

DIVISION OVERVIEW

As an integral part of New York City's Department of Transportation, the Division of Bridges has a two-fold mission: to maintain an optimal transportation network by ensuring smooth mobility on the city's bridges, and to ensure the safety of the public.

The New York City Department of Transportation's Division of Bridges is comprised of five major bureaus. The **Chief Bridge Officer** is responsible for formulating policy and providing executive direction. He oversees all aspects of the design, construction, rehabilitation and reconstruction, maintenance, operation and administration of the 788 bridges (including 5 tunnels), and 53 culverts presently under the jurisdiction of the New York City Department of Transportation (NYCDOT). In addition to broad supervision, the Chief Bridge Officer also provides overall executive and administrative direction for the Division of Bridges, and ensures that all contractors are promptly paid.

Reporting to the Chief Bridge Officer, the **Community Affairs Unit** maintains liaison with elected officials, community boards, community groups, and civic/neighborhood associations. The Unit takes a pro-active approach in addressing design issues, roadway closures, and detours by reaching out to communities prior to the onset of construction. This enables the Division to proceed with its rehabilitation program with community input, and allows the Agency and its contractors to co-exist in a more harmonious manner with the community surrounding the project. Issues and problems of concern to the communities are brought to the attention of the appropriate Division personnel and addressed.

The **Bureau of Bridge Maintenance, Inspections and Operations** employs almost 500 engineering, professional, administrative, and skilled trades employees in the maintenance and smooth operation of New York City's elevated infrastructure; it is composed of five major sections:

The **Flag Engineering** section is an engineering group that reviews, routes, and tracks hazardous or potentially hazardous safety and structural conditions ("flags") in or on the city's 788 bridges (including 5 tunnels). The Flags staff is on call 24 hours a day to respond to bridge emergencies. The section can be alerted to flag conditions by city and state inspectors and other sources, such as the Communications Center. All conditions undergo an evaluation involving review of the flag report and photographs of the condition, and, if necessary, a visit to the site. Subsequently, a "flag packet" describing the type of repair or response that is required is created and routed to an appropriate group, in-house or contractor, for elimination. Flags engineers supervise repair work performed by contractors. The section monitors the status of each flag, and reports on all activities on a monthly basis.

The in-house engineers and skilled trades personnel of the **Bridge Repair Section** perform repairs to address flagged conditions. Flag repairs include structural and safety work, such as the repair of steel members damaged by corrosion or accident impact, the replacement of box beams and bridge railings, the replacement of roadway gratings, repairs to traffic control devices, and the rebuilding of wooden walkways. Much of this work is performed in the off-hours, either to accommodate traffic or in response to emergencies.

This section also rehabilitates and replaces damaged, worn, or defective components whose failure can affect service. This type of work, known as *Corrective Repair*, primarily involves the electrical, mechanical and operational control systems for the twenty-five movable bridges, as well as the travelers (movable underdeck access platforms) on the four East River bridges. The Bridge Repair Section is also responsible for the lubrication of the movable bridges as well as the mechanical components and the main cables of the East River bridges. In addition, this section administers federally funded contracts for the preventive maintenance of the four East River Bridges.

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The ***Bridge Inspections and Bridge Management*** section performs three essential functions: *Bridge Inspections*, *Bridge Management*, and *Research and Development*.

The *Inspections Unit* inspects the city's bridges in accordance with state and federal standards; monitors bridge conditions with a high hazard potential, such as temporary repairs, outstanding flags, and fire hazards; responds to emergency inspection requests from NYCDOT and external sources; recommends repairs and remedial measures for hazardous conditions; generates flag and inspection reports for the Division; engages in special programs such as non-destructive monitoring of sensitive bridge components by advanced techniques; supervises inspections by consultants working for the Division; conducts inspections and inventories of expansion joints; conducts acoustic emission monitoring; and inspects non-structural cladding.

The *Bridge Management Unit* develops and maintains the database for the City's bridge inventory, condition ratings, and inspection information. The unit is also responsible for maintaining records of privately-owned bridges in the City. The database is the source of information used in a variety of reports, including the present Bridges and Tunnels Annual Condition Report. This unit uses the bridge and span condition database to determine current and future needs for bridge rehabilitation, bridge component rehabilitation, flag forecasting, inspections and monitorings.

This Section is also responsible for investigating new materials and methods to improve existing bridge conditions. It sponsors a series of lectures by experts on subjects relevant to design, construction, and maintenance, such as seismic retrofitting of bridges, salt substitutes, cathodic protection against corrosion, concrete patching materials, new paint strategies, non-destructive bridge testing, and deck resurfacing. The unit also participates in research programs with interested transportation and infrastructure entities. In conjunction with the Port Authority, MTA Bridges and Tunnels, and NYS Bridge Authorities, it sponsored a report on suspension bridge cables that led to a federal project for the entire United States. A number of articles on bridge management are published by the unit in technical journals in the United States, Japan, France, and elsewhere. This section created the system for generating bridge inspection reports with portable computers; a similar system is now being adopted by the NYSDOT.

Preventive Maintenance is a vital part of the overall bridge program. This section is responsible for functions including debris removal; mechanical sweeping; pointing of masonry brick and block; and emergency response, such as snow removal, oil/cargo spills, and overpass hits. The section also performs some corrective repair work such as asphalt and concrete deck repairs, sidewalk patching, fence repair, and brick and masonry repairs. Preventive Maintenance is responsible for conducting the Department's anti-icing operations on the four East River bridges.

Bridge and Tunnel Operations is responsible for operating the 25 City-owned movable bridges that span city waterways. This section operates under a variety of federal mandates that call for 24-hour coverage at many locations; its mission is to provide safe and expedient passage to all marine and vehicular traffic under and on movable bridges. In calendar year 2012 Bridge Operations effected a total of 5,496 openings, 4,819 of which allowed 8,402 vessels to pass beneath the bridges. The remaining 677 openings were for operational and maintenance testing. The section also operates the city's five mechanically-ventilated tunnels, performing electrical maintenance and arranging for roadway cleaning.

The overall mission of the Bureau of Bridge Maintenance, Inspections and Operations is to maintain the structural integrity of elevated structures and tunnels and to prolong their life by slowing the rate of deterioration. While our objective may be seen as "maintaining the status quo" of the infrastructure, we continue to take a new look at our methods, procedures, and general focus as we formulate our operational plans for the next several years.

As more bridges are rehabilitated, it becomes incumbent upon us to protect the government's investment in the infrastructure by developing and implementing a more ***substantive preventive maintenance program*** to keep these bridges in good condition.

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The Deputy Chief Engineer for Bridge Maintenance, Inspections and Operations also acts as the **Deputy Chief Bridge Officer**, assuming the responsibilities of the Chief Bridge Officer in that person's absence.

The **Bureau of Bridge Capital Design & Construction** is made up of two major sections:

The **East River and Movable Bridges Section** is responsible for all design and construction activities for all rehabilitation/reconstruction work that is planned, or currently taking place on the four East River Bridges, as well as all City-owned movable bridges and tunnels. This involves overseeing and supervising design consultants who prepare plans and specifications for bridge rehabilitation/reconstruction projects on the four East River Bridges and all Movable Bridges, as well as overseeing and supervising contractors, Resident Engineers and Inspection Consultants, and Construction Support Services Consultants during the construction phase.

This Section consists of two major areas: **East River Bridges**, and **Movable Bridges**. Each of these areas is headed by a Director to whom Section Heads or Engineers-in-Charge report. Each is assigned a specific bridge, or bridges, where they are responsible for all design and construction activities. The Directors, in turn, report to the Deputy Chief Engineer of the Bureau.

The **Roadway Bridges Section** is responsible for both design and construction activities for all rehabilitation/reconstruction work that is planned, or currently taking place on all City-owned, non-movable bridges, with the exception of the four East River Bridges. This involves overseeing and supervising design consultants who prepare plans and specifications for bridge rehabilitation/reconstruction projects, as well as overseeing and supervising contractors, Resident Engineers and Inspection Consultants, and Construction Support Services Consultants during the construction phase.

This Bureau covers two major geographic areas; **Brooklyn and Manhattan Bridges**, and **Bronx, Queens and Staten Island Bridges**. In each geographic area, the workload is divided by Community Board. Engineers-In-Charge report to the Directors of each major area, who, in turn, report to the Deputy Chief Engineer of the Bureau.

The **Engineering Review and Support Bureau** is responsible for providing Division-wide engineering support services. The following areas make up this Bureau: ***In-House Design, Engineering Support, Engineering Review, and Quality Assurance***.

In-House Design staff (comprised of the Structural, Electrical, and CADD Groups) prepare plans and specifications for bridge rehabilitation/replacement projects that enable the Division to restore bridges considered "structurally deficient," to a "very good" condition rating. This unit also handles urgent Division projects, as well as special repair projects of the **Bureau of Bridge Maintenance, Inspections and Operations**. Over the last 20 years, In-House Design has completed contract documents for over 30 major replacement/rehabilitation projects. Some of these structures were in highly environmentally sensitive areas, such as the FDR Drive from 42nd to 54th Streets, Hylan Boulevard over Lemon Creek, Chelsea Road over Sawmill Creek, Cropsey Avenue over Coney Island Creek, the Exterior Street Ramp, Belt Parkway Bridge over Paerdegat Basin, 145th Street Bridge over Harlem River, and the Greenpoint Avenue Bridge over Newtown Creek. The staff also provided plans, working drawings, and shop drawings for in-house built projects such as the temporary Pedestrian Bridge for PS-5, Ferry Terminals at 34th Street, the Hamilton Avenue Asphalt Plant conveyor supports, the Yankee Stadium Ferry Access, the concrete barrier at Cross Bay Boulevard, and the protection beam at Westchester Avenue.

The Electrical Group reviews and/or prepares contract documents for the electrical and street lighting work for all projects in the Division's capital program. They further review plans and

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specifications prepared by consultants and review test results of electrical systems conducted by vendors on the movable bridges.

The ***Engineering Support Section*** is comprised of four units: *Specifications, Survey, Records Management, and Special Projects*.

The *Specifications Unit* prepares and reviews contract bid documents and specifications for all Federal and City-funded, private developer, City-let in-house and consultant-designed bridge and various other construction projects, processes the contracts for bidding, after ensuring that they comply with the City, New York State and Federal standards, prepares, reviews, and transmits addenda, maintains and updates City-let bridge construction boiler plates in compliance with FHWA and NYSDOT Engineering bulletins and instructions, and updates and maintains an inventory of all NYC and NYS special specifications used in bridge and other construction projects. This Unit approves and issues item numbers for newly written special specifications for the city funded projects. In addition, it prepares "Revisions to NYSDOT Standard Specifications" (R-pages), which are compiled from NYSDOT Engineering Bulletins and Engineering Instructions, and reviews contract drawings for compliance with contract bid proposal books.

The *Survey Unit* performs field surveys and visual inspections for the preparation of monitoring bridge structures, bridge component movement, crack monitoring, and foundation settlement. This unit also is involved in the survey, visual inspection, and monitoring of movement and cracks in retaining walls.

The *Records Management and Electronic Media Unit* establishes drafting guidelines for contract plans and digital media standards for the archiving of bridge records. It reviews design, as-built and shop drawings prepared by consulting firms, as well as CDs and DVDs containing pdf and CAD files. This unit maintains original plan files, upgrades the records database and converts original drawings into electronic media in retrievable formats. It also responds to requests received from private, public and other agencies for information regarding records of City-owned bridges.

The *Special Projects Unit* reviews contract bid documents and specifications for public and private agencies to ensure compliance with City, State and Federal standards and guidelines.

The ***Engineering Review Section*** consists of ten units: *Structural Review, Retaining Wall, Bridge Hold, Cost Estimate, Other Agency/Private Developer, Scope Development, Overweight Truck Permit, Geotechnical, Land Use Planning, and Utilities*.

The *Structural Review Unit* reviews all City-let bridge construction contract drawings, oversees seismic design requirements for City-let contracts for bridge projects, reviews analysis and design calculations and ensures that the work to be performed conforms to NYCDOT requirements. This unit establishes design standards, including seismic requirements.

The *Retaining Wall Unit* is responsible for inspecting City-owned retaining walls, identifying walls in poor condition, and creating an inventory of all City-owned retaining walls. Retaining walls in poor condition requiring immediate attention are referred to in-house repair staff or When and Where contractors. Data on poorly rated retaining walls are developed into scope packages and forwarded to the New York City Department of Design and Construction for permanent rehabilitation with DOT funding. Walls of questionable ownership are researched for ownership and jurisdiction. A consultant has been assisting the unit in the inspection, condition assessment, temporary repair design, inventorying and budgeting for the permanent rehabilitation of the retaining walls.

The *Bridge Hold Unit* was established in February 2011, based on OCMC requests to review construction permit applications for any proposed work located within 100 feet of any City-owned bridge structure. The permit applications may also originate from other City agencies, private developers, and utility companies. The Unit reviews the proposed work to ensure that it does not compromise the integrity of the structure and that it is in compliance with Agency requirements. Based on the review's recommendations, OCMC approves or disapproves these permit applications. The Unit receives an average of 85 permit applications per week for review.

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The *Cost Estimate Unit* reviews and oversees design and construction cost estimates of City projects.

The *Other Agency/Private Developer Unit* currently provides engineering review supervision of projects from other agencies and private developers such as the Atlantic Yards Project, the Eastside Access Project, and the Riverside South Project. In addition, the unit conducts non-bridge engineering projects, such as the annual balloon wind study for the Macy's Thanksgiving Day Parade.

The *Scope Development Unit* reviews inspection reports, as-built drawings, and structural condition ratings, performs field inspection of bridges to develop the scope of work for the rehabilitation of deficient and poorly rated bridges, and initiates the procurement of Design Consultant contracts. The Unit is also responsible for reviewing of quarterly budgetary plans for bridge rehabilitation projects and coordinates these reviews with the Bureau of Bridge Maintenance, Inspections and Operations, and the Capital Procurement and Capital Planning Sections.

The *Overweight Truck Permit Unit* in coordination with the Division's Truck Permit Unit reviews the engineering aspects of overweight and over-dimensional truck and self-propelled crane permit applications, performs load rating analyses, and reviews load postings for City owned bridges. The Unit also reviews resurfacing, snow removal and other heavy equipment permit requests from within the Agency and from other agencies.

The *Geotechnical Engineering Unit* provides geotechnical-engineering services. This unit reviews bridge rehabilitation/reconstruction project reports, soil investigation/geotechnical foundation reports, City-let bridge construction contract drawings and other agency/private developers' geotechnical work which impacts City-owned projects.

The *Land Use Planning Unit* reviews and maintains a database of easement issues, right-of-way, and Uniform Land Use Review Procedures. This unit also reviews Design reports and Environmental Impact Statements of various other Agency projects with respect to their impact on City-owned bridges.

The *Utilities Unit* coordinates all issues related to utility design as they affect City-owned bridge projects and related projects.

The ***Quality Assurance Section*** ensures that materials installed for the Bridge Rehabilitation Program meet contractual requirements and are incorporated in strict compliance with plans and specifications. This section operates under its own formulated Quality Assurance Plan that is based on NYSDOT requirements and procedures. Quality Assurance has contractually retained the services of private inspection/testing firms. The provision of services required for various projects is better coordinated through this centralized method, which is also timely and cost effective.

Off-site Quality Assurance services relative to a wide variety of basic and manufactured construction materials including concrete, asphalt, soils, reinforcing steel, bridge bearings, timber, structural steel and precast/prestressed structural components for all bridge projects, irrespective of the funding source, are handled by this section. Through its engineers at bridge construction sites, Quality Assurance ensures that only acceptable materials are incorporated into rehabilitation/reconstruction work in strict accordance with plans, specifications and acceptable construction practice. Current major projects include the Brooklyn Bridge, Manhattan Bridge, Willis Avenue Bridge, Roosevelt Island Bridge, Belt Parkway Bridge over Paerdegat Basin, Belt Parkway Bridge over Rockaway Parkway, Belt Parkway Bridge over Fresh Creek Basin, 11th Avenue Viaduct over LIRR Westside Yard, East 8th Street Access Ramp over Belt Parkway, St. George Staten Island Ferry Terminal Ramps, Northbound and Southbound Bruckner Expressway Bridges, Wards Island Pedestrian Bridge over Harlem River, 149th Street Bridge over LIRR, East 78th Street Pedestrian Bridge over FDR, Shore Road Circle Bridge, Carlton Avenue Bridge over LIRR Yard, and the Claremont Parkway Bridge. In addition, the Section provides services to the Component Rehabilitation Section on an as-needed basis.

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The Section is currently involved in extending its services for inspection of concrete at batching plants for the Sidewalk and Inspection Management Citywide Concrete Program via its contract with a City-contracted inspection firm.

Through its *Environmental Engineering Unit*, Quality Assurance also oversees the implementation of the Final Environmental Impact Statement on bridge construction projects involving the removal and disposal of lead-based paint. The unit's active involvement in training the supervisors and overseeing the abrasive blasting operations has resulted in the successful completion of various paint removal projects. This unit also oversees the proper and safe disposal of other hazardous waste and regulated waste encountered during construction activities.

In addition to enforcing the lead paint removal protocols, the unit handles other environmental concerns. Typically, the unit participates in the design stage to ensure that any environmental issues are addressed during the construction phase of the project. These issues include, but are not limited to, asbestos abatement, soil sampling, groundwater sampling, remediation of contaminated soils and groundwater, worker exposure to environmental contaminants, management of waste oil, storage of hazardous waste, management of storm water runoff, soil erosion controls, management of concrete washout wastewater, site safety, and OSHA compliance. The role of this unit in ensuring public safety has been recognized and commended by the community.

The unit continues to monitor waste water discharge for numerous projects involving the generation and disposal of waste water, such as the Willis Avenue and Roosevelt Island bridges. The unit is responsible for discharge monitoring in conjunction with the NYS SPDES Discharge Permits for discharges at the Eastern Boulevard Bridge, Hunters Point Avenue Bridge, Greenpoint Avenue Bridge, Cropsey Avenue Bridge, Manhattan Plaza Underpass, Battery Park Underpass, and the Metropolitan Avenue Bridge. The unit continues to provide environmental oversight and compliance on major capital projects such as Willis Avenue Bridge, Manhattan Bridge, Williamsburg Bridge, Brooklyn Bridge, Wards Island Pedestrian Bridge over Harlem River, Floyd Bennett Field Wetland Mitigation, and Belt Parkway Bridges, as well as Component Rehabilitation, Roadway Bridge, and Design/Build projects such as the reconstruction of the ramps at the St. George Ferry Terminal in Staten Island, Bruckner Expressway over the Bronx River and the Bruckner Expressway Bridges over Conrail/Amtrak.

The **Specialty Engineering and Construction Bureau** is responsible for all **Component Rehabilitation** activities, **Design-Build/Emergency Contracts**, **Bridge Painting**, and the **When and Where Unit**.

Component Rehabilitation is the revamping or replacement of damaged, worn or defective bridge components. This type of work is performed primarily on those structures not classified as being "deficient," but which contain specific components that have low condition ratings. By rehabilitating these components, the Division can ensure that these bridges remain in "good" or "very good" condition; usually extending the bridge's useful life by up to 10 years. Section Heads or Engineers-in-Charge report to the Director of Component Rehabilitation. Each is assigned a specific bridge, or bridges, for which they are responsible for all component rehabilitation activities. In addition, the Component Rehabilitation Unit will be administering a new capital When and Where contract. The When and Where Unit will be responsible for the active construction and daily monitoring and supervision of the contract. The Component Rehabilitation Program is an ongoing program with cumulative effects. Each Fiscal Year, a number of bridges are selected for inclusion in the program and construction is completed on others. Through fiscal year 2018, the program will obligate approximately \$141.5 million.

The **Design-Build/Emergency Contracts Group** provides technical and procurement expertise related to the following areas: preparing Emergency Declarations for unsafe conditions that require immediate remediation; assisting the Chief Bridge Officer in the contractor selection

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process for declared emergency situations; providing technical expertise related to the development, procurement and administration of Design-Build contracts throughout the various areas of the Division; preparing and administering Design-Build agreements; and supervision of Design-Build project design, construction, and inspection services.

The ***Bridge Painting*** section's function is to maintain the protective coating of the City's bridges. The section is divided into two programs, the in-house (expense) program and the capital program. The capital program oversees total paint removal and repainting, performed by contractors; this is done at twelve-year intervals on bridges measuring more than 100,000 square feet of painted area, and bridges over railroads. In-house personnel provide the inspection services on East River Bridge preventive maintenance contracts for quality control purposes. The in-house program is responsible for full steel painting of bridges measuring less than 100,000 square feet, and bridges that are not over railroads. This includes local surface preparation of deteriorated areas and overcoating of the entire bridge. In addition, the in-house program is responsible for salt splash/spot painting.

Salt splash/spot painting is performed four years after full steel painting, and again four years later. After another four years, we once again perform full steel painting. The interval between full steel applications remains twelve years.

Members of the in-house program respond to emergency flag repairs alongside the in-house repair forces, to perform surface preparation prior to, and painting upon completion of, the steel work. In-house painting personnel also perform environmental clean-up after the iron workers finish their repair work.

The engineers and inspectors of the ***When and Where Unit*** supervise the contractors' repairs of structural and safety flags citywide under both marine and general repair contracts, as well as a new capital contract. The use of these contracts allows the unit greater flexibility in deploying the contractors' resources as necessary, and in obtaining a variety of construction equipment and materials that are not readily available to in-house forces. In addition, the unit responds to bridge emergencies, providing on-site inspection to verify field conditions, taking measurements for repairs and providing emergency lane closures. The section also supervises the repair work performed during night hours to reduce the impact on traffic and on public safety.

The ***Bureau of Management and Support Services*** provides essential administrative and analytic services to each of the operational bureaus of the Division of Bridges. The Bureau is divided into five primary sections: ***Office of the Executive Director, Administration and Finance, Capital Procurement, Capital Coordination, and the Truck Permit Unit***. Each highly-specialized section is designed to address those issues and requirements that are critical to the operation of the respective Bureaus within the Division.

In addition to the Division-wide responsibility for conflict resolution, Equal Employment Opportunity enforcement, confidential investigations, Bridges' Engineering Service Agreements, space allocation, and special projects, the ***Executive Director*** oversees, on an executive level, the following areas and functions:

The ***Senior Director of the Administration and Finance Section*** oversees and administers all administrative/personnel-related functions for the Division, acting as a liaison with the Central Personnel Coordinator in NYCDOT Personnel including, but not limited to, recruiting for vacancies (this includes reviewing for completeness and submitting the necessary paperwork, and reviewing and distributing candidates' resumes); maintaining all Managerial Position Descriptions; maintaining all Division organization charts; scheduling training; confidential investigations; maintaining records of IFA-funded positions; initiating and assisting in resolving disciplinary/grievance actions; serving as Conflicts of Interest and Financial Disclosure Officer; collecting and reviewing managerial and non-managerial performance evaluations; absence control; providing interpretive advice to Division management regarding City and Agency policy

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and procedures; and overseeing telephone and facility-related issues for personnel located at 55 Water Street and 59 Maiden Lane in Manhattan.

The Senior Director of the Administration and Finance Section also oversees the following three units:

The *Analytic Unit* prepares comprehensive bi-weekly and monthly reports that address major issues confronting the Division; compiles statistical data detailing the Division's productivity; processes and monitors all FOIL requests; frames issues in which oversight assistance is required for use by the Division, NYCDOT Executive Management and the Mayor's Office; and prepares the City Charter-mandated ***Bridges and Tunnels Annual Condition Report***.

The *Vehicle Coordination Unit* tracks the placement and condition of all vehicles under the jurisdiction of Bridges. It maintains a database and prepares reports containing this information; provides information and reports to appropriate inquiring Divisions and Agencies such as the Auditor General's Office, NYCDOT Legal Department and NYCDOT Litigation Support Services; coordinates the assignments of vehicles and their movement throughout various borough field locations and job sites; prepares reports on Vehicle Status and replacement; prepares reports for the purpose of tracking Overnight Vehicle Assignments for all Division vehicles; receives and routes vehicle Accident Reports, Police Reports and Security Incident Reports relating to vehicle accident, theft and/or vandalism; coordinates priorities for vehicle and equipment repair with Fleet Services; prepares reports and memoranda regarding vehicle safety issues and communication procedures for the NYCDOT Communication Center; and collects required documentation from field personnel for checking Driver Certifications with the Department of Motor Vehicles and EZ Pass.

The *Finance Unit* oversees the Division's entire expense budget process including, but not limited to, base-line preparation, spending plans, overtime control, financial plan changes, and budget modifications. The unit further oversees all Division-wide fiscal activities, including the establishment and monitoring of all IFA-related project budgets, while simultaneously ensuring that the budget and plans represent the Division's priorities.

The ***Capital Procurement Section*** serves as a liaison between the Division of Bridges and the Office of the Agency Chief Contracting Officer, other Agency Divisions, the public and private railroads, and the various consulting firms involved with the procurement process. The duties of this unit include: overseeing the Division's capital consultant contract procurement from scope to registration; preparing status reports; processing of the Division's change orders through registration, and coordinating Railroad Force Account Agreements and railroad invoice payments for Division construction projects.

Railroad Force Account Agreements are a vital component in the rehabilitation/reconstruction program since train traffic affects 327 (41.5%) of City-owned bridges. Careful cooperation between the NYCDOT and the various railroad agencies that service the metropolitan area is required. The Railroad Coordinator provides a single point of contact for all railroad issues. This coordination includes the use of railroad personnel for track safety, approval of reconstruction design drawings, track shutdowns and reductions in train service for bridge construction work. The coordinator informs managers of "typical" railroad problems and attempts to avoid them through proactive measures. Upon registration of the railroad force account contracts between the City of New York and the respective railroad, Notices to Proceed [NTPs] are issued, and invoices are generated. The invoices, once approved by the engineers for the railroad and the corresponding DOT Project Manager, are sent to the Railroad Coordinator for processing and actual payment by the New York City Comptroller's Office.

NYCDOT bridge designers make every effort to prepare accurate and complete contract documents. Unfortunately, in many instances, the original design drawings for the deteriorating bridges no longer exist, and previous records of modifications and repairs are not available. When the contract documents for the bridge reconstruction projects do not accurately address conditions found in the field, Contract Change Requests (CCR) are needed. Change order work

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can not proceed until the CCR is registered. Due to the nature of bridge construction projects, change order work is often on the critical path. Any delay in the issuance of a change order affects the overall project, and adds substantial overruns to the final cost. A tracking process for change orders has been implemented that significantly reduces the time for the approval process.

