks at 127th Street between the Harlem River Drive and the Harlem River; and improves operational characteristics of the Harlem River Drive from the Third Avenue Bridge to the Willis Avenue Bridge.

INSPECTION OF THE HIGH BRIDGE PEDESTRIAN BRIDGE OVER THE HARLEM RIVER (BRONX/MANHATTAN)

In support of the Department of Parks and Recreation (DPR), the Division prepared a detailed scope of work for the comprehensive in-depth inspection of this eleven span landmark structure, the oldest (circa 1848) bridge over the Harlem River. The bridge is currently under DPR's jurisdiction.

A Notice to Proceed was issued to the contractor with a start date of July 18, 2002. Engineering consultants are conducting this inspection, which is scheduled for completion in the spring of 2004, at an estimated cost of $1.6 million. The Division administers and supervises this work.

The resultant report will be furnished to DPR to pursue rehabilitation of the structure. Its goal is to open the historic promenade level for public use by pedestrians and cyclists and, once again, link the Bronx and Manhattan portions of High Bridge Park.



High Bridge Pedestrian Bridge (Credit: Peter Basich)

HONEYWELL STREET BRIDGE OVER AMTRAK AND LIRR YARD (QUEENS)

The Honeywell Street Bridge was closed in 1979, because it did not meet Department safety standards. The defunct bridge ran between Skillman Avenue and Northern Boulevard. It carried numerous utilities, including Amtrak high voltage catenary lines and other electrical facilities. By the end of 2001, preparatory work for the demolition of the bridge was complete, and demolition of the utility bay and sidewalk was underway.

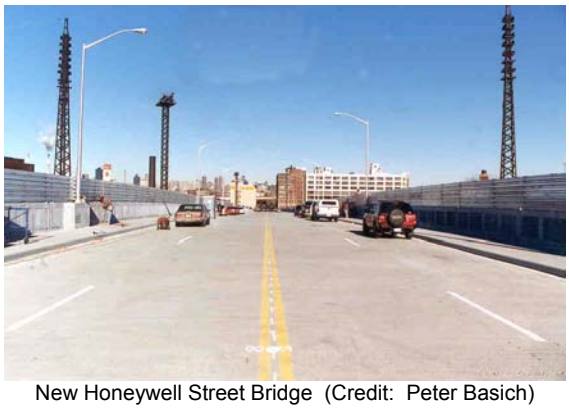
Old Honeywell Street Bridge Prior to Demolition

Removal of Old Honeywell Street Bridge Deck Slabs

Structural steel erection for the new bridge was completed in October 2002. The concrete deck placements, which began in October 2002, were completed in November 2002. The timing allowed for the placement of structural concrete during mild weather and avoided a winter shutdown of the project. The new bridge is constructed of A588 weathering steel, which will provide a high level of corrosion resistance with minimal maintenance. The new bridge is also designed to resist seismic forces per current design standards.

Structural Steel Erection of Span #9 of the New Honeywell Street Bridge

The Honeywell Street Bridge carries two traffic lanes in each direction and two sidewalks. Each sidewalk is eight feet wide, and ADA compliant with ramps on all corners. The reconstruction of the Honeywell Street Bridge was substantially completed on January 17, 2003, and the bridge was re-opened to vehicular and pedestrian traffic that morning.



New Honeywell Street Bridge (Credit: Peter Basich)

MANHATTAN COLLEGE PARKWAY, WEST 232ND STREET, WEST 239th STREET, AND WEST 252nd STREET BRIDGES OVER HENRY HUDSON PARKWAY (BRONX)

This $6.6 million project will reconstruct four bridges over the Henry Hudson Parkway. A Notice to Proceed was issued to the contractor with a start date of February 23, 2004. The reconstruction of the West 239th Street and West 252nd Street Bridges will commence after the substantial completion of the Manhattan College Parkway and West 232nd Street Bridges. Work on the Manhattan College Parkway, West 232nd Street, and West 239th Street Bridges will include the demolition and removal of the existing pavement and roadway slab down to the concrete arch of each bridge, and replacing it with a new deck on a protected membrane waterproofing system. In addition, the reconstruction of these bridges will include drainage, repointing the existing stone masonry, new signage and pavement markings, improving the under deck lighting systems, and private utility work.

On West 232nd street, the work will be completed in three stages, with one lane of vehicular traffic maintained in each direction during construction. On Manhattan College Parkway, the work will also be completed in three stages, with one lane of vehicular traffic maintained in the westbound direction during construction. On West 239th Street, the work will be completed in four stages, with one lane of vehicular traffic maintained in the each direction during construction.

Work on the West 252nd Street Bridge will include the demolition of the existing concrete arch bridge deck, and replacing it with a new prestressed concrete box beam superstructure. In addition, the reconstruction of this bridge will include installing a new 300 mm diameter water main, improving the under deck lighting systems, private utility work, partial removal of the pier and abutments, new roadway lighting, and adjustment of the existing drain inlets, manholes, and catch basins. The work will be completed in four stages, with one lane of vehicular traffic maintained in the eastbound direction during construction. The four bridge project is expected to be complete in June 2006.

QUEENS BOULEVARD BRIDGE OVER AMTRAK AND LIRR YARD (QUEENS)

In April 2003, the New York Association of Consulting Engineers selected the rehabilitation of the Queens Boulevard Bridge over Amtrak and LIRR Yard for an Engineering Excellence Award. The Engineering Excellence Awards Program recognizes engineering achievements that demonstrate the highest degree of skill and ingenuity.

Age, weather and increased traffic took their toll on the Queens Boulevard Bridge, which was originally built in 1910. The 93-year-old bridge carries motorists over the Sunnyside Rail Yards, linking Queens Boulevard to Queens Plaza. The structural steel which supports the bridge, roadway surface and bridge joints was severely deteriorated. The bridge had outlived its useful life and needed to be rebuilt to maintain and improve the service it provides as a connector to and from Manhattan.

Besides connecting Sunnyside and Long Island City in Queens, the Queens Boulevard Bridge is a vital link between western Queens and Manhattan via the Queensboro Bridge. More than 52,000 motorists used the bridge in 2000.

Rather than completely closing the Queens Boulevard Bridge during reconstruction, DOT studied the traffic patterns in the area and decided to rebuild the bridge in two stages, half of the bridge at a time, while keeping it partially open to traffic.

Our analysis revealed that at all times, traffic flow is heavier into Manhattan than into Queens. Thus, the bridge remained open to Manhattan-bound traffic during construction. However, the number of available travel lanes was reduced from three lanes to two.

Queens-bound traffic followed a carefully planned and clearly marked detour designed to minimize impacts on area businesses, the local community, and the traveling public. The traffic was diverted to side streets, including Crescent Street, 27th Street and Jackson Avenue. Service on the elevated #7 train that runs above the Queens Boulevard Bridge was not affected.

The bridge underwent a complete reconstruction, beginning in April 2001. Over the course of this $41 million project, the major improvements included the reconstruction of concrete abutments, crash walls and steel piers; new bridge steel; the installation of new concrete decks and approach pavement; new sidewalks including a walkway/bikeway separated from traffic by concrete barrier; a new and improved overhead lighting system; and the installation of an ITS consisting of nine closed circuit television cameras to monitor traffic and roadway conditions. It also included installation of temporary traffic signals and modifications to the existing signal timing. Nine electronic message boards provided motorists with real-time traffic information. NYPD Traffic Enforcement Agents were strategically deployed at various locations to ease the flow of traffic.

The contract included incentive and disincentive clauses. The Queens Boulevard Bridge contractor earned the maximum incentive award of $3 million for the early completion of the project.

The reconstruction of this bridge was substantially completed on July 31, 2002, and the bridge was fully re-opened to traffic at 5 AM on that date, two months ahead of schedule. The rebuilt bridge carries three westbound lanes, three eastbound lanes and two shared sidewalk/bicycle paths.

Full Depth Saw Cutting of Queens Boulevard Bridge Deck Slab Panels & Front Steel Demolition

Queens Boulevard - Hoisting a Roadway Grating for Transport & Installing Electrical Conduits in a New Concrete Barrier

Reconstructed Queens Boulevard Bridge (Credit: Peter Basich)

SEELEY STREET BRIDGE OVER PROSPECT AVENUE, CONGRESS STREET BRIDGE OVER BROOKLYN-QUEENS EXPRESSWAY, AND LINCOLN ROAD BRIDGE OVER BMT SUBWAY (BROOKLYN)

The project to reconstruct these three bridges is expected to begin in late spring 2004, and to be completed in April 2007.

At the recommendation from the local community board, the reconstruction of the Seeley Street Bridge will be performed in one stage. This project also includes the regrading of Prospect Avenue under the bridge. The avenue will be lowered in the bridge vicinity to improve vertical clearance. The work will include full depth construction of new pavement, curbs and sidewalks, as well as a new drainage system on Prospect Avenue. Seeley Street will be closed to through traffic for 9 months. During this time, the traffic will be detoured via adjacent roadways. The regrading of Prospect Avenue will be accomplished in stages and normal traffic will be maintained for the duration of the Prospect Avenue reconstruction. The existing bridge is a single span concrete arch structure supported by gravity type abutments. The reconstruction involves the demolition of the existing arch and the construction of a new arch that is a close replica of the existing arch. The existing abutments are in good condition and will be repaired as necessary. The Seeley Street Bridge is expected to be completed in July 2005.

The existing Congress Street Bridge is a two span structure over the Brooklyn-Queens Expressway (BQE). The major substandard feature of the bridge is its vertical clearance over the BQE. There is evidence of vehicular impacts on the bridge superstructure. The rehabilitation will include reconstructing a new bridge superstructure with high strength steel that will add 12 inches of additional vertical clearance. Stainless steel clad reinforcement will be

used for concrete deck reinforcement, and the bridge substructure will be rehabilitated to conform to seismic requirements. The reconstruction of this bridge will be accomplished in two stages. The existing bridge carries one-way east bound traffic, which will be maintained for the duration of the construction. The reconstruction will involve BQE lane closures at certain times. Traffic Enforcement Agents will be posted for the duration of the BQE lane closures to ensure the smooth flow of traffic. The Congress Street Bridge is expected to be completed in September 2005.

The Lincoln Road Bridge project will include a replacement of a water trunk main under the railroad track which is within the limits of the bridge reconstruction. The replacement of the water trunk main will be funded by NYCDEP. The existing bridge is a four span structure with asteel pier bent and reinforced concrete abutments. The bridge spans over NYCTA Brighton Beach line. The rehabilitation will include removal of the existing bridge in its entity and the construction of a new bridge. The new bridge will be a single span flexible type integral abutment bridge built compositely with a steel stringer and a concrete deck. The project work will be accomplished in four stages. The water trunk main will be replaced during the first stage. One lane of vehicular traffic in each direction and a pedestrian sidewalk will be maintained throughout the construction. Due to high traffic volume in the vicinityn of the project, Traffic Enforcement Agents will be posted for part of the construction period. The Lincoln Street Bridge is expected to be completed in April 2007.

SHORE ROAD CIRCLE BRIDGE OVER AMTRAK (BRONX)

This project will include the removal of the existing two span bridge and the construction of a new single span bridge structure with a reinforced concrete deck over steel girders. The work will also include the construction of new reinforced concrete abutments and wing walls, as well as new parapet walls with protective steel fences. The bridge will be reconstructed in three stages, with one lane of traffic maintained in each direction during construction. Construction is expected to begin in August 2004, and is expected to be complete in March 2006.

STEINWAY STREET BRIDGES OVER GRAND CENTRAL PARKWAY WB & EB (BROOKLYN-QUEENS EXPRESSWAY) (QUEENS)

This $16 million project will replace two bridges, originally built in 1937, that connect over the Grand Central Parkway. The six stage reconstruction schedule will last 42 months, nine of which will include preparation and fabrication of materials with no impact on traffic. The general public, however, will notice work on the four lane bridge for 33 months.

