Contents

Innovations and Accomplishments

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East River Bridges

A $2.8 billion reconstruction program is underway to rehabilitate all four East River crossings. In 2001, these bridges carried some 427,321 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.

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 $670 million reconstruction commenced in April 1981 with Contract #1, continues with Contract #6, (currently in the bidding phase and scheduled for completion in 2005), and will end with a seismic retrofit of the bridge, slated for completion in 2010. 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 176,469 vehicles per day in 2001.

Queensboro Bridge (Credit: Peter Basich)

Contract #6

Currently in the bidding phase, **Contract #6** 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, 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 $36 million project is expected to start in the summer of 2003 and be completed in the fall of 2005.

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 182,202 daily commuters – 82,202 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 $912 million reconstruction commenced in 1983 with Contract #1, continues with Contract #8, currently in the registration phase and 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 three contracts completed to date, all four main cables have been completely rehabilitated, the south roadways of the bridge have been replaced and the BMT subway structure across the bridge was completely reconstructed.

Williamsburg Bridge Subway Structure

Contract #7

The reconstruction work on the north roadways of the Williamsburg Bridge 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 is scheduled to begin in early 2003 and finish in early 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).

Brooklyn Tower Leg

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.

MANHATTAN BRIDGE

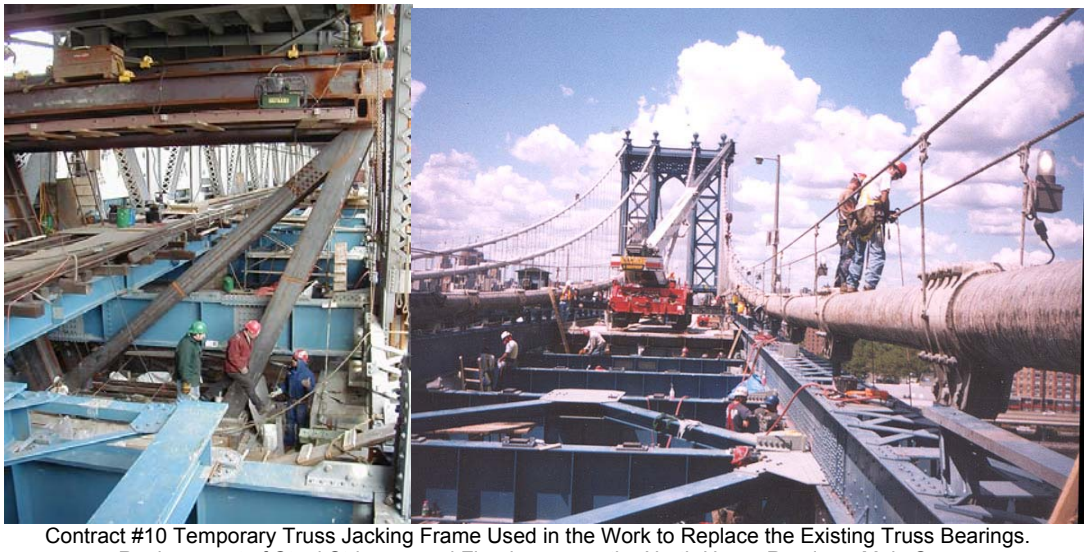
The youngest of the three suspension bridges that traverse the East River, the Manhattan Bridge carries some 313,064 commuters – 73,064 vehicles and 240,000 mass transit riders - between Manhattan and Brooklyn daily. It was designed by Leon Moisseiff and completed in 1909. The bridge supports a subway transit line upon which four different train lines operate.

The $740 million reconstruction commenced in 1982 with Contract #1, will continue with Contract #11, currently in the design phase and scheduled for completion in 2008, and will end with a seismic retrofit of the bridge, slated for completion in 2011. 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.

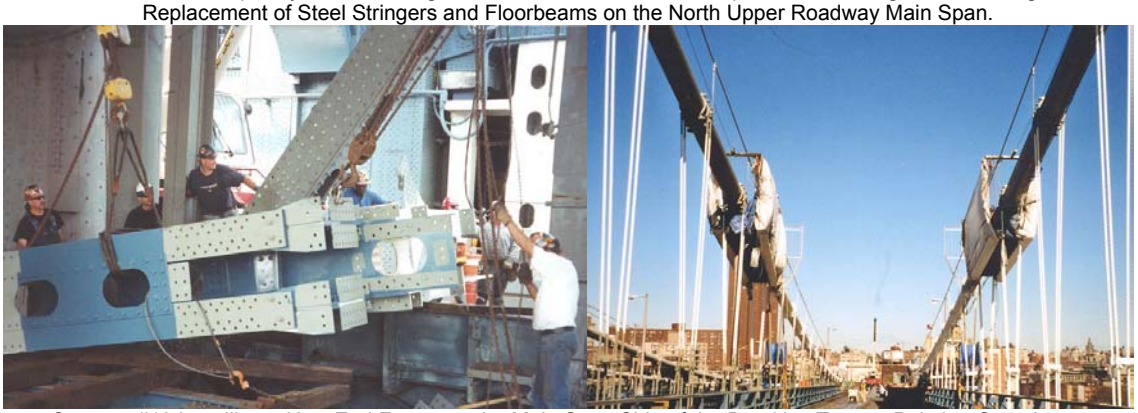
Contract #10

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.

The scope of work includes a new 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 January 31, 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 contractor will earn $50,000 per day (for a maximum of 60 days) in incentive payments for early reopening of the roadway. As a disincentive, the contractor will be charged a penalty of $50,000 for each day the milestone date is exceeded with no set maximum disincentive.

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.

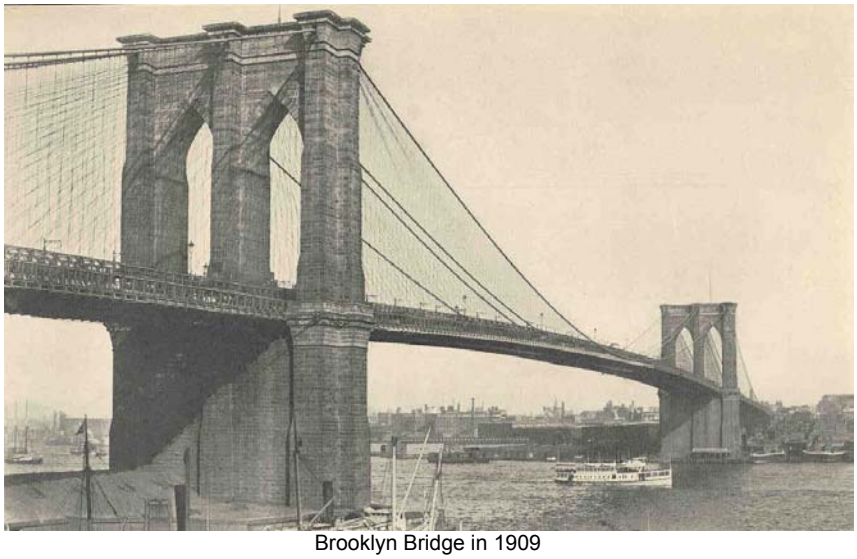
A Notice to Proceed for the additional work for NYCT on the bridge's north side tracks was issued to the contractor with a start date of September 9, 2002.

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

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.