Certificates to Proceed [CPs] are a critical component for the registration of any Construction, Consultant Programs, Force Account, Change Order and Engineering Service Agreement and assigned ESA tasks. Coordinating the submission of New and Revised Certificates to Proceed for submission to the Capital Budget is overseen by the Capital Procurement Unit.

The **Capital Coordination Section** is responsible for preparing, coordinating and updating the capital budget and capital program initiative within the Division of Bridges. Currently, the Division's Ten Year Capital Plan is worth approximately \$4.9 billion. This plan is designed to rehabilitate the City's bridges. Responsibilities include: administering and participating in the development and implementation of planning capital projects; acting as liaison with oversight agencies, DOT Administration and all responsibility centers within Bridges; reviewing and processing transfer of fund requests in an attempt to resolve funding issues; and maintaining the Division's registration report for all current year capital contracts. In addition, this section coordinates the Division's submission of Initial Financial Plans, Annual Financial Plan and Construction Management Plans prepared by Project Managers that must be submitted to the Office of Finance, Contracts & Program Management.

The **Truck Permit Section** issues approximately 682 Annual Overweight Load Permits (renewals only), and approximately 37,890 other permits, including Annual Self-Propelled Crane Permits, Daily Oversize/Overdimensional/Supersize Truck Permits, and Bulk Milk Permits; all in accordance with the New York City Department of Transportation Policy and Procedures and the New York City Traffic Rules and Regulations section 4-15.



In January 2012, the Section Coordinated a Series of Supersized Moves with Bay Crane to Move a 435,000 Pound Tunnel Boring Machine Head and a Smaller Machine Head Weighing 150,000 Pounds, as Part of the Ongoing Eastern Access Project. The Vehicle was 27'-10" high, 22'-5" Wide, and 94'-2" Long, With a Gross Weight of 689,800 Pounds. In February 2012, the Section Issued a Permit for the Move of the Sculpture "Bird" by Will Ryman. The 12 Feet High, 16 feet Wide, 2 Ton Sculpture was Exhibited From February 16 Until March 24, 2012. (Credit: Will Ryman and Paul Kasmin Gallery)

JANUARY***Hamilton Avenue Asphalt Plant (Brooklyn)***

On January 7, 2012, Division ironworkers repaired the drum, silo, and chute.

Willis Avenue Bridge over Harlem River (Bronx/Manhattan)

The newly built Ramp C, which provides a direct connection to the Major Deegan Expressway, was opened on January 10, 2012.

Flushing Avenue Service Road over Flushing Avenue (Queens)

Cleaning and painting of this bridge, which began on October 11, 2011, was completed on January 11, 2012.

Anti-Icing

On January 14 – 17, 2012 icicle patrols monitored the FDR Drive, and the Cross Bronx and Brooklyn-Queens Expressways.

Hamilton Avenue Asphalt Plant (Brooklyn)

On January 14, 2012, Division ironworkers repaired the drum, hopper, and chute.

Commissioner Richard J. Sheirer Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on January 20, 2012, in tribute to former Office of Emergency Management Commissioner Richard J. Sheirer, 65, who died on January 19. Commissioner Sheirer served under both Mayors Bloomberg and Giuliani. He oversaw all of the agency's emergency response, preparedness and recovery protocols and was responsible for coordinating plans for major events across the five boroughs. He began working in the Fire Department in 1967 as a Fire Alarm Dispatcher, and ultimately rose to become Deputy Commissioner in 1994, earning the Chief Thomas P. O'Brien Award in the process. In 1996, Mr. Sheirer was appointed as the NYPD's Deputy Commissioner for Administration and Chief of Staff, and in February 2000 became Director of the Mayor's Office of Emergency Management. After the terrorist attacks on September 11, 2001, he was in charge of coordinating the enormous effort of rescue and clean-up, involving dozens of local, state and federal agencies. Commissioner Sheirer retired in March 2002. The flags were raised on January 23, 2012.



Commissioner Richard J. Sheirer.

East 78th Street Pedestrian Bridge over FDR Drive (NB & SB)

The reconstruction of the bridge was substantially completed on January 20, 2012. Decades of use and exposure to the elements took a toll on the original structure, which was built in the 1940s. In 2006, the State Department of Transportation listed the bridge's condition as "poor" in its biennial inspection. Given the scope of repairs and need for additional upgrades, DOT chose to replace the entire crossing, an impressive undertaking given its location over a key six-lane arterial highway.

The new bridge, constructed entirely in Camden, New Jersey and delivered by barge, includes wider sidewalks and approaches, pedestrian safety fencing and ADA-compliant ramps for added safety and improved access. The new bridge also sits higher over the road than its predecessor to provide more clearance for large vehicles, particularly for emergency responders. The project

also improved lighting in the area, including replacements for nearby streetlights and the addition of decorative lighting on the East 78th Street approach. The contract also included re-pointing masonry for the retaining wall along East 78th Street.



East 78th Street Bridge. The Ribbon-Cutting Ceremony: Council Member Jessica Lappin, Neighborhood Advocate Loretta Ponticello, Commissioner Janette Sadik-Khan, Assembly Member Micah Z. Kellner, and Parks Manhattan Borough Commissioner William T. Castro.

Anti-Icing

On January 21, 2012, 4.3 inches of snow fell in Central Park, 3.4 inches at La Guardia Airport, and 1.6 inches at JFK Airport. Anti-icing crews were deployed on the East River bridges from 1:00 AM to 5:00 PM on January 21; 33 applications of chemicals were made. Crews were again deployed from 8:30 PM on January 22 until 5:00 AM the following morning; no applications were necessary. Snow was cleared from priority overpasses, and icicle patrols were active on the FDR Drive, Battery Park Underpass, and the Cross Bronx and Brooklyn-Queens Expressways.

Hamilton Avenue Asphalt Plant (Brooklyn)

On January 21, 2012, Division ironworkers repaired the drum and chute.

Hamilton Avenue Asphalt Plant (Brooklyn)

On January 28, 30, and 31, 2012, Division ironworkers worked on the installation of the new cyclone and repaired the ducts.

Brooklyn Bridge

At approximately 8 AM on January 30, 2012, an over-height truck on the northbound Brooklyn-Queens Expressway struck the Brooklyn Bridge. Four empty 90-foot long containers fell off the back of the truck into the street. No one was injured. All eastbound lanes were closed for several hours as the truck was removed and the bridge was inspected. The damage to the fascia girder was repaired that night by the contractor. Follow-up repairs were conducted in early February.

Willis Avenue Bridge over Harlem River (Bronx/Manhattan)

The sidewalk to the North Access Road was opened on January 30, 2012.

Belt Parkway Bridge over Fresh Creek (Brooklyn)

The first concrete deck pour in the winter concrete enclosure was completed in January 2012.



Fresh Creek Bridge: Winter Tent Enclosure for Stage IIB Concrete Bridge Deck Placement.

FEBRUARY

Shore Road Circle over Amtrak (Bronx)

On February 3, 2012, the traffic in the center lanes of the bridge was moved to the newly constructed outer lanes. The contractor then began demolition of the inner lanes of the bridge.

Hamilton Avenue Asphalt Plant (Brooklyn)

On February 4, 2012, Division ironworkers repaired the cyclone and drum.

Anti-Icing

Anti-icing crews were deployed on the East River bridges from 7:00 PM on February 8, 2012 until 4:00 AM the following morning, and from 10:00 PM on February 10 until 2:00 PM the following day. No applications of chemicals were necessary. Icicle patrols were active on the FDR Drive, Battery Park Underpass, and the Cross Bronx and Brooklyn-Queens Expressways.

South of Tillary Street Pedestrian Bridge over Navy Street (at NYCHA Ingersoll Houses) (Brooklyn)

Additional pedestrian fencing on the bridge approaches was needed to ensure public safety. Division in-house design staff provided plans for the additional fencing and maintenance personnel installed it. The fence extension installation began on January 24, 2012, and was completed on February 9, 2012.



Additional Fencing on the Pedestrian Bridge.

Hamilton Avenue Asphalt Plant (Brooklyn)

On February 11, 2012, Division ironworkers repaired the cyclone, main drum, and grizzly.

Ed Koch – Queensboro Bridge

The Agency's Urban Art Program enhances public space through art and improved street design and streetscapes. Launched in October 2008, the program brings the vision of the Agency's World Class Streets initiative to life by partnering with community organizations to install murals, sculptures and other art forms in plazas and on medians, triangles, sidewalks, Jersey barriers and construction fences for up to 11 months on NYCDOT properties.

Rena Leinberger's "When it opens like this, up is not over" transposed images of the veiled environment behind a 50-foot fence on Vernon Boulevard and Queens Plaza South onto its face.

She took six photographs shot in documentary fashion of the view beneath the Ed Koch - Queensboro Bridge. These photographs were then re-photographed with everyday objects, in a state of falling, in front of them suggesting precipitation, celebration, and elusiveness. Neither the artwork nor the scenes they depict can ever be viewed in entirety, partially obscured by the flurry. The exhibit opened on February 3, 2012.



Installing the Exhibit. Art on the Fence.

Champions of Change: Rebuilding America's Infrastructure

On February 15, 2012, Chief Bridge Officer Henry D. Perahia participated in a roundtable discussion regarding transportation projects, and discussed the St. George Ferry Terminal Project, as part of the White House Champions of Change Program.



United States Secretary of Transportation Ray LaHood, Director of the Navajo Division of Transportation Paulson Chaco, Chief Bridge Officer Henry D. Perahia, and Project Manager for the DFW Connector Project Sam E. Swan.

Hamilton Avenue Asphalt Plant (Brooklyn)

On February 18, 2012, Division ironworkers repaired the cyclone and hoppers.

Harper Street Asphalt Plant (Queens)

On February 18, 2012, Division ironworkers repaired the cyclone and hoppers.

Harper Street Asphalt Plant (Queens)

On February 25, 2012, Division ironworkers repaired the mixer and hopper.

Service Road Turnaround over Flushing Avenue (Queens)

Cleaning and painting of this bridge, which began on September 15, 2011, was completed on February 27, 2012.

Bruckner Expressway Bridge over Bronx River (a.k.a. Eastern Boulevard Bridge) (Bronx)

Cleaning and painting of the bridge operator's house, which began in January 2012, was completed in February 2012.

FDR Drive Southbound over FDR Drive Northbound Underpass (Manhattan)

Cleaning and painting of the motor and control rooms began and was completed in January 2012.

Department of Transportation Facility at Plymouth Street (Brooklyn)

Cleaning and painting of this structure began and was completed in February 2012.

Third Street Bridge over Gowanus Canal (Brooklyn)

Cleaning and painting of the bridge operator's house, which began in January 2012, was completed in February 2012.

MARCH

Awards

In March 2012, the American Council of Engineering Companies of New York selected the replacement of the Willis Avenue Bridge for both a Gold and a Diamond Award in the structural systems category in its 2012 Engineering Excellence Awards. The Manhattan Bridge biennial inspection and the emergency reconstruction of the Borden Avenue Bridge were selected for Platinum Awards in the structural systems category, the reconstruction of the Roosevelt Island Bridge was selected for a Diamond Award in the transportation category, and the protective coating project on the Belt Shore Parkway Bridges received a Silver Award in the transportation category.

Harper Street Asphalt Plant (Queens)

On March 3, 2012, Division ironworkers repaired the hopper and scales.

Manhattan Bridge

Bicyclists returned to the bridge's north path and pedestrians to the south path on March 5, 2012, as scheduled.

65th Place Bridge Railing over Brooklyn-Queens Expressway (Queens)

Cleaning and painting of this bridge, which began on June 17, 2011, was completed on March 5, 2012.

Superior Road Bridge over Cross Island Parkway (Queens)

The component rehabilitation of this bridge was substantially completed on March 9, 2012.



Sandblasting the Underdeck Concrete and Rebar on the Superior Road Bridge. Placing Rapid Hardening Polymer Concrete.

37th Street Bridge over Brooklyn-Queens Expressway (Queens)

The component rehabilitation of this bridge was substantially completed on March 9, 2012.



Placing Concrete for Northeast Sidewalk on the 37th Street Bridge. New Fence and Railing.

Harper Street Asphalt Plant (Queens)

On March 10, 2012, Division ironworkers repaired the crusher, mixer, and conveyor belt.

Harper Street Asphalt Plant (Queens)

On March 17, 2012, Division ironworkers repaired the mixer, pulley system, and conveyor belt.

Belt Parkway Bridge over Fresh Creek (Brooklyn)

The new path for bicycles and pedestrians on the eastbound bridge was opened on March 20, 2012, and vehicular traffic commenced on March 24.



Eastbound Fresh Creek Bridge Deck Open to Motor Vehicle, Bicycle, and Pedestrian Traffic.

Ed Koch Queensboro Bridge

On March 30 and 31, 2012, Division electricians assisted a film crew from the television series “Elementary” at the Ed Koch Queensboro Bridge.

Brooklyn Bridge

The necklace lights on the Brooklyn Bridge were turned off for one hour on the evening of March 31, 2012 in observance of Earth Hour.

Hamilton Avenue Asphalt Plant (Brooklyn)

On March 31, 2012, Division ironworkers repaired the chute channel, screener, and silo.

Harper Street Asphalt Plant (Queens)

On March 31, 2012, Division ironworkers repaired the rap bin, main drum, chute channel, screener, and silo.

Belt Parkway Bridge over Paerdegat Basin (Brooklyn)

The Pier #2 cofferdam was completed and excavations inside began in March 2012.



Paerdegat Basin Waterway with Partially Demolished Bridge, Temporary Work Platform, and Pier 2 Cofferdam. Embankment for Future Westbound Bridge in Background.

Greenpoint Avenue Bridge over Newtown Creek (Brooklyn/Queens)

Cleaning and painting of the bridge operator's house, which began in January 2012, was completed in March 2012.

APRIL

Awards

In April 2012, the American Council of Engineering Companies selected the replacement of the Willis Avenue Bridge and the reconstruction of the Roosevelt Island Bridge for National Recognition Awards in its 2012 Engineering Excellence Awards.

Marine Borer Remediation (Manhattan and Brooklyn)

A Notice to Proceed for the marine borer remediation work on the supporting structures of the relieving platforms along the FDR Drive (from East 15th to East 96th Street), and the timber piles and structures of the Carroll Street and Ocean Avenue bridges in Brooklyn was issued to the contractor with a start date of April 2, 2012.

West 33rd Street Bridge over Land Adjacent to Amtrak (Manhattan)

Cleaning and painting of the bridge, which began on December 21, 2011, was completed on April 3, 2012.

Hamilton Avenue Asphalt Plant (Brooklyn)

On April 7, 2012, Division ironworkers repaired the grizzly.

Harper Street Asphalt Plant (Queens)

On April 14, 2012, Division ironworkers repaired the mixer, chute, and conveyor belt.

Fire Lieutenant Richard A. Nappi Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on April 17, 2012, in tribute to Fire Lieutenant Richard A. Nappi of Engine Company 237 in Brooklyn. He collapsed while battling a three-alarm fire at a commercial building in the Bushwick section of Brooklyn on April 16, and died later that day. Fire Lieutenant Nappi, 47, was a 17-year veteran of the FDNY.

After his appointment to the FDNY on October 23, 1994, then-Firefighter Nappi worked at Engine 7 on Duane Street in lower Manhattan. Although he was off-duty on September 11, 2001, he responded from his home in Long Island that morning to the World Trade Center, which was several blocks from his firehouse. In 2003, he transferred to Engine 302 in Queens, and, after his promotion to Lieutenant on November 10, 2007, he was assigned to Engine 237.

Before joining the FDNY, Lieutenant Nappi was a parole officer for the NYS Division of Parole, and a case worker for the Suffolk County Department of Social Services. Fire Lieutenant Nappi was the 1,142nd firefighter to die in the line of duty since the FDNY's founding in 1865. The flags were raised on April 22, 2012.



Fire Lieutenant Richard A. Nappi.

Woodside Avenue Bridge over Brooklyn-Queens Expressway (Queens)

Cleaning and painting of the bridge, which began on March 8, 2012, was completed on April 24, 2012.

41st Avenue Bridge Railing over Brooklyn-Queens Expressway (Queens)

Cleaning and painting of the bridge railing, which began on April 23, 2012, was completed on April 24, 2012.

69th Street Bridge over Brooklyn-Queens Expressway (Queens)

Cleaning and painting of the bridge, which began on March 9, 2012, was completed on April 24, 2012.

Council Member Enoch H. Williams Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on April 26, 2012, in tribute to former Council Member and former New York Army National Guard Major General Enoch H. Williams, 84, who died on April 24. Council Member Williams represented District 41 in Brooklyn for five terms, from 1978 until 1997. As chairman of the Health Committee during his last term, Mr. Williams was a principal force behind the law that in 1994 banned smoking in restaurants, offices, and many outdoor locations.

He also served as commander of the New York Army National Guard from 1990 to 1993. Major General Williams earned his commission in 1950 after serving as an enlisted member during World War II, rising from the ranks of second Lieutenant to Colonel. He served in many positions; among them-Artillery Officer, Transportation Officer, liaison to the Deputy Chief of Staff for Logistics and Commander of the Selective Service. General Williams was appointed Commander of the New York Guard in 1990. He retired from the military in 1995 after more than 30 years of active service.



Council Member Enoch H. Williams.

Harper Street Asphalt Plant (Queens)

On April 28, 2012, Division ironworkers repaired the scale and duct plates.

Manhattan Bridge

Each spring, the Agency’s Urban Art Program, in collaboration with New York Cares, commissions artists and designers to produce murals for concrete barriers that typically separate bicycle lanes from lanes of vehicular traffic. Hundreds of New York Cares volunteers assist the selected artists with painting their designs onto assigned barrier sites. Murals remain installed for 11 months.

In April 2012, approximately 600 feet of concrete wall along the Manhattan Bridge Ramp in Brooklyn were brought to life with artist Abby Goldstein’s engaging play of color and pattern. Her design referred to both the natural world and the built environment with cast shadows of botanical forms and a background of repeated blues and greens in a staggered pattern.



Barrier Beautification on the Manhattan Bridge Ramp in April 2012.

MAY

Award

In May 2012, the Metropolitan Section of the American Society of Civil Engineers selected the replacement of the Willis Avenue Bridge as its Construction Achievement Project of the Year.

Gregory Jackson Tribute

The American flags on the Brooklyn Bridge that had been lowered to half-mast in tribute to former Council Member Enoch H. Williams remained at half-mast in tribute to Parks and Recreation Department employee Gregory Jackson. He collapsed while at the Department's Brooklyn headquarters in Prospect Park on May 1, 2012, and died later that day. Mr. Jackson, 60, was a 26-year veteran of the Department and the Director of the Brownsville Recreation Center.

A former NBA basketball player drafted by the New York Knicks, he grew up playing in the Brownsville Recreation Center and vowed to one day lead it. Mr. Jackson joined the Department as a Recreation Specialist on June 24, 1986 and true to his word, was promoted to his leadership post in 1997. He enlisted local artists to paint murals on the walls and expanded the center's programs beyond athletics, staging plays, running talent shows and holding roller-skating nights. Mr. Jackson was the 2010 recipient of the W. Allison and Elizabeth Stubbs Davis Award, which recognizes Department employees who show extraordinary dedication to the communities that they serve. The flags were raised on May 9, 2012.



Gregory Jackson.

East 8th Street Access Ramp (Guilder Avenue Ramp to Belt Parkway) Over Belt Parkway (Brooklyn)

The reconstruction of the bridge was substantially completed on May 4, 2012.



East 8th Street Access Ramp – East Side View. Traffic on Bridge.

Harper Street Asphalt Plant (Queens)

On May 5, 2012, Division ironworkers repaired the bin and duct.

35th Annual Five Borough Bike Tour

In preparation for the 42-mile Five Borough Bike Tour on May 6, 2012, Division personnel swept the bridges along the route and patrolled them for potholes. Carpenters installed temporary plywood covers over the finger joints of the Pulaski Bridge, which were removed after the tour concluded that day.



Preparing the Pulaski Bridge for the Bike Tour by Installing Plywood Covers Over the Finger Joints. Blowing Out Debris, Placing the Plywood Board, and Taping into Place: Carpenters Mark Pavia, Michael Short III, and Patrick Burns. Completed Job: Carpenter Patrick Burns, Supervisor Carpenter John Motylewski, and Carpenters John Green, Andrew Myjer, Michael Short III, and Mark Pavia. (Credit: Paul Schwartz) Cyclists on the Madison Avenue, Third Avenue, Ed Koch Queensboro, and Pulaski Bridges. (Credit: Mark Feinman)

Grand Concourse over Metro North (Bronx)

Expansion joint repairs on this bridge, which began on the night of April 16, 2012, were completed on May 8.

Hamilton Avenue Asphalt Plant (Brooklyn)

On May 10, 2012, Division ironworkers made emergency repairs on the mixer.

Hamilton Avenue Asphalt Plant (Brooklyn)

On May 12, 2012, Division ironworkers repaired the shaker box, support angles, recycling fan and hydraulic arms.

Harper Street Asphalt Plant (Queens)

On May 12, 2012, Division ironworkers repaired the dryer.

Merrick Boulevard Bridge over Laurelton Parkway Eastbound and Merrick Boulevard Bridge over Laurelton Parkway Westbound (Queens)

Cleaning and painting of these bridges, which began on April 26, 2012, was completed on May 14, 2012.

Peace Officers Memorial Day Tribute

The Brooklyn Bridge American flags flew at half-mast on May 15, 2012, to commemorate Peace Officers Memorial Day.

Hamilton Avenue Asphalt Plant (Brooklyn) and Harper Street Asphalt Plant (Queens)

On May 17, 2012, Division ironworkers repaired the elevator, drum, and silo.

Henry Hudson Parkway Bridge over Broadway (Bronx)

Cleaning and painting of this bridge, which began on April 4, 2012, was completed on May 17, 2012.

70th Street Bridge Railing over Brooklyn-Queens Expressway (Queens)

Cleaning and painting of this bridge, which began on April 16, 2012, was completed on May 18, 2012.

Jeffrey Barbieri Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on May 19, 2012, in tribute to Parks and Recreation Department employee Jeffrey Barbieri. He collapsed while working to preserve elements of the 9/11 Memorial in Tribute Park, in Rockaway, Queens on May 18, and died later that day. Mr. Barbieri, 38, was a three and a half year veteran of the Department, and worked as a Cement Mason, building and renovating features of the City's parks. The flags were raised on May 24, 2012.



Jeffrey Barbieri.

Division Years of Service Ceremony

Division personnel were honored on May 23, 2012 for their years of service to the City. The awards were presented by Chief Bridge Officer Henry D. Perahia and First Deputy Chief Engineer Russell Holcomb.

30 Years of Service

Supervisor Bridge Operator Brian Corry and Highway Repairer John Godfrey

25 Years of Service

Highway Repairer Alfred Black, Area Supervisor Highway Maintenance James Campbell, Associate Staff Analyst Michael DePompo, Highway Repairer Kevin Donahue, Supervisor Bridge Operator Arturo Fisher, Civil Engineer Lev Gold, Associate Staff Analyst Paul Kahn, Bridge Operator George Kutty, Highway Repairer Karim McLean-Nur, Bridge Repairer and Riveter Gonzalo Montano, Cement Mason Luigi Mula, Computer Associate Software Laurie Oberson, Electrician Richard Parisi, Electrician Steven Radice, Executive Director of Management and Support Services Dorothy Roses, Assistant Civil Engineer Reza Taheri, Staff Analyst Agnes Thanjan, and Bridge Repairer and Riveter Ignazio Trapani.



Division Staff at the Ceremony With Deputy Chief Engineer Russell Holcomb, Chief Bridge Officer Henry D. Perahia, and Executive Director of Management and Support Services Dorothy Roses. (Credit: Michele N. Vulcan)

Knapp Street Bridge over Belt Parkway (Brooklyn)

Cleaning and painting of this bridge, which began on February 28, 2012, was completed on May 23, 2012.

Memorial Day Tribute

The Brooklyn Bridge American flags flew at half-mast until noon on May 28, 2012, to commemorate those who died serving the nation during war.

Ninth Street Bridge over Gowanus Canal (Brooklyn

Due to heat expansion, the Ninth Street Bridge was closed to marine traffic beginning at 4:50 PM on May 29, 2012, and was returned to service at 1:00 AM.

Stand Alone Demolition 670 and 676 Grand Concourse and the New Roots Community Farm (Bronx)

Originally, this project was a part of the scope of work for the construction of the East 153rd Street cable stayed bridge, which has been pushed to Fiscal Year 2022 due to budgetary constraints. To avoid future issues related to security, maintenance and safety of the buildings, the Agency decided to demolish them under a stand-alone contract.

The properties 670 Grand Concourse and 676 Grand Concourse were acquired by the City under its power of Eminent Domain Law to satisfy the street widening and to accommodate the proposed alignment of the cable stay bridge as part of the right-of-way for East 153rd Street between Grand Concourse and Morris Avenue. A Notice to Proceed for the demolition of these buildings was issued to the contractor with a start date of April 11, 2011. The demolition began on January 9, 2012. The project was substantially completed on May 30, 2012.



Grand Concourse Project Site. During Demolition in Winter 2012.



May 2012: Application of Binder Course and Tack Coat.



Ready for Planting in Spring 2012.

Rather than leave a vacant lot until construction moves ahead, DOT coordinated with GreenThumb (the Department of Parks and Recreation's community gardening program) and the International Rescue Committee to prime the site for a temporary garden. The entire site was backfilled and brought to grade. A concrete pad and oversized gate were constructed to accommodate garden deliveries and a new fresh water service connection was installed. New sidewalks and fencing also were installed around the garden's perimeter.

On June 15, 2012, Commissioner Janette Sadik-Khan inaugurated the "New Roots Community Farm," a 6,500 square foot temporary community garden for refugees and the South Bronx

community on the site. In conjunction with GreenThumb, DOT prepared the site and is partnering with the International Rescue Committee, which will manage the space.



Angele Nogue (who Fled her Native Cameroon and was Given Sanctuary in the U.S., Ellee Igoe (International Rescue Committee’s Advisor for U.S. Food and Agriculture Programs), and Commissioner Janette Sadik-Khan. Emad Kuterneh, Bronx Borough Commissioner Constance Moran, Chief Bridge Officer Henry D. Perahia, Commissioner Janette Sadik-Khan, Deputy Chief Engineer Robert Collyer, Mosey Said, Administrative Engineer Mohammad Arain, and Civil Engineer Atiq Rehman. Commissioner Janette Sadik-Khan and Students from the Nearby Knowledge is Power Program Schools.
(Credit: Alexander Engel)

130th Avenue Bridge over Laurelton Parkway Eastbound and 130th Avenue Bridge over Laurelton Parkway Westbound (Queens)

Cleaning and painting of these bridges, which began on May 3, 2012, was completed on May 30, 2012.