The contract has incentive/disincentive clauses amounting to $5,000 a day for a maximum of 90 days for incentive. There is an equal amount for disincentive with no limit. This means that the contractor will receive a bonus of $5,000 a day for every day that the work is completed ahead of schedule, up to 90 days, or will be penalized $5,000 a day with no limit if the work is completed late.

The contract provides for several NYPD Traffic Agents to maintain the flow of traffic at the Steinway Street intersections affected by the bridge for the duration of the replacement. Variable Message Signs (VMS) will be utilized to advise motorists of impending nightly lane closures on the Grand Central Parkway.

A Notice to Proceed for the reconstruction of these bridges was issued to the contractor with a start date of July 1, 2002. The project is scheduled for completion in June 2006.

WESTCHESTER AVENUE BRIDGE OVER THE HUTCHINSON RIVER PARKWAY (BRONX)

This bridge supports a transit structure overhead and has substandard clearance over the highway below. In 2003, 13 unauthorized overheight vehicles struck the bridge's girders. A project to install an ITS solution, which includes an overheight vehicle detection system that will flash signs directing vehicles identified as being over 9' in height to exit the parkway, is scheduled for completion in April 2004. It also includes cameras that will be activated by acoustics and will document future damage to the bridge as well as the offending vehicles' descriptions and plate numbers for recoupment of costs by the City. A separate project is underway to reconstruct the bridge and lower the Parkway.

2nd AVENUE BRIDGE OVER LIRR (BROOKLYN)

This $9 million project will reconstruct the bridge in two stages. During both stages, the bridge will be open for one lane of traffic in each direction. Pedestrian traffic on the bridge will be maintained at all times. The existing six span bridge was constructed in 1912. The current bridge superstructure will be completely removed and replaced with a new two span, cast-in-place reinforced concrete deck and weathering steel composite superstructure. A recent inspection revealed significant deterioration of the steel frames and the reinforced concrete piers. The bridge is currently supported by temporary 12"x12" wooden columns at various locations. A Notice to Proceed for the reconstruction of this bridge was issued to the contractor with a start date of November 4, 2002. The project is scheduled for completion in the spring of 2005.

Demolition of the 2nd Avenue Bridge Superstructure. Abutment Footing and Stem Reinforcement.

Installation of Footing and Column Reinforcement for the 2nd Avenue Bridge's Center Pier. Excavation Protection System at the North Abutment.

View of the Partially Completed Center Pier and South Abutment of the New 2nd Avenue Bridge. View of the New North Abutment Stem Wall.

Installation of Stay-in-Place Deck Forms on the 2nd Avenue Bridge

EAST 3rd STREET AND 52nd STREET BRIDGES OVER LIRR (BROOKLYN)

This $4 million project will reconstruct these two bridges, built in 1906. The bridges span a railroad track owned by LIRR, and presently used by New York and Atlantic Railway for freight service. A Notice to Proceed for the reconstruction of these bridges was issued to the contractor with a start date of May 5, 2003. The work will include building new superstructures of steel stringers, reinforced concrete decks, parapets with protective screenings, and steel faced curbs and concrete sidewalks. The bridges will be constructed in two stages, with one traffic lane in each direction and one sidewalk open at all times during construction. The project is expected to be complete in November 2004.

7th AVENUE BRIDGE OVER NYCT (BROOKLYN)

The current two span concrete encased steel stringer bridge consists of one span and a cantilever over a concrete encased steel column pier. The reconstruction of this bridge will include the replacement of the entire existing superstructure, the repair of the existing abutments and pier, and the reconstruction of the approaches. The bridge was closed to traffic for 10 months beginning on June 19, 2002, as agreed to by Community Board #7. This $3.7 million bridge reconstruction began in April 2002, and is expected to be complete by May 2004.

Installation of Safety Wrap Around the High Pressure Gas Main and the Con Edison Oil-o-Static Pipeline

Installation of Reinforcement in the 7th Avenue Bridge Abutment Stem and Backwall

8th AVENUE BRIDGE OVER LIRR AND NYCT (BROOKLYN)

This $5.3 million project replaced the original four span bridge. The existing bridge had concrete-encased steel built-up multi-stringer-floor beam systems supported by a concrete encased steel pier and concrete abutments. The new bridge is a two span multi-girder steel structure of the same length supported by steel cap beams and pier columns. In addition, a new water main was installed, and the existing electrical conduits and gas main were replaced. Construction began on March 6, 2000. The reconstruction of this bridge was substantially completed, and it was re-opened to traffic on May 5, 2003.

8th Avenue Bridge Before Reconstruction

8th Avenue Bridge Before and After Reconstruction

EAST 10th STREET PEDESTRIAN BRIDGE OVER FDR DRIVE (MANHATTAN)

This $2.1 million project began on April 8, 2002. Work included the removal and replacement of the steel superstructure and the concrete deck slab. In addition, new ramps were built to meet the requirements of the Americans with Disabilities Act. The reconstruction of this bridge was substantially completed and it was re-opened to traffic on October 24, 2003.

New East 10th Street Pedestrian Bridge

East Approach Lower Ramp of East 10th Street Bridge. VMS Board Attached to North Fascia.

14th AVENUE BRIDGE OVER LIRR (BROOKLYN)

This $3.3 million project will reconstruct a bridge originally built in 1927. The existing four span superstructure will be removed and replaced with a single span precast, pre-stressed concrete and steel composite jointless superstructure. The bridge will be constructed in two stages. During each construction stage, two lanes of traffic, one lane in each direction, will be maintained. Pedestrian traffic will be maintained at all times. A Notice to Proceed for the reconstruction of this bridge was issued to the contractor, with a start date of December 2, 2002. The project is scheduled for completion in the late spring of 2004.

Installation of the Soldier Piles for the Excavation Protection System for the 14th Avenue Bridge. Excavation for the Abutment Footing.

Installation of Abutment Footing and Stem Reinforcement for the 14th Avenue Bridge

View of Reinforcement and Form Work Installation at the 14th Avenue Bridge Abutment

Concrete Pour at the 14th Avenue Bridge Abutment. View of the Partially Completed Abutments.

15th AVENUE, 18th AVENUE, 17th AVENUE, AND 20th AVENUE BRIDGES OVER NYCT (BROOKLYN)

The 15th Avenue Bridge is an arch barrel bridge, constructed in 1912-1913 between 63rd and 64th Streets. Age, weather and increased traffic have affected the bridge. The roadway slab, concrete abutments and concrete piers are severely deteriorated. The bridge has now outlasted its useful life. The scope of this project will include the removal of the existing pavement, sidewalk, piers, columns, roof beams, portions of the abutments and the concrete arches over the NYCT tracks. The reconstruction will include portions of the abutments, installation of precast reinforced concrete pier wall and deck panels, construction of a reinforced concrete deck on top of precast deck panels, and the installation of a 300 mm water main, 408 mm gas main and electric facilities. The approach slabs and bridge joints will be replaced. In addition, new roadways, sidewalks, steel faced curbs, and a concrete parapet with pedestrian fencing and street lighting will be constructed. The 15th Avenue Bridge is expected to be completed in the fall of 2004. The entire bridge will be closed to vehicular traffic; however, pedestrian traffic will be maintained at all times. The intersection of 63rd Street and 15th Avenue will be closed to vehicular traffic; however, two-way traffic will be maintained on 63rd Street between 15th Avenue and 16th Avenue for use by local businesses and residents.

The 18th Avenue Bridge is also an arch barrel bridge, constructed in 1912-1913 between 63rd and 64th Streets. Age, weather and increased traffic have affected the bridge. The roadway slab, concrete abutments and concrete piers are severely deteriorated. The bridge has now outlasted its useful life. The scope of this project will include sewer work, the removal of a portion of the existing abutments, columns, roof beams, piers and the arches over the NYCT tracks. Cast-in place concrete piles, a steel superstructure, and new integral abutments will be installed. The water main, gas main, and sewer will be removed and relocated. A new concrete deck, approach slabs, and sidewalks will also be part of this reconstruction project. The 18th Avenue Bridge is expected to be completed by July 2005. The bridge will be constructed in four stages, with one lane open in each direction at all the times.

Similar construction at the 17th Avenue and 20th Avenue Bridges is scheduled to begin after the completion of the 15th and 18th Avenue Bridges. A Notice to Proceed for the $17.7 million reconstruction of these four bridges was issued to the contractor with a start date of September 29, 2003. The project is scheduled for completion in October 2006.

WEST 37TH STREET BRIDGE OVER AMTRAK (MANHATTAN)

A Notice to Proceed for the $3.4 million reconstruction of this bridge was issued to the contractor with a start date of January 21, 2002. A new reinforced concrete deck and approach slabs were installed, approach roadways were reconstructed, and wingwalls, abutments, and pier crash walls were replaced. Concrete encasement was removed from the existintg stringers, and they were cleaned and painted. New water mains and electrical conduits were installed.

The bridge opened to both vehicular and pedestrian traffic on January 27, 2004. The project is scheduled for completion in April 2004.

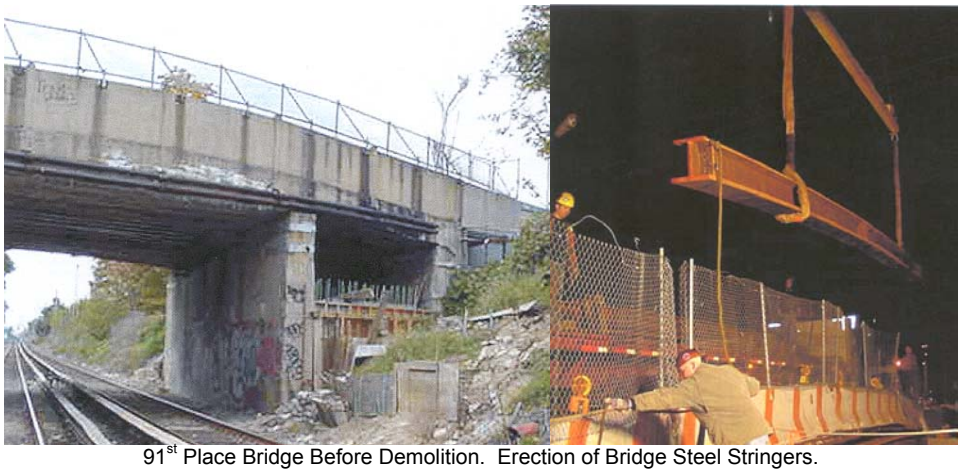
91st PLACE BRIDGE OVER LIRR (QUEENS)

The 91st Place Bridge over the LIRR in Elmhurst was built in 1927. Because a recent inspection revealed significant deterioration, DOT decided to replace the entire bridge. This $4.5 million project included removal of the existing superstructure and replacement with a single steel span structure, removal of part of the existing abutments and piers and construction of new abutments, replacement of the existing roadway pavement, sidewalks and curbs, installation of a new larger water main, electrical conduits and Time Warner cable conduits.

The bridge was reconstructed in three stages. During the first stage, one lane was opened in each direction. At the community's request, only one lane, northbound, was opened to traffic during the second stage. The southbound traffic was detoured. During the third stage, one lane was maintained in each direction.

The contract includes incentive and disincentive clauses. The contractor was awarded an incentive of $160,000 for completing Stage II 16 days early on November 9, 2002. $5,000 per day (up to $125,000 for a maximum of 25 days) will be awarded for early completion of Stage III, with an unlimited disincentive of $5,000 per day for late completion.

At the community's request, the bridge was widened to accommodate an additional lane by reducing the sidewalk width. Construction began on September 17, 2001, and was substantially completed on June 30, 2003.



91st Place Bridge Before Demolition. Erection of Bridge Steel Stringers.

Exposing the Old Steel Stringer Ends on the 91st Place Bridge. Removing the Central Pier by Saw Cutting the Concrete in Two Directions – Each Piece Weighed 9 Tons.

Placing Concrete for the 91st Place Bridge Grid Deck. Installation of New Sidewalk and Roadway at the Corner of Corona Boulevard and 91st Place.