BROOKLYN BRIDGE

The Brooklyn Bridge carried some 95,586 vehicles per day in 2001. The $464 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. The next work scheduled for the bridge is an $8 million project to replace the existing travelers with a state of the art technology system. Construction is scheduled to begin in the fall of 2004 and conclude in the fall of 2006.



Brooklyn Bridge in 1909

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 2002, the number of openings declined further to a total of only 142 openings.

In addition, significant and costly traffic congestion results from the operation of this outmoded drawbridge. In 2001, the Mill Basin Bridge carried 146,602 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.

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, high-level, fixed bridge. 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.

Currently in its final design phase, the $124 million reconstruction of the Mill Basin Bridge is scheduled to start in fall 2004, and to last approximately 4 years. The bridge will be reconstructed in four stages, while maintaining three traffic lanes in each direction and a bike/pedestrian path on the eastbound side during construction.

As an interim measure, beginning in September 2001, part of the existing deck grating (approximately 20 plated-over panels) of the bridge are being 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 on hold, pending the completion of the emergency contract project to install a center median railing system on the bascule span. This new railing system will minimize the chances of a vehicle crossing over the center median into oncoming traffic. The deck grating replacement project is expected to resume in September 2003.

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 2001, the bridge carried 39,615 vehicles per day. The $144 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 includes an incentive for early completion of $50,000 of per day with a cap of $2 million. There is a disincentive of $100,000 for each day the contractor is 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.

Macombs Dam Bridge

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.

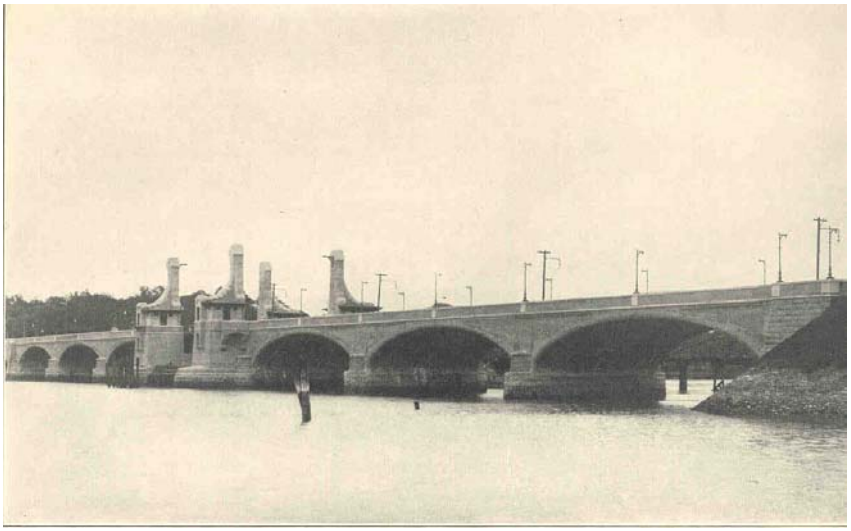
The third and final stage of construction began on October 7, 2002. Work includes replacement of the structural deck, and rehabilitation of the superstructure steel and the concrete substructure members on the southern portion of the bridge. In addition, truss members in both the swing span and camelback portions of the bridge will be reinforced. Expected completion of the bridge reconstruction is March 31, 2003.

West 155th Street Viaduct of the Macombs Dam 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 2002, various alternatives for the new bridge were being evaluated for further design. The $110 million 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 72,756 vehicles per day in 2001. 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.

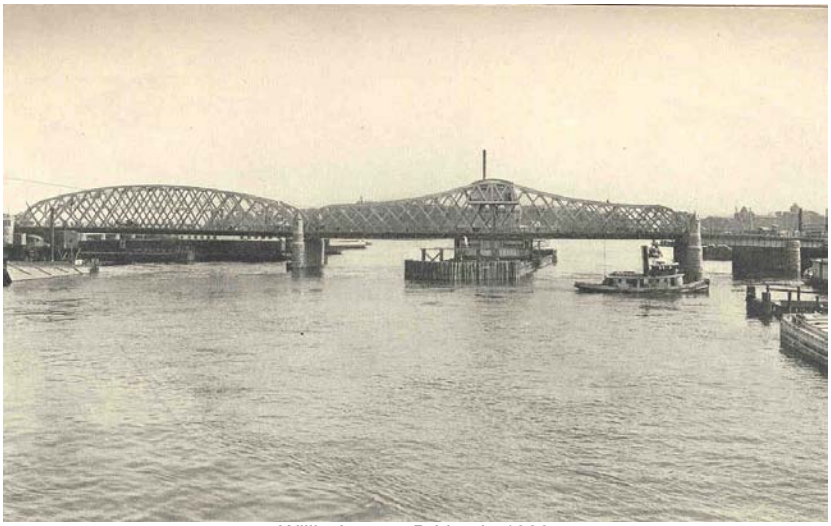
If the roadway is completed five months ahead of schedule, the contractor will receive a maximum incentive of $5 million. As a disincentive, the contractor will be penalized from $25,000 to $37,500 each day the milestone date is exceeded with no set maximum penalty. Completion of the project is scheduled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

Third Avenue Bridge

The contractor is currently drilling new shafts, which will eventually support the entire new swing span. Two southwest lanes and the Bruckner Boulevard Ramp were closed to traffic in October 2002 for this purpose.

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 72,901 vehicles per day in 2001. 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 $250 million project is slated for completion in March 2012. In the meantime, to minimize the chances

of closures due to the deteriorated grating on the existing bridge, the grating will be replaced in 2003.

Willis Avenue Bridge Grating (Credit: Bojidar Yanev)

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

In 2001, the 145th Street Bridge carried approximately 26,552 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.

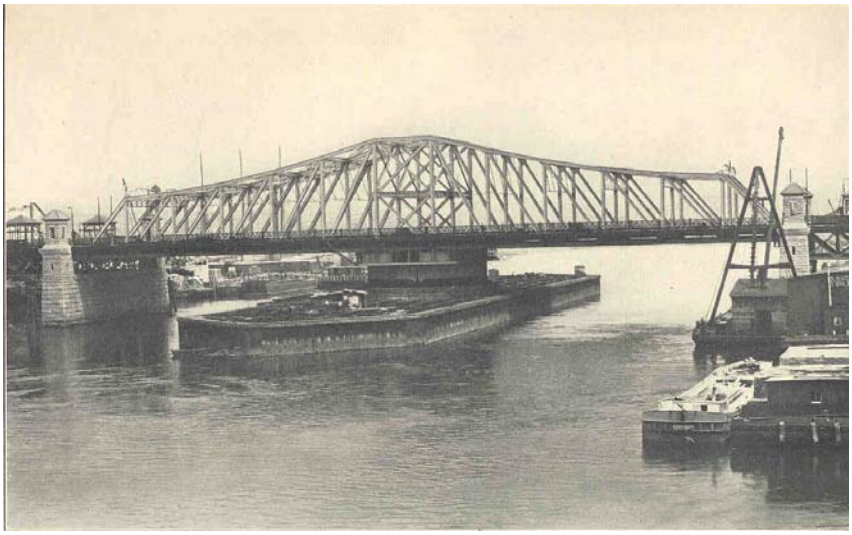
Scheduled for construction between November 2003 and September 2007, the $66 million 145th Street Bridge Reconstruction project will include the complete replacement of the swing span and six approach spans, seismic retrofitting, partial reconstruction of substructures and the reconstruction of the approach 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

MADISON AVENUE BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN)

This rehabilitation project, which began in 1994, is expected to be complete in the summer of 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 end lifts, the Bronx approach traffic signals, and final testing. A contract to install the final mechanical system and to complete a seismic upgrade is expected to be in effect in 2010.