John Jones

Supervisor Bridge Repairer and Riveter John Jones was the subject of the “Staff Spotlight” feature in the May 2012 edition of “Byways,” the official Agency newsletter.



Supervisor Bridge Repairer and Riveter John Jones.

JUNE

Award

In June 2012, the New York Chapter of the New York State Society of Professional Engineers selected the replacement of the Willis Avenue Bridge as its Project of the Year.

Wards Island Pedestrian Bridge over Harlem River (Manhattan)

The bridge was reopened to pedestrian and bicycle use at 10:45 AM on June 1, 2012. Commissioner Janette Sadik-Khan officiated at the ribbon cutting ceremony.



Associate Urban Designer Neil Gagliardi (2nd from Left), Chief Bridge Officer Henry D. Perahia, Civil Engineer George Chamoun (Partially Obscured), Council Member Melissa Mark-Viverito, Director of Movable Bridges Rahul Shah, Deputy Chief Engineer Robert Collyer, and Administrative Engineer Hani Faouri. Bicyclist on Bridge. (Credit: Nicole Garcia)

Hamilton Avenue Asphalt Plant (Brooklyn)

On June 2, 8, and 9, 2012, Division ironworkers repaired the main drum.

Farmers Boulevard Bridge over Belt Parkway (Queens)

Cleaning and painting of this bridge, which began on May 25, 2012, was completed on June 12, 2012.

Southern Boulevard Bridge over East Fordham Road (Bronx)

Cleaning and painting of this bridge, which began on May 18, 2012, was completed on June 14, 2012.

Shore Road Circle Bridge over Amtrak (Bronx)

The installation of structural steel for Stage 2 was completed on June 15, 2012.



Steel Girder and Shielding Plank Installation on June 15. Disassembling the Crane.

Crotona Avenue Bridge over Bronx Pelham Parkway (Bronx)

Cleaning and painting of this bridge, which began on June 15, 2012, was completed on June 20, 2012.

Hylan Boulevard Bridge over Lemon Creek (Staten Island)

Cleaning and painting of this bridge, which began on April 24, 2012, was completed on June 21, 2012.

Highland Boulevard Bridge Eastbound over Jackie Robinson Parkway (Brooklyn)

Cleaning and painting of this bridge, which began on May 24, 2012, was completed on June 22, 2012.

Harper Street Asphalt Plant (Queens)

On June 23, 2012, Division ironworkers repaired the shaker and hot elevator.

Roosevelt Island Bridge over East River/East Channel (Manhattan/Queens)

The reconstruction of the bridge was substantially completed on June 27, 2012.



Roosevelt Island Bridge Preparing to Open. (Credit: Kevin Hillery) Executive Director of Bridge Preventive Maintenance and Repair Thomas Whitehouse Inspecting the Bridge. (Credit: Bojidar Yanev)

Third Avenue Bridge over Harlem River (Bronx/Manhattan)

On June 23, 2012, Division engineers assisted a film crew from “The Secret Life of Walter Mitty” at the Third Avenue Bridge.

Bancroft Avenue Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on October 6, 2011, was completed on June 29, 2012.

Lincoln Avenue Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on August 5, 2011, was completed on June 29, 2012.

Midland Avenue Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on July 5, 2011, was completed on June 29, 2012.

Belt Parkway Bridge over Rockaway Parkway (Brooklyn)

Concrete paving operations for the westbound side of the new bridge began in June 2012.



Placing and Finishing On-Grade Concrete Pavement for Westbound Roadway on West Side of the Rockaway Parkway Bridge.

JULY

Williamsburg Bridge

On July 3, 2012, Division electricians and an engineer assisted a film crew for a Samsung commercial at the Williamsburg Bridge.

Greenpoint Avenue Bridge over Newtown Creek (Brooklyn/Queens)

Due to heat expansion, the bridge was closed to marine traffic beginning at 2:25 PM on July 5, 2012. It was returned to service at 10:55 PM.

Chelsea Road Bridge over Sawmill Creek (Staten Island)

Cleaning and painting of the bridge, which began on June 25, 2012, was completed on July 6, 2012.

Cohancy Street Bridge over Belt Parkway (Queens)

Cleaning and painting of the bridge, which began on June 12, 2012, was completed on July 10, 2012.

Brooklyn Bridge and Adams Street Ironworker Facility

On July 10, 2012, the Agency's summer interns visited the Brooklyn Bridge and the Adams Street Ironworker Facility. Divisional responsibilities and capabilities were discussed and questions were answered.



Supervisor Bridge Repairer and Riveter John Jones at the Adams Street Facility. Division Staff Answering Interns' Questions About the Bridge: Oiler Stanley Karolewicz, Deputy Chief Engineer Russell Holcomb, Administrative Engineer Sunil Desai. Deputy Chief Engineer Russell Holcomb, Supervisor Carpenter Joseph Vaccaro, Administrative Engineer Sunil Desai, and Assistant Civil Engineer Clara Medina. (Credit: Jingqin Gao) Interns on the Brooklyn Bridge. (Credit: Russell Holcomb) Summer College Interns Kevin Hillery and Nikita Gupta With Their Supervisor, Assistant Mechanical Engineer Vera Ovetskaya.

First Deputy Mayor Donald D. Kummerfeld Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on July 11, 2012, in tribute to former First Deputy Mayor Donald D. Kummerfeld, 78, who died on July 5. He served as the City's Budget Director beginning in January 1976, when the City was on the edge of bankruptcy. Mr. Kummerfeld enforced budget cuts and extended financial planning years into the future. He was promoted to First Deputy Mayor in April 1977, serving in that position until

January 1978, when he was appointed by Governor Hugh Carey to be executive director of the New York State Emergency Financial Control Board. The flags were raised on July 12, 2012.



Donald D. Kummerfeld.

Belt Parkway Bridge over Mill Basin (Brooklyn)

Due to heat expansion, the Mill Basin Bridge was closed to marine traffic beginning at 1:20 PM on July 12, 2012. It was returned to service at 11:15 PM.

Belt Parkway Bridge over Mill Basin (Brooklyn), and Hutchinson River Parkway over Hutchinson River (Bronx)

Due to heat expansion, the Mill Basin Bridge was closed to marine traffic beginning at 1:20 PM on July 17, 2012. It was returned to service at 3:00 AM on July 18. The Hutchinson River Parkway Bridge was closed to marine traffic beginning at 6:35 PM on July 17, and was returned to service at 3:30 AM on July 18.

9th Street Bridge over Gowanus Canal (Brooklyn)

Due to heat expansion, the 9th Street Bridge was closed to marine traffic beginning at 2:37 PM on July 18, 2012. It was returned to service at 7:00 PM. On July 18, a record high temperature of 101 degrees was set at La Guardia Airport, and a record 96 degrees at JFK Airport.

Union Street Bridge over Brooklyn-Queens Expressway (Brooklyn), Brooklyn-Queens Expressway over Adams Street (NB) (Brooklyn), Brooklyn-Queens Expressway over Adams Street (SB) (Brooklyn), 4th Avenue Bridge over Belt Parkway (Brooklyn), Belt Parkway Bridge over Bedford Avenue (Brooklyn), Carroll Street Bridge over Gowanus Canal (Brooklyn), Crown Street Bridge over Franklin Shuttle (Brooklyn), Bedford Avenue Bridge over LIRR Bay Ridge (Brooklyn), Hill Drive Bridge (Cleft Ridge Span) over Pedestrian Path South of Boathouse (Brooklyn), and 5th Avenue Bridge over Greenwood Cemetery (Brooklyn)

A Notice to Proceed for the component rehabilitation of these bridges was issued to the contractor with a start date of July 23, 2012.



Union Street Bridge over Brooklyn-Queens Expressway, Brooklyn-Queens Expressway over Adams Street (NB), Brooklyn-Queens Expressway over Adams Street (SB), 4th Avenue Bridge over Belt Parkway, Belt Parkway Bridge over Bedford Avenue, Carroll Street Bridge over Gowanus Canal, Crown Street Bridge over Franklin Shuttle, and Bedford Avenue Bridge over LIRR Bay Ridge. (Credit: NYSDOT) Hill Drive Bridge (Cleft Ridge Span) over Pedestrian Path South of Boathouse. 5th Avenue Bridge over Greenwood Cemetery. (Credit: NYSDOT)

Brooklyn Bridge

On July 24, 2012, at approximately 5PM, an over-height truck traveling east in the left lane of the Brooklyn-Queens Expressway struck the Brooklyn Bridge. The truck overturned, blocking all three eastbound lanes. An engineer evaluated the condition and did not detect any significant new damage to the bridge. Traffic was restored at approximately 7:30 PM.



Preparing to Remove the Damaged Truck. (Credit: Rafael Lopez) Overturned Truck. (Credit: Russell Holcomb)

Shore Road Circle Bridge over Amtrak (Bronx)

The Stage 2 concrete deck placement was completed on July 25, 2012. The first truck load of concrete was poured at approximately 6:45 AM, and the 14th and final load was completed at approximately 10:00 AM.



Following Behind the Finishing Machine Along the Deck, the Concrete was Textured and Wet-Burlaped Within the Prescribed Time Limits. Texturing was Performed in the Longitudinal Direction. Continuous Wet Curing was Set up With Hoses Over the Burlap.

Travis Avenue Bridge over Main Creek (Staten Island)

Cleaning and painting of the bridge, which began on July 1, 2012, was completed on July 31, 2012.

AUGUST

New Dorp Lane Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on July 27, 2011, was completed on August 1, 2012.

Whitelaw Pedestrian Bridge over Conduit Avenue (Queens)

Cleaning and painting of the bridge, which began on May 25, 2012, was completed on August 3, 2012.

Summer Streets

As part of the fifth annual Summer Streets program in August 2012, Division crews closed the Centre Street exit ramp from the Brooklyn Bridge on August 4, 11, and 18 from 7:00 AM until 1:00 PM.



Cyclists Enjoying the Park Avenue Viaduct on August 4 During the Summer Streets Event.

Harper Street Asphalt Plant (Queens)

On August 4, 2012, Division ironworkers repaired the recycle bin, hot tower door plate, and dry mixer drum.

Riverside Drive Bridge over West 96th Street (Manhattan)

Cleaning and painting of the bridge, which began on June 25, 2012, was completed on August 6, 2012.

Slater Boulevard Bridge over New Creek (Staten Island)

Cleaning and painting of the bridge, which began on July 23, 2012, was completed on August 6, 2012.

Manhattan Bridge

"(Super)heroes," an art installation curated by United Photo Industries' Creative Director Sam Barzilay in partnership with the DUMBO Business Improvement District, was officially unveiled on the fence at Adams Street, Plymouth Street, and Anchorage Place – the Manhattan Bridge Anchorage, on August 9, 2012. The exhibit explores the unsung heroes all around us, the innate desire of humanity to believe in powers greater than ourselves, and upending gender roles or stereotypes. With a total of nine artists, the photographs cover 340 feet of the fence. The 11 month installation is part of the Agency's Urban Art Program.



The "(Super)heroes" Exhibit at the Manhattan Bridge.

North Conduit Avenue Bridge Westbound over Belt Parkway Westbound and North Conduit Avenue Bridge Westbound over Belt Parkway Eastbound (Queens)

Cleaning and painting of these bridges, which began on July 24, 2012, was completed on August 9, 2012.

Belt Parkway Bridge over Mill Basin (Brooklyn)

Due to heat expansion, the bridge was closed to marine traffic beginning at 1:05 PM on August 9, 2012. It was returned to service at 8:15 PM.

United Nations Plaza (East 42nd Street – East 47th Street) over First Avenue Tunnel (Manhattan)

The component rehabilitation of this tunnel was substantially completed on August 10, 2012.



Repairing the Railing in April 2012.

Harper Street Asphalt Plant (Queens)

On August 11, 2012, Division ironworkers repaired the hot tower, docking area, and boundary fence.

Hamilton Avenue Asphalt Plant (Brooklyn) and Harper Street Asphalt Plant (Queens)

On August 14, 15, and 17, 2012, Division ironworkers repaired the drum and frames.

Linden Boulevard Bridge over Conduit Avenue (Queens)

Cleaning and painting of the bridge, which began on August 6, 2012, was completed on August 20, 2012.

Hamilton Avenue Asphalt Plant (Brooklyn) and Harper Street Asphalt Plant (Queens)

On August 25, 2012, Division ironworkers repaired the chutes and the mixing and drying drums.

Guy Brewer Boulevard Bridge over Belt Parkway (Queens)

Cleaning and painting of the bridge, which began on June 25, 2012, was completed on August 31, 2012.

Belt Parkway Bridge over Paerdegat Basin (Brooklyn)

Tub girder erection for the new westbound bridge began in August 2012.



Paerdegat Basin- Eastbound Belt Parkway Traffic on New Eastbound Bridge Shown at Left. Westbound Belt Parkway Traffic on Old Paerdegat Basin Bridge at Center. Tub Girder Erection in Progress at Right Side by Crane on a Temporary Work Platform at Future Westbound Bridge.

SEPTEMBER

Grand Concourse over East 174th Street (Bronx)

Cleaning and painting of the bridge, which began on June 13, 2012, was completed on September 7, 2012.

Hamilton Avenue Asphalt Plant (Brooklyn)

On September 8, 2012, Division ironworkers repaired the mixing drum and its housing.

Patriot Day Tribute

The Brooklyn Bridge flags flew at half-mast on September 11, 2012 to commemorate the National Day of Service and Remembrance.



Brooklyn Bridge Flag at Half-Mast at Dusk. (Credit: Michele N. Vulcan)

Ambassador John Christopher Stevens and Benghazi Mission Personnel Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on September 13, 2012, in tribute to United States Ambassador to Libya John Christopher Stevens, Sean Smith, Glen Doherty, and Tyrone Woods, who were killed on September 11, 2012, in the attack on the United States diplomatic facility in Benghazi, Libya. Ambassador Stevens, 52, was the sixth U.S. ambassador to be killed in the line of duty, and the first since 1979. Sean Smith, 34, was a Foreign Service information management officer, had served in the State Department for 10 years, and was an Air Force veteran. Glen A. Doherty, 42, and Tyrone S. Woods, 41, former Navy SEALs, worked for a private company that provided security for American officials overseas. Mr. Doherty was an experienced pilot and paramedic. Mr. Woods was also a registered nurse and certified paramedic. The flags were raised on September 17, 2012.

Harper Street Asphalt Plant (Queens)

On September 15, 2012, Division ironworkers repaired the bins and dry mixer.

Ross Avenue Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on June 11, 2012, was completed on September 15, 2012.

Rose Avenue Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on July 27, 2012, was completed on September 15, 2012.

15th Avenue Bridge over LIRR Bay Ridge (Brooklyn)

The component rehabilitation of this bridge was substantially completed on September 17, 2012.



15th Avenue Bridge - Vertical Patch Repair on the Abutment Wall. Joint Repair Work.

Brooklyn-Queens Expressway (Eastbound and Westbound) over Cadman Plaza (Brooklyn)

Cleaning and painting of the bridge, which began on August 10, 2012, was completed on September 19, 2012.

Linden Boulevard Bridge over Cross Island Parkway (Queens)

Cleaning and painting of the bridge, which began on September 3, 2012, was completed on September 19, 2012.

Belt Parkway Bridge over Mill Basin (Brooklyn)

High water temperatures in the region around New York appeared to be the result of an unusually warm winter that preceded the mild spring and summer months. A stingray with a wingspan of approximately 2.5 to 3 feet was spotted under the bridge on September 21, 2012.



Stingray in Mill Basin.
(Credit: Samuel Teaw)

Ed Koch Queensboro Bridge

On September 21, 2012, Division highway repairers assisted a film crew from the television series “Blue Bloods” at the Vernon Boulevard Yard.

Harper Street Asphalt Plant (Queens)

On September 22, 2012, Division ironworkers repaired the mixer drum, brace ladder, and conveyor belt.

East Drive (East Wood Arch) over Pedestrian Path Near Center Drive (Brooklyn)

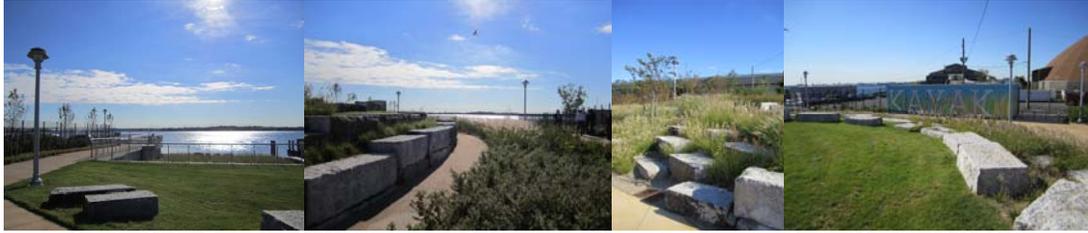
The component rehabilitation of this bridge was substantially completed on September 24, 2012.



East Wood Arch. Pointing the Masonry. Cleaning the Stone Fascia.

Hunts Point Landing Park (Bronx)

This 1.5 acre park, located at the confluence of the Bronx and East Rivers, is a component of the South Bronx Greenway Master Plan. It opened on September 24, 2012. The New York City Economic Development Corporation utilized large granite slabs from the old Willis Avenue Bridge to construct the boulder seating area and a grass retaining wall. One of the stones was engraved to identify it as a reused local material.



Granite Slabs From the Old Willis Avenue Bridge in the Hunts Point Landing Park. (Credit: NYCEDC)

Eliot Avenue Bridge over Queens Boulevard (Queens)

Cleaning and painting of the bridge, which began on August 23, 2012, was completed on September 27, 2012.

Woodhaven Boulevard Bridge over Queens Boulevard (Queens)

Cleaning and painting of the bridge, which began on August 21, 2012, was completed on September 27, 2012.

Williamsburg Bridge

On September 30, 2012, Division electricians assisted a film crew from “Chinese Puzzle” at the Williamsburg Bridge.

Battery Park Underpass of the FDR Drive (Manhattan)

Cleaning and painting of the motor and control rooms, which began in January 2012 and continued intermittently, was completed in September 2012.

Department of Transportation Facilities at the Greenpoint Avenue Yard (Brooklyn/Queens)

Cleaning and painting of these structures, which began in February 2012 and continued intermittently, was completed in September 2012.

Belt Parkway Bridge over Paerdegat Basin (Brooklyn)

Tub girder erection for the new westbound bridge was completed in September 2012.



Setting the Last Tub Girder Section for the Westbound Bridge at the East Abutment.

OCTOBER

West 128th Street Pedestrian Bridge over 3rd Avenue Bridge Approach (Manhattan)

Cleaning and painting of the bridge, which began on September 12, 2012, was completed on October 4, 2012.

Harper Street Asphalt Plant (Queens)

On October 6 and 13, 2012, Division ironworkers repaired the mixer drum and rap hopper.

Braddock Avenue Bridge over Cross Island Parkway (Queens)

Cleaning and painting of the bridge, which began on September 10, 2012, was completed on October 9, 2012.

American Cancer Society's "Making Strides Against Breast Cancer" Campaign

During September and October 2012, Division personnel and their friends and families participated in bake and book sales and other fundraisers, and sponsored the DOT Teams for the American Cancer Society's annual "Making Strides Against Breast Cancer" walk.



Cupcake Display at the
Fundraiser.
(Credit: Gladys Millan)

Beach Avenue Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on July 21, 2012, was completed on October 19, 2012.

Harper Street Asphalt Plant (Queens)

On October 20, 2012, Division ironworkers repaired the pipe supports, mixer frame, and drum.

Brooklyn Bridge

As part of the contract to rehabilitate the Brooklyn Bridge ramps and approaches, a full closure of the Manhattan-bound lanes of the bridge was performed on two full weekends this month: from 11:59 PM October 5 to 6:00 AM October 8, and again from 11:59 PM October 12 to 6:00 AM October 15. The first weekend closure was for work on Ramp A (from the southbound FDR Drive to the bridge) for concrete placement. Brooklyn-bound approach work and abrasive blasting was also progressed. The second weekend closure was for work on Ramp A (from the southbound FDR Drive to the bridge), South Cantilever closure pour concrete placement, Brooklyn-bound approaches rehabilitation work, painting of Ramp D/Span 4, Franklin Square Structure orthotropic deck welding, Ramp F (from the southbound FDR Drive to Pearl Street) Stage I grid deck removal/replacement, and preparatory work for widening the exit ramp to Cadman Plaza.



First Full Roadway Closure: Manhattan Approach, Ramp A Concrete Placement. Engineer-in-Charge Ohene Duodu at the Site. Second Full Roadway Closure: Brooklyn Approach, Brooklyn Bound Roadway Super Slab installation - Installing Super Slab.

Hamilton Avenue Asphalt Plant (Brooklyn)

On October 22, 2012, Division ironworkers performed emergency repairs on the cracked main drum ring.

Park Avenue Viaduct over East 42nd Street (Manhattan)

Cleaning and painting of the bridge, which began on September 20, 2012, was completed on October 22, 2012.

East 129th Street Pedestrian Bridge over 3rd Avenue Bridge Ramp (Manhattan)

Cleaning and painting of the bridge, which began on September 12, 2012, was completed on October 29, 2012.

Hurricane Sandy

On October 29, 2012, the New York Metropolitan area was impacted by Hurricane Sandy (Post-Tropical Cyclone Sandy), causing flooding, loss of power and damage to many components of New York City's infrastructure. Division employees ensured the safety of City residents and infrastructure.

East River Bridge Openings

All four East River Bridges were inspected early in the morning of October 30 as the storm began winding down. They were deemed safe and re-opened by 10:15 AM. These were the first bridges in New York City to re-open. Manhattan Bridge Engineer-in-Charge Brian Gill also coordinated all efforts with the Division of Traffic to route MTA buses unable to use the Brooklyn Battery - Hugh Carey Tunnel. The "Bus Bridge" was operational one day after the storm and the maintenance and protection of traffic plan for the Manhattan Bridge was modified on short notice, which allowed buses on November 1 and 2 onto the lower roadway to accommodate the 250 buses per hour running when there was no transit service between Brooklyn and Manhattan. Over 400 pedestrians an hour crossed the south walkway, and 10,000 bicyclists used the north path.



HOV Variable Message Sign at Tillary Street in Brooklyn. Busses Entering on Manhattan Side Near the Colonnade. (Credit: Brian Gill) Director of Bicycle and Pedestrian Programs Joshua Benson and Manhattan Bridge Engineer-in-Charge Brian Gill Preparing to Set up Traffic Barrels for the Bus Bridge.



Pedestrians on the Manhattan Bridge South Walkway. Bicyclists on the North Path. (Credit: Brian Gill) November 3 - Special Temporary Shuttle Buses Carried Subway Customers Across the East River While Train Service was Being Restored. All Six of the MTA's Subway Tunnels Connecting Brooklyn and Manhattan, as Well as the G Train's Tunnel under Newtown Creek, Flooded with Seawater During Hurricane Sandy. (Credit: Metropolitan Transportation Authority/Patrick Cashin)

Battery Park Underpass/West Street Underpass

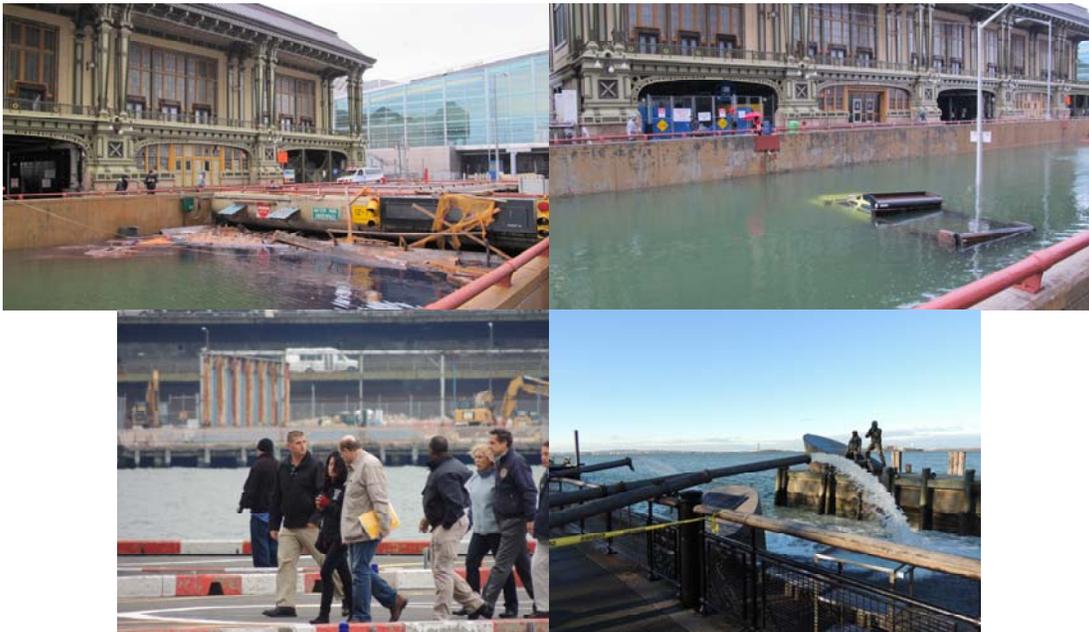
Hurricane Sandy arrived in the metropolitan region in time to catch both the full moon and lower Manhattan's high tide. The storm surge overwhelmed the Battery and roared into both the Battery Park Underpass and the West Street Underpass (which serves as the Brooklyn Battery - Hugh Carey Tunnel entrance). Pre-storm efforts included barricading the tunnels to prevent motorists' attempts to ford the flow which prevented injury and potential loss of life to an unwary public. When Con Edison announced the possibility of cutting electrical service to lower Manhattan, generators were brought to the site to power the sump pumps. The 8 to 13 foot storm surge overwhelmed the Battery and roared into both the Battery Park and West Street Underpasses. After the storm, Division staff coordinated the effort to remove 10 to 15 million gallons of seawater from the tunnels with the assistance of the Department of Environmental Protection (West Street Underpass) and the Army Corps of Engineers (Battery Park Underpass). Crews worked around the clock for over a week to de-water the tunnels, remove storm debris, pressure wash tunnel walls and perform initial inspections of the tunnels' electrical, ventilation and lighting operating systems. Initial estimates peg the cost of the tunnels' rehabilitation at 40 million dollars.