New East Sidewalk on the North Side of the 91st Place Bridge. Northwest View of the New Bridge.

153rd STREET BRIDGE OVER METRO NORTH (BRONX)

This project, currently in the design and environmental impact assessment stage, will include a two-span, single tower, cable stayed vehicular bridge. It will be the first of its kind in New York City. The new four lane bridge will extend East 153rd Street in the Bronx across the Mott Haven rail yards from Morris Avenue to the Grand Concourse just north of Hostos Community College in the Melrose Section of the Bronx. This bridge will complete a link the street lost in the early 1980's when the old turn-of-the-century bridge was closed and demolished because of its age and deterioration. Construction of the new bridge is tentatively scheduled to begin in December 2005 and be completed in December 2007.

Original 153rd Street Bridge

The new bridge will significantly ease congestion on the current east-west streets in the South Bronx, along 149th and 161st Streets as well as the local streets in this neighborhood. With this bridge, East 153rd Street will be a continuous east-west thoroughfare from the commercial hub of Third Avenue to the Civic Center area of the Grand Concourse. It will serve the new revitalization projects of Melrose Commons, the Concourse Shopping Plaza and the Bronx Criminal Court Complex.

The bridge's graceful design, similar to the Tampa Bay Bridge in Florida, will create a very prominent landmark for this neighborhood. The cable-stayed structure will contain a tower rising above East 153rd Street to add to the Bronx skyline, with ribbons of steel cables holding up the roadway structure. The roadway will run between the two towers, and the sidewalk and bicycle lanes will be located on cantilever sections outside of the towers. This will reduce the overall depth of the superstructure by reducing the floor beam depths.

Rendering of New 153rd Street Bridge

EAST 161ST STREET BRIDGE OVER CONRAIL PORT MORRIS (BRONX)

The $5.6 million reconstruction of this bridge began on June 11, 2001. The existing bridge deck and utilities were demolished, and the abutments were partly removed. A new superstructure was constructed, the abutments were repaired, and the geometry of the local streets was widened.

O'Neill Square Park is a triangular park that was originally bounded by Elton and Washington Avenues and East 161st Street, and it is located above the CSX (Conrail) Port Morris Branch right of way. The park originally consisted of trees, asphalt pavers, park benches with concrete tables, and a flagpole, and was approximately 720 square meters in area.

Old O'Neill Square Park

The current bridge reconstruction project incorporated New York City mapping changes in conjunction with the May 1994 Melrose Commons Urban Renewal Project, mainly the elimination of the portions of East 161st Street and Washington Avenue that bounded O'Neill Square Park. The demapped portions of streets were reduced to form pedestrian ways, and the remaining land was incorporated into O'Neill Square Park, forming a larger park area, now approximately 2,040 square meters in area.

The new park consists of additional tree plantings, a flowerbed with animal art (bronze snails), park benches, a water fountain, sprinkler connection, park lights, grass, and colored asphalt pavers that complement the bronze snail art.

New Colored Asphalt Pavers

Bronze Snails at the Flower Beds

The bridge was reconstructed in three stages, with one vehicular lane maintained in each direction during construction. The project was substantially completed on December 15, 2003.

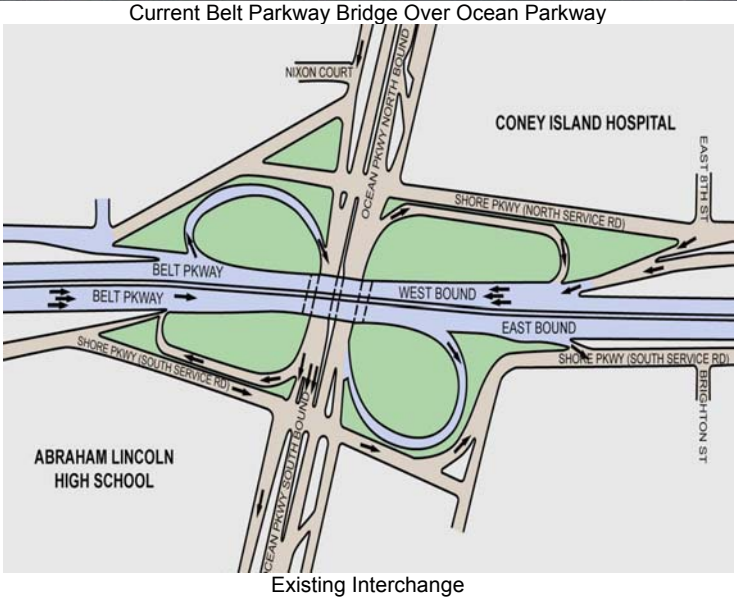
Design-Build

In 2003 the Department continued to use the Design-Build process to expedite capital bridge rehabilitation. These contracts retain the same company for both design and construction on selected projects. It is evident that there are many advantages to the Design-Build program, including the use of one consolidated procurement rather than two or more, resulting in significant time savings; the ability to commence construction before design completion; the avoidance of project escalation costs as construction commences two or three years earlier than with the conventional design-bid-build method; minimization of design change orders; and better coordination between design and construction, as critical field issues are addressed expeditiously. In addition, the design is custom made and reflects the capabilities and strength of the specific contractor; the Department establishes a single point of contact for communicating its goals and objectives; and overall costs are reduced substantially.

BELT PARKWAY BRIDGE OVER OCEAN PARKWAY (BROOKLYN)

This $55 million project involves the replacement of the Belt Parkway Bridge over Ocean Parkway, reconfiguration of the interchange, roadway work on approximately a mile of the Belt Parkway, and roadway and associated landscaping work on Ocean Parkway from approximately Avenue Z to West End Avenue.

Current Belt Parkway Bridge Over Ocean Parkway

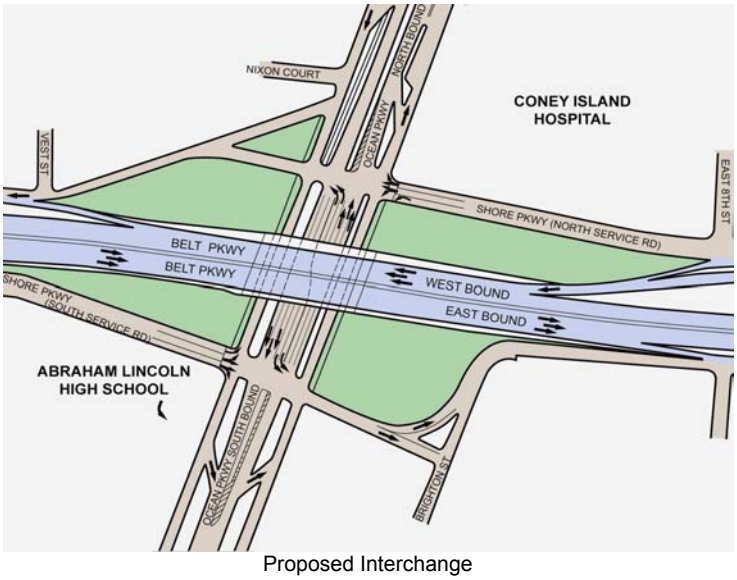


Existing Interchange

The bridge needs to be replaced because of its deteriorating condition, which cannot be done without affecting the already substandard ramps. This necessitated the re-design of the entire interchange and the associated work on Belt Parkway and on Ocean Parkway. The existing traffic patterns at the bridge and interchange ramps were projected to reach unacceptable levels of service within the next ten years without the reconstruction. The existing interchange design placed pedestrians in conflict with vehicles, especially by the loop ramps that are adjacent to Coney Island Hospital, located to the northeast of the interchange.

The Belt Parkway is a significant corridor of the Regional Transportation System with daily volumes of 166,000 vehicles. Coupled with the rapid deterioration of the bridge, the possibility of closure, and our concern for public safety, the New York State Department of Transportation (NYSDOT) requested that NYCDOT procure this project using Design-Build. NYSDOT will act as the Federal Highway Administration's representative. The project has secured 80% federal funding since it involves this significant corridor of the Belt Parkway, as well as the Historic Ocean Parkway, which was the first parkway of its kind in the United States. It is part of the Special Experimental Project No. 14 Program, a Federal Program that allows innovative contracting practices to be used.

Rendering of New Belt Parkway Bridge Over Ocean Parkway



Proposed Interchange

This project will extensively utilize precast elements. The precast beams, parapets, and approach slabs will be fabricated in upstate New York and transported to the site on an as-needed basis. A temporary bridge will be placed at the south side of the existing bridge. Traffic will be diverted onto the temporary bridge and the existing south portion, while the north portion is demolished and rebuilt. The newly built north portion will be wide enough to accommodate all

six lanes (three in each direction) on the Belt Parkway while the south is being demolished and rebuilt.

Rendering of Landscaping Plan

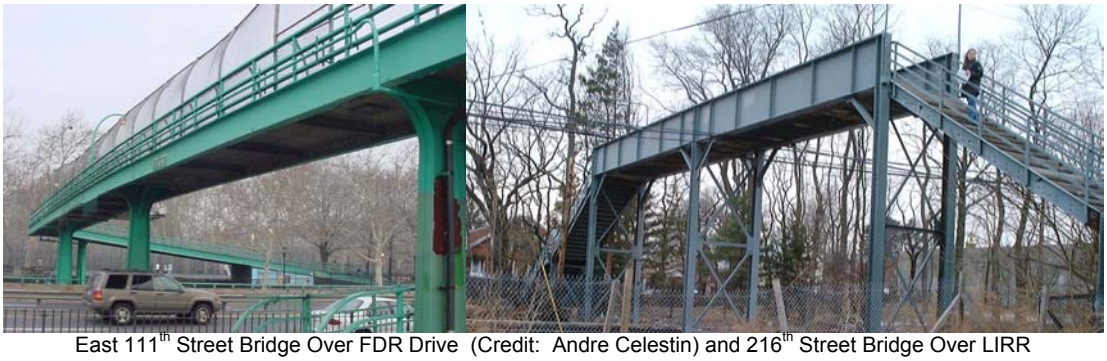
The project includes incentives and disincentives and liquidated damages clauses to ensure timely completion of critical activities and to minimize the inconvenience to the public. The project includes an incentive for early completion of $85,000 per day with a cap of $2 million. There is a disincentive of $85,000 for each day the contractor is late in finishing the project with no limit. A Notice to Proceed for the design-build reconstruction of this bridge was issued to the contractor with a start date of September 12, 2002. Pre-construction preparatory activities began in September 2003.

From September 2003 through the end of November 2003, the contractor installed the pile foundation for the new bridge as well as the foundation and pier caps for the temporary bridge; completed all watermain work on Ocean Parkway, and provided all necessary tree protection. In addition, the contractor created new embankments where necessary, compacted the soil, widened the north and south Belt Parkway service roads, and created new exit and entrance ramps between the Belt Parkway and the service roads. The existing loop ramps were then closed, and necessary signal modifications and installation of the dual left turns on Ocean Parkway were performed, thus establishing the permanent traffic pattern for the new intersection. Construction activities will resume in Spring 2004, after a three month winter shutdown. The spring activities are such that traffic will be impacted. However, the contractor is addressing this by providing a temporary bridge, thus minimizing any impact. Substantial completion of this project is expected in mid-January 2005.