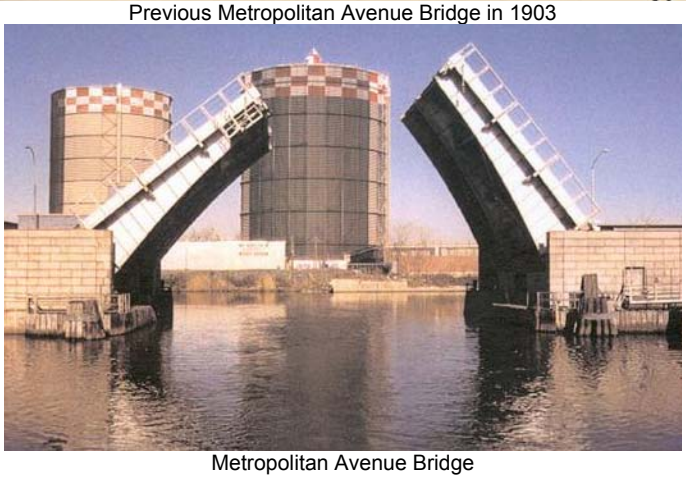
Madison Avenue Bridge in 1910

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 is expected to begin in July 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 early 2007.

Previous Metropolitan Avenue Bridge in 1903



Metropolitan Avenue 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, Willis 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 late 2003.

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 second half of Fiscal Year 2003.

In April 2002, the New York Association of Consulting Engineers selected the Movable Bridge Waterway Study for an Engineering Excellence Award.

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 1988 - 2002

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Brdn Ave. (Q)	77	39	218	282	107	141	0	0	105	15	0	3	0	28	0
Brdwy (B/M)	33	0	0	12	3	10	6	7	24	7	2	0	6	27	83
Brcknr Expwy (Estrn Blvd) (B)	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Brcknr Expwy (Unnprt Brdg) (B)	591	676	745	743	635	554	594	431	386	363	257	345	385	420	332
Carroll St. (K)	0	243	552	517	627	669	704	432	245	142	110	174	102	80	124
Grand St. (K/Q)	51	162	610	419	549	224	254	239	189	37	23	24	17	50	19
Grnpoint Ave. (K/Q)	0	371	1390	1014	860	587	549	498	557	626	669	787	688	641	659
Hmltn Ave. (K)	1681	1475	1597	1466	1331	1300	1336	1246	1191	1157	996	982	933	832	946
Hntrs Point Ave. (Q)	77	30	157	264	106	141	0	0	113	15	0	1	0	36	0
Htchnsn River Pkwy (B)	197	59	30	8	0	0	0	37	31	32	75	46	5	120	30
Macombs Dam (B/M)	0	2	0	0	0	0	6	5	13	3	0	0	0	0	0
Mdsn Ave. (B/M)	2	4	9	3	1	5	5	0	0	0	0	0	0	0	0
Metrpltn Ave. (K)	756	694	351	301	356	225	310	272	407	423	448	513	279	366	339
Mill Bsn (K)	554	480	699	867	879	1151	1250	954	903	628	591	433	336	317	142
Pulaski (K/Q)	522	527	577	584	426	224	239	206	195	291	332	383	276	208	308
Rsvlt Islnd (M/Q)	14	0	2	0	0	0	0	0	0	0	4	0	58	48	125
Shore Rd (Pelham Pky) (B)	2689	2180	2457	1968	1996	2138	2222	2190	2167	2158	2274	2162	2168	2222	1897
Union St. (K)	771	728	574	502	547	657	713	432	236	144	103	144	85	101	62
Ward's Isnd Pdstrn (M)	6	6	0	0	0	2	0	1	0	2	1	0	0	279	0
Willis Ave. (B/M)	7	8	9	15	6	8	18	24	17	9	0	4	4	40	0
3rd Ave. (B/M)	2	3	7	3	1	7	19	20	18	9	0	2	1	1	0
3rd St. (K)	791	762	638	410	549	663	732	432	256	149	112	157	178	117	212
9th St. (K)	1083	986	1082	864	984	927	836	0	0	0	0	192	513	808	733
145th St. (B/M)	0	4	0	2	0	0	9	24	24	3	0	0	1	6	0
W.207th St. (B/M)	10	0	0	0	0	1	6	4	12	7	2	0	6	14	4
TOTAL	**9917**	**9439**	**11707**	**10244**	**9963**	**9634**	**9808**	**7454**	**7089**	**6220**	**5999**	**6352**	**6041**	**6761**	**6015**

Roadway Bridges

INNOVATIONS

Innovations in the design and construction of Roadway Bridges continued in 2002. 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 OVER LIRR (QUEENS)

The $5.2 million replacement of this bridge in Maspeth, currently under design by the In-House Design Section, is scheduled to start in the summer of 2003. The Division proposes utilizing precast modules for the abutment stems, wing walls and retaining 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 could be done during the winter months in a relatively short time, and would 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.

Rendering of New Andrews Avenue Bridge

BELT PARKWAY BRIDGES OVER FRESH CREEK, GERRITSEN INLET, AND PAERDEGAT BASIN (BROOKLYN)

On a New York State-mandated scale from 1 to 7, these three bridges possess a condition rating of "fair" (3.001 – 4.999). In 2002, the Fresh Creek Bridge was 3.11; Gerritsen Inlet was 3.58; and Paedergat Basin was 3.25. 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; and the existing 11 span, 520 foot Gerritsen Inlet Bridge will be replaced with a new 3 span, 492 foot bridge. In both cases, the stopping sight distance for the bridge and approach roadway will be improved.

The $48 million reconstruction of the Fresh Creek Bridge, currently in its final design phase, is scheduled to start in spring 2004, and to last for approximately 3 years. The bridge 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 $69 million reconstruction of the Gerritsen Inlet Bridge, currently in its final design phase, is scheduled to start in summer 2004, and will last for approximately 3½ years. The bridge will be constructed in multiple stages, while maintaining three traffic lanes in each direction and a bike/pedestrian path on the eastbound side 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 $93 million project is scheduled to begin construction in the summer of 2004, 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.

HARLEM RIVER DRIVE AT EAST 127th STREET (MANHATTAN)