Division supervisory personnel for this effort included: Deputy Chief Engineer Russell Holcomb, Executive Director of Bridge Preventive Maintenance and Repair Thomas Whitehouse, Administrative Superintendent of Bridge Operations George Kern, and Acting Director of Bridge Preventive Maintenance Paul Schwartz. Together they led an effort of more than three dozen that included: Bridge Painters Safdar Ali, Jamie Andrade, and Juscelino Andrade, Supervisor Bridge Painter Robert Avellino, Bridge Painters Henry Bollin and William Budge, Supervisor Bridge Operator Keith Burrowes, Bridge Operator Daniel Casale, Supervisor Bridge Operator Robert Costanza, Bridge Operator Abel Daley, Bridge Painter Frank Duic, Supervisor Bridge Painters Hughie Flood, and Reynaldo Grant, Bridge Painter Branko Grzancic, Bridge Operator Michael Guergues, Bridge Painter Frank Hollen, Supervisor Bridge Operator Anthony Hunter, Bridge Painters Brian Kavanagh, Nicholas Krevatas, Andrew Law, Arlindo Lima, and Goncalo Lima, Supervisor Electrician Ronald Marano, Bridge Painters Samuel Martinez, Louis Masucci, and Richard Mocciano, Supervisor Bridge Operators Edgardo Montanez and Antonio Morales,

CHRONOLOGY

Bridge Painter Russell Newbe, Supervisor Bridge Painters Albert Pappas and Cesar Pazmino, Bridge Painter Julio Perez, Deputy Director of In-House Painting Earlene Powell, Electrician Steven Radice, Bridge Painter Milan Radovic, Director of In-House Painting Ronald Rauch, Bridge Painters Teodoro Rendall and Herbert Rodriguez, Electrician Jerry Salzman, Bridge Painter Michael Scotti, Bridge Operator Anthony Small, Bridge Painter Willie Taylor, Supervisor Bridge Operator Mohamed Adel Tork, Supervisor Bridge Painter David Yanolatos, and Bridge Painter Vlatko Zic.

Not long after the tunnels were drained, the metropolitan region braced for a second storm. On November 7, 2012, a snow laden nor'easter hit the city and although it did not hit, as Sandy did, in perfect concert with time, tide and the moon, the surge was still expected to reach more than 7 feet at the Battery. In anticipation of this impact, Division crews were dispatched to the facility at Harper Street to fill sandbags. With the help of a 5-person crew from the Sidewalk and Inspection Management Division, the sandbags were then brought to the underpass to hold off the second surge in less than ten days. Just 12 hours after the operation began, the tunnel was closed 35 minutes ahead of schedule with one thousand sandbags by the crew of: Assistant City Highway Repairer Luis Baez, Bridge Repairer and Riveter Brook Budd, Assistant City Highway Repairer Luciano Cardona, Bridge Repairer and Riveter Kevin Clarkson, Highway Repairers Michael Cunningham, Joseph Davis, and Roosevelt Gee Jr., Supervisor Highway Repairer Anthony Irizarry, Assistant City Highway Repairer Daniel Jean, Supervisor Highway Repairer Luis Soto, and Assistant City Highway Repairer Peter Valentino.



Entrance of the Battery Park Underpass on October 30. A Division Truck Used to Barricade the Entrance is Barely Visible. (Credit: George Kern) Governor Andrew Cuomo (2nd from Right) Arriving on October 30 to Inspect the Damage. Pumping Water from the Underpass on November 2.



Bridge Operations Crew: Bridge Operator Daniel Casale, Supervisor Bridge Operators Anthony Hunter and Mohamed Adel Tork, Administrative Superintendent of Bridge Operations George Kern, Supervisor Bridge Operators Anthony Small and Robert Costanza, Bridge Operator Michael Guergues, Supervisor Bridge Operator Keith Burrowes, Bridge Operators Abel Daley and Carlo Fragola, and Supervisor Bridge Operator Antonio Morales. (Credit: Edgardo Montanez)
Administrative Superintendent of Bridge Operations George Kern inspecting the Battery Park Underpass on November 9. (Credit: Alexander Engel)



Bridge Painters Cleaning the Battery Park Underpass. (Credit: Alexander Engel) Sandbags Used for the November 7 Storm.

Metropolitan Avenue Movable Bridge

Hurricane Sandy surged water levels in the English Kills by over six feet, flooding into the counterweight pits of the bridge control house. Flood waters damaged the electrical control system, burning out the transformer and power supply. Approximately 25,000 cubic feet (187,000 gallons) of water flowed into both bridge pits. On the morning of October 31, oilers and electricians began the recovery effort with portable pumps, pumping continuously for four straight days. The Department of Environmental Protection augmented the pumping effort with larger pumps and the bridge pits were finally drained dry on November 3. On November 4, a crew of ten oilers began a manual operation process which took five straight hours of hard labor but permitted a fuel oil barge to enter its port. In its usual glass-is-half-full outlook, Division maintenance personnel used this opportunity to perform a test of the emergency hydraulic system to open and close the bridge. Further access for fuel was also undertaken on November 6 when the opening time was reduced to 1.5 hours as the hydraulic system was returned to service.

Truck Permits

Over dimensional truck permits enable the movement of construction equipment and important goods into and through the city on travel routes that protect the city's bridge infrastructure and in turn the city as a whole. The Division of Bridges' Truck Permit Section process over 37,000 permit applications every year. Director Kevin Lobat, a Staten Islander whose own home was without electricity, set up shop in his car, (the only place with heat and power) with a laptop running on a car charger and e-mails flowing via a Blackberry. He continued processing permit applications for essential truck permits to facilitate storm clean up, the delivery of essential clean-up equipment and the arrival of goods necessary to the immediate and long term recovery of the City. He was not alone in this effort. Members of the team, led by Executive Director of Management and Support Services Dorothy Roses and including Administrative Manager David Paul Gerber and Civil Engineer Farid Tadros were available up to 20 hours a day to assist in the routing. The entire group, including Administrative Manager Diana Neal, Clerical Associate

George Liang, Computer Aide Lisa Burns, Community Assistant Gladys Millan, Clerical Associate Tiffany Utle, Assistant Civil Engineers Darlyn Alvarez and Jafar Haider, Civil Engineering Intern Monica Palacio Rodriguez, Project Manager Ajda Ozyurt, and Associate Project Manager Maria Zhurakhinskaya, were required to move from location to location, some without heat and communication, working without one of their most important tools – mapping software. They were a vital part of the effort that is keeping the construction industry moving.

Belt Parkway

Three important bridges on the Belt (Shore) Parkway are currently under reconstruction: Fresh Creek Bridge, Rockaway Parkway Bridge and Paerdegat Basin Bridge. Situated along the picturesque south shore of Brooklyn and adjacent to the Gateway National Park, this lovely but low-lying area's propensity for flooding is well known. Keeping the roadway dry, safe and open is always a priority; during storm events it is critical. As soon as the storm began, Administrative Engineer Daniel Hom went to the field office and began coordinating the effort to keep the pumps running and keep the road open. Both during and after the storm, this effort also included coordinating the removal of the tons of debris that washed onto the walkways and roadway.

Sheridan Expressway Through-Hole

On the evening of November 7, at the height of the nor'easter, an expansion joint in the roadway of the northbound Sheridan Expressway near the Westchester Expressway failed, creating a through-hole 4 feet long by 1.5 feet wide. A crew of nine worked with very limited light amidst gale winds of 30-35 miles per hour, with stinging snow blowing sideways into the operation, and at temperatures between 28 and 30 degrees. In a four and a half hour effort, they set and pegged a steel plate across the center lane of the roadway and cold-patched the area for a functional riding surface. Two crews responded to this emergency led by Supervisor Bridge Repairer and Riveters Damian Venezia and Gean Pilipiak with Bridge Repairer and Riveters Michael Collins, Neil Dalton, Daniel Jederlinic, Michael Ledson, John McAllister, and John Mohabir. Assistant Civil Engineer Sohrab Hossain provided engineering direction.

On November 7 through 9, 2012, Division carpenters provided assistance to the Office of Emergency Management (OEM) with storm damage emergency repairs at George Washington High School in Washington Heights. In addition, Division ironworkers assisted OEM in unloading heavy equipment at the Citifield staging area in Queens.



Payloader Cleaning up Debris From Hurricane Sandy on the Eastbound Belt Parkway East of Mill Basin. Private Boat Washed up on Slope of Eastbound Belt Parkway West Side of Paerdegat Basin During Hurricane Sandy. Note Damage to Bicycle/Pedestrian Path and Timber Rail. Motor Grader Operator Peter Paramithis Operating Machinery to Clear Streets in the Oakwood Beach Neighborhood of Staten Island on November 6. (Credit: Stephen Mallon)

Department of Transportation Ironworker Shop and Garage at 59th Street (Manhattan)

Cleaning and painting of these structures, which began in January 2012 and continued intermittently, was completed in October 2012.

NOVEMBER

Award

In November 2012, Roads & Bridges Magazine selected the replacement of the Willis Avenue Bridge as the fifth place finisher in its annual selection of the country's top 10 bridge projects.

Award

In November 2012, the Municipal Engineers of the City of New York selected the St. George Ferry Terminal Ramps Rehabilitation project as its 2012 Municipal Project of the Year. The Society promotes and advances the various engineering sciences and services which are employed in the government of the City of New York and elevates the standards of proficiency of the technical services of the City.

Newkirk Avenue Bridge over BMT Subway (Brooklyn)

Cleaning and painting of the bridge, which began on October 11, 2012, was completed on November 7, 2012.

Award

On November 8, 2012, Director of Quality Assurance Muhammad Afzal received an Outstanding Achievement Award from the South Asian American Association.



Chief Bridge Officer Henry D. Perahia and Director of Quality Assurance Muhammad Afzal. (Credit: Rudy Collins)

Belt Parkway Bridge over Nostrand Avenue (Brooklyn)

Cleaning and painting of the bridge, which began on September 4, 2012, was completed on November 14, 2012.

Award

On November 16, 2012, Acting Director of Bridge Preventive Maintenance Paul Schwartz was presented the Young Engineer of the Year award from the Municipal Engineers of the City of New York. Mr. Schwartz he is responsible in the summer/seasonal system for routine maintenance including asphalt repairs, mechanical sweeping, scupper (drain) maintenance, grass cutting, guiderails and fencing. In the busy winter season, responsibility shifts to anti-icing and snow removal. He also serves year-round as the Bureau of Maintenance, Inspection and Operations' Environmental Compliance Officer, and supervises a staff of over 100 in a wide variety of labor titles. In the aftermath of Hurricane Sandy, Mr. Schwartz joined his staff in every Bridge Division effort including the de-watering of the Battery Park and West Street underpass. He also bagged sand with them in the second wave nor'easter on the night of November 7.



Chief Bridge Officer Henry D. Perahia and
Acting Director of Bridge Preventive
Maintenance Paul Schwartz.

Belt Parkway over Rockaway Parkway (Brooklyn)

The demolition of the final structural steel sections of the existing bridge was completed on November 2, 2012.

Hurricane Sandy Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on November 6, 2012 as a mark of respect for the memory of those who lost their lives due to Hurricane Sandy. The flags were raised on November 9, 2012.

Anti-Icing

On November 7, 2012, a record 4.3 inches of snow fell in Central Park, a record 1.1 inches fell at La Guardia Airport, and a record 4 inches fell at JFK Airport. Anti-icing crews were deployed on the East River bridges from 6:00 PM on November 7 until 5:30 AM on November 8. 4,300 gallons of liquid anti-icer and 28 tons of solid de-icer were applied. Crews also cleared priority overpasses.

Belt Parkway Bridge over Mill Basin (Brooklyn)

The bridge was closed to marine traffic due to loss of power from November 1 to November 8, 2012.

Belt Parkway Bridge over Rockaway Parkway (Brooklyn)

The first phase of the eastbound traffic switch from Stage 3 to Stage 4 was successfully implemented on October 18-19, 2012, as scheduled. However, the second phase of the traffic shift at the east end of the project was delayed due to Hurricane Sandy. The contractor completed this traffic shift on November 20, 2012.

Bruckner Expressway SB and NB Bridges over Amtrak & CSX (Bronx)

The design-build reconstruction of these bridges was substantially completed on November 20, 2012.

86th Annual Macy's Thanksgiving Day Parade

Division engineers assisted the NYPD and Macy's representatives in walkthroughs of the new parade route along 6th Avenue. They also reviewed and approved the design specifications of Papa Smurf, Hello Kitty, and Elf on a Shelf, three new large balloons to be introduced in the parade. A balloon is classified as large if it is larger than 5,000 cubic feet. However, the balloons in the parade cannot be taller than 70 feet, wider than 40 feet, or longer than 78 feet. Division representatives attended the test flights of the balloons at the Meadowlands Sports Complex in New Jersey on November 10, 2012, with NYPD and other agencies.

On November 22, 2012, wind speeds were relatively low and all 16 large balloons flew in the parade without incident. The maximum wind speed was approximately 12 miles per hour. Chief Bridge Officer Henry Perahia, Deputy Chief Engineer Anil Vyas, and Director of Engineering Review Udaya Dommaraju were positioned at various locations along the parade route to

observe compliance with the approved procedures. Seven anemometers were mounted on top of light poles along the route between 77th Street and 34th Street to measure the wind speed during the parade. Division and consultant engineers were assigned to the anemometer locations to monitor the wind gusts.



Testing the Balloons (Elf on a Shelf) in New Jersey on November 10: NYPD Lieutenant Franco Barberio of Emergency Services, Director of Engineering Review Udaya Dommaraju, NYPD Deputy Inspector Daniel J. Mulligan, and Vice President of Event Operations at Macy's Susan Babb. Spiderman and Elf on Shelf Balloons. (Credit: George Jarvis)



Parade 2012: Consultant Engineer Patrick D'Ambrosio and Planner Patrick Roth, Director of Engineering Review Udaya Dommaraju, First Deputy Commissioner Lori Ardito, Deputy Chief Engineer Anil Vyas, Chief Bridge Officer Henry D. Perahia, Construction Project Manager George Jarvis, and Assistant Civil Engineers Jana Krettova and Jafar Haider.

Department of Transportation Facility at Wythe Avenue (Brooklyn)

Cleaning and painting of this structure, which began in January 2012 and continued intermittently, was completed in November 2012.

DECEMBER

Harper Street Asphalt Plant (Queens)

On December 1, 8, and 15, 2012, Division ironworkers repaired the dryer drum and cold-feed bins.

Foster Avenue Bridge over BMT Subway (Brooklyn)

Cleaning and painting of the bridge, which began on November 16, 2012, was completed on December 6, 2012.

27th Avenue Pedestrian Bridge over Belt Parkway (Brooklyn)

Cleaning and painting of the bridge, which began on November 19, 2012, was completed on December 6, 2012.

National Pearl Harbor Remembrance Day

The Brooklyn Bridge flags flew at half-mast on December 7, 2012 to commemorate National Pearl Harbor Remembrance Day, in honor of those who died as a result of their service at Pearl Harbor and to pay special tribute to veterans of World War II.

Newtown, Connecticut Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on December 14, 2012 as a mark of respect for the victims of the shooting violence that occurred that morning at the Sandy Hook Elementary School in Newtown, Connecticut. The flags were raised on December 19, 2012.

Hurricane/ Post-Tropical Cyclone Sandy Recovery and Overdimensional Trucks

Under Governor Andrew Cuomo's waiver, the Division's Truck Permit Section processed and issued more than 195 Overdimensional Permit Waivers to transport various qualifying vehicle/load combinations throughout the five boroughs (loads included excavators, loaders and other construction equipment, mobile home/office/and medical trailers, boats and cranes) directly related to the storm recovery effort from November 1 through the middle of December.

Springfield Boulevard Bridge over Belt Parkway (Queens)

Cleaning and painting of the bridge, which began on September 10, 2012, was completed on December 19, 2012.

Belt Parkway over Paerdegat Basin (Brooklyn)

The new westbound bridge was opened to traffic at 4:40 AM on December 20, 2012. Final demolition of the existing bridge then commenced.

Superior Road Bridge over Cross Island Parkway (Queens)

Cleaning and painting of the bridge, which began on December 7, 2012, was completed on December 20, 2012.

Anti-Icing

On December 26, 2012, 0.4 inches of snow fell in Central Park, and 0.3 inches at La Guardia Airport. On December 29, 2012, 0.3 inches of snow fell at La Guardia Airport, and 0.4 at JFK Airport. Anti-icing crews were deployed on the East River bridges from 1:00 PM until 6:30 PM on December 26; no applications of chemicals were necessary. Crews were again deployed from 6:00 AM on December 29 until 12:30 AM on December 30. 400 gallons of liquid anti-icer and 11 tons of solid de-icer were applied.

Harper Street Asphalt Plant (Queens)

On December 29, 2012, Division ironworkers repaired the cold-feed bins.

Department of Transportation Facilities at the Harper Street Yard (Queens)

Cleaning and painting of these structures, which began in November 2012, was completed in December 2012.

Department of Transportation Ironworker and Carpenter Shops at Kent Avenue (Brooklyn)

Cleaning and painting of these structures, which began in February 2012 and continued intermittently, was completed in December 2012.

Department of Transportation Facilities at South 6th Street (Brooklyn)

Cleaning and painting of these structures began and was completed in December 2012.

Paul Schwartz, Kevin Lobat, George Kern, Ronald Marano, and Samuel Teaw

Acting Director of Bridge Preventive Maintenance Paul Schwartz, Truck Permit Unit and Special Projects Director Kevin Lobat, Director of Bridge Operations George Kern, Supervisor Electrician Ronald Marano, and Administrative Engineer Samuel Teaw were among the subjects of the “Staff Spotlight: DOT’s Hurricane Heroes” feature in the December 2012 edition of “Byways,” the official Agency newsletter.

ACCOMPLISHMENTS & PLANNED PROJECTS

Bridge Capital Design & Construction

East River Bridges

Movable Bridges

Roadway Bridges

Brooklyn and Manhattan Roadway Bridges

Bronx, Queens, and Staten Island Roadway Bridges

Specialty Engineering & Construction

Design-Build/Emergency Contracts

Component Rehabilitation

When and Where

Bridge Painting

Engineering Review & Support

In-House Design

Engineering Support

Engineering Review

Quality Assurance

Bridge Maintenance, Inspections & Operations

ACCOMPLISHMENTS & PLANNED PROJECTS

East River Bridges

BROOKLYN BRIDGE

Arguably the most influential bridge in American history, the Brooklyn Bridge remains one of New York City's most celebrated architectural wonders. Designed by the brilliant engineer John Augustus Roebling, and completed by his equally ingenious son Washington Roebling and daughter-in-law Emily Roebling, this elegant structure was, at the time of its completion in 1883, the longest suspension bridge in the world. It was declared a National Historic Landmark in 1967.



Brooklyn Bridge. (Credit: Bojidar Yanev)

The Brooklyn Bridge carries some 105,820 vehicles and 2,661 commuter bicyclists daily. The \$832 million reconstruction commenced in 1980 with Contract #1, and continues with Contract #6, scheduled for completion in 2014. This contract includes the rehabilitation of both approaches and ramps, the painting of the entire bridge, as well as the seismic retrofitting of the structural elements that are within the Contract #6 project limits.

Work completed on the bridge to date includes reconditioning of the main cables, replacement of the suspenders and cable stays, rehabilitation of the stiffening trusses, and the replacement of the suspended spans deck and the four travelers.

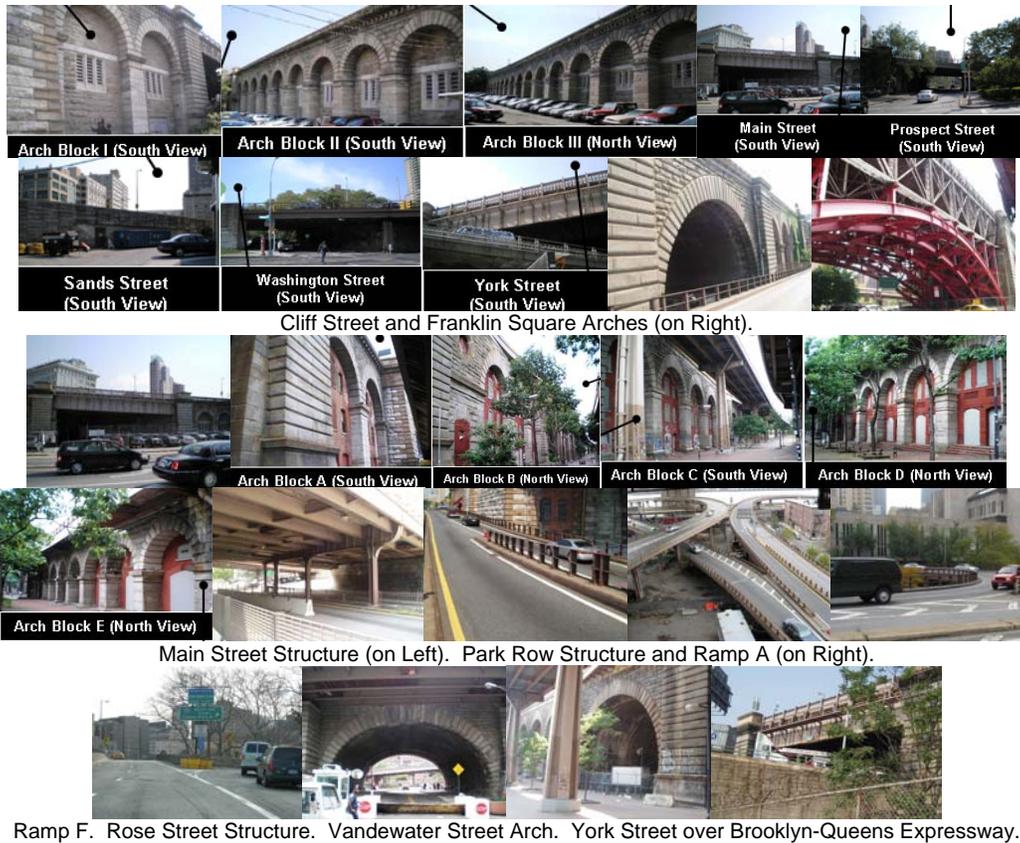
Contract #6

A Notice to Proceed for this \$508 million project was issued to the contractor with a start date of January 19, 2010. The ramps and approaches to the Brooklyn Bridge are in need of rehabilitation and repair, to improve safety and reduce congestion along both the Brooklyn-side and Manhattan-side approaches, particularly from the FDR Drive. With stimulus money from the federal government's American Recovery and Reinvestment Act, the ramps in Brooklyn and Manhattan will be rehabilitated and widened and the entire bridge will be repainted to prevent steel corrosion on the structure.

The approach roadway to the Brooklyn Bridge is aging, with a failed membrane system and deteriorated closure walls. The existing roadway pavement above the historic arch blocks and masonry structures will be rehabilitated. A precast concrete roadway slab will be installed in segments, over sprayed-on waterproofing membrane. Rusted historic railings at Franklin Square, York, and Main Street structures, some from the original bridge construction, will be refurbished and reinstalled. The existing ramp from the FDR southbound roadway will be widened from one to two lanes to reduce bottlenecks and pinch points in traffic flow. All steel structures, including the ramp structures and the main span, will be painted, restoring them to their original Brooklyn Bridge Tan color, as chosen by the Landmarks Preservation Commission.

On all the bridge approach structures on both the Manhattan and Brooklyn sides, the existing deck will be removed by lifting out sections and replacing them panel by panel with precast concrete-filled steel grid deck panels. This approach will greatly reduce noise from drilling and jackhammers, and will also increase the reliability of the start and end times of construction activities every night.

ACCOMPLISHMENTS & PLANNED PROJECTS



Painting work, to prevent steel corrosion and improve aesthetics, will occur in negative-pressure containment units that travel along the bridge structure, high above the traffic. All three travel lanes will be maintained during the course of this work, and painting will take approximately two years. Equipment will be placed underneath the FDR Drive, and on land abutting the Brooklyn tower. Dust collection, vacuum and recycle units will be employed to minimize environmental air quality risks, and there will be continuous air monitoring during operations. All painting work will be conducted in accordance to the US Environmental Protection Act and NYS Department of Environmental Conservation requirements. Noise generated by these units will conform to the NYC Noise Code standards adopted in 2007.

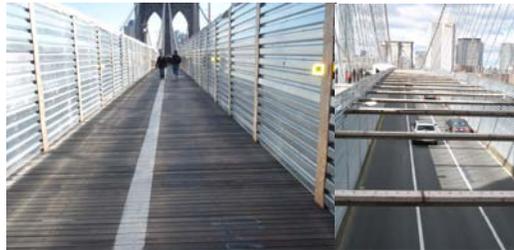
In order to facilitate the reconstruction and associated painting work, the contractor began to mobilize in the area known as the Brooklyn Banks and Red Brick Park, between Pearl Street and Park Row on the north side of the Manhattan approach of the Brooklyn Bridge. The area was closed to the public starting June 2, 2010. The security plan for this area requires that the Red Brick area be completely closed to the public for the duration of this phase of work. Pedestrian access between Pearl Street and the Rose Street/City Hall area is maintained through a walkway adjacent to the banks along Avenue of the Finest.

On the Brooklyn side, two lanes of free-flowing traffic will be created at the Cadman Plaza exit, and approach roadways will be rehabilitated to replace the membrane system and deteriorated closure walls. On the Manhattan side, rusted railings and safety barriers will be replaced, and two lanes of free-flowing traffic will be created from the southbound FDR Drive onto the Brooklyn Bridge.

The contract allows for 24 full weekend closures over the duration of the contract; however, the contract also contains clauses that encourage fewer weekend closures with monetary compensation. Although the promenade will be open, there will be sections immediately under the painting area, which will be narrowed by a foot on each side to facilitate work.

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In 2010, after mobilization, the contractor started work on the ramp foundation; installed protective shielding under the Brooklyn main and Brooklyn side spans, the Franklin Square structure, and some of the Manhattan ramps; installed vertical walls at both sides of the Brooklyn and Manhattan-bound roadways at the Brooklyn main and Brooklyn side spans; began the set-up of the containment for the lead paint removal at all of these locations; and proceeded with blasting and painting activities. Other activities included detailed surveying, installation of super slabs and the fabrication of precast members.



Bicycle/Pedestrian Path with Protective Shielding in November 2010. Roadway Shielding in October 2010.

Lead paint removal operations are conducted in a Class 1A containment unit. Rigid containment walls, HEPA filters, and negative air pressure are used to prevent material release. Ambient air quality readings are conducted during lead paint abatement work. Airborne lead levels are continuously monitored using high-volume total suspended particulate samplers at multiple locations in Brooklyn and Manhattan. Additional in-depth testing for volatile organic compounds were conducted at five locations in the summer of 2011.