Engineer-in-Charge Valeriya Remezova, Beatriz Duran, and Director of Design-Build/Emergency Contracts Chris Sklavounakis Inspecting Wick Drain Installation at the Northeast Corner of the Belt Parkway Bridge Over Ocean Parkway Project. (Credit: Andre Celestin)

PEDESTRIAN BRIDGES

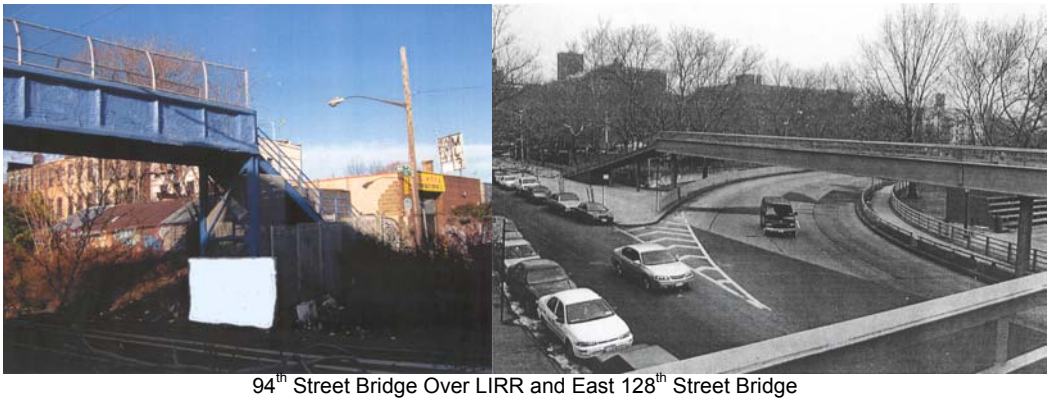
The Division is currently working on the preliminary engineering to be included in the Design-Build RFP (Request for Proposals) to replace 22 pedestrian bridges in all five boroughs. The bridges are Bethel Avenue over SIRT South Shore, and Tracy Avenue over SIRT South Shore in Staten Island; Crocheron Park over BCIP, 51st Avenue over LIRR Main Line, 55th Avenue over LIRR Main Line, 71st Avenue over LIRR, 94th Street over LIRR, 167th Street over LIRR Port Washington Branch, and 216th Street over LIRR Port Washington Branch in Queens; 204th Street over Metro North in the Bronx; Morris Street over Brooklyn Battery Tunnel Plaza, Pedestrian Bridge West of 8th Avenue over West 155th Street, 81st Street Stairway at the Promenade over FDR Drive, East 111th Street over FDR Drive, Pedestrian Bridge over East 128th Street, 129th to 130th Street over ramp off 3rd Avenue, West 155th Street over Amtrak 30th Street Branch, and West 181st Street over Henry Hudson Parkway NB in Manhattan; West 8th Street over Surf Avenue, 17th Avenue over BSHP, 27th Avenue over BSHP, and 92nd Street over BSHP in Brooklyn. The RFP was issued in August 2003. Construction is expected to begin in October 2004, and be complete in the mid-summer of 2007, with no construction activity at any single location exceeding six months. In addition, no construction is expected to take place at the West 8th Street Bridge during the summer months, so as not to interfere with Aquarium activities and access to the waterfront.



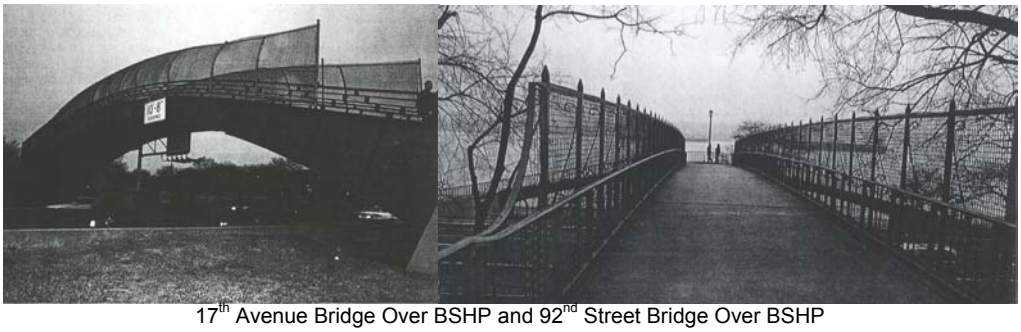
East 111th Street Bridge Over FDR Drive (Credit: Andre Celestin) and 216th Street Bridge Over LIRR

Bethel Avenue Bridge Over SIRT and Crocheron Park Bridge Over BCIP

51st Avenue Bridge Over LIRR and 55th Avenue Bridge Over LIRR



94th Street Bridge Over LIRR and East 128th Street Bridge



17th Avenue Bridge Over BSHP and 92nd Street Bridge Over BSHP

Bridge	Average 2002 Daily Pedestrian Traffic - Weekday	Average 2002 Daily Pedestrian Traffic - Weekend
Bethel Avenue over SIRT South Shore	390	169
Tracy Avenue over SIRT South Shore	410	179
Crocheron Park over BCIP	176	351
51st Avenue over LIRR Main Line	635	188
55th Avenue over LIRR Main Line	244	186
71st Avenue over LIRR	No Existing Bridge	No Existing Bridge
94th Street over LIRR	626	369
167th Street over LIRR Port Washington Branch	254	176
216th Street over LIRR Port Washington Branch	58	30
204th Street over Metro North	131	102
Morris Street over Brooklyn Battery Tunnel Plaza	789	632
Pedestrian Bridge West of 8th Avenue over West 155th Street	N/A	N/A
81st StreetStairway at the Promenade over FDR Drive	687	578
East 111th Street over FDR Drive	563	389
Pedestrian Bridge over East 128th Street	602	329
129th to 130th Street over ramp off 3rd Avenue	598	340
West 155th Street over Amtrak 30th Street Branch	567	434
West 181st Street over Henry Hudson Parkway NB	416	883
West 8th Street over Surf Avenue	1051	1129
17th Avenue over BSHP	648	916
27th Avenue over BSHP	394	813
92nd Street over BSHP	393	773

RIKERS ISLAND BRIDGE OVER RIKERS ISLAND CHANNEL (QUEENS)

This project, currently in the preliminary engineering phase, involves replacing the superstructure of this rapidly deteriorating bridge. Cores taken from the bridge deck reveal that the estimated useful life of the deck will soon expire, thus making bridge rehabilitation necessary. In 2002, the bridge carried approximately 13,447 vehicles per day.

The Division had previously completed the replacement of the bridge's substructure in 1998. The salty environment of the channel significantly contributes to the deterioration of the superstructure. This continued deterioration could also negatively impact the recently completed substructure work. The Division considered Design-Build to be the best project delivery method for this project, as it can expeditiously bring projects to the construction stage, and is the preferred method in all cases where time is of the essence. As the bridge exclusively serves the Rikers Island Correctional Facility, this project will require coordination with the Department of Corrections. Construction is expected to begin in 2012. As an interim measure, a project is planned for Fiscal Year 2005 to rehabilitate the bridge deck.

Emergency Contracts

BELT PARKWAY BRIDGE OVER MILL BASIN (BROOKLYN)

On November 6, 2002, in the interest of public safety (pursuant to Section 103(4) of the General Municipal Law and Section 315 of the New York City Charter) the Department declared that an emergency existed relative to the movable bridge carrying the Belt Parkway over Mill Basin.

A Notice to Proceed for this $3 million emergency contract was issued to the contractor with a start date of December 23, 2002. The project included an incentive for early fabrication completion of $10,000 per day with a cap of $50,000, and an incentive for early construction completion of $10,000 per day with a cap of $70,000. There were disincentives of the same amounts for a late finish with no limit to the amount of penalty.

The contractor completed the emergency median guide rail installation and re-opened all lanes to traffic on March 29, 2003, six days ahead of schedule, thus collecting an incentive of $60,000. The bridge was re-opened to marine traffic on April 3, 2003. The emergency project on this bridge, which began on December 23, 2002, was substantially completed on April 5, 2003.

Crash tests were performed at a testing site on a copy of the new barrier, resulting in the need to make some modifications to the barrier that was installed. Completion of additional crash tests are expected in early 2004, and further modifications may be introduced, if necessary. While this fine-tuning is proceeding, the new barrier has already proved its worth by saving lives on more than one occasion. Recent accidents at the site have resulted in property damage only.

New Median Barrier of the Mill Basin Bridge (Credit: Vera Ovetskaya)

BELT PARKWAY BRIDGE OVER PAERDEGAT BASIN (BROOKLYN)

On February 21, 2003, NYCDOT was informed by the Police Harbor Unit that extensive damage was observed to one of the columns supporting the bridge. The column appeared to have been hit by a vessel. Inspection revealed that the column was cracked through, and was hanging from the bridge instead of supporting it. The cap beam between this column and the adjacent column was also pulled out of place, as was the pedestal.

Broken Pier Column at the Belt Parkway Over Paerdegat Basin Bridge. (Credit: Bojidar Yanev)

In order to immediately address this condition, NYCDOT took traffic off the part of the road whose load the damaged column would carry. Today the bridge has three narrower lanes of traffic and weight restrictions are being strictly enforced. We used our in-house forces to remove the cap beam and the deck over the damaged column.

The real concern, however, is that the column adjacent to the one that was hit exhibited significant distress. This column was now taking more load than that for which it was designed. This reinforced concrete column had cracks running lengthwise along its height. The column also exhibited cracks and spalls at the level where the first column was damaged. Failure of this column could result in a catastrophic failure of the bridge, and therefore posed an immediate threat to life and property.

The above described condition had to be corrected as soon as possible by implementing the necessary repairs. These repairs included the following: removal of unsafe structural elements and obstructions of the existing bridge; repair of distressed elements (columns, dolphins, etc.); replacement of stringers and concrete deck around the location of the impact; protection of elements of the bridge from marine traffic; replacement of a portion of the bridge railing; creation of cuts in the median barrier on the approaches with removable barriers to allow overweight emergency vehicles to make u-turns; and installation of overhead gantries at the Rockaway Parkway and Flatbush Avenue entrances to the Belt Parkway to warn motorists of the bridge restrictions.

In the event of another emergency that would make the bridge unable to carry heavy loads (and necessitate its closing), the gates installed at the median barrier would enable vehicles to turn around and travel in the opposite direction on the Belt Parkway to the closest exit, and then re-enter the parkway at an entrance pass the bridge. Traffic lights to stop the traffic in such an event were installed as well as appropriate signs to notify motorists of the upcoming traffic light.

The Department was notified by its consultant that the bridge may be left in service for 7 years until the programmed replacement (planned to be completed in 2011), provided that all repairs mentioned above were carried out on an emergency basis.

On June 18, 2003, in the interest of public safety, pursuant to Section 103(4) of the General Municipal Law and Section 315 of the New York City Charter, the Department declared that an emergency exists relative to the bridge carrying the Belt Parkway over Paerdegat Basin.

A Notice to Proceed for this $11.3 million emergency contract was issued to the contractor with a start date of September 3, 2003. The project included a milestone for the structural portion of the work involving the replacement and/or repair of the distressed column and the replacement of that portion of the deck. This work required that one westbound lane on the Belt Parkway be closed for 24 hours. The contractor was given nine days to complete this work. In spite of adverse weather conditions, the contractor completed this work on November 14, 2003, in only 6 days, thus collecting the maximum incentive of $120,000.

When and Where Unit

In 2003, the following bridges were worked on under the Division's When and Where contracts: Carroll Street over the Gowanus Canal, Pedestrian Bridge in Center of Park over Transverse Road #2, East Drive over Transverse Road #3, Flushing Meadow Park Pedestrian Bridge over Lawrence Street, FDR Drive Viaduct over Avenue C to East 25th Street, Grand Concourse over East 161st Street, Hamilton Avenue Bridge over Gowanus Canal, Harlem River Drive Northbound Ramp over Harlem River, Henry Hudson Parkway Viaduct over West 72nd to West 79th Street, Summit Street Pedestrian Bridge over BQE, West Drive over Transverse Road #2, West Drive over Transverse Road #4, 14th Avenue Bridge over Cross Island Parkway, 79th Street Traffic Circle over 79th Street Pedestrian Plaza, Promenade over FDR Drive from East 79th to East 91st Streets, 147th Street Bridge over Cross Island Parkway, and West 181st Street Pedestrian Bridge over Henry Hudson Parkway NB.