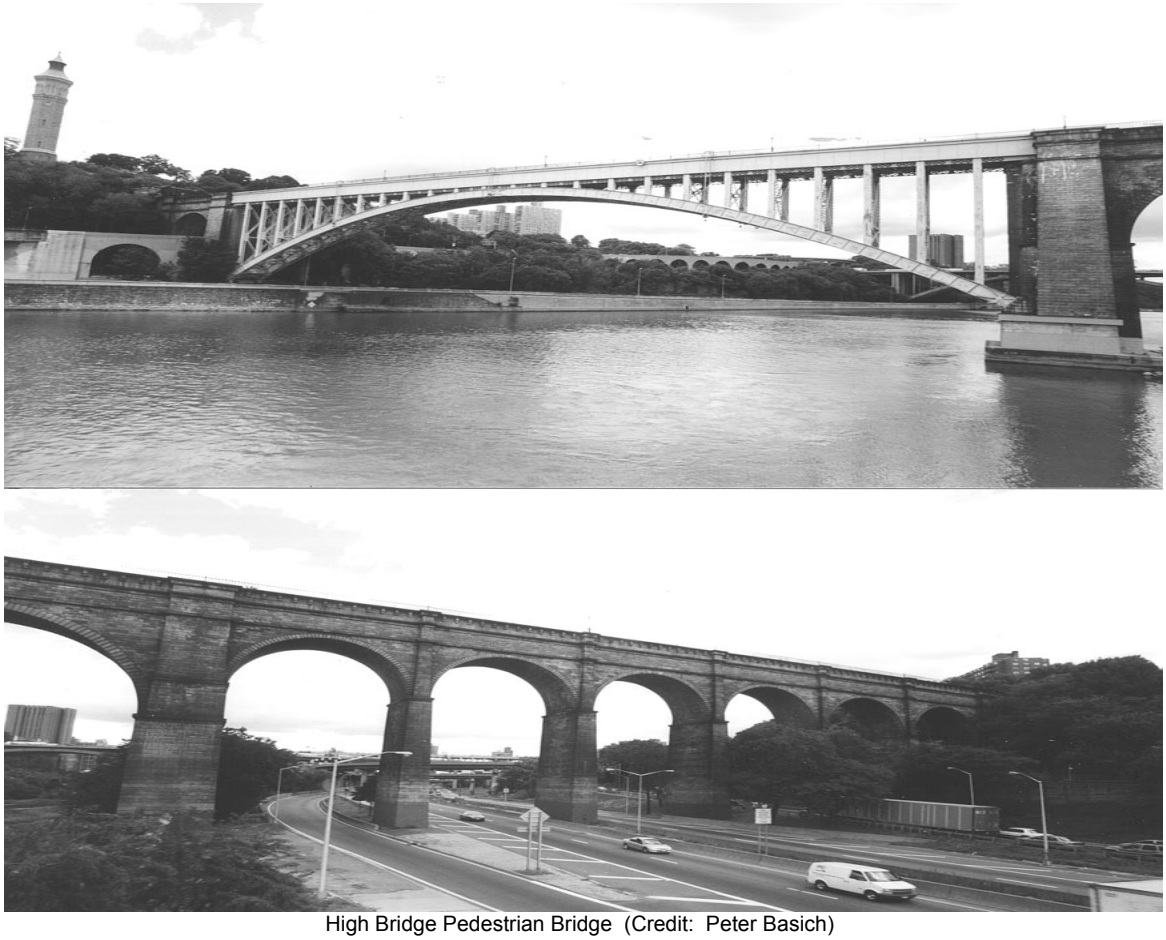
This $56 million project, currently in its preliminary design phase, involves the replacement of the existing 11 span bridge and the construction of a flyover ramp over the Third Avenue Bridge, in addition to various highway improvements. It eliminates a major weaving problem between the southbound Harlem 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 2003, 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)

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 2002, 16 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 July 2003. 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.

153rd STREET BRIDGE OVER METRO NORTH (BRONX)

This $35 million 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 2005 and be completed in 2007.

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.

Rendering of New 153rd Street Bridge

GUY BREWER BOULEVARD OVER THE BELT SYSTEM – SOUTHERN PARKWAY (QUEENS)

The Guy Brewer Boulevard Bridge was built in 1937. Because a recent inspection revealed significant deterioration, DOT decided to replace the entire bridge. The old two span bridge consisted of reinforced concrete arch rigid frames with variable frame slabs. The new bridge consists of four spans with three new steel piers, a concrete grid deck, and concrete parapet walls with protective bridge fencing. The concrete abutments, approach slabs, adjacent curb, sidewalk, roadway and guiderails were replaced. New traffic signals, traffic regulatory signs, street lighting and thermoplastic stripping were installed. The utilities, including the water main, gas main, telephone cable and Fire Department cable were installed across the Belt Parkway under the bridge deck. Approximately 300 new trees will be planted in spring 2003 as part of the project's landscaping improvements. To improve safety, the safety barriers were rebuilt on the Belt Parkway adjacent to the bridge piers in the median areas. New directional overhead signs were installed across the Belt Parkway to guide motorists.

The contract included incentive and disincentive clauses. $4,000 per day (up to $360,000 for a maximum of 90 days) will be awarded for early completion of bridge construction, with an unlimited disincentive of $8,000 per day for late completion.

The Division reconstructed this bridge in a single stage with full bridge closure. This reduced the expected construction time from 24 months to 12 months. However, pedestrian access across the Belt Parkway was maintained at all times during construction using a temporary pedestrian bridge.

Demolishing the Old Guy Brewer Boulevard Bridge in March 2002 The New Bridge

Normal travel lanes on the Belt Parkway were restored on June 28, 2002, resulting in the completion of Phases II and III of this project 57 days ahead of schedule. On November 1, 2002, the bridge was re-opened to both vehicular and pedestrian traffic 104 days ahead of schedule. The contractor earned the maximum incentive for the completion of this milestone. Removal of the temporary pedestrian bridge at Guy Brewer Boulevard was completed on November 14, 2002.

The $11.8 million reconstruction of this bridge, which began on July 9, 2001, was substantially completed on December 12, 2002.

91ST PLACE 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 includes 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 will be 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 is being 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 will be widened to accommodate an additional lane by reducing the sidewalk width. Construction began in September 2001, and is expected to be complete by April 2003.

GRAND CONCOURSE OVER EAST 161st STREET (BRONX)

This $27 million 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. $9.7 million in federal funds will be used to reconstruct the Grand Concourse. A temporary vehicular fly-over bridge will be installed on the Grand Concourse at East 161st Street prior to the total reconstruction of the 161st Street underpass. This will allow traffic to flow unimpeded along the Grand Concourse during the reconstruction. Construction of the bridge is scheduled to begin in November 2004, and is expected to be complete by November 2007.

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. The bridges will be constructed in two stages. During Stage I, the eastbound Atlantic Avenue service road will be closed. During Stage II, the westbound Atlantic Avenue service road will be closed. Vehicular traffic will be diverted to carefully planned detour routes. A Notice to Proceed for the $4.5 million reconstruction of these bridges was issued to the contractor with a start date of September 9, 2002. The project is scheduled for completion in the spring of 2004.

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 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 $3.2 million bridge reconstruction began in April 2002, and is expected to be complete by the end of 2003.

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 three lanes of traffic maintained in each direction at all times.

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 July 2004.

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 will be replaced with high strength weathering steel girders, and a high performance concrete deck. The existing abutments will be repaired, and the approach roadways reconstructed. New water mains, electric and telephone conduits will be installed. The project is expected to be complete by March 2004.

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 the summer of 2005.

STEINWAY STREET 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.

2ND AVENUE BRIDGE OVER LIRR (BROOKLYN)

This $8 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.

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 superstructure with an integral overlay. 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 spring of 2004.

QUEENS BOULEVARD AND HONEYWELL STREET BRIDGES OVER AMTRAK AND LIRR YARD (QUEENS)

Age, weather and increased traffic took their toll on the Queens Boulevard Bridge, which was originally built in 1910. 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.

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

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.

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. Service on the elevated #7 train that runs above the Queens Boulevard Bridge was not affected.

Both bridges underwent a complete reconstruction, beginning in April 2001. Over the course of this 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 contracts included incentive and disincentive clauses. On the Queens Boulevard Bridge, the contractor earned the maximum incentive award of $3 million for the early completion of the project.