In March 2012, airborne particulate samples were collected in accordance with regulatory guidelines, at locations where dust is most likely to be deposited during dust-generating activities. Additional tests were replicated in June 2012 for respirable silica, suspended particulates and asbestos. All results were acceptable according to standards set by the Occupational Safety and Health Administration, the National Institute for Occupational Safety and Health, and the American Conference of Industrial Hygienists.



Noise Reduction Along the Sound Pathway – Acoustical Barriers on the Bridge During Night Construction Activities. Acoustical Curtains Along Frankfort Street. Two Crews Work Along Frankfort Street in April 2012. Cranes (On Left) Lift Material In And Out of Walled Enclosures of Sound Blankets. Inspector Taking Noise Measurements.

In 2011, painting was completed at the Franklin Square structure and is currently in progress at the Manhattan ramps and Brooklyn main and Brooklyn side spans with continuous installation of protective shielding and containment. Painting of the truss top struts was also started, and is currently in progress at the Brooklyn-bound Manhattan side span. The following construction work was started in 2011 and is currently in progress: on the Manhattan approach, activities include Brooklyn-bound roadway removal, waterproofing and super slab installation, Franklin Square floor beam replacement, south cantilever beam excavation and repair, and arch block strengthening. On the Manhattan ramps, work includes bearing replacement, widening, and deck replacement, and fascia removal. Asbestos abatement work is taking place in the Brooklyn maintenance shop. Electrical work is also in progress with activities that include light pole and abandoned equipment removal, temporary lightning installation, and temporary power provisions.

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Other activities include detailed surveying, testing and repairing of dry-standpipe system, fabrication of precast and steel members.



December 2011: Painted Top Struts of the Brooklyn-Bound Manhattan Side Span.
Summer 2011: Manhattan Approach - Ramp C Deck Replacement.
December 2011: Ramp C.

In 2012, work continued on the Manhattan side of the bridge, including deck replacement on ramps and the south cantilever, super-slab installation and arch block strengthening. Painting under the Brooklyn main and side spans was completed, as well as the top struts along the Brooklyn-bound roadway. Painting of the Manhattan main and side spans started in 2012 and will continue through 2013.

In Brooklyn, new shielding was installed under the Prospect and Washington Street structure in anticipation of deck removal. In addition, preparatory work is ongoing for superstructure replacement of the York and Main Street structures.

As part of the contract to rehabilitate the Brooklyn Bridge ramps and approaches, a full closure of the Manhattan-bound lanes of the bridge was performed on two full weekends: from 11:59 PM October 5 to 6:00 AM October 8, and again from 11:59 PM October 12 to 6:00 AM October 15. The first weekend closure was for work on Ramp A (from the southbound FDR Drive to the bridge) for concrete placement. Brooklyn-bound approach work and abrasive blasting was also progressed. The second weekend closure was for work on Ramp A (from the southbound FDR Drive to the bridge), South Cantilever closure pour concrete placement, Brooklyn-bound approaches rehabilitation work, painting of Ramp D/Span 4, Franklin Square Structure orthotropic deck welding, Ramp F (from the southbound FDR Drive to Pearl Street) Stage I grid deck removal/replacement, and preparatory work for widening the exit ramp to Cadman Plaza.



First Full Roadway Closure in October 2012: Manhattan Approach, Ramp A Concrete Placement. Chief Bridge Officer Henry D. Perahia and Deputy Chief Engineer Robert Collyer at the Site. Second Full Roadway Closure: Brooklyn Approach, Brooklyn Bound Roadway Super Slab installation - Installing Super Slab.

Asbestos abatement was completed in the Brooklyn maintenance shop and is in progress in the Manhattan arch blocks.

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To date 321 bearings have been replaced under the Manhattan ramps and the flag repairs on the suspended spans are in progress.



April 2012: Overview. (Credit: Maria Mikolajczyk) Manhattan Approach, Ramp A Existing Deck Demolition.
June 2012: Brooklyn Side Span Netting Protection for Main Cable and Suspender Rope Painting.



June 2012: Platform Removal at Ramp D. Granite Removal at Main Street Structure. Structural Steel and Flag Repairs.



June 2012: Night Shift - Brooklyn Bound Brooklyn Tower Top Struts Primer-Intermediate Coat in Progress. Super Slab Installation on the Brooklyn Approach Brooklyn-Bound Lanes. Temporary Supports at the Park Row West Abutment. Duct Hose Platform Over Esplanade.



July 2012: Painting Brooklyn-Bound Top Struts. Manhattan Side Span Blasting in Progress. Platform Installation at Ramp E. August 2012: Manhattan Main Span Vertical Wall.



August 2012: Manhattan Side Span Containment at Manhattan Tower. Brooklyn Side Span Protective Shield. Brooklyn Side Span Suspender Ropes Painting.

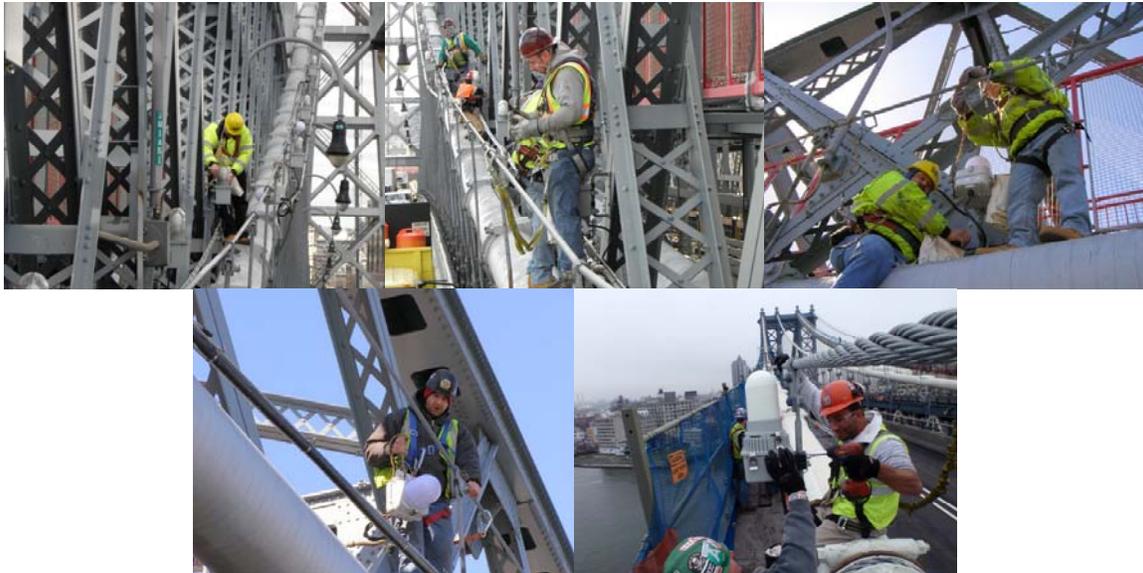
ACCOMPLISHMENTS & PLANNED PROJECTS



December 2012: Brooklyn Main Span in Finish Coat.

NECKLACE LIGHTS

In the fall of 2008, to compare options for energy efficiency, we replaced 20 100-watt mercury vapor lamps of the necklace lights on the Brooklyn and Manhattan Bridges with 10 LED fixtures and 10 induction fixtures. The test was completed in spring 2009; we chose an LED fixture in a dish style and will obtain them for the Ed Koch Queensboro, Williamsburg and Brooklyn Bridges. The test fixtures were removed on April 24, 2009. The replacement of the existing mercury vapor lights on the Williamsburg Bridge was completed in summer 2012. The replacement of the Brooklyn Bridge necklace lights will not be scheduled until the completion of Contract #6. The completion of the replacement of the existing lights on the Ed Koch Queensboro Bridge, and the start of the replacement work on the Manhattan Bridge with the new LED's will occur in the spring of 2013.



Installing New LED Necklace Lights on the Williamsburg Bridge in April 2012: Electrician Thomas Cipriano, Supervisor Bridge Repairer and Riveter Gean Pilipiak (in Front). (Credit: Thomas Whitehouse) May 2012: Electricians Thomas Cipriano and Robert Stackpole on the Williamsburg Bridge. Bridge Repairer and Riveter Neil Dalton. (Credit: Hany Soliman). Installing New LED Necklace Lights Along D Cable on the Manhattan Bridge in May 2012.

MANHATTAN BRIDGE

The youngest of the three NYCDOT suspension bridges that traverse the East River, the Manhattan Bridge carries some 451,701 commuters – 85,392 vehicles, 4,703 bicyclists, and 361,606 mass transit riders - between Manhattan and Brooklyn daily. The bridge's total length is

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5,780 feet long abutment to abutment at the lower level, and 6,090 feet on the upper roadways portal to portal; its main span length is 1,470 feet and each of its four cables is 3,224 feet. It was designed by Leon Moisseiff and first opened in 1909. The bridge supports seven lanes of vehicular traffic, a bikeway and walkway, as well as four transit tracks upon which four different train lines operate.



Manhattan Bridge in July 2009. (Credit: Bernard Ente) Arch and Part of the Colonnades in March 2011. (Credit: Bojidar Yanev)

The \$918.6 million reconstruction program commenced in 1982 with Contract #1, and continues with Contract #14 (currently in progress) to rewrap the cables and replace the suspenders and 166 necklace lights. Completion is expected in summer 2013. Work completed on the bridge to date includes reconstruction of the south and north upper roadways, re-anchoring the north interior main cable, reconstruction of the north and south subway lines, installation of a truss stiffening system to reduce twisting, restoration of the Manhattan Plaza, including the historic arch and colonnades, reconstruction of the south walkway, installation of a new north bikeway, replacement of the lower roadway, and rehabilitation of the Brooklyn Plaza.

Contract #14

Most of the existing suspenders on the Manhattan Bridge were installed under a \$2.2 million contract with Roebling and Sons in 1956 and was one of their last before closing their Bridge Division in 1964. Under Contract #14, the existing main cables are being rehabilitated with new wire wrapping and a neoprene barrier to insulate from weather. In addition, all vertical suspenders are being replaced. A Notice to Proceed for this \$149 million construction project was issued to the contractor with a start date of December 28, 2009.

Major activities undertaken during 2010 included the modifications to the approach span subway stringers (to repair flagged cracks), microsurfacing of the North upper roadway, truss vertical rehabilitation, beginning of the main cable rewrapping, suspender replacement, and continuity plate replacement.

Major activities completed during 2011 included the replacement of all suspenders along two of the four cables, replacement of the wire wrapping with new wire and neoprene wrapping along two of the four cables, and replacement of the cable band bolts along two of the cables.



March 2011: Removal of Existing Suspender, 'C' Truss. April 2011: Installation of New Hand Ropes for 'C' Cable. April 2011: Checking Bolt Tension in New Cable Band Bolts. August 2011: Checking Suspender Loads With an Accelerometer.

Major activities completed during 2012 included the replacement of suspenders on three cables, replacement of wire wrapping with new wires and neoprene wrapping on three cables, replacement of cable band bolts on all four cables and replacement of the necklace lights on the

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north exterior cable. Also completed was the bearing replacement for the north trusses at the towers during a weekend train outage.

On-going activities planned for completion in 2013 include the replacement of suspenders, wire wrapping and neoprene wrapping on the remaining south exterior cable, installation of maintenance platforms at the towers, bearing replacement for the south trusses at the towers during a weekend train outage, and replacement of light poles and conduit on the south upper roadway.



March 2012: View of Bridge From Tower Top. April 2012: Application of Anti-Skid Walking Surface on Main Cable. June 2012: Measuring New Cable Band Bolts. August 2012: Barge Carrying Temporary Work Platforms and Jacking Steel.



September 2012: Main Cable Work Platforms. New Suspenders Along Truss B. September 2012: Jacking Struts and Work Platforms. November 2012: Sidewalk Protection Sheds.



April and September 2012: Manhattan Bridge Suspender Replacement. (Credit: Bojidar Yanev) December 2012: Manhattan Bridge Engineer-in-Charge Brian Gill and Deputy Chief Engineer Russell Holcomb on the Bridge.

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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.

BATTERY PARK UNDERPASS AND WEST STREET UNDERPASS (MANHATTAN) – EMERGENCY CONTRACT

The Battery Park Underpass is a two-span rigid frame reinforced concrete tunnel structure connecting eastbound and westbound traffic between the FDR Drive and West Street (Route 9A) at the southern end of Manhattan. The West Street Underpass is a one-span rigid frame reinforced concrete tunnel structure connecting southbound traffic from West Street heading toward the entrance to the Brooklyn Battery Tunnel (Hugh L. Carey Tunnel).

On October 29, 2012, the New York Metropolitan area was impacted by Hurricane Sandy, causing flooding, loss of power and damage to many components of New York City's infrastructure. On October 30, 2012, a site inspection by the Department revealed major damage to both tunnels. Specifically, certain electrical, mechanical and structural issues with regard to the tunnels must be addressed.

Salt water penetrated the electrical and mechanical equipment in both tunnels, including but not limited to, motors, lighting and pumps. It is therefore, necessary to solicit the services of a specialty contractor to perform all necessary repairs.

Due to the potentially serious danger to life and public safety posed by the current condition, it is critical that the repair work be performed as expeditiously as possible.

On November 7, 2012, 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 Battery Park Underpass and West Street Underpass on Route 9A in Manhattan.

A temporary repair of the Battery Park Underpass ventilation system which will allow normal traffic flow as opposed to single-lane traffic is expected to begin in Spring 2013. A permanent repair of the systems in the underpass is expected to begin in November 2013 and to be complete in July 2014.

A Letter of Intent for the emergency repairs of these underpasses is expected to be issued in late Fall 2013.

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Battery Park Underpass - View Looking West at the South Portal Entrance Near the FDR Drive. View Looking South at the North Portal Entrance Near West Street. Both Tunnels Were Flooded to Their Roofs, Which Means That all Tunnel Ventilation, Electrical, and Mechanical Systems Were Entirely Submerged in Saltwater.

METROPOLITAN AVENUE BRIDGE OVER ENGLISH KILLS (BROOKLYN), GRAND STREET BRIDGE OVER NEWTOWN CREEK (BROOKLYN/QUEENS), GREENPOINT AVENUE BRIDGE OVER NEWTOWN CREEK (A.K.A. J. J. BYRNE MEMORIAL BRIDGE (BROOKLYN/QUEENS), PULASKI BRIDGE OVER NEWTOWN CREEK (BROOKLYN/QUEENS), BORDEN AVENUE BRIDGE OVER DUTCH KILLS (QUEENS), HUNTERS POINT AVENUE BRIDGE OVER DUTCH KILLS (QUEENS), UNION STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN), CARROLL STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN), THIRD STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN), NINTH STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN), THIRD AVENUE BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN), MADISON AVENUE BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN), 145TH STREET BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN), MACOMBS DAM BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN), AND WEST 207TH STREET/WEST FORDHAM ROAD BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN) (A.K.A. UNIVERSITY HEIGHTS BRIDGE) – EMERGENCY CONTRACT

On October 29, 2012, the New York Metropolitan area was impacted by Hurricane Sandy, causing flooding, loss of power and damage to many components of New York City's infrastructure. On October 30, 2012, a site inspection by the Department revealed major damage to the operational portions of these bridges. Specifically, certain electrical and mechanical issues parts must be repaired or replaced immediately.

Salt water penetrated the electrical and mechanical equipment in the bridges, including but not limited to, motors, electric relays, lock control devices, gates, pier lights, and pumps. It is therefore, necessary to solicit the services of a specialty contractor to perform all necessary repairs.

These bridges provide a necessary service in compliance with federal law which requires that the bridges be operational for marine traffic. It is critical that the repair work be performed as expeditiously as possible.

On November 20, 2012, 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 these 15 movable bridges in the Bronx, Brooklyn, Manhattan, and Queens.

A Letter of Intent for the emergency repairs of these bridges is expected to be issued in early Winter 2014.

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East End of the West 207th Street Bridge - Missing Traffic Signal was Knocked Down by the Hurricane Winds. Borden Avenue Bridge Operator's House Basement Level – Depicted Flood Line was Approximately 5 Feet Above the Floor. Grand Street Bridge – Standing Water in the Access Light Fixture at the East Wedge Walkway. Madison Avenue Bridge - General View of Fender and Center Pier—the Red Line Depicts the Approximate Water Level.

BELT PARKWAY BRIDGE OVER MILL BASIN (BROOKLYN)

Opened on June 29, 1940, the Mill Basin Bridge is adjacent to the Jamaica Bay Wildlife Refuge and the Gateway National Recreation Area. It is the only movable bridge on the Belt Parkway. The current clearance over Mean High Water is 35-feet. 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 2012, the number of openings declined further to a total of only 277 openings.

In addition, significant and costly traffic congestion results from the operation of this outmoded drawbridge. In 2011, the Mill Basin Bridge carried 139,835 vehicles per day. The average opening and closing time for the bridge (and others like it) is ten minutes. Thus, this structure's operation has a negative and significant effect on the efficiency of New York City's vehicular traffic flow.

In 2012, on a New York State-mandated scale from 1 to 7, this bridge had a condition rating of 3.179, or "fair." While the bridge is not in any immediate danger of structural failure, its reconstruction is required in order to maintain mobility and public safety on this vital artery.

The existing Mill Basin Bridge is 864-feet long and 14 spans, including double movable leaf bascule spans and a steel superstructure, supported on reinforced concrete pier on timber piles, and abutments supported on pre-cast concrete piles. The existing structure and immediate approaches will be demolished and replaced.

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Belt Parkway Bridge Over Mill Basin. Aerial View.

The replacement will be a 2,645-foot, 17 span fixed bridge. It will consist of a steel composite superstructure and reinforced concrete substructure on piled footings, and will be constructed on a new alignment set on the north side of the existing bridge and partially overlapping with the existing bridge. The new bridge and approach will have three 12-foot wide traffic lanes, a 12-foot wide right shoulder on the bridge, a 10-foot wide right shoulder on the approach, and a minimum left shoulder in each direction. The eastbound side will carry a dedicated pedestrian/bicycle path along the south fascia. The new bridge will be a fixed structure with a 60-foot vertical clearance over Mean High Water, obviating the need for opening and closing the structure to accommodate tall vessels. The new design of the bridge will result in increased sight distances, an increase in lane width from 11-feet 4-inches to 12-feet, and the inclusion of safety shoulders in both directions. The channel will remain navigable during construction, and the clear channel width will remain the same after the new structure is in place. A new fender system will be installed to protect the bridge substructure from marine traffic. Currently in its final design phase, the reconstruction of the Mill Basin Bridge (part of the second Belt Parkway Group) is scheduled to start in summer 2014, and to last approximately 4 years.

BORDEN AVENUE BRIDGE OVER DUTCH KILLS (QUEENS)

The Borden Avenue Bridge over Dutch Kills is located just south of the Long Island Expressway between 27th Street and Review Avenue in the Sunnyside section of Queens. It is a retractile-type movable bridge. The original bridge construction was completed in 1908 and was opened to traffic on May 25, 1908.



1908 Borden Avenue Bridge Plaque. Waterside View in 2008. (Credit: Bernard Ente)

The bridge structure carries two lanes of vehicular traffic with sidewalks on either side. The roadway is 34 feet wide and the sidewalks are 8 feet wide. In 2011, the bridge carried 8,696 vehicles per day.

A project to rehabilitate the existing steel bridge, including approaches, and upgrade the operating system is currently scheduled to begin in August 2018. Construction is expected to be complete in February 2020.

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BROADWAY BRIDGE OVER THE HARLEM RIVER (BRONX/MANHATTAN)

Broadway extends from the southern tip of Manhattan, through the Bronx and terminates in Westchester County. The Broadway Bridge, a lift type movable bridge crossing the Harlem River, is located between West 220th Street in Manhattan and West 225th Street in the Bronx. In 2011, the bridge carried 35,770 vehicles per day. Three tracks of the IRT subway are carried on its upper deck and a five-lane two-way roadway with sidewalks on either side is carried on its lower deck. The two roadways each measure 34 feet and the sidewalks are 7 feet wide.

The vertical lift bridge is the third movable steel structure at this location. The original steam powered single-deck swing span built in 1895 carried only highway and pedestrian traffic. The second structure was built in 1905 to accommodate the extension of IRT subway into the Bronx from Manhattan. The second bridge was again a double deck swing span to carry the subway line on the upper deck and highway traffic on the lower deck. The current structure, a double deck vertical lift bridge to carry the subway and vehicular traffic, was built in 1960.



Broadway Bridge in December 2008.
(Credit: Sergey Parayev)

The bridge underwent a protective coating project to protect the steel components of the bridge against the effects of corrosion. This project was completed in October 2003 at a cost of approximately \$8.7 million.

The bridge also underwent recent component rehabilitation, including miscellaneous steel repairs, grating replacement, sealing and waterproofing of its deck, repair of spalled concrete pavement, new expansion joints and new median barrier at an approximate cost of \$2.14 million. This project was completed in May 2004.

Currently in its final design phase, the reconstruction of the bridge is scheduled to start in August 2016. The project's scope of work includes a major rehabilitation of the roadway deck, superstructure steel and substructure elements of the vertical lift span, as well as the approach spans. It will also include the replacement and rehabilitation of the electrical and mechanical components of the vertical lift span, as well as replacement of the existing fender system with a new larger and stronger one. Construction is expected to be complete in July 2019.

BRUCKNER EXPRESSWAY (NB & SB SERVICE ROAD) OVER WESTCHESTER CREEK (UNIONPORT BRIDGE) (BRONX)

This double leaf bascule bridge opened in 1953. In 2011, the bridge carried 61,619 vehicles per day. This 17-span structure (three waterway spans and fourteen concrete approach spans) carries five lanes of the Bruckner Boulevard Expressway service road traffic over Westchester Creek. This bridge opens for important fuel oil deliveries up to 300 times a year. The reconstruction design of the bridge underwent a Value Engineering Study by the Office of Management and Budget which recommended several changes to the design that are being incorporated.

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Subsequent to the study, concepts for two temporary movable bridges (for MPT purposes only) were developed in lieu of a complete bridge closure during construction. However, an assessment revealed a significant impact on local traffic would occur, due to the required traffic rerouting via local streets to the temporary bridges, and the location of the temporary bridges would have a severe impact on the operations of the Department of Sanitation and a Department of Environmental Protection pump station. In addition, the cost of implementing the temporary bridges for only a couple of years was very high, in the order of \$40 million. The concept of rehabilitating the bridge by constructing new temporary bridges for MPT purposes was then abandoned.

A follow-up feasibility study was conducted for completely replacing the existing bridge with a new wider bridge in phases while maintaining traffic on the existing bridge. The project's new scope of work includes: a complete replacement of the bascule, flanking, and approach substructures and superstructures, providing six 12-foot travel lanes with 10-foot shoulders on both sides of the bridge; a new 15-foot bicycle/pedestrian path on the south, separated from traffic with a barrier; replacement of the existing mechanical and electrical systems for the bascule span; reconstruction of the bridge operator and control houses, and replacement of the existing fender system, drainage system, street lighting, traffic signal facilities, and gates. Construction is expected to start in fall 2016.



Unionport Bridge in 1953 and 2009.



Unionport Bridge in 2002. (Credit: NYSDOT) Eastbound View.

MADISON AVENUE BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN)

A project for electrical, mechanical, and miscellaneous operating system-related work is scheduled to be performed between March 2017 and September 2018. The bridge is currently operating with the very old machinery components, along with a temporary electrical system known as the "Interim Drive System" installed during the 1994 rehabilitation contract. Some of the machinery components currently in service are over 100 years old and have far exceeded their service life. Moreover, the bridge does not have any back-up operating system which renders the bridge inoperable in case of failure of any component of the Interim Drive System. The preliminary design phase of this project began in early 2011. In 2011, the bridge carried 41,423 vehicles per day.

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Madison Avenue Bridge Sign in 2007. (Credit: Duane Bailey-Castro) Bridge in 2009. (Credit: Bernard Ente)

PARK AVENUE TUNNEL OVER 34TH STREET (MANHATTAN)

The Park Avenue Tunnel was originally built as an open cut in 1836 to accommodate horse drawn trolley cars between East 33rd Street and East 42nd Street. In 1854, a five course brick arch roof was constructed and the underground tunnel was used by the New York and Harlem River Railroad steam engine trains from East 42nd Street to its terminal then located at East 30th Street and Park Avenue. In 1870 the rail road was converted to electric powered trolleys.

The tunnel in its present form was converted to vehicular traffic only in 1917, when trolley tracks were covered with fill and roadway pavement was built. In its present form, the tunnel is located under the center mall of Park Avenue South. The roadway width inside the tunnel varies from 19'-2" to 22'-5" and used to carry a single lane of traffic in each direction. On August 3, 2008, the traffic in the tunnel was restricted to only a single northbound lane.

Some rehabilitation work was completed on the tunnel in November 2005. That contract included the rehabilitation of the fans and the ventilation system. The new project is currently in its final engineering design phase. The scope of work includes complete rehabilitation of civil and structural components of the tunnel as well as upgrading of fire detection and ventilation system of the tunnel. Construction is expected to start in 2014 and be complete in 2016.



Two Views of Park Avenue Tunnel in 2010. (Credit: NYSDOT)

ROOSEVELT ISLAND BRIDGE OVER EAST RIVER/EAST CHANNEL (MANHATTAN/QUEENS)

This lift bridge opened in 1955, when it was known as the Welfare Island Bridge. In 2011, the bridge carried 9,103 vehicles per day. The 8 span structure carries two lanes of traffic over the East Channel of the East River. It is the only vehicular access to Roosevelt Island from the Borough of Queens.

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A Notice to Proceed for the \$86.5 million reconstruction of this bridge was issued to the contractor with a start date of March 12, 2007. The project's scope of work includes rehabilitation of the existing bridge superstructure, substructure and approaches, replacement of some of the existing mechanical and all of the electrical systems for the lift span, rehabilitation of the bridge operator house, installation of safety fences on the sidewalk, replacement of the street lighting, resurfacing of the approach roadways, installation of pigeon proofing systems and re-painting the entire structure. The project will also include the installation of a dedicated right-hand turn lane onto the southbound Vernon Boulevard in Queens, and the construction of a new back-up generator building under the Queens approach to provide power to allow operation of the bridge in an emergency. Fabrication and testing of mechanical and structural components was in progress by the end of 2007.

By the end of 2008, the rehabilitation of the existing bridge superstructure, substructure and approaches was nearly complete. The roadway was returned to full service on December 2, 2008 after the complete re-decking of the main bridge and approaches. The sidewalks were returned to service in 2009. Due to a design change, the replacement of some of the existing mechanical and all of the electrical systems for the lift span, and the rehabilitation of the bridge operator house was performed during a Navigation Channel closure between October 2009 and August 2010. The installation of safety fences on the sidewalk, replacement of the street lighting, resurfacing of the approach roadways, and installation of pigeon proofing systems was completed in 2009.