191st STREET TUNNEL TO BROADWAY (MANHATTAN)

This tunnel provides the main access to the 191st Street train station for the 1 and 9 trains in upper Manhattan. The tunnel underwent a facelift to repair 21 safety and structural conditions. The scope of work included waterproofing designated sections of the tunnel to limit groundwater intrusion; installing additional weep holes along the walls to convey any intruding groundwater to the drainage troughs that are on each side of the tunnel; repairing the drainage troughs and the installation of new gratings; repairing cracks and spalls in the concrete of the tunnel roof and walls; providing a new skid resistant walking surface; installing new high pressure sodium lighting fixtures to replace the old existing florescent fixtures, thus providing for a brighter tunnel; repairing the entrance stairway surface; and applying a new coat of graffiti resistant paint, thus giving it a new fresh, clean look. The tunnel was re-opened to pedestrian traffic on January 5, 2004.

Western Half of 191st Street Tunnel Before Repairs and Painting. Repairs Almost Completed – the Tunnel's Lighting Creates the Yellow Tint. (Credit: Thomas Leung)

Old Drainage Grate Covers in the Eastern Half of the 191st Street Tunnel. New Galvanized Grate Covers. (Credit: Thomas Leung)

Applying the 2nd Skid Resistant Coating to the Western Half of the Tunnel Floor. Repaired Staircase With a Skid Resistant Coating on the Ramp and Landing. (Credit: Thomas Leung)

MARINE WHEN AND WHERE

New York State DOT conducts the underwater inspections of our waterway structures. A contract was needed to facilitate the performance of marine repairs and to maintain structures in need. The objective is to perform marine structural repairs and maintenance together with other appurtenant work, which constitutes repairs of defective and deteriorated parts of bridge structures due to and in a water environment. The Department has neither the staffing nor the equipment to handle this type of special work. The work could not be handled under the usual time and materials When and Where contract, because the work is unique, in that it requires a consultant with underwater-licensed inspectors to supervise and inspect the work for compliance and adequacy. Furthermore, detailed note taking is necessary by the inspectors to check and approve payments for the contractor's work. A Notice to Proceed for this project was issued to the contractor with a start date of February 14, 2002.

Marine bridge repairs already completed include Botanical Garden Road Bridge over the Twin Lakes inside the Bronx Botanical Garden, 145th Street Bridge over the Harlem River, Hutchinson River Parkway Bridge over the Hutchinson River, Shore Road Bridge over the Hutchinson River, Carroll Street Bridge over the Gowanus Canal, and East 15th Street over the FDR Drive.

Ironically, the increasing cleanliness of the water in New York Harbor is responsible for an enormous increase in the activity of marine borers. These organisms are now consuming wood within the tidal zone at an alarming rate, and are causing considerable damage to timber pile sheathing and other bridge structures. The use of a marine When and Where contract enables the Division to take quick and decisive action to repair this structural damage.

In August 2002, an underwater inspection of the timber piles supporting the FDR Drive relieving platform at approximately East 15th Street revealed severe damage by marine borers. Emergency repairs to address this red flagged section began on August 19, 2002, and were completed on September 7, 2002. Additional yellow structural flag work of a similar nature was performed along this site and completed in December 2003.

Current projects include Hamilton Avenue Bridge over the Gowanus Canal, Northern Boulvard over the Alley Creek, and Cropsey Avenue Bridge over the Coney Island Creek. Scheduled projects include Boston Post Road over Hutchinson River, Borden Avenue over Dutch Kills, and 163rd Street Pedestrian Bridge over Hawtree Basin.

CARROLL STREET BRIDGE OVER THE GOWANUS CANAL (BROOKLYN)

The Carroll Street Bridge is an example of a retractable bridge, i.e., a movable bridge that is mounted on tracks that are positioned to one side of a navigational channel. To open, the span is withdrawn or "retracted" to shore.

Carroll Street Bridge Before Repairs – Deteriorated Timber Walls Need Replacement. (Credit: Thomas Leung)

The bridge was closed to traffic effective June 27, 2003, as agreed to by Community Board #6. Work performed to eliminate the 44 structural and safety flags under the marine when and where contract included the repair and replacement of the dolphin cluster and abutment walls on both sides of the bridge; partial deck rehabilitation of the east approach of the bridge; and repairs of the tracks, railing, and sidewalk. These repairs have added new life to this historic bridge. The bridge was re-opened to traffic on September 1, 2003.

Work Barge Used During Carroll Street Bridge Repairs. Work Platform From Which the Timbers Were Replaced. (Credit: Thomas Leung)

Cutting 12x12 Timbers On the Barge to Match the Wall. Clam Bucket Used for the Backfilling Operation at the Carroll Street Bridge. (Credit: Thomas Leung)

Gravel Pile to be Used as Backfill After Completion of Timber Replacement at the Carroll Street Bridge. Restoring the Paving Blocks in the Roadway. (Credit: Thomas Leung)

Engineering Review and Support

IN-HOUSE DESIGN

In-House Design staff prepares plans and specifications for bridge replacement/reconstruction projects that enable the Division to restore bridges considered "structurally deficient" to a "very good" condition rating. This unit handles urgent Division projects, as well as special projects under construction by the Bureau of Bridge Maintenance, Inspections and Operations. Projects underway in 2003 included 145th Street Bridge over the Harlem River; Belt Parkway Bridge over Paerdegat Basin (both replacement and Emergency Repair projects) in Brooklyn; and Andrews Avenue Bridge over LIRR, Hempstead Avenue Bridge over Cross Island Parkway, Springfield Boulevard Bridge over Belt Parkway, and Union Turnpike Bridge over Cross Island Parkway (and Creedmoor Center Road) in Queens.

In-House Design's Electrical Group reviews and/or prepares contract documents for all electrical and street lighting work on all projects on the Division's Capital Program. Some of the contracts reviewed during 2003 included the Willis Avenue, Broadway, Macombs Dam, Madison Avenue, 145th Street, Third Avenue, and Wards Island Pedestrian Bridges over Harlem River; 3rd Street and Hamilton Avenue Bridges over Gowanus Canal; Metropolitan Avenue Bridge over English Kills, Belt Parkway Bridge over Mill Basin (Emergency Repairs), Crooke Avenue, and Newkirk

Avenue Bridges over BMT Subway, and Belt Parkway bridge over Paerdegat Basin in Brooklyn; Roosevelt Island Bridge over East River Channel; Bruckner Expressway NB & SB Service Road (Unionport Bridge) over Westchester Creek in the Bronx; Williamsburg and Manhattan Bridges; Andrews Avenue Bridge over LIRR in Queens; the Park Avenue Tunnel; and the Battery Park Underpass under West Street to FDR Drive in Manhattan.

ENVIRONMENTAL ENGINEERING

The Environmental Engineering staff of the Quality Assurance Section provides environmental oversight on all capital projects in the Division. Lead paint abrasive cleaning projects underway in 2003 included Williamsburg Bridge, Manhattan Bridge, Willis Avenue Bridge, Washington Bridge, East 241st Street Bridge, Wards Island Bridge and Macombs Dam Bridge. In addition, this staff provided environmental engineering services for the dewatering and dredging operations at the Third Avenue Bridge; the environmental site assessment at the Metropolitan Avenue Bridge over English Kills Creek; the remediation of transformers at the Broadway Bridge; the removal of underground storage tanks at the Belt Parkway over Ocean Parkway project; the investigation of transformers at the Gerritsen Inlet Bridge; and the environmental site investigation of the Metropolitan Avenue Bridge over LIRR. Environmental oversight was provided to emergency work-over-water projects on the Mill Basin Bridge, Roosevelt Island Bridge, Willis Avenue Bridge, Borden Avenue Bridge and Metropolitan Avenue Bridge.

In addition, the staff implemented a new quality assurance plan for coating inspection and application on Division bridge structures. Services are implemented through the use of consultant contracts. Coating inspection services and engineering were provided on numerous projects such as the East 191st Street Tunnel, the West 37th Street Bridge over Amtrak, the Williamsburg Bridge, the historical coating analysis of the Trolly Barn Kiosk at the Queensboro Bridge (in progress), and the review of various RFI's for shop applied coatings on steel components.

BRIDGE PROJECT SPECIFICATIONS

In 2003, the Engineering Support Section prepared and/or reviewed specifications for 26 bridge rehabilitation and reconstruction contracts which included seven combined or multiple-bridge contracts. Ten of these contracts totaling approximately $300 million in construction costs have been bid and are currently in different stages of award and registration. Seven contracts with a total construction cost of approximately $160 million have been approved by the Law Department and are waiting to be advertised. The specifications for the remaining nine contracts are in various stages of preparation.

Notable among the bridge contracts prepared and/or reviewed are the 145th Street Bridge; Rehabilitation of the Queensboro Bridge; Grand Concourse Bridge over 161st Street (includes the Grand Concourse from 161st to 166th Streets): Protection Against Marine Borers of the FDR Drive (and two bridges in Brooklyn); Protective Coating of the Queensboro Bridge; Hamilton Avenue Bridge and Manhattan Bridge Rehabilitation.

CONTRACT PROPOSAL BOOK PREPARATION GUIDELINES

The Contract Proposal Book is an essential document for the bidding and execution of a construction contract. It contains necessary information for bidders, forms to be completed by bidders, contract provisions and specifications. To assist consultants on City contracts in the preparation of acceptable Contract Proposal Books, the Bureau prepared a guidance manual. This manual specifies the requirements and standards for preparing a Proposal Book, and explains its review and approval process. It is also a useful reference for agency project engineers who manage the bridge rehabilitation and reconstruction contracts.

This manual is given to the consultant during the early stages of final design so that it may be reviewed prior to the specification guidance meeting. Any questions that the consultant may have regarding the Proposal Book preparation can then be discussed at this meeting, at which point the consultant will also be given other necessary information for going ahead with the preparation of the book. The use of this new manual by the consultants on City contracts is expected to significantly reduce the Bureau's review comments and hence the preparation and review time for proposal book submissions by the consultant.

SUPERSIZED LOADS

The weight and frequency of very heavy loads traveling over the City's bridges and roadways have taken a toll on the bridges' infrastructure. The Engineering Review Section is very involved in reviewing the requests for issuing permits for these vehicles. NYSDOT has a project to develop a computerized Automated Overweight Permitting Program for use on State–owned bridges that will handle the complete permitting process and its accompanying required analyses. At the request of NYCDOT, the State is including our locations in their ongoing consultant contract. This will ensure both a lower development cost for the City as well as compatibility between the two systems (routes often pass over both City and State owned bridges). The Department's Management and Information Systems Section has been managing the City's part of the project beginning in 2002, and they assisted in the preparation of the Memorandum of Agreement with the State. This project is expected to begin in the middle of 2004.

The new system will have the following benefits:

As the turn-around time will be days instead of weeks, truckers will be more likely to apply for permits rather than ignoring the restrictions and driving without permits on the bridges.

Ease of permit rule enforcement efforts by the NYPD, as they will have access to the system.

The program will create a database of bridges used by the trucks on the approved routes. This will help the Division to assess the affected bridges when creating the scope of work for rehabilitation and/or reconstruction, and to decide whether or not to design them for higher loads.

Many consumers are now buying merchandise via the Internet. Giant warehouses are being built around the country for packaging and shipping these goods by trucks. We expect a large increase of overweight truck movement in the City in the near future. The new permit computer program will be able to handle a large number of permit requests.

A streamlined vehicle permitting approval process coupled with the ongoing inspections of the bridges being subjected to repetitive super-loads will actually reduce the yearly capital outlays of the Department in the long run.

Review of Con Edison Superload Transporters Permit for Crossing City-Owned Bridges

In 2003, Bureau engineers reviewed calculations submitted by Con Edison in conjunction with their permit application for transporting super-heavy reactors (up to one million pounds) across city-owned bridges in the Bronx and Queens. Special attention was necessary because of the very heavy loads to which the bridges would be subjected. Con Edison was required to perform pre- and post-move inspections of the affected bridges for each move. In addition, they assumed liability for any type of damage that might be incurred. All the moves were carried out without any problems.