The ITS installation was completed by the end of March 2001. The first stage of the reconstruction of the Queens Boulevard Bridge was completed on December 28, 2001. This included construction of a roadway slab and concrete barrier, installation of sidewalk slab, completion of street light work, watermain and approach work, striping, and installation of a temporary pedestrian barrier.

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

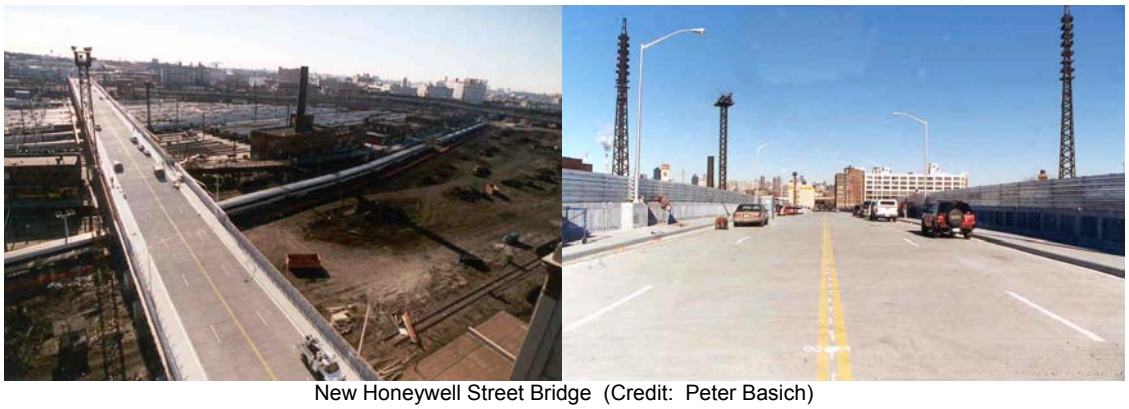
Queens Boulevard - Hoisting a Roadway Grating for Transport & Installing Electrical Conduits in a New Concrete Barrier

The Department entered into an expedited contract and the $85 million project is scheduled to be completed by spring 2003. By the middle of January 2003, both the Queens Boulevard and Honeywell Street Bridges were completely rebuilt and reopened to traffic. The Queens Boulevard Bridge carries three westbound lanes, three eastbound lanes and two shared sidewalk/bicycle paths. 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 Queens Boulevard Bridge was substantially completed on July 26, 2002, and the bridge was fully re-opened to traffic at 5 AM on July 31, 2002, two months ahead of schedule.

Reconstructed Queens Boulevard Bridge (Credit: Peter Basich)

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.



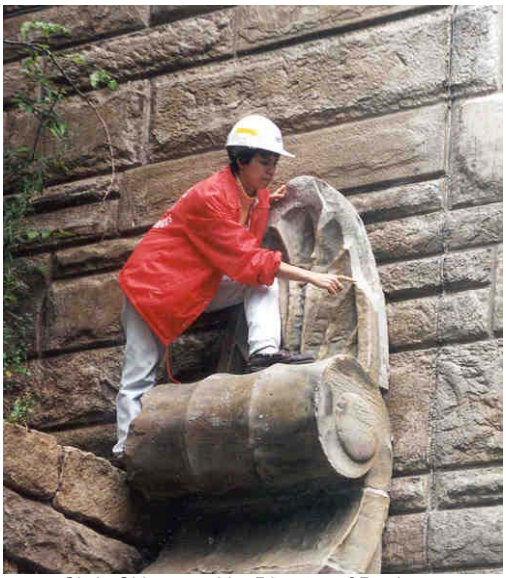
New Honeywell Street Bridge (Credit: Peter Basich)

Design-Build

In 2002 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.

RIDGE BOULEVARD AND THIRD AVENUE BRIDGES OVER SHORE ROAD DRIVE (BROOKLYN)

In April 2002 the New York Association of Consulting Engineers selected the Design-Build reconstruction of the Ridge Boulevard (a.k.a. Second Avenue) and Third Avenue Bridges over Shore Road Drive in Brooklyn for an Engineering Excellence Award. The Engineering Excellence Awards Program recognizes engineering achievements that demonstrate the highest degree of skill and ingenuity. This $7 million project, begun in April 2000, rehabilitated the two masonry arch bridges over Shore Road Drive in Brooklyn. Traffic was accommodated by providing a temporary road through parkland, reversing the entrance ramp to the Belt Parkway, and maintaining pedestrian access to the bridge. The erection of arches underneath the truss used to support the utilities was innovative and expedited the project. Another innovation was designing around the existing scroll monuments at Ridge Boulevard and cleaning them in place, thus eliminating the need to remove, clean, and reinstall them. In addition, the decision to use form liners rather than stone veneer resulted in a $150,000 savings, while providing for a safer structure. The bridges were reopened on February 15, 2001, 13½ months ahead of the original schedule, and 1½ months ahead of the accelerated schedule. Erection of the superstructure was completed in fall 2000. Shore Road Drive was opened to traffic on March 16, 2001, and the project was completed on June 7, 2001.

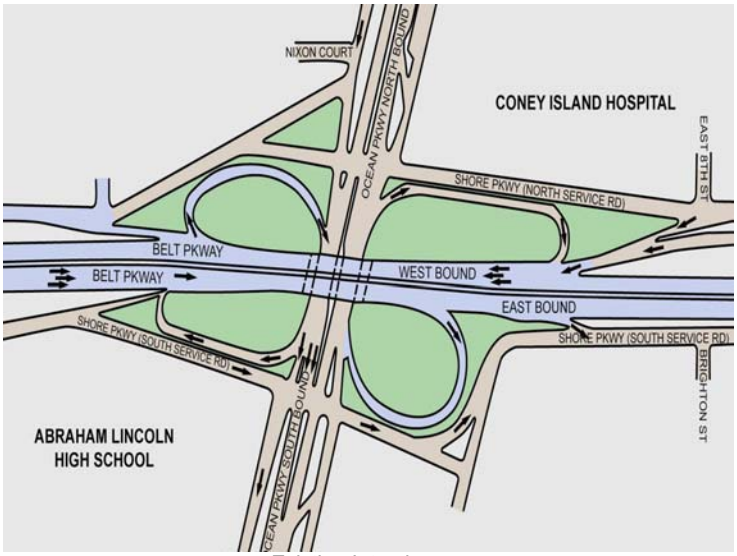


Chris Sklavounakis, Director of Design-Build/Emergency Contracts, Inspecting a Scroll Monument at Ridge Boulevard Prior to Cleaning (Credit: Peter Basich)

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

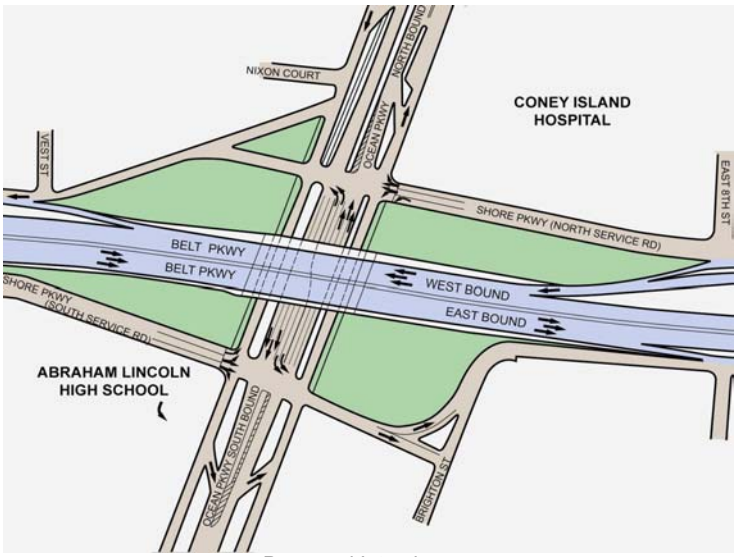


Existing Interchange

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 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.