The cleaning and repainting of the bridge began in January 2008, and the structure painting was complete by the end of 2009. Local touch up painting followed the installation of the new lift machinery. The Department and its contractor strictly adhered to the safety requirements regarding lead paint removal as approved by the United States Environmental Protection Agency and the Occupational Safety and Health Administration, New York City Departments of Health and Environmental Protection, and the New York State Departments of Health and Environmental Conservation.

The work was performed within an entirely sealed Class 1A containment system (under negative pressure) which acted as an added safety measure to prevent any materials from escaping into the air. Filtration of the enclosed air prevented paint waste dust from being released. The Department placed several air monitoring stations in the area around the bridge. The Department performed continuous monitoring and testing of the soil and air quality as well as noise levels in the area surrounding the containment enclosure to minimize impacts and ensure the safety and quality of life for workers and residents nearby.

In 2010, the contractor completed the rehabilitation of the machinery, replacement of the bridge's power systems, installation of the bridge control systems, installation of new barrier gates, bridge railings, warning lights, new protective bollards, replacement of the sewer lines with new curbing, and the replacement of pavement. Under-deck temporary work platforms were removed and the bridge is now operational for the passage of marine traffic.

In 2011, the architectural work in the control and machinery rooms was completed. Bird screens were installed around the elevator shafts and a bird prevention system was installed at the piers. Security fences with gates were installed around the generator house and three land piers. Elevators at both east and west towers were rehabilitated and tested. The reconstruction of the bridge was substantially completed on June 27, 2012.

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January 2011: North Sidewalk With New Pedestrian Fence. Recently Painted Bridge With New Traffic Control Equipment. View of Bridge in August 2011.



Sidewalk and Pedestrian Fence in October 2011. (Credit: Chris George and Ryan Scatenato)
View of the Bridge in October 2011. (Credit: Rafael Lopez)



Chief Bridge Officer Henry D. Perahia, Commissioner Janette Sadik-Khan and Executive Director of Bridge Inspections and Bridge Management Dr. Bojidar Yanev on the Roosevelt Island Bridge. (Bridge View Credit: Bojidar Yanev)

SHORE ROAD BRIDGE OVER THE HUTCHINSON RIVER (BRONX)

This bridge, built in 1908, was originally called the Pelham Parkway Bridge over Eastchester Bay. In 2011, the bridge carried 16,966 vehicles per day. The \$5 million interim rehabilitation of the existing bridge superstructure and substructure enables the Department to keep it operational 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.

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Shore Bridge in 2007. (Credit: Peter Basich)

As of the end of 2009, a mid-level, single leaf bascule movable bridge was in design. It will be constructed to the south of the existing bridge, with a wider navigation channel. An environmental impact study, co-sponsored by the Federal Highway Administration, is underway. The construction of a new bridge is scheduled to begin in October 2020.



Open Bridge in 2007. (Credit: Peter Basich)

UNION STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN)

The original Union Street Bridge over the Gowanus Canal was constructed in 1870 as part of the construction of Prospect Park. A major crossing over the Gowanus Canal, this bridge is the last in a series of five eastbound crossings, and it is 885 feet from the canal's end. The neighborhood, located in the Gowanus section of Brooklyn, is primarily industrial; however, public facilities such as schools, parks, and public transportation are nearby.

In its current configuration, the bridge is a double-leaf Scherzer type (rolling lift) bascule bridge, which was opened in 1905. The bridge carries two lanes of eastbound traffic, a delineated bike lane and a sidewalk.

During the preliminary design, eight alternatives were identified for the rehabilitation of the bridge. The recommended design alternative proposes a replacement of the entire bridge structure with a new single leaf fixed trunnion bascule bridge on a reinforced concrete substructure and new pile foundation. Preliminary plans have been developed. However, during the Value Engineering study in 2009, the team recommended converting the movable span into a low level fixed bridge. NYCDOT, OMB and other affected agencies are currently reviewing the feasibility of this alternative. The construction is anticipated to begin around April 2019.

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Union Street Bridge in 2010. (Credit: NYSDOT)

WARDS ISLAND PEDESTRIAN BRIDGE OVER HARLEM RIVER (MANHATTAN)

The Wards Island Bridge is a pedestrian bridge connecting the East River Housing Project at East 103rd Street in Manhattan to Wards Island. Located on the East River, this bridge is located between exits 14 and 15 of the FDR Drive. This vertical-lift bridge has a total of twelve spans. Four spans are located on the Manhattan side of the bridge and are oriented in the south/north direction, whereas the remaining spans are oriented in the west/east direction. The curb-to-curb width of the lift span is 3.66 meters, the clear width of the Manhattan approach ramp is 3.66 meters and the clear width of the Wards Island approach ramp measures about 3.76 meters. The bridge's Wards Island approach provides immediate pedestrian access to the 68-acre Wards Island Park.



Wards Island Bridge August 2011. (Credit: Duane Bailey-Castro)

The bridge was built by the U.S. Army Corps of Engineers in 1951 and was designed by Othmar Hermann Ammann.

A protective coating project was completed in May 2003 at an approximate cost of \$1.2 million. A Notice to Proceed for the reconstruction of this bridge was issued to the contractor with a start date of June 14, 2010. The project's scope of work includes the replacement of the electrical components, the replacement of the walkway deck on the lift span, the repair and overlay of the deck on the other spans and approaches, the rehabilitation of the steel superstructure members, new fencing and lighting, and restoring the control and tender houses to their original condition.

In 2010, the contractor mobilized and began the installation of protective containment shielding. Following training from Division Bridge Operations personnel, the contractor took over operational control of the bridge on November 12, 2010. Deck cracks were repaired, and the old bridge railing and protective fencing were removed in preparation for removal of the steel grid decking.

In 2011, the contractor installed a new concrete-filled steel grid deck on the lift span. Concrete repairs were performed on piers over land as well as in the East River. The bridge was temporarily opened to pedestrians on June 30, 2011 for the summer months and was closed from November 21, 2011 through May 7, 2012 for remainder of the construction. The bridge was

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reopened to pedestrian and bicycle use at 10:45 AM on June 1, 2012. Construction is expected to be completed in March 2013.



January 2011: Under-Deck Shield Installation for Manhattan Approach Span 6. April 2011: Removing Concrete Decking Material. June 2011: Pouring Concrete Decking at Span 7.



Construction in August, October, and December 2011. Installing Handrails Between Spans 7 and 9.



Council Member Melissa Mark-Viverito, Commissioner Janette Sadik-Khan, and Chief Bridge Officer Henry D. Perahia at the Re-opening of the Bridge on June, 1, 2012. Chief Staff Manager/Executive Director of Community Affairs Joannene Kidder and Associate Urban Designer Neil Gagliardi. Pedestrians on Bridge. (Credit: Nicole Garcia)

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

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

A major hub between the FDR Drive in Manhattan, the Major Deegan Expressway and the Bruckner Boulevard in the Bronx, the Willis Avenue Bridge carried approximately 57,710 vehicles per day in 2011. Ten local and interstate bus lines use the bridge as a principal route from New York City to points throughout the northeastern United States.

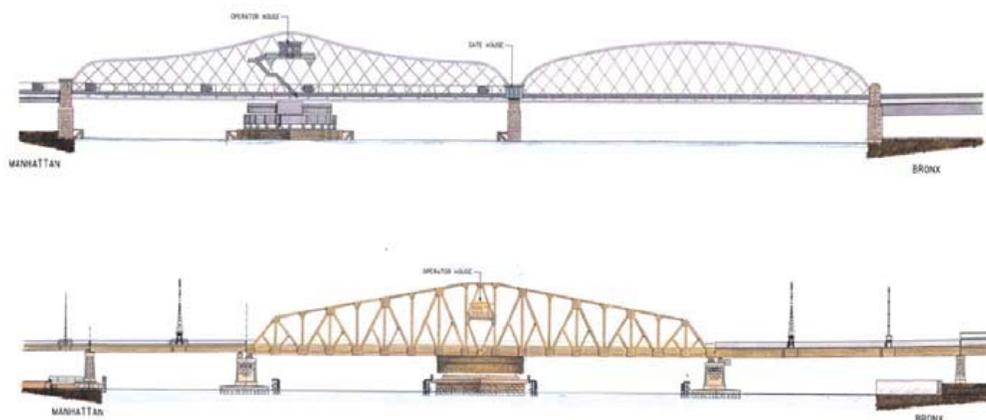
Because of substandard curves that were present on the structure's approaches, the Willis Avenue Bridge was one of the City's most accident-prone crossings. Between 1992 and 1994, there were 809 vehicular accidents on the bridge, for an average of 269 per year.

Because of the advanced age and condition of the Willis Avenue Bridge, the City of New York decided to replace the existing bowstring truss swing bridge with a new swing span bridge constructed just to the south of the existing bridge. The project also replaced the FDR Drive approach ramp and the ramp onto Bruckner Boulevard, and improved the alignment. NYCDOT

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will also reconstruct Willis Avenue over the Major Deegan Expressway for the New York State Department of Transportation. It also included a direct connection to the northbound Major Deegan Expressway in the Bronx with wider travel lanes and shoulders, and a broader, combined pedestrian/bicycle pathway along the north side of the bridge.

The old swing bridge, which opened for tall vessels, had a vertical clearance of 24 feet above Mean High Water Level (MHWL) when closed. The new swing bridge when closed has a 25 foot clearance above the Mean High Water Line which makes it consistent with other bridges along the river. It also incorporated the placement of a solid riding surface on the swing span instead of the existing open grating deck. In addition, modern electrical, mechanical and communications systems are being installed.



Old and New Willis Avenue Bridge Span.

A Notice to Proceed for the replacement of this bridge was issued to the contractor with a start date of August 27, 2007. Foundation construction work was in progress by the end of 2007.

Traffic continued to use the current bridge until the new bridge opened, resulting in limited impact to motorists and nearby communities. The NYC Marathon was not impacted: runners continued to use the old bridge each year until the new swing span was completed.

Throughout the project, little impact to marine traffic was experienced. The new swing span was fabricated and assembled off site, and floated into place once the foundations, center pier and rest piers were ready to receive it.

On January 3, 2008, the East 125th Street exit ramp off the northbound FDR Drive was closed. This closure was necessary so that work on the construction of a temporary loop ramp, as well as construction of the new north-bound FDR Drive ramp to the Willis Avenue Bridge, could begin. The East 125th Street exit ramp, which typically carries only a low volume of traffic, was reopened after its reconstruction in June 2012.

In 2008, the project focused on foundation construction work, along with construction of a temporary ramp from the north-bound FDR Drive onto the bridge. At the end of 2008 the loop ramp was nearing completion. It went into service on January 24, 2009. This allowed the removal of the existing ramp and the construction of the new ramp to proceed. One half of the foundations for the new FDR Ramp were installed. Additionally one of the four piers in the river was in place, and work on a second had begun. The foundations in the Harlem River Rail Yard were more than 50 percent complete, and work had begun on the footings for the new Bruckner Boulevard Ramp.

In 2009, the project continued to focus on foundation construction work, with the installation of footings and piers for the new ramp from the FDR Drive as well as the one-half of the 1st Avenue Approach. The precast concrete pier box for River Pier 5 was transported in February 2009 by

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ocean-going tug and barge from the fabrication yard in Virginia to the contractor's yard in Jersey City, New Jersey. Over 30 automobiles were removed from the Manhattan channel in spring 2009. At the end of 2009 the contractor began the installation of the steel superstructure over the FDR Drive. The work in the river consisted of the installation of the drilled shafts for the four river piers and the installation of three of the four precast pier boxes in the river. The assembly of the new swing span began in Coeymans, near Albany, New York in June 2009.

In the Bronx, a temporary pedestrian bridge was installed in May 2009 over the Major Deegan Expressway, just south of the existing bridge, to carry pedestrians until the new bridge is constructed. More than half of the paving and drainage work on the expressway was completed. One-half of the bridge over the Major Deegan was removed and work on the new abutment wall began. One-half of the abutment at Bruckner Boulevard was reconstructed and the piers to carry the south half of the new bridge were installed. The foundations in the Harlem River Rail Yard were completed and the first phase of the new Bruckner Boulevard exit ramp was also completed.

The contractor began 2010 with construction of the FDR Drive entrance ramp, and the First Avenue Approach on the Manhattan side of the bridge. On the Bronx side, the new Bruckner Boulevard exit ramp was partially opened to traffic on February 12, 2010. The work then proceeded with the demolition of the existing ramp. Assembly of the new swing span along with new machinery and electrical system was continued.

The swing span was floated down the river and towed to the bridge site on July 26, 2010. The new swing span was floated on to the new pier on August 9, 2010.



Voyage up the East River on July 26, 2010. New Willis Avenue Bridge Span Passing Under the Brooklyn Bridge. (Credit: Douglas Reese)

Work continued on the new bridge span in August 2010 with the placement of a new lightweight concrete deck surface, bridge machinery and electrical utility work. Demolition of the existing Willis Avenue Overpass over the Major Deegan Expressway was completed by September 2010.

On October 2, 2010, with the completion of the FDR Drive approach, partial First Avenue Approach, and the Willis Approach in Bronx, traffic was allowed over the new swing span and the existing bridge was closed to traffic. The old bridge was retired after 109 years of service.



New and Old Willis Avenue Bridges on October 2, 2010. Old Willis Avenue Spans in December 2010. (Credit: Duane Bailey-Castro) Aerial View in September 2011. (Credit: Hardesty and Hanover)

The float-out of the old existing swing span took place on October 21, 2010, and the adjacent, flanking bow-string arch span was floated out on November 3, 2010. Both spans remained on

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site through November for the asbestos abatement process before being floated to the contractor yard in Jersey City. The first bridge test operation of the new swing span was conducted successfully during the early morning hours of December 23, 2010.

In 2011, the contractor completed work on the existing swing and flanking spans and towed them to the recycling facility in New Jersey. In Manhattan, work continued on the remaining half of the First Avenue approach roadway and spans, the demolition of the temporary loop ramp, and the reconstruction of the 125th Street exit and local streets. In the last quarter of 2011, work also continued on the Manhattan ramp and stairs and the auxiliary bridge operator's house.

In the river, the contractor started removal of the river piers and continues work to complete the demolition of center pier and the west rest pier by blasting. They also worked on the installation of the fender system for the new piers as well as the final alignment of the bridge machinery and testing of the electrical and mechanical system. In the last quarter of 2011, the contractor completed demolition work at pier 10 and carried out blasting of pier 9. Post-blasting excavation continued at Pier 9 for removal of the pier, and fender building work continued in the river. Work also continued for the construction of bridge machinery and testing of the electrical and mechanical systems. Installation of granite continued throughout the project.

In the Bronx, the contractor continued work on the relieving platforms, construction of the remaining superstructure and decks for the spans over the Harlem River Yard and mainline. They also worked on the construction of combined pedestrian/bicycle bridge over the Major Deegan Expressway as well as the new direct ramp to the northbound Major Deegan Expressway.



June 2011 River Work: Picking Up Waste With a Clamshell Bucket. July 2011: Demolition of Old Pier 9. March 2011: Stage III Caisson Concrete Placement at Caisson #2 at Pier 11. Setting Granite Stone Facing at Pier 11. Finished Stage VB Removal of Steel Girder at South Bay at Existing Span 15.



February 2011: Pedestrian/Bicycle Bridge and Ramp to Major Deegan Expressway. September 2011: Granite Installation for Approach to Connector Ramp. Bridge in November 2011. (November Credit: Hardesty and Hanover)

2012 started with the opening of the ramp to the northbound Major Deegan Expressway as well as the complete opening of the Bruckner Ramp and Bruckner Boulevard. Ramp C, which provides a direct connection to the Major Deegan Expressway, was opened on January 10. The contractor opened the sidewalk to the North Access Road on January 30. Most of the landscaping was done in the spring with some minor work left for the fall. Reconstruction of the 125th Street exit ramp and the 127th Street work was completed and opened to traffic. In the river, fenders for the new piers were completed and testing of electrical, machinery and control system continued. Reconstruction of Willis Avenue between 132nd Street and Bruckner Boulevard was completed and was opened to traffic on September 24, 2012.

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Architectural work at the bridge operator house is near completion. By October 2012, all of the traffic lanes and shoulders throughout the project were completed with final pavement markings. The pedestrian bridge over the Major Deegan Expressway and the adjacent walkway/bikeway were opened to the public on November 1, 2012.

In the Bronx, granite masonry work is expected to be complete in early summer 2013. The project is slated for completion in summer 2014.



Demolition of Old Piers 13 – 15 in May and June 2012.



May 2012: Pier 6 North Fender. Touch-up Paint Operations at the Underside of Span 5. Finished Span 10 Parapet Wall Concrete Placement. Girder Touch-up Painting at Span 12. Preparing and Installing Granite Stone Pavers at Ramp-C End Abutment.

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September 2012: Bridge Fender North Elevation Looking South. Bridge South Elevation Looking North. Pier 6 South Fender Looking South. Pier 7 West Face Looking East.

WILLIS AVENUE GRANITE IN PUBLIC PLAZAS

New York City has a program to encourage public plazas in neighborhoods lacking in open space. The program plays a key role in ensuring that all New Yorkers live within a 10-minute walk of quality open space, as proposed in the PlaNYC 2030. Public plazas improve the quality of life and transform the cityscape by providing spaces where people can sit, socialize, and enjoy public life. Granite slabs from the old Willis Avenue Bridge have been repurposed as seating in several of these plazas.

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Old Fulton Street. Delancey Street Near the Williamsburg Bridge. Bogardus Plaza in Tribeca.
Belmont Plaza. New Lots Triangle in East New York.

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Roadway Bridges

INNOVATIONS

Innovations in the design and construction of Roadway Bridges continued in 2012. Where feasible, the continued use of precast elements in bridge reconstruction reduces construction duration and the resulting negative impacts on the traveling public. In addition, the implementation of applicable Environmentally Preferable Purchasing (EPP) standards on bridge projects will ease the impact of the increased demands on resources and surrounding environment, and Best Management Practices (BMP) in all applicable projects will mitigate the impact of the project on the surrounding environment.

BROOKLYN AND MANHATTAN BRIDGES

ATLANTIC AVENUE BRIDGE OVER LIRR – ATLANTIC BRANCH (BROOKLYN)

The Atlantic Avenue Bridge is a 75 span viaduct located between Eastern Parkway and Georgia Avenue in Brooklyn. The bridge carries two traffic lanes each eastbound and westbound, divided by a center median. Two LIRR tracks (of the Atlantic Branch) run under and parallel to the bridge for its entire length. The bridge was built in 1942 by the Transit Commission. The bridge superstructure consists of steel stringers and floor beams. The substructure consists of steel piers and concrete bearing walls founded on spread footings. The Agency replaced the structural deck in 1985 with a new concrete deck slab overlay. The project will include rehabilitating the deteriorated steel members, concrete abutments and bearing walls; replacing the bridge wearing surface, drainage scuppers, and expansion joints; performing localized concrete deck repairs; and retrofitting the viaduct to meet current seismic requirements. Construction is expected to begin in early 2016.



Aerial View in 2009. Elevation Left Spans 38 -43 and Elevation Right Spans 20 – 34. (Credit: NYSDOT)

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

On a New York State-mandated scale from 1 to 7, these seven bridges possess a condition rating of “fair” (3.001 – 4.999). In 2012, the Paerdegat Basin Bridge was 3.340; the Fresh Creek Bridge was 6.915; the Rockaway Parkway Bridge was 6.644; the Gerritsen Inlet Bridge was 3.463; the Mill Basin Bridge was 3.179; the Bay Ridge Avenue Bridge was 3.625; and the Nostrand Avenue Bridge was 3.986. All are original structures, which were built beginning in 1939. 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.

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The Seven Belt Parkway Bridges.

Reconstruction of the seven bridges and their approaches on the Belt Parkway (over three local streets and four waterways) began in the fall of 2009. Group 1 (Paerdegat Basin, Fresh Creek, and Rockaway Parkway Bridges) is expected to be complete in fall 2014. Gerritsen Inlet Bridge is expected to start in spring 2013 and to be complete in summer 2017. Mill Basin Bridge is expected to start in summer 2014, and to be complete in fall 2018. Bay Ridge Avenue Bridge is expected to start in fall 2013 and to be complete in summer 2015. Nostrand Avenue Bridge is expected to start in Fiscal Year 2022.

During the past 65 years, traffic demand along the Belt Parkway corridor has increased dramatically. The opening of New York International Airport (now JFK Airport) in 1948, the development of suburban communities on Long Island post World War II, and the opening of the Verrazano-Narrows Bridge in 1964 have dramatically increased demand on the Belt Parkway. When the parkway first opened the two-way average daily traffic was about 20,000 vehicles per day. Presently it is about 150,000 vehicles per day.

Reconstruction of these bridges and their approach roadways is necessary to alleviate substandard conditions and bring these areas into compliance with current state and federal standards. These standards require wider lanes, safety shoulders, concrete median barriers, super-elevation of the roadway around curves, and realignment of the approach roadways to improve sight distances. The Department anticipates that these improvements will reduce the current accident rate on this section of the Belt Parkway by approximately 45%.

NYCDOT conducted research to provide recommendations and design guidelines for the treatment of the parkway corridor. The goals of the analysis were threefold: first, to propose improvements to the parkway to satisfy safety and accessibility standards; second, to preserve and re-establish the historic character of the parkway; and third, to retain and improve public access for all parkway users. The recommendations also include complementary designs of the seven bridges.

The research provided detailed recommendations on how common elements should be incorporated to achieve a consistent and historical character to the corridor. Items considered included trees and vegetation, lighting fixtures, railings and fences, design of bicycle and pedestrian paths across the bridges, as well as stonework detailing on bridge abutments with relief detailing on bridge parapets.

On July 18, 2006, the Art Commission (now known as the Public Design Commission) selected the Seven Belt Parkway Bridge reconstruction project for a Design Award in its 24th annual Excellence in Design Awards.

All of the bridges, except for the Bay Ridge Avenue and Nostrand Avenue Bridges, are located adjacent to the Gateway National Recreation Area, (GNRA) a division of the National Park Service. This bridge and highway program is in full compliance with New York City Department of Environmental Protection requirements for the initiation of a long-term plan that will increase wetlands, decrease pollution into the bay, and decrease the highway's footprint around the rim of Jamaica Bay. NYCDOT is also working closely with New York City Department of Parks and Recreation, the New York State Department of Environmental Conservation, Gateway National

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Recreation Area, the US Coast Guard, and the US Army Corps of Engineers to ensure compliance with all environmental protocols.

An upland mitigation project, to be administered by the New York City Department of Parks and Recreation, will include the planting of replacement trees to offset the number of trees being removed during the course of the bridge replacement project. The number of trees that will be planted in will be determined in accordance with the caliper rule for tree replacement.

In addition to mitigating environmental impacts along the Belt Parkway corridor, an off-site Tidal Wetland Mitigation project was performed. A Notice to Proceed was issued to the contractor with a start date of March 8, 2011. The plan focused on compensating for wetland losses at the waterway bridges by increasing and improving the quality of habitats at a nearby location. Approximately 2.3 acres of land at Floyd Bennett Field was cleaned of rubbish and debris and converted to tidal wetland area. The project was substantially completed during 2012.

The overall goal of the mitigation project was to restore selected areas of the Floyd Bennett shoreline with productive habitats, including unvegetated intertidal areas, vegetated intertidal areas restored with naturally occurring *Spartina* marsh, and high marsh habitats. A significant portion of the area involved the removal of approximately 20,000 cubic yards of previously filled areas and the restoration of the areas to productive vegetated and unvegetated wetland resources.

Restoration of the area, specifically, the removal of existing fill and debris from the Floyd Bennett Field Mitigation site has increased the functional value of the area. This area is an important contributor to primary production and breakdown of organic materials. In addition, algal communities often found in these areas are producers, and provide a food source for snails and other benthic organisms, which in turn, provide food sources for larger animals that forage along the shorelines of Jamaica Bay.

Planting at the intertidal wetland and the high marsh zones was completed in summer 2011. The installation of cabled concrete erosion control revetment was started in June 2011 and completed in July 2011. In fall 2012, all replacement and final upland tree plantings were completed. Monitoring of the wetland mitigation project, as mandated by the New York State Department of Environmental Conservation, is expected to be complete in early 2017.



Tidal Wetland Mitigation Site. On June 16, 2011, Work Stopped When Ordnance was Found During Excavation at the Mitigation Site, Floyd Bennett Field. The Bomb Squad was On-Site to Inspect and Remove the Items, Which Were Determined to be Inert World War II Era Torpedoes That Were Buried at the Site.

The old Paerdegat Basin Bridge was a 692-foot long, 13 span, multi-girder, simple supported steel superstructure, supported on reinforced concrete pier cap beams and abutments supported on reinforced concrete piles. The bridge has two 34-foot wide roadways carrying three lanes of traffic in each direction; with a 3-foot safety walk on the north side, a 4-foot wide center median/barrier, and an 8-foot wide south pedestrian/bicycle sidewalk. The existing structure and immediate approaches will be demolished and replaced by two new bridges and new approach roadways on split alignments. The existing structure was permanently closed to traffic on December 20, 2012, upon opening of the new westbound structure. Demolition of the existing structure will be completed in early 2013.

The old bridge consisted of 12 cast-in-place concrete bents. Two navigation channels cross under the bridge. At one of these channels (bent number 7) a concrete pier was damaged.

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Because of this damage and other structural concerns, the Paerdegat Basin Bridge has been under continuous monitoring since September of 2004.

The replacement bridges will consist of two trapezoidal steel box girder structures: the 825-foot, 3 span westbound bridge, north of the existing structure, and the 1,227-foot, 5 span eastbound bridge, south of the existing structure, remaining at 28 feet over the navigable channel. Both bridges will have a 36-foot wide roadway with a 12-foot wide right shoulder. The eastbound bridge will have a 4-foot wide left shoulder, while the westbound bridge will have a 10-foot wide left shoulder. The southern structure will carry eastbound traffic while the northern structure will accommodate westbound traffic. Both the horizontal and vertical alignments will change resulting in improved sight distances on the bridge and its approach roadways. The bridge carrying eastbound traffic will also have a dedicated pedestrian/ bicycle path along the south side. The pedestrian/bicycle path will be separated from traffic lanes by a concrete barrier on the bridge, and by a 15-foot wide grass mall on the approach roadways.



Old Paerdegat Basin Bridge.