CONVERSION OF DIVISION ENGINEERING ARCHIVES

In 2001, the Division prepared a justification for emergency funds for electronic conversion of existing Division engineering archives and the creation of a remote management system. These items were being damaged by the temperature and humidity at their Battery Maritime Building storage area. These records include 80,000 frames of microfilm, 20,000 original construction photographs, 12,000 full-sized original drawings, and one million letter-size design documents.

The funding was received in 2002, and the transfer of the drawings and photographs to CD-ROMs was completed in spring 2003. The next phase of the project will consist of the digitizing of the microfilm collection.

NONDESTRUCTIVE TESTING OF DRILLED SHAFTS

Osterberg load cells are a relatively recent innovation; they are now commonly used to perform static load tests on high capacity drilled shafts and bored piles. Osterberg load cells consist of hydraulically operated jacks that are installed within the drilled shaft at the time of concrete placement. After the concrete achieves the required strength, the load test is performed by expanding the Osterberg load cell using hydraulic pressure. The expanding cell then applies an upward load to the section of the drilled shaft above the load cell and a downward load to the section of shaft (or shaft base) below the load cell. The Osterberg load cell thereby produces an internal load within the shaft using the soil or rock friction above the load cell as reaction to the applied downward load. The use of Osterberg load cells eliminates the need for costly reaction piles or reaction weights that are necessary for conventional static load tests, providing an economical and practical method for testing large diameter, high capacity drilled shafts.

Osterberg load cells are available in diameters of 4” to 34”, and corresponding load capacities from 40 to 3,000 tons. The load cells are typically attached to the drilled shaft reinforcing cage at the base of the shaft and, occasionally, at an intermediate level along the length of the drilled shaft. For a larger diameter drilled shaft, two or more load cells can be installed at each Osterberg cell level, using thick bearing plates above and below the load cells to join the load cells and distribute the applied load to the shaft.

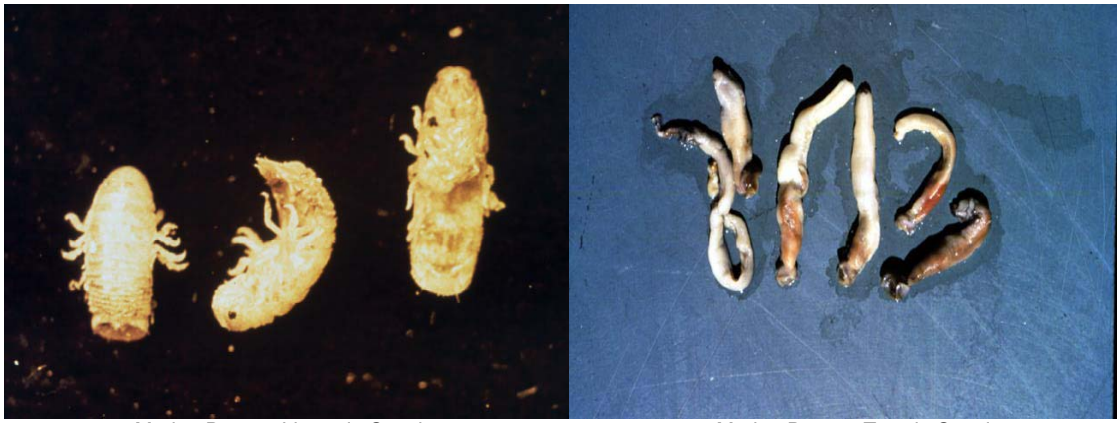
Instrumentation used to monitor the load tests includes electronic displacement gauges to measure expansion of the Osterberg load cell, tell-tales and dial gauges to measure upward displacement of the top of the Osterberg load cell, dial gauges to measure top-of-shaft displacements, and electronic strain gauges to measure strains at frequent intervals along the reinforcement cage (for use in determining loads and shear resistance along the length of the drilled shaft). Applied load tests are determined by an electronic pressure gauge. All instrumentation data is electronically collected at frequent time intervals, and stored on a laptop computer. During the test, load is applied in increments until the shaft fails in end bearing or friction, or the capacity of the load cell is reached, or at the maximum expansion of the load cell (typically 6”).

In 2003, this form of nondestructive testing was performed on the drilled shafts at the Third Avenue Bridge over the Harlem River.

Osterberg Load Cell and Bearing Plate at Bottom of Reinforcing Cage. Instrumentation, Integrity Testing Tubes, And Concrete Tremie Pipe Within A Completed Reinforcement Cage.

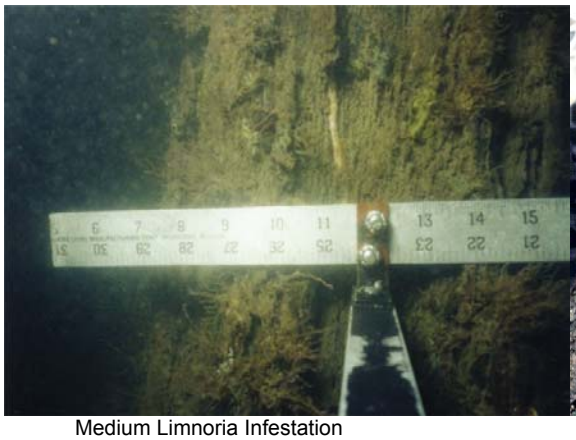
MARINE BORER STUDY

Marine borers pose an immediate and serious danger to the thousands of piles and other structures of timber built in the marine environment. In New York Harbor, as the water quality improved due to many years of clean up efforts, marine borer (limnoria, teredo, etc.) activity has increased significantly in recent years. The recent inspections of timber structures by various local agencies (such as The Port Authority of NY & NJ, NYS Department of Transportation, NYC Department of Sanitation, and NYC Economic Development Corporation) indicate increasing damage to their structures resulting from marine borer activity. These agencies are implementing measures to protect the structures against marine borers.



Marine Borer – Limnoria Species

Marine Borer – Teredo Species

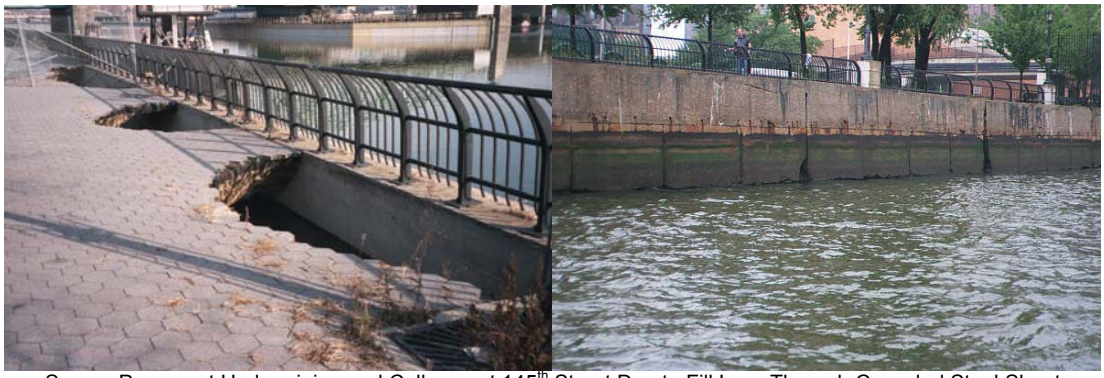


Medium Limnoria Infestation

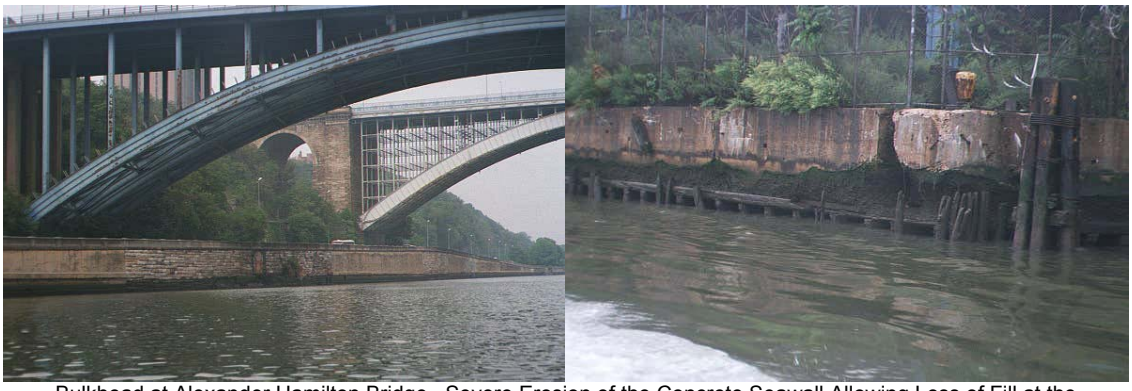
Teredo Damage (holes up to ¼" diameter)

In October 1999, the Department began a study to assess the existing 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 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. The final design is in progress and is scheduled for completion by April 2005. The construction work is expected to commence in December 2005.

Based upon information gathered during this study, DOT expanded the scope of the study to include the inspection of other City-owned property not under the jurisdiction of the Agency. In addition to timber pile supported low level relieving platforms, these structures include masonry or crib-type gravity retaining walls, high level decks, steel sheet pile bulkheads and rip rap embankments. The additional inspection of property belonging to the City but not under the jurisdiction of DOT, which began on May 7, 2001, was completed in April 2002.



Severe Pavement Undermining and Collapse at 145th Street Due to Fill Loss Through Corroded Steel Sheet Piling. East River Bulkhead.



Bulkhead at Alexander Hamilton Bridge. Severe Erosion of the Concrete Seawall Allowing Loss of Fill at the MTA Rail Yard at 151st Street.

A critical condition along the esplanade at East River Park was identified during the week of June 25, 2001 and reported to the Department of Parks and Recreation and other City agencies. Contract documents for the repair of this esplanade under a change order were prepared, and the remediation of this condition will be the financial responsibility of the Department of Parks.

In August 2002, an underwater inspection of the timber piles supporting the FDR Drive relieving platform at approximately East 15th Street revealed severe damage by marine borers. Emergency repairs to address this red flagged section began on August 19, 2002, and were completed on September 7, 2002.

A total of six critical conditions and twenty-one immediate repair conditions were identified during the inspections. Critical condition reports, which identified the condition and included sketches and cost estimates for the proposed repairs, were provided for each of the critical conditions. For the immediate repair conditions, defined as those requiring repairs to be carried out within three years from the date of inspection, conceptual repair details and cost estimates were prepared. A detailed, two volume evaluation/recommendation report consisting of inspection findings, repair details, cost estimates and general recommendations was prepared and distributed to all the concerned agencies, including the Department of Parks and Recreation, the NYC Economic Development Corporation and the Departments of Sanitation and Environmental Protection.

Deteriorated Pile Caps Under the Relieving Platform Adjacent to Pier 36. Severe Impact Damage to the Concrete Seawall and Stone Facing at the Foot of Cherry Street.

TRUMP/NEW WORLD PROJECT

The Trump/New World project (Riverside Drive between 59th and 72nd Streets) includes the construction of seven new bridges, a ramp, and connector roads along Riverside Drive as a part of the residential and commercial development over the former Penn Central Rail Yard. When completed, the infrastructure network will be transferred to DOT for maintenance. The Division is providing engineering review of the design drawings, as well as quality assurance inspections, to ensure the developer's compliance with DOT's construction and design standards. The project is now in its second stage, and is 65 percent complete overall.

BRIDGESCOPE

The Division is responsible for maintaining the structural integrity of the Department's 753 bridge structures and six tunnels. These structures are inspected to rate the current condition as compared with the original design capacity and function. Inspections also identify safety and structural conditions (flags). Repairs are performed to resolve flagged conditions. Painting and preventive maintenance are performed and defective, damaged, and worn bridge components are rehabilitated or replaced. The Division is also responsible for the rehabilitation and reconstruction projects on all NYCDOT owned bridges and tunnels.

To successfully perform its functions, the Division needs to share information necessary to coordinate maintenance, design and construction projects.