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 are expected to commence in the fall of 2003, with construction beginning in February 2004 and ending in December 2004.

PEDESTRIAN BRIDGES

The Division is currently working on the preliminary engineering to be included in the Design-Build RFP (Request for Proposals) to replace 21 pedestrian bridges in all five boroughs at an estimated construction cost of $38 million. 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, 81st Street 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 is expected to be issued in the summer of 2003. Construction is expected to begin in the spring of 2004, and be complete in the late spring of 2005, with no construction activity at any single location exceeding six months.

East 111th Street/FDR Drive (Credit: Andre Celestin) and 216th Street over LIRR

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
81st Street 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 $41 million 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 expire in 2005, thus making bridge rehabilitation necessary. In 2001, the bridge carried approximately 14,503 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 summer 2005, and be complete in summer 2007.

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 exists relative to the movable bridge carrying the Belt Parkway over Mill Basin.

While the existence of random accidents at a certain location does not necessarily lead to the re-examination of engineering parameters at that location, the existence of a pattern of accidents called for an investigation to be done. The Belt Parkway Bridge over Mill Basin is scheduled for replacement beginning in late 2004, and the design of the new bridge will be an improved engineering solution as compared to the existing one. However, over time it appears that the traffic patterns have changed, and a pattern of crossover accidents has emerged, creating a serious threat to public safety. As a result of this change in the traffic patterns, the Department conducted a traffic engineering review and concluded that the placement of a median barrier and bridge rail would reduce the immediate threat to life and property. However, the engineering feasibility of barrier installation was in question, as placement of a barrier would very likely interfere with the operation of the movable bridge. The Department directed a consulting firm to determine whether an appropriate design would be possible.

On July 1, 2002, the Department was notified by its consultant that an engineering feasibility for installation of a median barrier and a bridge rail on the eastbound sidewalk at the area between the sidewalk and the roadway does exist. The Department then directed the consultant to proceed with the final design.

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 includes 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 are disincentives of the same amounts for a late finish with no limit to the amount of penalty.

ST. FELIX STREET (BROOKLYN)

In January 1997, an eight inch water main burst beneath St. Felix Street between Hanson Place and Lafayette Street in Brooklyn. This break caused damage to a number of buildings, including partial wall collapses, building façade cracking, and stoop movement. Inspection revealed pervasive soil loss under the street bed over several blocks.

The B and D subway lines run below the street, along with numerous public and private utilities. The #2, #3, #4, and #5 subway lines and the Long Island Railroad run immediately adjacent to that area, as well. Any of these infrastructure elements could have caused or contributed to the existing soil loss.

Preliminary evidence pointed to an improper backfill created during the original subway construction in 1916. Soil borings and test pits suggested that timber was left in the ground causing huge voids below the street's surface. Over the years, the soil shifted into the voids causing water main damages.

Consequently, on February 19, 1997, in the interest of public safety, the Agency declared the situation to be an emergency, pursuant to Section 315 of the New York City Charter. Division engineers from the Design-Build section oversaw the restoration project.

Soil stabilization, drilling and grouting were completed in December 1997. Façade work began in March 1999. In the spring of 2000, the Landmarks Preservation Commission requested the full replacement of all windows for all of the houses.

These repairs were substantially completed on November 15, 2001. All remaining punchlist items were completed as of the end of April 2002. The street was stabilized and its houses restored to early 20th century landmark condition. The project provided homeowners with new facades, straight stoops, areaways and trees, lampposts, stamped colored concrete sidewalks, custom-made windows and cornices, and numerous other exterior and interior repairs.

The New York Construction News "Best of 2002 Awards Program" selected the restoration of St. Felix Street as the 2002 Rehabilitation Project of the Year.

When and Where Unit

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, and Shore Road Bridge over the Hutchinson River.

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.

Current projects include Carroll Street Bridge over the Gowanus Canal, Hamilton Avenue Bridge over the Gowanus Canal, Northern Boulvard over the Alley Creek, and Cropsey Avenue Bridge over the Coney Island Creek.

Carroll Street Bridge Over the Gowanus Canal

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, Inspection and Operations. Projects underway in 2002 included 145th Street Bridge over the Harlem River, Belt Parkway Bridge over Paerdegat Basin in Brooklyn, Andrews Avenue Bridge over LIRR, Hempstead Avenue Bridge over Cross Island Parkway, Springfield Boulevard Bridge over Belt Parkway, Union Turnpike Bridge over Cross Island Parkway (and Creedmoor Center Road), and the Steinway Street Bridges over the Grand Central Parkway 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 2002 included Williamsburg Bridge, Hamilton Avenue Bridge over Gowanus Canal, and Metropolitan Avenue Bridge over English Kills in Brooklyn, Battery Park Underpass under West Street to FDR Drive in Manhattan, Queensboro Bridge, Roosevelt Island Bridge over East River Channel, Bruckner Expressway NB & SB Service Road (Unionport Bridge) over Westchester Creek in the Bronx and 145th Street Bridge over Harlem River Drive. They also completed the street lighting design for Andrews Avenue Bridge over LIRR in Queens.

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 2003.

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 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 are expecting a large increase of overweight truck movement in the City in the near future. The new permitting 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.

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 completion of the transfer of the drawings and photographs to CD-ROMs is expected in spring 2003. The next phase of the project will consist of the digitizing of the microfilm collection.

MARINE BORER STUDY

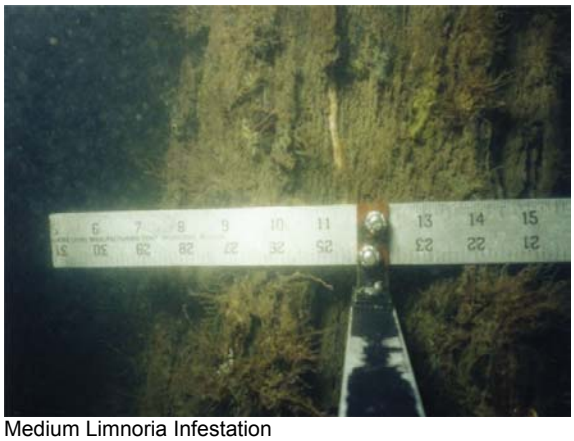
Marine borers pose an immediate and serious danger to the thousands of piles and other structures of timber built in the marine environment. In New York Harbor, as the water quality improved due to many years of clean up efforts, marine borer (limnoria, teredo, etc.) activity has increased significantly 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

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 the end of 2003. The cost of the construction work, which is expected to commence in 2004, is estimated to be $35 to $40 million.



Medium Limnoria Infestation

Teredo Damage (holes up to ¼" diameter)

Based upon information gathered during this study, DOT has 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.

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, which is estimated to cost approximately $30 million, 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 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.

TRUMP/NEW WORLD PROJECT

The Trump/New World project (Riverside Drive between 59th and 72nd Streets) includes the construction of six 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 60 percent complete overall.