The Fresh Creek Bridge was a 264.5 foot, 5 span, multi-girder, simple supported steel superstructure, supported on pre-cast concrete columns founded on four reinforced concrete piers on concrete piles with concrete gravity abutment walls on timber piles. One navigation channel crosses under the bridge. The bridge had two 34'-2" wide roadways, a 5-foot wide center median/barrier, and a 10-foot wide south sidewalk. The parkway, east and west of the bridge, has a 10-foot wide bicycle/pedestrian path on the south side. The existing structure and immediate approaches were demolished in spring 2012, and the replacement structure will be fully opened in 2013.

The replacement bridge will be a 316-foot, 3 span structure; the new structure will have only two support piers, resulting in a wider channel. The bridge deck and approaches will be widened to 126 feet from the existing 86 feet to accommodate three 12-foot lanes in each direction, 12-foot wide shoulders, and a 12-foot wide bicycle/pedestrian path, separated from the traffic lanes by a barrier system. The profiles of the approach roadways and bridge structure accommodate stopping sight distances for a design speed of 60 miles per hour. The proposed construction will result in improved landscaping on the bridge approaches. The existing pedestrian and bicycle pathway will be maintained and open at all times during construction.



Fresh Creek Bridge in 2002. (2002 Credit: NYSDOT)

The Rockaway Parkway Bridge was a 150-foot, 4 span, multi-stringer, simple supported steel superstructure, supported on steel cap beams on concrete filled steel pipe columns, and reinforced concrete abutment walls supported by concrete pile foundations. The bridge has two

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34'-2" wide roadways, a 5-foot wide center median/barrier, and a 10-foot wide south sidewalk. The existing structure and immediate approaches were demolished in fall 2012, and the replacement structure will be fully opened in 2013.

The replacement bridge will be a single span structure to improve visibility along Rockaway Parkway. The new structure will be built in the same alignment as the existing bridge. The bridge deck will be widened to 109 ½ feet from the existing 84 feet to accommodate three 12-foot lanes with a 12-foot wide right shoulder and 4-foot left shoulder in each direction, including 5 ½ feet for median and parapet width. The right shoulder lane on each approach will be 10 feet (while the width of the right shoulders on the bridge structure will be 12 feet), with the other dimensions the same width as those on the bridge. In addition to reconstruction of the bridge, four access ramps will also be reconstructed as will Rockaway Parkway in the vicinity of the Belt Parkway.



Rockaway Parkway Bridge in 2002. (Credit: NYSDOT)

A Notice to Proceed for the reconstruction of the Group 1 bridges was issued to the contractor with a start date of October 26, 2009.

In 2010, 2011, and 2012, work on the Paerdegat Basin bridges progressed on the construction of the new eastbound and westbound bridges, and the project is currently in Stage IV of the proposed construction sequence. Various construction milestones have been completed to date, including the temporary relocation of the bicycle/pedestrian path which runs along the eastbound roadway; the removal of the existing median and installation of temporary roadway lighting; the replacement of the existing sludge force main within the project area using open cut and directional boring methods; the installation of earth embankments for the new eastbound and westbound approach roadways; the installation of new drainage structures and pipe, and the opening of both the new eastbound bridge (including the new bicycle/pedestrian path), and the new westbound bridge.

All substructure work for the new eastbound bridge, including the pier and abutment footings, pier columns, pier caps and abutments, was completed during the spring of 2011. The erection of the 51 sections of trapezoidal steel box girders was completed during the summer and was followed by nine concrete deck placements in the early fall. Installation of the concrete barrier sections and modular joints were completed during the fall, as was the construction of the eastbound approach roadway sections, drainage and electrical work. The new eastbound bridge, including the new bicycle/pedestrian path, was formally opened to traffic on December 19, 2011. Traffic was switched from the existing westbound bridge to the existing eastbound bridge on December 29 to enable construction of the new westbound bridge.



February 2011: Pumping Concrete at Paerdegat Basin Cofferdam for Pier No.3. April 2011: Setting Tub Girder Sections at Eastbound Bridge Between West Abutment and Pier No. 1. June 2011: Hammer Being Positioned to Drive Steel Sheet Piling for Cofferdam at Westbound Bridge – Pier # 2. July 2011: Setting Final Tub Girder Section at East Abutment.

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Paerdegat Bridge in August 2011. (Credit: Daniel Hom) Placing Concrete at Headers for Modular Joints in November 2011. November Aerial View. December 2011: New Eastbound Bridge.

For the new westbound bridge, cofferdams were constructed in 2011 and pile installation commenced for the construction of the new bridge piers and abutment substructures. All substructure work for the new westbound bridge, including the pier and abutment footings, pier columns, pier caps and abutments, was completed during the summer of 2012. The erection of the 33 sections of trapezoidal steel box girders was completed during the summer and was followed by five concrete deck placements in the early fall. Installation of the concrete barrier sections and modular joints were completed during the fall, as was the construction of the westbound approach roadway sections, drainage and electrical work. The new westbound bridge was formally opened to traffic on December 19, 2012. Final demolition of the existing bridge commenced at the end of 2012 and is scheduled to be completed in early 2013.



Paerdegat Basin Bridge in January 2012: Removal of Existing Westbound Lanes. February 2012: North Side Cofferdam and Pier for New Westbound Bridge. Driving Piles for Temporary Work Trestles on the North Side for the Future Westbound Bridge. April 2012: Galvanized Steel Rebars for Westbound Pier 1 Cap Beam. May 2012: Pumping Concrete for Footing of Westbound Bridge Pier 2 Cofferdam. Galvanized Rebars for Footing and Piers Shown. June 2012: Erecting Steel Falsework Temporary Supports for the Westbound Paerdegat Tub Girders. Unloading Tub Girder Section for Westbound Paerdegat Basin Bridge at Contractor's Storage Yard. October 2012: Finished Concrete Deck on Westbound Paerdegat Basin Bridge. Finishing Machine and Mason's Bridge at Left. November 2012.

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Site Visit in September 2012: Acting Director of Bridge Preventive Maintenance Paul Schwartz, Assistant Civil Engineer Evgenia Campbell, Interim Director of In-House Design Ferdinand John, and Civil Engineers Jagdish Patel, Gregory Novofastovsky, and Serge Rigaud.

To date, various construction milestones have been completed on the Fresh Creek Bridge, including the removal of the existing median, the placement of temporary median asphalt pavement, and the installation of temporary roadway lighting. During 2011, the contractor's Value Engineering proposal to utilize a temporary bridge to facilitate the reconstruction of the existing bridge was implemented. The temporary bridge was opened to traffic in March and traffic was shifted to allow for the demolition of the south half of the bridge during the summer. As demolition was completed, deep foundation cofferdams were constructed in advance of the pile installation work, which was completed in late summer. Substructure work, including the pier and abutment footings, pier columns, pier caps and abutments, proceeded accordingly through the fall and were completed in advance of steel erection. All steel was erected during November and concrete deck placements continued through the winter of 2011-2012 in tight adherence to the Agency's winter concrete guidelines and procedures. Relocation of the existing sludge force main within the project area, using open cut and jacking methods, was also completed during 2011, as was the installation of permanent drainage structures and outfalls. The contractor also continued the installation of new permanent lighting, and completed the lead abatement of the existing superstructure steel in advance of demolition.



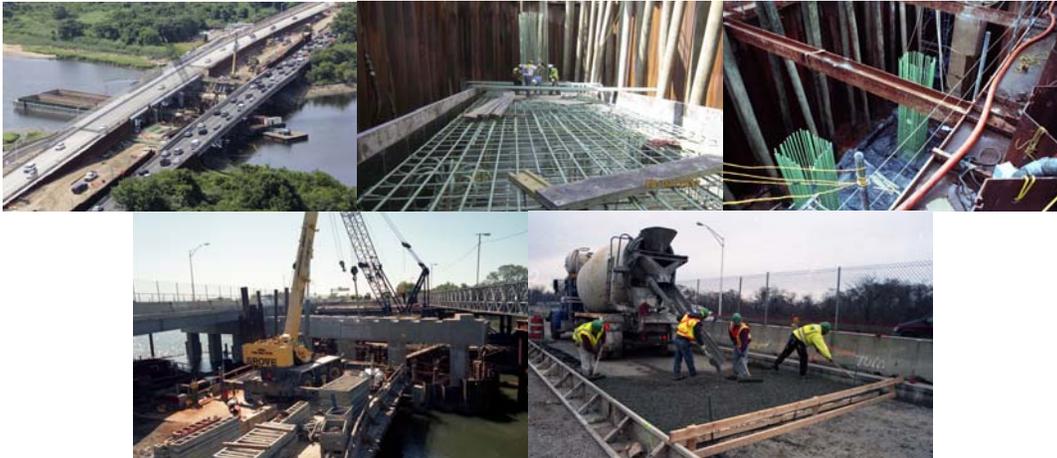
Fresh Creek Bridge March 2011: Westbound Temporary Bridge at Left, Existing Bridge at Right. July 2011: Concrete Pouring in Piles. November 2011: The Remaining Bridge Carrying East Bound Traffic and Temporary Bridge Carrying West Bound Traffic. (Credit: NYSDOT) December 2011: Commenced Installation of Winter Tent Enclosure for Stage IIB Concrete Bridge Deck Placement. (Tent Credit: Daniel Horn)

On March 24, 2012, the new eastbound side of the bridge, including the new bicycle/pedestrian path, was formally opened to traffic. Demolition of the final half of the existing bridge continued and was completed in the spring. As demolition was completed, deep foundation cofferdams were constructed in advance of the pile installation work, which was completed in the spring, followed by the substructure work, which was completed in the summer. Steel erection commenced and was completed in the fall, and concrete deck placements will continue through the winter in accordance with specified winter concrete guidelines and procedures. The new westbound side of the bridge is scheduled to open to traffic in winter 2013.

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Fresh Creek Bridge in February 2012: Concrete Placement. Fresh Creek Bridge in April 2012: Facing East. New Eastbound Approach Roadways, Bridge Deck, Bicycle/Pedestrian Walkway on Right. Temporary Bridge for Westbound Traffic at Left. Old Bridge Demolition at Center. Fresh Creek Facing East. Stage 3 Demolition of Piers of Old Fresh Creek Westbound Bridge. Workers Cutting off Excess Steel Pipe Casing for Cast-in-Place Concrete Piles at Future Westbound Bridge. Temporary Bridge at Left.



July 2012: Temporary Westbound Bridge at Right. New Eastbound Bridge With Pedestrian/Bicycle Walkway at Left. Work Barges in Channel for Pier Construction. August 2012: Pier #1 Westbound. Setting Rebars for Piers and Footing Inside the Cofferdam. September 2012. November 2012.

In 2010, significant progress was made in moving the Rockaway Parkway Bridge through Stage 1 and into Stage 2A. Stage 1 activities that were completed included the removal of the center median slab and curb; the installation of a temporary center median barrier; the paving of the center median and right shoulders to create the additional travel lanes necessary to allow for construction shifts; the installation of temporary street lighting in the center median and along the shoulders; the installation of construction fences and tree protection; the removal of existing trees as specified in the contract; and the installation of soil stabilization and erosion control measures. The existing water main along the east side of Rockaway Parkway was also relocated.

In 2011, construction moved through Stages 2A and 2B, and into Stage 3. Stage 2A began with the shift of traffic to the south side on the approaches and over the bridge to create a work zone for the removal of the north portion of the existing Rockaway Parkway Bridge. Work on the bridge and approaches included the installation of temporary support steel; and the removal of existing deck and support steel. In addition, the widths of the existing westbound entrance and exit ramps were reduced to allow for construction of the new portion of the highway along the west bound shoulder. Excavation, fill and grading to elevation for the new north section of the bridge on the northeast and northwest slopes between the main line and the two ramps was completed and approach pavement sections were placed. The contractor completed the excavation and removal of the existing substructure and the installation of piles and new abutments. Steel erection was completed during overnight hours in early August 2011, and the new concrete bridge deck was placed in late September. Barrier and approach roadway construction, including drainage and electrical work, continued through the fall. The northern section of the new bridge was opened to traffic on December 8 and the traffic pattern shifted to Stage 3 to replace the center portion of the structure. The new ramps were opened in sections with the northern sides of the ramps (Stage 2A) opening in the early summer and the southern

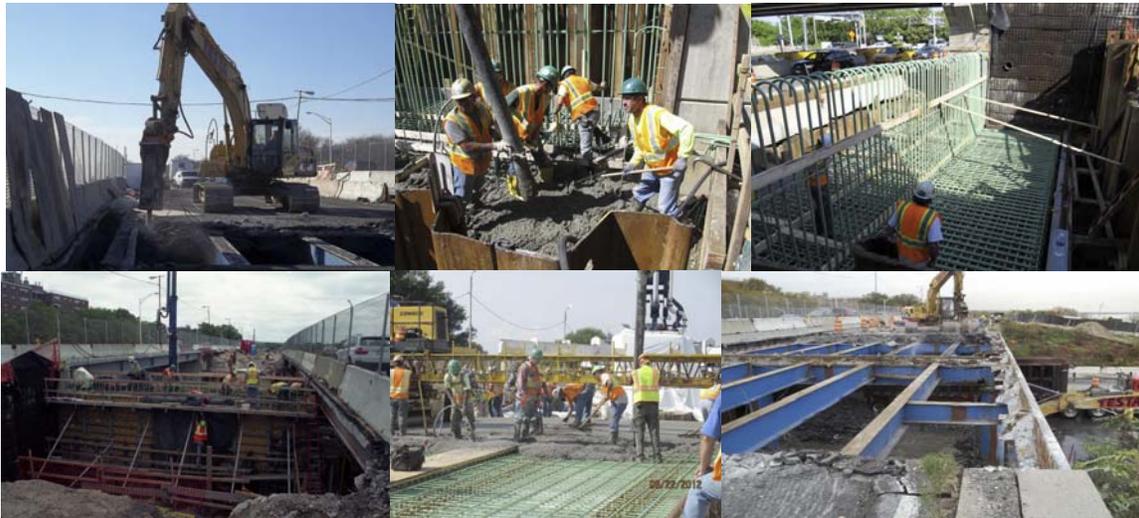
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sides of the ramps (Stage 2B) opening in line with the December opening of the bridge and the shift to Stage 3. Work also continued on the installation of new street lighting around Canarsie Circle to the south of the bridge.



May 2011: Preparing Rebar for Northeast Abutment Footing. October 2011: Pouring Concrete for Northeast Approach. Aerial View in November 2011.

In 2012, construction moved through Stage 3 and into Stage 4. Excavation, fill and grading to elevation for the new center section of the bridge along the main line were completed and approach pavement sections were placed. The contractor completed the excavation and removal of the existing substructure and the installation of piles and new abutments in the spring. Steel erection was completed during overnight hours in July 2012, and the new concrete bridge deck was placed in August. Approach roadway construction, including drainage and electrical work, continued into the fall. The center section of the new bridge was opened to traffic on October 18, and the traffic pattern shifted to Stage 4 to replace the southern section of the structure and the ramps on the south side of the parkway. The final section of the existing bridge was demolished in the fall, and excavation, fill and grading to elevation for the new southern section of the bridge between the main line and ramps commenced. Excavation and removal of the existing substructure and the installation of piles and new abutments will continue through winter 2012 - 2013. The final section of the new bridge and ramps are scheduled to open to traffic in spring 2013.



Rockaway Parkway Bridge in January 2012: Stage III Deck Removal and Concrete Demolition. May 2012: Pumping and Vibrating Plastic Concrete Into West Abutment Forms. June 2012: Rebars for Footing and East Abutment Wall of Eastbound Bridge. August 2012: Placing Deck Concrete at Eastbound Bridge. October 2012: South Side of Old Bridge Under Demolition, Facing East. Eastbound Traffic on New Bridge at Left.

Milestone A consists of all work required to complete the reconstruction of the Paerdegat Basin, Fresh Creek, and Rockaway Parkway Bridges, including all roadway sections and ramps, within the limits of the construction, adjacent to and between the bridge structures. The contract provides for an incentive of \$35,000 per day for each day that milestone A is finished early, with a

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maximum incentive of \$14.98 million. There is a similar disincentive if the milestone date is exceeded, with no maximum.

On October 29, 2012, the New York Metropolitan area was impacted by Hurricane Sandy, causing flooding, loss of power and damage to the bridge and roadway infrastructure. While this damage occurred throughout the City, some of the hardest hit areas were the various highways near the waterfront throughout the City, including the section of the Belt Parkway that is under construction. The damage included: roadway and pedestrian/ bicycle paths that were completely covered with storm wash up and debris and rendered impassable; concrete bridge elements and pedestrian/bicycle paths that were undermined or washed away, including portions of the pedestrian/bicycle paths that were damaged beyond repair or destroyed by the high winds and storm surge; maintenance and protection of traffic devices, including concrete barriers and construction signs, that were displaced or blown away; erosion and sediment control facilities, including the turbidity curtain, silt fence and straw bales, that were displaced or washed away. At Floyd Bennett Field, the established site grades were overwhelmed by the storm surge, ground protection and slope stabilization measures were displaced, and the plantings were uprooted and washed away.

The existing Gerritsen Inlet Bridge is a 520-foot long, 9 span, steel girder and reinforced concrete beam superstructure, supported on reinforced concrete piers, and abutments supported on timber piles. The existing structure and immediate approaches will be demolished and replaced.

The replacement bridge will consist of a 496-foot, 3 span bridge, aligned 10'-6" north of the centerline of the existing structure, and remaining 35 feet over the navigable channel. The bridge will have a 36-foot wide roadway with a 12-foot wide right shoulder and a 4-foot wide left shoulder in each direction. The eastbound side will carry a dedicated pedestrian/bicycle path along the south fascia. Construction is scheduled to begin in early 2013.



Gerritsen Inlet Bridge in 2002. (Credit: NYSDOT) Proposed Gerritsen Inlet Bridge.

Opened on June 29, 1940, the Mill Basin Bridge is adjacent to the Jamaica Bay Wildlife Refuge and the Gateway National Recreation Area. It is the only movable bridge on the Belt Parkway. The current clearance over Mean High Water is 35-feet. 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 2012, the number of openings declined further to a total of only 277 openings.

In addition, significant and costly traffic congestion results from the operation of this outmoded drawbridge. In 2011, the Mill Basin Bridge carried 139,835 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.

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The existing Mill Basin Bridge is 864-feet long and 14 spans, including double movable leaf bascule spans and a steel superstructure, supported on reinforced concrete piers on timber piles, and abutments supported on pre-cast concrete piles. The existing structure and immediate approaches will be demolished and replaced.

The replacement will be a 2,645-foot, 17 span fixed bridge. It will consist of a steel composite superstructure and reinforced concrete substructure on piled footings, and will be constructed on a new alignment set on the north side of the existing bridge and partially overlapping with the existing bridge. The new bridge and approach will have three 12-foot wide traffic lanes, a 12-foot wide right shoulder on the bridge, a 10-foot wide right shoulder on the approach, and a minimum left shoulder in each direction. The eastbound side will carry a dedicated pedestrian/bicycle path along the south fascia. The new bridge will be a fixed structure with a 60-foot vertical clearance over Mean High Water, obviating the need for opening and closing the structure to accommodate tall vessels. The channel will remain navigable during construction, and the clear channel width will remain the same after the new structure is in place. A new fender system will be installed to protect the bridge substructure from marine traffic.



Current and Proposed Mill Basin Bridge. Open Bridge.

The existing Bay Ridge Avenue Bridge is a 58-foot long, single span, reinforced concrete deck on a multi-girder system superstructure over Bay Ridge Avenue. The superstructure is supported by concrete gravity type abutments on pile foundations. The underpass is access to the NYCDEP Owl's Head Waste Treatment Plant. The existing superstructure will be demolished and replaced.

The replacement bridge superstructure will consist of pre-stressed concrete box beams and a reinforced concrete slab. The bridge will have three 12-foot wide lanes in the eastbound direction and two 12-foot wide lanes separated by a 4-foot wide painted stripe flush median in the westbound direction. There is no pedestrian/bicycle path on the structure. The existing bridge will be reconstructed using pre-cast deck sections. The clearance will be increased to 14-feet 6-inches, which removes the need for clearance signs currently posted for a substandard condition and will obviate the need for underdeck wood shielding.

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Bay Ridge Avenue Bridge in 2011. (Credit: NYSDOT) Proposed Bay Ridge Avenue Bridge.

The existing Nostrand Avenue Bridge is a 140-foot long, 3 span, multi-girder superstructure, consisting of a concrete deck with an asphalt overlay over Nostrand Avenue. The superstructure is supported by concrete pier columns with a steel cap beam, and abutments on concrete filled steel pile foundations. The existing structure and immediate approaches will be demolished and replaced.

A computerized traffic simulation model was developed to analyze traffic conditions in connection with the Division's plans to reconstruct these seven bridges on the Belt Parkway. This model was a useful tool for understanding the impact of construction on the traveling public and helped us determine appropriate construction schedules. It enabled us to rapidly evaluate the impact of a variety of combinations of construction staging.

BEVERLY ROAD BRIDGE OVER BMT SUBWAY (BROOKLYN)

This bridge is a three span structure and was built in 1907. The superstructure consists of two built-up through girders, floor beams and stringers. The stringers are encased in a concrete jack arch deck. The superstructure is supported by concrete gravity wall abutments and piers. The project will involve the replacement of the existing deck with a new floor system using a concrete exodermic deck, and the repair of the existing primary members. The work will also include cleaning and painting the steel, and repairing the bridge seat and deteriorated concrete abutments. The bridge will be constructed in three stages and will remain open to traffic and pedestrians at all times. This project, in the final design stage and currently on hold, is expected to begin in early 2016, and is expected to be completed in early 2018.



Beverly Road Bridge in 2009. (Credit: NYSDOT)

HENRY HUDSON PARKWAY OVER 72ND STREET VIADUCT (MANHATTAN)

The viaduct was originally constructed in 1937. Since then, several rehabilitation projects were performed, including deck replacement and structural steel repair at various locations. The

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reconstruction project will consist of repairs of the deck and steel elements of the viaduct superstructure in ten spans from West 72nd Street to West 82nd Street. The deck repairs will include top pavement replacement, concrete barrier repairs and deck joints replacement. The steel repairs will include installation of reinforcements to the deteriorated girders, columns, connections and bearings. The deck top work will be performed in stages to minimize the parkway closures. Construction is expected to begin in 2015.



Aerial View of the Viaduct.

HILL DRIVE BRIDGE (TERRACE BRIDGE) OVER PROSPECT PARK LAKE (BROOKLYN)

The landmark Hill Drive Bridge was built in 1890, and was designed by Calvert Vaux. It was previously known as the Breeze Hill Bridge. The existing Parks bridge is a three span simply supported steel girder/beam structure, with the center arch span crossing Prospect Park Lake, and the other two spans consisting of underground masonry cellular structures with multiple interior masonry-bearing walls and non-composite concrete deck and concrete sidewalk. The substructure of the bridge consists of solid gravity masonry abutments with U-type wing walls.

This project will include the replacement of the existing masonry cellular abutments with new reinforced concrete abutments clad with existing stone and new brick masonry; the removal, storage, and reinstallation of the existing stone wing walls with a new reinforced concrete core; the replacement of the existing stringers and floor beams with new steel stringers; the reinforcement of the existing arch girders with new cover plates; the reinstallation of the steel arch girders at their current locations to replicate original construction; and the replacement of the existing masonry arches spanning between floor beams by masonry cladding on the underside of the new arched concrete deck. The concrete deck, approaches, sidewalk, and roadway will be replaced within the project limits.

The ornamental cast iron and stones will be rehabilitated and reinstalled, replicating all the historic features and aesthetics of the original bridge. New bridge lighting and drainage systems will be installed. The park landscape will be restored, and trees identified by the Prospect Park Alliance as rare and/or historic shall remain undisturbed during construction.

The project to reconstruct the bridge has been suspended until such time as Parks funding is available. Repairs requiring immediate attention are performed by the When and Where contractor. This bridge is closed to vehicular traffic.

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Hill Drive Bridge in 2001. End Approach in May 2011: The Bridge is Closed to Vehicular Traffic. The Left Half of the Bridge is Closed to Pedestrians. (Credit: NYSDOT)

MARINE BORER REMEDIATION (MANHATTAN & BROOKLYN)

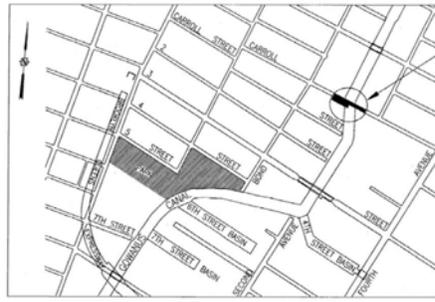
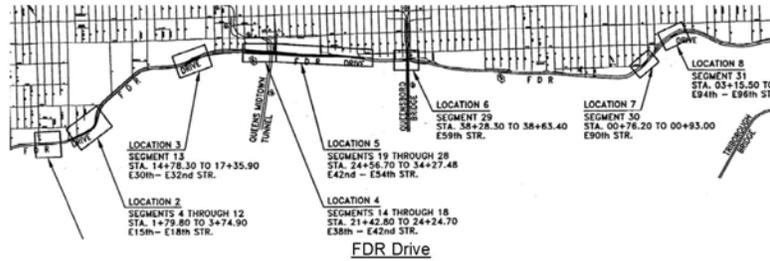
Marine borers pose an immediate and serious danger to the thousands of piles and other structures of timber built in the marine environment. In New York Harbor, as the water quality improved due to many years of clean-up efforts, marine borer (*limnoria*, *teredo*, etc.) activity has increased significantly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



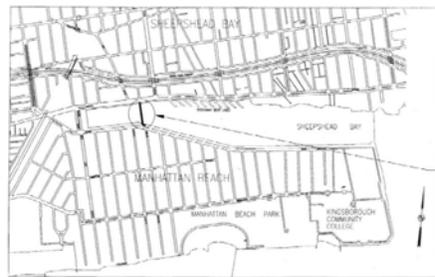
Marine Borer – *Limnoria* Species. Marine Borer – *Teredo* Species. *Teredo* Damage (Holes up to ¼" Diameter).

In October 1999, the Department began a study to assess the existing damage caused by marine borers as well as the potential for future damage at several waterfront DOT structures, including the supporting structures of the relieving platforms along the FDR (from East 15th to East 96th Street) Drive, and the timber piles and structures of the Carroll Street and Ocean Avenue bridges in Brooklyn. The underwater inspection of timber piles supporting the FDR Drive began on May 8, 2000. Inspection of the Brooklyn sites was conducted during the week of October 23, 2000. The inspections were completed in October 2000, and the Marine Borer Evaluation Report was published in June 2001. Using the results of the underwater inspections, preliminary plans were developed for the implementation of repairs and remediation measures to protect the structures from attack. These preliminary plans were completed in December 2001. An updated underwater inspection was performed within the limits of the proposed contract in 2009.