Bridgescope is an integrated, Division-wide system that provides a seamless flow of information among the bureaus within Bridges and between other divisions within the Department. This system also provides external organizations the ability to view certain information. The system will provide flexibility for incorporating any future units and functions. A timely electronic flow of information among the bureaus will be provided. This accomplishment will greatly assist the Division in meeting its objective of moving toward a paperless environment. A comprehensive on-line help function will be incorporated for the entire Bridgescope system.

The Bureau of Engineering Review and Support has undertaken the responsibility, on behalf of the end users, to ensure that the new Bridgescope application performs as defined in the consultant's scope. Bridgescope is a computer program developed in two phases. Phase I is the Memorandum of Bids, which is in production now. This application allows engineers to input engineers' estimates and contractors' bids into the system's database. The system can then print Certificate to Proceed reports and Memorandum of Bid reports, which are required for the registration of construction contracts. Phase II is the tracking system, which is under development now. This application will allow engineers to input all the information about any projects under design. This system will track all the milestones for a particular project and alert engineers and supervisors if any milestones are delayed and the consequences of this delay on the project schedule. Eventually Phase I and Phase II will be linked so that anyone can track a project from the initiation to the close out of construction of the project. The final report containing the detailed system specifications was completed on July 25, 2002, and after review by the Division, was submitted to the Agency's Management Information Services bureau for further development.

Bridge Maintenance, Inspections and Operations

EAST RIVER BRIDGES ANTI-ICING PROGRAM

Traditional snow and ice control practices rely heavily on the use of salt, a material known to corrode steel and accelerate the deterioration of concrete and asphalt surfaces. A new method of snow and ice control was needed to protect the City's $2.5 billion investment in the rehabilitated East River Bridges. This method, known as anti-icing, involves the application of a chemical freezing point depressant to the roadway surface to prevent snow and ice from bonding to the roadway. Frequent plowing removes any accumulation of unbonded snow or ice before traffic is affected.

The Division's Anti-Icing Program uses the chemicals potassium acetate and magnesium chloride. The anti-icing fleet consists of fifteen spray trucks, ten plow trucks and several smaller plows. Six of the spray trucks are combination spray/plow trucks with an 1800 gallon tank capacity, and four are spray-spreader/plow trucks with a 900 gallon spray capacity, and a four cubic yard spreader capacity. There are fourteen chemical storage tanks, with a total storage capacity of 76,250 gallons.

In the winter of 2002-2003, a total of 125,000 gallons of anti-icing chemicals were applied on the roadways of all four East River Bridges.

BROOKLYN BRIDGE PROMENADE

The replacement of the Brooklyn Bridge promenade deck and stringers by Division personnel was completed in December 2000. The temporary footbridge, which had been built several years earlier and maintained throughout the project, was removed. The replacement of the deteriorated sections of promenade railing with replicas of the existing steel was completed on December 16, 2003. Virtually all of the work was done from the promenade, closing the left roadway lane as little as possible.

Painting the Replicated Railing. New Promenade Railing (Credit: Peter Basich)

INSPECTIONS

In 2003, Inspections covered 82 bridges and 659 spans. Emphasis was placed on ensuring public safety through the monitoring of potentially hazardous conditions and temporary repairs. The unit performed 290 monitoring inspections, and 272 special winter monitoring inspections of cellular structures, shorings, and potential fire hazards. In addition, 151 emergency inspections were conducted in response to hot line calls, in-house requests, or citizen complaints.

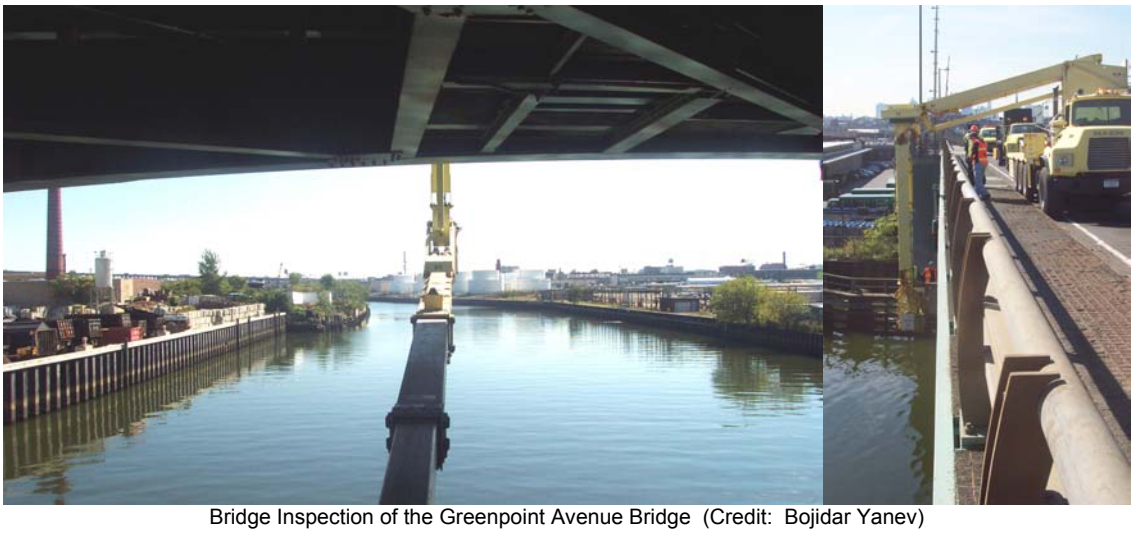
View of the East 64th Street
Pedestrian Bridge over FDR Drive
From the 120-Foot Boom
(Credit: Bojidar Yanev)

Emergency Inspection of Francis Lewis Boulevard over Cross Island Parkway in March 2003. (Credit: Wen Liao)

A Multi-Vehicle Accident Resulted in Damage to the Stone Cladding and About 200 Feet of Bridge Rail.
(Credit: Wen Liao)

In 2002, the Division began to receive State DOT bridge inspection reports in CD-ROM format. Flag reports are now also transmitted electronically. As of September 2003, standard inspection work is funded by a federal grant. Emergency response inspections and administrative support remain city funded.

The Division is inspecting 31 Parks Department bridges on a priority basis, and the necessary flag repairs are being performed under our present When and Where contract utilizing $500,000 transferred to us by Parks for this work. The bridges are: Footbridge North of Route 1 over Bronx River, West Footbridge over Prospect Park Stream, Footbridge Near Boathouse over Prospect Park Lake, Pedestrian Bridge at 73rd Street over HHP/Amtrak, West 151st Street Footbridge over Conrail 30th Street Branch, Footbridge Opposite 62nd Street over Bridle Path, Pedestrian Bridge Between 73rd and 74th Streets over the Lake, Footbridge Opposite 77th Street over the Lake, Pedestrian Walk Opposite 77th Street over Stream to Lake, Pedestrian Walk Opposite 86th Street over Bridle Path (both directions), High Bridge Pedestrian Overpass, Isham Park Pedestrian Bridge over Harlem River Inlet, Belmont Park Ramp, Motor Parkway Pedestrian Bridge over Francis Lewis Boulevard, Motor Parkway Pedestrian Bridge over Bell Boulevard, Motor Parkway Pedestrian Bridge over Springfield Boulevard, Motor Parkway Pedestrian Bridge over Hollis Court Boulevard, Flushing Meadow Park Pedestrian Bridge over Lawrence Street, Motor Parkway Pedestrian Bridge over 73rd Avenue, Motor Parkway Pedestrian Bridge over Alley Park Pedestrian Walk, Flushing Meadow Park over Willow Lake and 76th Road, Flushing Meadow Park over Stream North of Long Island Expressway, Highland Park Pedestrian Bridge over Pedestrian Path, Flushing Meadow Park Road over Aquacade Lake, West Footbridge over Clove Lake, East Footbridge over Clove Lake, Bridge over Dam at North End of Clove Lake, South of Brooks Lake over Stream in Park, Footbridge over Brooks Lake Dam, and Footbridge South of Forest Avenue over Stream in Park.

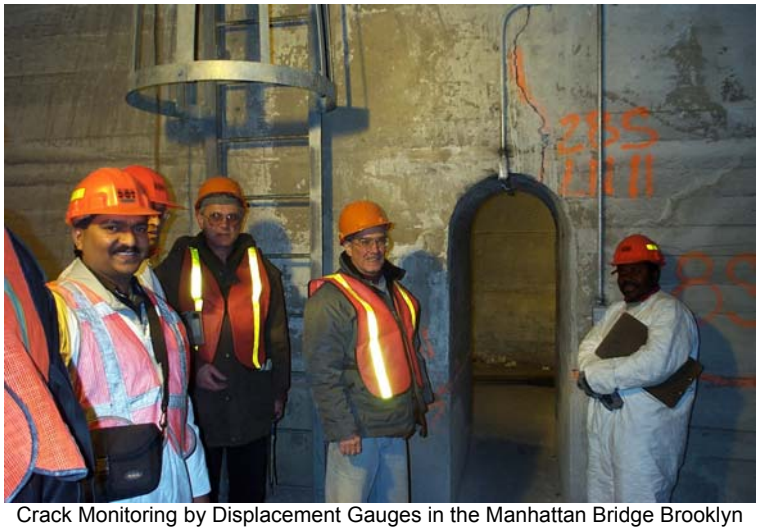


Bridge Inspection of the Greenpoint Avenue Bridge (Credit: Bojidar Yanev)

Bridge Inspectors in Bucket Truck under the Willis Avenue Bridge
(Credit: Bojidar Yanev)

STRAIN GAUGE TESTING

The monitoring of cracks in the Manhattan Bridge anchorages utilizing displacement gauges by Strain Monitoring Systems continued in 2003. In a demonstration project provided at no cost to the City, the reduction in the main span torsion on the Manhattan Bridge under train loads is monitored with fiber-optic strain gauges as the stiffening of the structure approaches conclusion.



Crack Monitoring by Displacement Gauges in the Manhattan Bridge Brooklyn Anchorage. (Credit: Bojidar Yanev)

CLEANING

In 2003, 12,037 cubic yards of debris were removed from bridges and their surrounding areas, and 1,549 drains were cleaned.

PIGEON DETERRENCE

Excessive numbers of pigeons cause property deterioration, unsafe working conditions and health hazards. Besides being unsightly, accumulation of pigeon droppings and feathers is corrosive to steel structures and raises concerns about health hazards. Many disease organisms have been associated with pigeons. They harbor ectoparasites which can infest or bite humans. Pigeon droppings also harbor fungi that can trigger serious, even fatal, lung diseases such as Histoplasmosis, Cryptococosis and Toxoplasmosis, when the spores are transmitted to humans who breathe in the harmful dust.

The Division utilizes a relatively low tech, and passive, approach to deterring pigeons. Chicken wire or heavier wire fabric is attached to metal studs to create panels which are used, much like a drop ceiling, to keep the pigeons out. The panels rest horizontally on top of the bottom flanges of the steel beams, and vertically along the top of the abutment walls. The pigeons are caged out. This method is currently in use under the Brooklyn Bridge approach (over Cadman Plaza East), Shore Parkway over Bay Ridge Avenue, and under the Pulaski Bridge approach (over Clay Street). In 2003, pigeon dropping removal and/or pigeon proofing were performed at the Cross Island Parkway Bridge over the Fort Totten Entrance, the Shore Road Bridge over the Hutchinson River (a.k.a. Pelham Bay Bridge), the Hutchinson River Parkway Bridge over the Hutchinson River, the Belt Parkway Bridge over Ocean Parkway, the Belt Parkway Bridge over Mill Basin, the Brooklyn Bridge Arch at Franklin and Pearl Streets, the Brooklyn Bridge Manhattan-side anchorage, the Williamsburg Bridge Manhattan-side anchorage, and the Clay Street Yard.

Nature's Pigeon Deterrent—A Falcon
on the Brooklyn Bridge South Side Tower

BLOODBORNE PATHOGEN PROGRAM

In 2003, the Division came into compliance with the OSHA Bloodborne Pathogen Standard, which aims to protect workers from exposure to bloodborne pathogens. While this standard is often associated with practices in hospitals, labs and doctors' offices, Division workers can be exposed to blood while removing debris at locations which have been inhabited by the homeless. In particular, used hypodermic needles are a concern for field crews who clean these areas.