ERSKINE STREET OVER THE BELT PARKWAY (BROOKLYN)

This bridge was built by a private developer and recently turned over to the City. The bridge was opened to traffic in October 2002 following three years of design and construction. The structure is a part of a private development in the Gateway area north of the Belt Parkway. The Division provided 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. This was an engineering challenge in view of the proposed construction on soft organic landfill. To overcome this problem, Division engineers, in coordination with their State DOT colleagues, recommended dynamic compaction, and the use of surcharges on the bridge approaches and ramps. Engineers monitored the landfill's performance prior to construction, and the data obtained proved satisfactory. The private developer has provided the City with a five year warranty, including three years of bridge maintenance and monitoring of foundation settlement.

BRIDGESCOPE

The Division is responsible for maintaining the structural integrity of the Department's 755 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.

Bridge Maintenance, Inspection 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 mild winter of 2001-2002, a total of 20,150 gallons of anti-icing chemicals were applied on the roadways of all four East River Bridges.

BROOKLYN BRIDGE PROMENADE

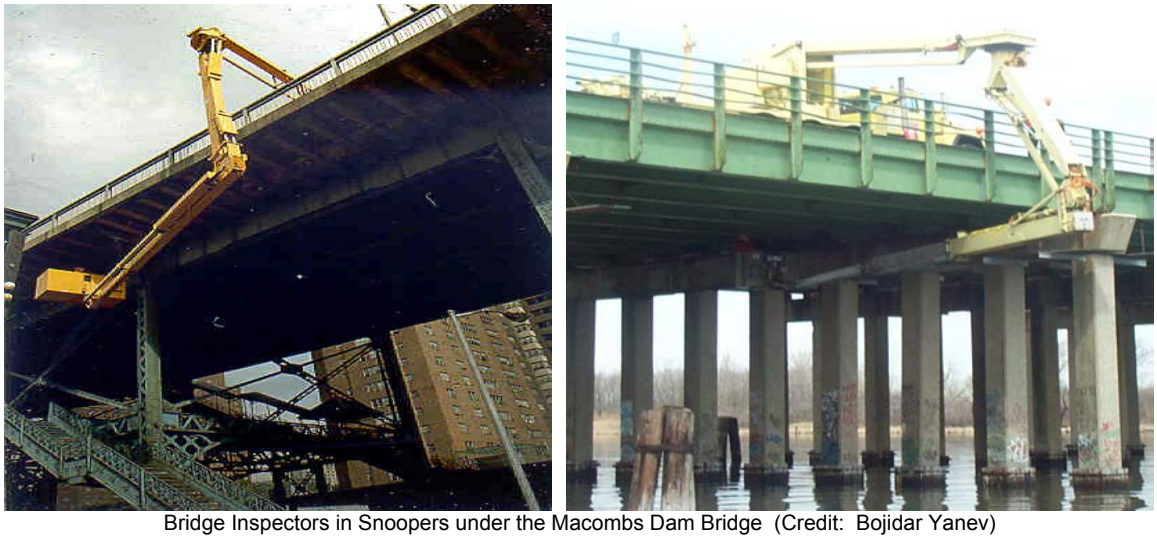
The replacement of the Brooklyn Bridge promenade deck and stringers by Division personnel was completed in December 2000. The temporary footbridge, which had been built several years earlier and maintained throughout the project, was removed. The replacement of the deteriorated sections of promenade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

INSPECTIONS

In 2002, Inspections covered 87 bridges and 484 spans. Emphasis was placed on ensuring public safety through the monitoring of potentially hazardous conditions and temporary repairs. The unit performed 260 monitoring inspections, and 435 special winter monitoring inspections of cellular structures, shorings, and potential fire hazards. In addition, 132 emergency inspections were conducted in response to hot line calls, in-house requests, or citizen complaints.

In 2002, the Division began to receive State DOT bridge inspection reports in CD-ROM format. Flag reports are now also transmitted electronically.

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 Inspectors in Snoopers under the Macombs Dam Bridge (Credit: Bojidar Yanev)
and the Mill Basin Bridge (Credit: Jyotish Shah)

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

CLEANING

In 2002, 12,616 cubic yards of debris were removed from bridges and their surrounding areas, and 1,630 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 may 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), Ridge Boulevard over Shore Road Drive, and under the Pulaski Bridge approach (over Clay Street).

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

PAINTING

In 2002, the following bridges were painted: Belmont Park Ramp over Cross Island Parkway, Borden Avenue Bridge over Dutch Kills, Boston Post Road over Hutchinson River, Broadway Bridge over Harlem River, Brooklyn-Queens Expressway over Furman Street, Brooklyn-Queens Expressway over Joralemon Street, Brooklyn-Queens Expressway over Nassau Street, Brooklyn-Queens Expressway West Leg over Grand Central Parkway, Bruckner Boulevard Overpass from 133rd to 135th Streets, Carroll Street Bridge over Gowanus Canal, Crocheron Park Pedestrian Bridge over Cross Island Parkway, Cross Bay Boulevard Bridge over Belt Parkway, Cross Island Parkway over Dutch Broadway—115th Avenue, Grand Concourse Bridge over East Tremont Avenue, Grand Concourse over East Kingsbridge, Grand Concourse over East 161st Street, Grand Concourse over East 167th Street, Grand Concourse over East 170th Street, Grand Concourse over East 175th Street, Grand Concourse over East 204th Street, Hamilton Avenue Bridge over the Gowanus Canal, Harlem River Drive northbound ramp to the George Washington Bridge, Hempstead Avenue Bridge over Cross Island Parkway, Henry Hudson Parkway Bridge over Broadway, Highland Boulevard Bridge (Northbound) over Vermont Avenue, Hunters Point Avenue Bridge over Dutch Kills, Hylan Boulevard over Lemon Creek, Myrtle Avenue Bridge over Jackie Robinson Parkway, Page Avenue over SIRT South Shore, Pulaski Bridge over Newton Creek, Queens Boulevard over Brooklyn-Queens Expressway, Queens Boulevard over Jackie Robinson Parkway, Richmond Avenue over Richmond Creek, Roosevelt Avenue Bridge over Brooklyn-Queens Expressway, Shore Road Bridge over Hutchinson River, Stillwell Avenue over Coney Island Creek, Sunrise Highway over Laurelton Parkway, Third Avenue over Gowanus Canal, Third Street over Gowanus Canal, Pedestrian Bridge near Union Turnpike over Abandoned LIRR, Van Cortlandt Park Pedestrian Bridge over Henry Hudson Parkway, Willis Avenue Bridge, Woodside Avenue over Brooklyn-Queens Expressway, 21st Street over Conrail,

28th Avenue Pedestrian Bridge over Cross Island Parkway, 35th Street Bridge over Brooklyn-Queens Expressway (Queens), 37th Street Bridge over Brooklyn-Queens Expressway (Queens), 44th Street Bridge over Grand Central Parkway, 47th Street Bridge over Grand Central Parkway, 49th Street Bridge over Grand Central Parkway, 65th Place Bridge over Brooklyn-Queens Expressway, 69th Street over the Brooklyn-Queens Expressway, 71st Avenue over Cooper Avenue, 79th Street Pedestrian Plaza over 79th Street Boat Basin Garage, Pedestrian Bridge over East 128th Street, 129th & 130th Street Pedestrian Bridge over the Ramp off 3rd Avenue, 149th Street over Cross Island Parkway, 160th Street over Cross Island Parkway, 163rd Street Pedestrian Bridge over Hawtree Basin, West 181st Street Pedestrian Bridge over Henry Hudson Parkway (Northbound), and 236th Street Pedestrian Bridge over Henry Hudson Parkway.