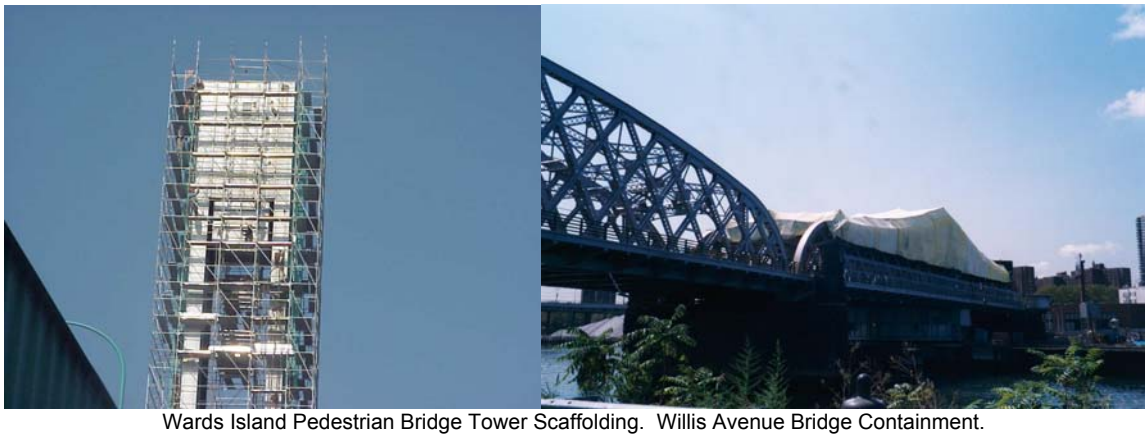
Under the guidance of the Agency's Office of Safety and Health, the Division developed a bloodborne pathogen protocol for field workers. Engineering controls such as the use of special equipment and tools to physically distance the workers from possible needles are the first lines of protection, along with special gloves, work practices and training. In addition, Hepatitis-B vaccines have been made available to those workers who perform debris removal. The vaccines are a three-shot series administered under a contract with Jamaica Hospital Medical Center. The Division will continue to monitor the effectiveness of the engineering controls and work practices in order to best protect its workers from accidental needle sticks.

PAINTING

In 2003, the following bridges were painted: Aqueduct Racetrack Ramp over Belt Parkway, Bay 8th Street over Belt Parkway, Belt Parkway over Bedford Avenue, Belt Parkway over Ocean Avenue, Belt Parkway over Nostrand Avenue, Belt Parkway over Rockaway Parkway, Belt Parkway over Sheepshead Bay Road, Broadway Bridge over Harlem River, Cropsey Avenue over Belt Parkway, Cross Island Parkway over Fort Totten Entrance, Eagle Avenue over East 161st Street, Grand Avenue over Long Island Expressway, Greenpoint Avenue Bridge over Newton Creek, Hamilton Place over Long Island Expressway, Harlem River Drive Northbound Ramp over Harlem River, Henry Hudson Parkway Viaduct over West 72nd to West 79th Street, Matthewson Road over MacCracken Avenue, Northern Boulevard over Cross Island Parkway, Riverside Drive Bridge over West 96th Street, Roosevelt Avenue over Flushing Meadow Park Road, Union Turnpike Bridge over Jackie Robinson Parkway, Wards Island Pedestrian Bridge over Harlem River, Washington Bridge over Harlem River, Willis Avenue over Harlem River, Woodhaven Boulevard over Atlantic Avenue, 11th Avenue Viaduct over LIRR West Side Yard, East 12th Street over Belt Parkway, East 14th Street Pedestrian Bridge over Belt Parkway, 31st Street Bridge over Brooklyn-Queens Expressway, 32nd Street Bridge over Brooklyn-Queens

Expressway, 35th Street Bridge over Brooklyn-Queens Expressway, 69th Street over Long Island Expressway, and East 241st Street Bridge over BRPand Metro North HAR.

Partly Finished Span 4 of the Washington Bridge



Wards Island Pedestrian Bridge Tower Scaffolding. Willis Avenue Bridge Containment.

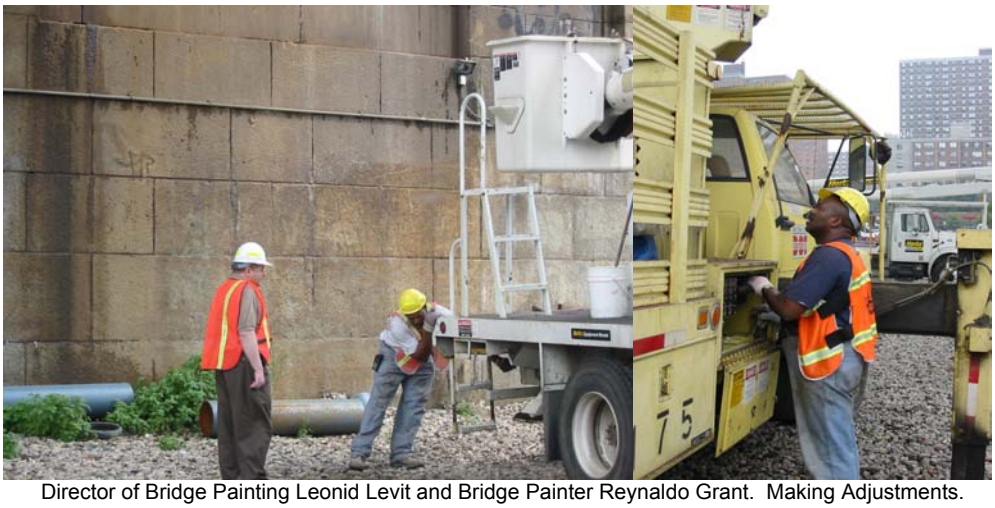
During 2003, the following structures were also painted: Railings of Beverly Road over BMT Subway, Railings of Botanical Garden Road Bridge over Twin Lakes, Broadway Bridge Operator House, Brooklyn Army Terminal Facility, Railings of Brooklyn Bridge over Brooklyn-Queens Expressway, Six columns supporting the Brooklyn Bridge Approach adjacent to Pace University, Railings of Bruckner Expressway (NB) Service Road over Hutchinson River Parkway, Railings of Cohancy Street Bridge over Southern Parkway, Railings of Cypress Hills Street Bridge over Jackie Robinson Parkway, Railings of Promenade over FDR Drive from East 79th to East 91st Streets, Flatlands Fleet Services Facility, Railings of Flushing Avenue Service Road Turnaround over Flushing Avenue (near 56th Street), Railings of Francis Lewis Boulevard over Laurelton Parkway (Eastbound and Westbound), Greenpoint Avenue Bridge Operator House, Hamilton Avenue Bridge Operator House, Railings of Highland Boulevard Bridge (Westbound) over Jackie Robinson Parkway, Railings of Houston Street Bridge over the FDR Drive, Maspeth Fleet Services Facility, Railings of North Conduit Avenue (Westbound) over Belt Parkway, Railings of Ocean Avenue Pedestrian Bridge over Sheepshead Bay, Railings of Park Road (204th Street) Bridge over the Bronx River, Roosevelt Island Bridge Operator House, Railings of Rust Street Bridge over Flushing Avenue, Railings of Springfield Boulevard Bridge over Abandoned Equestrian Path, Railings of Springfield Boulevard Bridge over Southern Parkway, DEP Plant at West 135th Street at North River, DEP Plant at Port Richmond, Staten Island, Willis Avenue Bridge Operator House, Willis Avenue Bridge Ramps, Railings of 130th Avenue Bridge over Laurelton Parkway (Eastbound and Westbound), and the 145th Street Bridge Operator House.

GRAFFITI REMOVAL

In 2003, 3,367,010 square feet of graffiti were eliminated. This program focuses its primary attention on the four East River bridges, as well as the following 21 arterial highways: Clearview Expressway, Gowanus Expressway/Belt Parkway, Major Deegan Expressway, Harlem River Drive, Van Wyck Expressway/Whitestone Expressway, Brooklyn-Queens Expressway, Jackie Robinson Parkway, Sheridan Expressway, Hutchinson River Parkway, Henry Hudson Parkway, West Shore Expressway, Richmond Parkway, Martin Luther King Jr. Expressway, Staten Island Expressway, Bruckner Expressway, Prospect Expressway, Grand Central Parkway, Long Island Expressway, Cross Bronx Expressway, Nassau Expressway, and Bronx River Parkway.

Pressure Washing Machine Used for Graffiti Removal.
It is Set to 2500 psi and 212˚ F.

Manhattan Bridge Graffiti Removal (Credit: Vadim Sokolovsky)



Director of Bridge Painting Leonid Levit and Bridge Painter Reynaldo Grant. Making Adjustments.
(Credit: Vadim Sokolovsky)

During 2003, graffiti was also removed from the following structures: Belt Parkway between Bay Parkway and Cropsey Avenue, Southbound FDR Drive between 71st and 73rd Streets, Greenpoint Avenue Bridge over Newton Creek, the New York City Marathon Route, and13th Avenue between 61st and 62nd Streets.

RESEARCH AND PRESENTATIONS

In 2003, research work of the Division was presented in the following proceedings:

Transportation Research Board Annual Meeting, Committee on Joints and Sealants, Washington, D.C., 15 January 2003. Yanev, B. *Replacement of Cushion with Plug Joints on the Henry Hudson Parkway.* In addition to the TRB committee on Joints and Sealants, Dr. Yanev was invited to join the Committee on Bridge Maintenance.

Bridge Engineering Association, 3 February 2003. Chief Bridge Officer Henry Perahia delivered the opening presentation of the "Bridge Cables: Assessment, Design and Erection" seminar. His subject was the "Construction and Rehabilitation of the Williamsburg Bridge Cables". The Director of Bridge Inspections chaired the session on Understanding Cable Behavior.

9th International Bridge Management Conference,Orlando, Florida, 28 – 30 April 2003. Yanev, B., Testa, R. B., and Garvin, M. *Maintenance Strategy to Minimize Bridge Life-Cycle Costs*.

International Workshop on Structural Monitoring of Bridges, Kitami Institute of Technology, Hokkaido, Japan, 1 – 2 September 2003. Dr. Yanev delivered the keynote address, *Monitoring the Condition of Bridges in New York City*.

Second New York City Bridge Conference, New York City, 20 – 21 October 2003. Chief Bridge Officer Henry Perahia chaired the session on Bridge Analysis and Design, and Dr. Bojidar Yanev, the Division's Executive Director of Inspections and Bridge Management, chaired the session on Bridge Health Monitoring and Management.

First International Conference on Structural Health Monitoring and Intelligent Infrastructure, Tokyo, Japan, 13 – 15 Novemer 2003. Dr. Yanev delivered the keynote address, *Structural Health Monitoring as a Bridge Management Tool*.

Yanev, B. "Management for the Bridges of New York City," International Journal of Steel Structures, Volume 3, #2, June 2003.

In addition, Dr. Yanev continued his participation on the technical advisory panels of the National Council for Highway Research (NCHR) for the following projects: FHWA DTFH61-98-C-00094 *Seismic Vulnerability of the Highway System* and NCHRP 10-57 *Strength Evaluation of Parallel Wire Suspension Bridge Cables*.

Dr. Yanev has joined the ASCE Committee working on revising the NYC Building Code. He continues to serve on the advisory panel of the NYC Department of Buildings for emergency response after citywide disasters.

In addition, the Division sponsors an in-house lecture series, inviting speakers from industry and academia several times a month. Highlight topics of the presentations in 2003 included: integral concrete waterproofing; bridge management software, a dynamic bridge positioning system, optical diagnostics and early detection of degradation, monitoring structural deformations by fiber optic sensors, blue ribbon panel findings on infrastructure security, and rapid bridge replacement technology.

Dr. Yanev on the Brooklyn Bridge