During 2002, the following structures were also painted: Railings of Boston Road Bridge over Bronx River Parkway, Railings of Bronx River Parkway Bridge over Boston Road at the Bronx Zoo, Brooklyn Bridge flagpoles, Railings of the BQE between Brooklyn Bridge and Atlantic Avenue, Railings of the BQE over Prospect Street, Bruckner Expressway NB & SB Service Road over Westchester Creek Operator House (a.ka. Unionport Bridge), Railings of Crotona Avenue Bridge over Bronx Pelham Parkway, Railings of Forest Avenue Bridge over Clove Lakes Park Stream, Railings of Giffords Lane Bridge over SIRT South Shore, Handrails of Grand Concourse Bridge over Burnside Avenue, Railings of Grand Concourse Bridge over East 138th Street, Greenpoint Avenue Bridge Operator House, Railings of Guyon Avenue Bridge over SIRT South Shore, Railings of Henry Hudson Parkway entrances and exits at 96th Street, Railings of Jackie Robinson Parkway over Austin Street, Railings of Linden Boulevard Bridge over BCIP, Railings of Markwood Road over Jackie Robinson Parkway, Railings of Midland Avenue Bridge over SIRT South Shore, Railings of New Dorp Lane Bridge over SIRT South Shore, Railings of Queens Boulevard Bridge over Access Road to Brooklyn-Queens Expressway (SB), Railings of Richmond Valley Road Bridge over SIRT South Shore, Riis Park flagpole, Railings of Rose Avenue Bridge over SIRT South Shore, Shore Road Bridge Operator Houseover Hutchinson River, Railings of Steinway Street over Brooklyn-Queens Expressway, DEP Plants at Coney Island, West 135th Street at North River, Oakwood Beach, Staten Island, and Knapp Street, DEP Pump Station at 3rd Avenue, Railings at Southern Boulevard Bridge over the Bronx Pelham Parkway, Tudor City Place Bridge railings over East 42nd Street, Railings of Union Turnpike Bridge over Creedmore Hospital Road, York Avenue fencing under the Queensboro Bridge between 59th and 60th Streets, and West 207th Street/West Fordham Road over Harlem River Bridge Operator House (a.k.a. University Heights Bridge).

GRAFFITI REMOVAL

In 2002, 6,865,564 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.

During 2002, graffiti was also removed from the following structures: Alley Pond Park at Grand Central Parkway, Amsterdam Avenue at 179th Street, Austin Street underpass of the Jackie Robinson Parkway between 80th Road and Union Turnpike, Beverly Road over BMT Subway, Brooklyn Bridge, Brooklyn-Queens Expressway at Prospect Street, Bruckner Expressway NB & SB Service Road over Westchester Creek Operator House (a.ka. Unionport Bridge), Coney Island Avenue at Avenue H, Coney Island Avenue over Belt Parkway, Coney Island Avenue over LIRR, Cropsey Avenue over Belt Parkway, Cross Island Parkway, FDR Drive, FDR Drive northbound from Houston Street to 96th Street, Fingerboard Road Bridge over SIRT South Shore, Flatlands Maintenance and Repair Facility, Grand Concourse over Bedford Park Boulevard, Grand Concourse between 138th and 204th Streets, Grand Concourse over East 170th Street, Grand Concourse at 204th Street and Kingsland Road, Hamilton Avenue under the Brooklyn-Queens Expressway, Hunterspoint Avenue Bridge Operator House, Manhattan Bridge North Pedestrian Walkway, Manhattan College Parkway over Henry Hudson Parkway, New York City Marathon Route, Queensboro Bridge Pedestrian Walkway, Richmond Avenue under the Staten Island Expressway, Ridge Boulevard over Shore Road Drive, Rockaway Parkway at the Belt Parkway Interchange, Roosevelt Avenue at College Point Boulevard, Roosevelt Avenue at Willets Point Boulevard, Roosevelt Island Bridge over East River and East Channel, St. George Ferry Terminal, Shea Stadium and vicinity, NYC Municipal Parking Lot at Steinway Street, Thomson Avenue at Jackson Avenue, Throgs Neck Expressway, Watchogue Road between East and Willow Road West, Webster Avenue Maintenance and Repair Facility, Williamsburg Bridge, Willis Avenue Bridge over Harlem River, 424 Wythe Avenue Facility, First Avenue between 42nd and 43rd Streets, Third Avenue over LIRR Bay Ridge, Third Avenue Bridge over Shore Road Drive, 10th Avenue over Railroad between 35th and 48th Streets, 60th Street Heliport at York Avenue, 65th Place Bridge over Brooklyn-Queens Expressway, 81st Street Pedestrian Bridge over Belt Parkway, 163rd Street Pedestrian Bridge over Hawtree Basin, 191st Street Tunnel, West 207th Street/West Fordham Road over Harlem River (a.k.a. University Heights Bridge), 235th Street over Henry Hudson Parkway, and 236th Street Pedestrian Bridge over Henry Hudson Parkway.

RESEARCH AND PRESENTATIONS

In 2002, research work of the Division was presented in the following proceedings:

University of California, Irvine, California, April 2002. Dr. Yanev, the Division's Executive Director of Inspections and Bridge Management, co-organized an international seminar on bridge cable strength evaluation.

On May 24, 2002, as part of the American Society of Civil Engineers' (ASCE) 150th anniversary celebration, Dr. Yanev, a Director of the ASCE Metropolitan Section, delivered a lecture on the history of New York City bridge management.

Transportation Research Board Bi-Annual Conference on Non-Destructive Testing, Cincinnati, Ohio, 10 – 13 September 2002. Dr. Yanev, a member of the Board's committees on bridge joints and bearings, chaired the session on "Sonic Methods for Non-Destructive Testing of Bridges."

Structural Engineers World Congress, Yokohama, Japan, 9 – 12 October 2002. Dr. Yanev delivered the keynote address, *The Management of Bridge Maintenance, Construction and Design: A View From New York City*.

Tongji University, Shanghai, China, 15 – 17 October 2002. Dr. Yanev taught a brief course on bridge management.

60th Anniversary Conference, University of Architecture and Engineering, Sofia, Bulgaria, 24 – 26 November 2002. Dr. Yanev delivered the keynote address *The Collapse of the World Trade Center*.

60th Anniversary Conference, University of Architecture and Engineering, Sofia, Bulgaria, 24 – 26 November 2002. Yanev, B. *Bridge Management in New York City*.

Laboratoire Central des Ponts et Chaussees, Paris, France, 27 November 2002. Yanev, B. *The World Trade Center in New York City: Design, Construction, Collapse and Consequences*.

Taiwan Central University, Taiwan, 10 – 11 December 2002. Dr. Yanev taught a brief course on bridge management.

Dr. Yanev's article, "Steel Bridges of New York" appears in Stahlbau, Berlin, February 2002.

Yanev, B., and Testa, R. B., "Bridge Maintenance Level Assessment," *Computer-Aided Civil and Infrastructure Engineering 17*, 2002.

In addition, Dr. Yanev participated 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 also serves 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.

Dr. Yanev on the Brooklyn Bridge