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Carroll St



Ocean Ave

Project Locations.



Severe Marine Borer Infestation in Timber Cribbing of Carroll Street Bridge and Moderate Marine Growth Below Waterline on the Ocean Avenue Pedestrian Bridge in 2009. (Credit: NYSDOT)

The construction project will be performed almost entirely underwater and will include barrier wrapping (placement of plastic barrier wrap around a timber pile to prevent marine borers from settling on and penetration into exposed wood); pile encasement (concrete encasement of selected severely damaged piles to reinforce and protect them from marine borers); pile posting (cutting off deteriorated upper portion of pile and replacing it with a new treated timber post); pile cap encapsulation (encapsulation of submerged timber pile caps and timber fascia with plastic lumber and synthetic mastic); bracing replacement (replacement of structural timber bracing with new treated lumber); timber removal (removing timber stays, bracing and formwork located at the top of the piles); installation of additional two-way bracing (installation of two-way bracing using tread lumber to upgrade the strength of piles by reducing the unbraced length); placement of light

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weight concrete fill (filling in locations where the distance from underside of the platform deck to the top of the mudline is less than one meter creating insufficient headroom for divers to wrap or jacket piles); and superstructure timber replacement (timber pile caps, railing members and other timber superstructure elements along with severely corroded steel correction hardware located above the high water line will be replaced in kind). A Notice to Proceed was issued to the contractor with a start date of April 2, 2012. The construction work is expected to be complete in April 2016.

RIVERSIDE DRIVE BRIDGE OVER WEST 158TH STREET (MANHATTAN)

The Riverside Drive Viaduct is located between West 153rd Street and West 161st Street. It is approximately 1,924 feet long and has 77 spans. This viaduct consists of intermittent straight portions, and six curves of different radii. The bridge carries four lanes (two each way). The superstructure is made of two types of framing. The northern part is a steel bent type structure, whereas the southern part is a steel cantilever type structure with half of the deck over Amtrak railroad tracks. The area below the entire bridge is utilized for storage of Agency vehicles and roadway maintenance materials. Construction is expected to begin in 2017.



Riverside Drive Bridge in 2010. (Credit: NYSDOT)

TRANS-MANHATTAN EXPRESSWAY CONNECTOR RAMP FROM THE HARLEM RIVER DRIVE (HARLEM RIVER DRIVE RAMP TO GEORGE WASHINGTON BRIDGE OVER HARLEM RIVER DRIVE SOUTHBOUND) (MANHATTAN)

The Trans-Manhattan Expressway Connector Ramp is an elevated viaduct that consists of a multi-span steel superstructure supporting a concrete deck. The ramp connects the Trans-Manhattan Expressway to the Harlem River Drive and it was built in 1939. The project will rehabilitate the bridge steel and concrete components. Construction is expected to begin in summer 2014.



Trans-Manhattan Expressway Connector Ramp in 2009. (Credit: NYSDOT)

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5TH AVENUE BRIDGE OVER LIRR & SEA BEACH NYCT (BROOKLYN)

The bridge is a four span concrete-encased steel girder and floor beam structure, built in 1914. The reconstruction project will include replacement of the superstructure, rehabilitation of the abutments and wingwalls, reinforcement of existing piers, construction of new reinforced concrete sidewalks, approach slabs, new concrete parapet, and bridge fence. Construction is expected to begin in May 2019, and is expected to be complete in June 2021.



5th Avenue Bridge in 2011. (Credit: NYSDOT) Aerial View in 2009.

EAST 8TH STREET ACCESS RAMP (GUIDER AVENUE RAMP TO BELT PARKWAY) OVER BELT PARKWAY (BROOKLYN)

The East 8th Street access ramp (Guider Avenue ramp), built in 1942, provides vehicular access to the westbound Belt Parkway from Coney Island Avenue and the surrounding area, south of the Belt Parkway. The bridge also serves pedestrian traffic crossing the Belt Parkway. The bridge was a four span, simply supported, multi-girder steel superstructure with a reinforced concrete deck. The abutments and wingwalls are also reinforced concrete, as are the three piers. The entire substructure is supported on reinforced concrete pile caps and steel piles. The project included the replacement of the superstructure with new steel stringers, a cast-in-place deck including a new sidewalk, a new steel bridge railing with protective screen fencing, and the replacement of the tops of the existing pier columns and abutments. In addition, the piers were modified by adding two columns on new steel pile foundation at each pier, and underdeck and ramp lighting was installed, as well as new storm drainage systems. The ramp was closed to both vehicular and pedestrian traffic for the duration of the reconstruction. Traffic was diverted to local streets.



East 8th Street Bridge Aerial View in 2009.

A Notice to Proceed for the project was issued to the contractor with a start date of August 10, 2009. The bridge was closed to vehicular and pedestrian traffic on February 16, 2010. A temporary detour route was implemented, routing traffic via local streets to access the westbound Belt Parkway. The bridge deck demolition work began in March 2010 and was completed in June 2010. The north and south abutments were partially removed and were reconstructed. New pile

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foundations were installed at piers 1, 2, and 3. The new reinforced concrete bridge columns were completed in February 2011.

The structural steel for the new bridge superstructure was fabricated off site, along with new bridge bearings. The bridge bearings were delivered to the site in March of 2011. The structural steel was delivered in June 2011, and its installation commenced immediately. This was followed by the installation of the bridge deck, which was completed in August 2011. The north and south approach roadways were completed in November 2011. The bridge opened to vehicular traffic on December 2, 2011. The reconstruction of the bridge was substantially completed on May 4, 2012.



2011: Installation of Steel Girders over the South Service Road and Eastbound Belt Parkway. August 2011: Concrete Deck Placement. November 2011: Completed North and South Approach Roadways. December 2, 2011: Bridge Open to Traffic.



East 8th Street Access Ramp – West Side View.

17TH AVENUE AND 27TH AVENUE PEDESTRIAN BRIDGES OVER BELT PARKWAY (BROOKLYN)

The 17th Avenue and 27th Avenue Bridges are three-hinged, steel arch girder bridges with granite-faced concrete abutments and Art Deco steel railings. These two pedestrian overpasses have deteriorated over time, and due to low vertical clearance, have suffered impact damage from overheight vehicle traffic on the Belt Parkway below. In addition, these structures are not in compliance with American Disability Act (ADA) requirements.

The 17th Avenue Bridge provides the only pedestrian access to the shoreline promenade from the

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surrounding Bath Beach and Bensonhurst communities. The 27th Avenue Bridge provides the main pedestrian access from the community to Dreier Offerman-Calvert Vaux Park.

In this project, the overpasses at 17th and 27th Avenues will be completely replaced. The structures will be designed to current codes and standards and all substandard features will be eliminated. Additionally, as the existing bridges were constructed under the Robert Moses era Master Plan for NYC, the proposed bridge designs will follow the Shore (Belt) Parkway Design Guidelines which were developed in November 2006, in order to preserve and reestablish the historic character of the parkway for drivers and pedestrians while enhancing and strengthening the visual cohesiveness of the greenspace connected to the adjacent park and recreation land. Construction is anticipated to begin in July 2014, and is expected to be complete in July 2016.



17th Avenue Bridge. 27th Avenue Bridge in 2012.

EAST 78TH STREET PEDESTRIAN BRIDGE OVER FDR DRIVE (MANHATTAN)

The old bridge was a nine span reinforced concrete structure over the FDR Drive. The bridge provides access from East 78th Street to the East River esplanade by going over the entrance ramp to the southbound FDR Drive and six travel lanes of the Drive. There is a ferry house on the East River Esplanade which was used for storage for the old ferry when the bridge was built in 1940. The bridge was supported on the ferry house structure on the Esplanade side. This project will include the removal of the entire superstructure; concrete deck, floor beams, parapet, girders, railing, protective screening, encased steel beams in the ferry house, existing concrete stair case on the esplanade side, existing substructure of piers, and ramp walls and wall of the ferry house, as well as a portion of the pier foundations below grade. The new fourteen span bridge includes steel piers with caisson foundations, a ramp retaining wall, and new superstructure using welded structural tubing, vertical steel railing, and horizontal hand rails, as well as protective fencing. A new cast-in-place reinforced concrete deck was installed. The west ramp is enclosed with a stone masonry wall to match the existing park wall. The new bridge complies with ADA regulations.

During construction, pedestrian traffic was detoured to the 71st and 81st Street pedestrian bridges. A Notice to Proceed for the project was issued to the contractor with a start date of July 12, 2010. The bridge was closed to pedestrians on October 19, 2010.



Old East 78th Street Bridge. February 2011 at the East Ramp Area: Installing Interim Steel Sheeting on East Side, at Pier Footings # 10 and 11. May 2011.

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In summer 2011, construction of the ramps was in progress. On the night of July 31, 2011, the old bridge and the piers supporting the structure were demolished and moved onto a barge on the East River between 2 AM and 7 AM. To speed the process, temporary support columns, brackets and hydraulic jacks were installed in advance, and the superstructure and pier walls were saw cut. Both the side and main spans were removed using a 500 ton crane.



Removal of the Old Bridge in July 2011.

On the night of October 23, 2011, the new steel for the main span of the bridge was installed, using a crane, between 2 AM and 7 AM. It had previously been assembled in the steel fabricator's yard and transported to the site on barges. The reconstruction of the bridge was substantially completed on January 20, 2012.



The New Bridge Span in Transit from Just North of Philadelphia to Jersey City. It was Then Loaded on the Barge and Brought up the East River to the Site. The Span Size was 26' x 135' and Weighed Approximately 80 Tons.
New Main Span Steel Erection in October 2011. New West Ramp Masonry Wall.

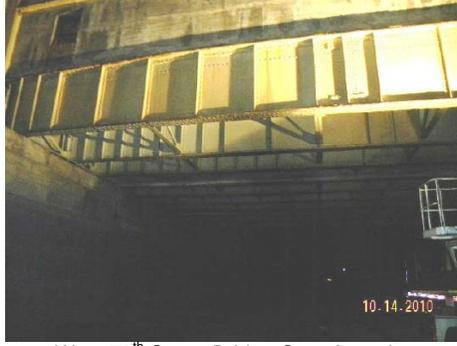


New East 78th Street Bridge in January 2012.

WEST 79TH STREET BRIDGE OVER AMTRAK (MANHATTAN)

The West 79th Street Bridge over Amtrak, built in 1937, is a single span structure, with steel, non-composite girders and a reinforced concrete slab. The bridge carries two lanes of traffic in each direction and has a sidewalk on each side. The project work will include the removal of the existing concrete deck, sidewalks and the pedestrian safety barrier. The deck will be replaced with a 9.5 inch concrete slab with integral wearing surface, a new sidewalk and safety barriers on a rehabilitated superstructure. Construction is expected to begin in March 2017.

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West 79th Street Bridge Over Amtrak
in 2010. (Credit: NYSDOT)

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BRONX, QUEENS, AND STATEN ISLAND BRIDGES

TEN CULVERTS: GALLOWAY AVENUE OVER MARIANNE STREET, FOREST AVENUE OVER CRYSTAL AVENUE, NAUGHTON AVENUE OVER PATTERSON AVENUE, MIDLAND AVENUE OVER HYLAN BOULEVARD, ROCKLAND AVENUE OVER BRIELLE AVENUE, FOREST AVENUE OVER RANDALL AVENUE, GREGG PLACE OVER RANDALL AVENUE, ARTHUR KILL ROAD OVER MULDOON AVENUE, RICHMOND HILL ROAD OVER RICHMOND ROAD, AND ARTHUR KILL ROAD OVER RIDGEWOOD AVENUE (STATEN ISLAND)

This ten culvert reconstruction project is in the final design stage.

The Galloway Avenue culvert is a single span timber pedestrian bridge supported on a concrete abutment. It is located approximately 262.4' east of the intersection of Galloway Avenue and Crystal Avenue. The channel beneath the bridge bisects Galloway Avenue, thereby making the bridge the only means of carrying pedestrians from one side of the channel to the other. The existing bridge will be removed and a new bridge will be constructed. The bridge will be closed during construction.

The Forest Avenue culvert over Crystal Avenue is a single span reinforced concrete box culvert. It is located approximately 230' east of the intersection of Forest Avenue with Crystal Avenue. The reconstruction will consist of the demolition of the existing culvert, clearance of debris from the channel, replacement of the culvert with a concrete deck slab supported on steel beams on reinforced concrete abutment and wingwalls. The construction work is planned to be performed in four stages with proposed two traffic lanes being maintained in each direction (during rush hours) and two lanes at other times.

The Naughton Avenue culvert consists of three parallel reinforced concrete pipes at the north and south ends separated by a twin barrel box culvert. It is barricaded at the east end by guide rail and bordered at the west by a wooded area. The rehabilitation will include repairing the concrete cracks and spalls, cleaning the debris, and replacing the missing anchor bolts for the retractable steel grates.

The Midland Avenue culvert consists of a single span reinforced concrete box, which will be replaced with a new pre-cast box culvert. It is located on Midland Avenue between Boundary Avenue and Mason Avenue. The work will be performed in two stages, with one lane of traffic maintained in each direction.

The Rockland Avenue reinforced concrete culvert project will include concrete repair and a lined and stabilized north embankment. It is located approximately 361' west of the intersection of Rockland and Manor Avenue.

The Forest Avenue culvert over Randall Avenue is a single span concrete box culvert, located at Forest Avenue between Randall Avenue and University Place. It will be replaced with a new precast concrete box culvert with new sidewalks and asphalt pavement. The work will take place in three stages while maintaining one traffic lane in each direction during construction.

The Gregg Place culvert is a single span reinforced concrete box culvert, located approximately 98.4' west of the intersection of Gregg Place and Randall Avenue. It will be replaced at the southern portion with a new precast box culvert with new pavement. The north side of the road will remain open to through traffic.

The Arthur Kill Road culvert over Muldoon Avenue consists of a reinforced concrete pipe at north and a reinforced box culvert at south. It is located on Arthur Kill Road between Muldoon Avenue and Arden Avenue. The box culvert will be replaced with a new box culvert, and a structural lining will be installed in the pipe culvert. The construction will be performed in one stage with one lane of traffic maintained in each direction.

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The Richmond Hill Road culvert consists of a single span stone masonry arch, built in 1845 according to a sign posted by the wingwall of the culvert. It is located on Richmond Hill Road between Richmond and Old Mill Roads. The rehabilitation work will include removing and re-pointing the stone masonry, removing and replacing the fill and asphalt wearing surface above the arch, and cleaning the vegetation and sedimentation. The work is proposed to be completed in one stage utilizing night time hours, when the northbound lanes on Richmond Hill Road will be closed and a detour route will be offered.

The Arthur Kill Road culvert over Ridgewood Avenue consists of a non-reinforced concrete pipe at south and a corrugated metal pipe at north. It is located approximately 100' west of the intersection of Arthur Kill Road and Ridgewood Avenue. The rehabilitation work will include installing a structural lining inside the concrete pipe and repairing the concrete at the head walls and catch basins. There will be two stages of construction and one lane of traffic will be maintained in each direction.

This project to rehabilitate and/or replace the ten culverts is currently in the final design stage, and is expected to begin in August 2014 and to be complete in 2015.



Galloway Avenue over Marianne Street, Forest Avenue over Crystal Avenue. Naughton Avenue over Patterson Avenue, Midland Avenue over Hylan Boulevard. Rockland Avenue over Brielle Avenue, Forest Avenue over Randall Avenue. Gregg Place over Randall Avenue, Arthur Kill Road over Muldoon Avenue. Richmond Hill Road over Richmond Road, Arthur Kill Road over Ridgewood Avenue.

BRYANT AVENUE BRIDGE OVER AMTRAK AND CSX (BRONX)

The Bryant Avenue Bridge, oriented east to west between Buckner Boulevard and Garrison Avenue, is a one span structure constructed in 1908. It spans 90 feet over four railroad tracks. This project includes replacement of the steel superstructure, bearings, approaches, water mains and rehabilitation of the existing substructures by removing and replacing the top portion of the concrete abutments to accommodate the new superstructure. The abutments will be retrofitted to meet seismic criteria. The proposed superstructure will consist of a reinforced concrete deck over pre-stressed concrete adjacent box beams. The two existing water mains will be removed and replaced. Both water mains will be installed on top of the north sidewalk in a fenced-off area. The Division's in-house design staff will now complete the design for this project. Construction is expected to begin in spring 2014, with a duration of eighteen months.

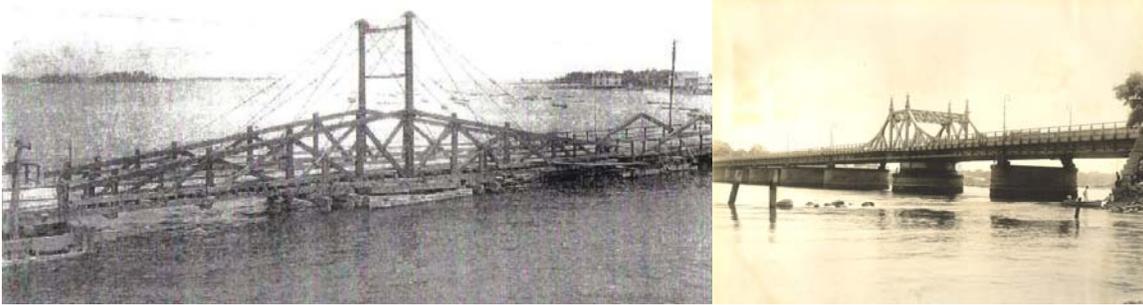
ACCOMPLISHMENTS & PLANNED PROJECTS



Bryant Avenue Bridge in 2011. (Credit: NYSDOT)

CITY ISLAND ROAD BRIDGE OVER EASTCHESTER BAY (BRONX)

The existing City Island Road Bridge was built in 1901 and is the only vehicular, bicycle and pedestrian access between the mainland Bronx and City Island. In 2011, the bridge carried 14,480 vehicles per day. The bridge is part of City Island Road, which is located within Pelham Bay Park and crosses over Eastchester Bay. With seven spans and six piers in the water, the bridge has outlived its useful life and requires extensive continuous maintenance.



Original City Island Bridge in 1873. Bridge in 1928.



Aerial View of Current Bridge. Welcome Sign.

The existing bridge will be replaced along the same alignment with a new single span, single tower cable-stayed bridge which will be a unique structure type in the NYC area. The new bridge will be approximately 17 feet wider than the existing one to accommodate three standard 12-foot wide traffic lanes, a 6-foot wide bicycle lane and a 6-foot wide pedestrian walkway on each side. The tower and concrete counterweight for backstay anchorage of the new bridge will be located in Pelham Bay Park. The new bridge will be designed to current standards and with its wider roadway width, will allow future repair and rehabilitation to be carried out while maintaining one 12-foot lane in each direction. It will also eliminate the vehicle height restriction caused by the existing overhead truss. In order to maintain traffic during the demolition of the existing bridge and construction of the new bridge, a temporary bridge will be constructed on the south side of

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the existing bridge. Marine traffic will remain undisturbed beneath the bridge during peak boating season.

At the City Island side there is a seawall along the shore which is about 500 feet in length starting from the bridge and heading in a southerly direction. This seawall will be rehabilitated and turned over to the Department of Parks and Recreation along with the esplanade which it is supporting.



Existing Seawall.

Turtle Cove Culvert is located under City Island Road approximately half a mile west of the existing bridge. As part of the wetland impact mitigation activities for the project, this culvert will be replaced with a larger one that will allow for greater tidal flooding from Eastchester Bay to the upland portions of Turtle Cove.



City Island Road Bridge in 2010. (Credit: Bojidar Yanev) Vertical Clearance Posting. (Credit: NYSDOT) 9 Foot Tall Ornamental Finial.

The project is currently in its final design phase. The construction phase for this Federally-funded project is scheduled to begin in summer 2013 with an approximate duration of 3 years.



Rendering of New City Island Road Bridge. Side View Rendering of New City Island Road Bridge.

CLAREMONT PARKWAY BRIDGE OVER METRO NORTH RR (BRONX)

The Claremont Parkway Bridge was built in 1889, with major reconstruction in 1938. Claremont Parkway is a roadway link in the Crotona Park section of the Bronx where the street system features few continuous east-west routes. The existing bridge is a steel superstructure encased

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in concrete supported on the original stone masonry abutments. It spans the tracks of the extremely busy Harlem Valley and New Haven lines of Metro-North Railroad, an essential regional commuter link between the northern areas of the metropolitan region, key points in the Bronx and Harlem, and the Manhattan central business district. Reconstruction will extend the life of the bridge by 40 years.



Claremont Parkway Bridge. (Credit: NYSDOT) Looking Northwest in 2008.

The reconstruction of the bridge will include removal of the entire superstructure and approaches. The new bridge will consist of pre-stressed concrete box beams supporting a reinforced concrete deck and approach slab, concrete sidewalks and reinforced concrete parapet walls with protective fencing, and reconstructed approach roadways. A portion of both existing abutments will be removed to accommodate the new bridge profile. The utility work will include the installation of two new water mains, a gas main, and electrical conduits. The bridge will be constructed in four stages, with one traffic lane and one sidewalk open in each direction at all times during construction. A Notice to Proceed for the project was issued to the contractor with a start date of April 4, 2011.

The contractor began setting up the maintenance and protection of traffic for stage 1 construction on July 11, 2011. All Stage 1 demolition was completed in October 2011. By the end of 2011, the contractor completed the installation of vertical protective shielding above the existing abutment, the demolition of the existing abutment caps and forming, the placement of reinforcing bars, and the placement of concrete on each of the abutment caps.



Existing North Side Guardrail and Fence. Proposed Guardrail and Fence. Stage 1 in October 2011: Removal of the Existing Bridge Girders.



Installation of Pre-Cast Box Beams for Stage 1 in November 2011.

In 2012, the contractor completed the removal and reconstruction of the southern half of the bridge (Stage 1 Construction) and reconfigured the work zone traffic control. Traffic was detoured onto the newly constructed half of the bridge in August 2012. The contractor then began

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preparatory work (such removing existing utilities, saw cutting concrete deck for removal, removing exiting bridge rails and the protective fence) for the removal and reconstruction of the remaining portion of the existing structure as part of Stage 2 Construction activities. Construction is expected to be complete by May 2013.



October 2012: Second Stage Demolition: Removal of the Remaining Portion (10 Concrete-Encased Steel Girders) of the Existing Bridge Superstructure.

GRAND CONCOURSE BRIDGE OVER METRO NORTH (BRONX)

The bridge was originally built in 1906. It is a single span bridge consisting of a concrete deck supported on five steel plate girders, one truss, and a steel truss subway structure located in the center of the bridge. The bridge carries three lanes of vehicular traffic in each northbound and southbound direction as well as NYCT subway traffic underneath the Grand Concourse Boulevard and above the Metro North railroad right of way. The upper portion of the bridge carrying the roadway is now structurally supported by the lower portion carrying the subway. The two portions of the bridge are dependent upon each other for support and stability but are being maintained individually by two separate agencies, the NYC Department of Transportation, and NYC Transit Subways respectively. The subway portion of the structure, comprised of four warren trusses, is stabilized by the roadway portion floor beams and the roadway portion is supported by the subway trusses.

In the new rehabilitation scheme, the roadway will be supported independently from the subway structure: the structures will be physically separated. Steel members will be added to the subway trusses to provide the stability previously provided by the roadway portion floor beams. The substructure consists of two concrete abutments bearing on rock ledges. The tops of these abutments lie at two levels, an upper level which supports the bridge stringers and a lower level which supports the subway trusses. The bridges stringers over the subway tracks bear on a composite steel beam/concrete backwall which will be replaced as part of this project. The foundation for the new trusses being installed to carry the roadway superstructure will bear on the rock behind the existing abutments.

The reconstruction project will also include building new sidewalks, as well as bridge railings with protective fencing, expansion deck joints, electrical conduits and fixtures, and the relocation of the existing water main under the sidewalk. Two lanes of vehicular traffic and the pedestrian

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walkway will be maintained in each direction on the Grand Concourse. Deterioration was discovered during a final design inspection to assess the structural condition of the bridge, and the consultant has been instructed to prepare an interim load rating to establish the structural capacity. This project, currently in the final design phase, is expected to begin construction in February 2018, and is expected to be complete in May 2020.



Grand Concourse Bridge over Metro North in 2002. (Credit: NYSDOT) Aerial View. Sidewalk.

GRAND CONCOURSE BRIDGE OVER EAST 174TH STREET (BRONX)

The bridge was originally built in 1914 as a reinforced concrete arch and in early 1931, a major reconstruction was performed to accommodate a truss bridge structure to carry subway trains. The subway structure is supported on its own concrete piers. The superstructure consists of two single in-fill concrete arches carrying Grand Concourse across East 174th Street. In between those two arches, NYCT has a steel structure supporting their tracks underneath Grand Concourse and crossing above East 174th Street. The arch substructures consist of massive reinforced stem walls bearing on rock. The subway structure piers are supported on individual concrete footings with steel grillage bearing on rock.

The project will include replacing the existing roadway, sidewalks and parapets with new reinforced concrete deck slab, providing bridge railing and fencing, repairing concrete arches by adding reinforcing bars with concrete encasements to the entire underside and top of arches to make the bridge seismically resistant, repairing east/west spandrel walls, and replacing the subway bearings at pier support.

This project is expected to begin construction in September 2018, and is expected to be completed in August 2020.



Grand Concourse Bridge over East 174th Street in 2007.

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

This eleven span landmark structure is the oldest (circa 1848) bridge over the Harlem River. The bridge is under the Department of Parks and Recreation's (DPR) jurisdiction. It was erected to

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carry water from the Croton aqueduct, and has been closed since 1970. The bridge spans the Harlem River, connecting the neighborhoods of Highbridge in the Bronx and Washington Heights in Manhattan.

Designed on principles of Roman aqueduct architecture, the granite bridge is about 116 feet in height, with the peak of its arches 100 feet above the Harlem River. The bridge is 1,450 feet long, measured from gatehouse to gatehouse, with a 1,200-foot-long brick walkway. The High Bridge was begun in 1839 and completed in 1848. Larger water pipes were added and the walkway was built in 1861-64. In 1927-28, after many years of calls for complete demolition of the bridge, the city replaced five of the original 15 arches with a central steel span to ease the passage of large ships. The rest of the majestic stone arches still stand, the majority on the Bronx side of the river. The bridge has never carried vehicles.

In support of DPR, the Division prepared a detailed scope of work for the comprehensive in-depth inspection of the bridge. Engineering consultants conducted this inspection, which was completed in the summer of 2006, at an estimated cost of \$2.5 million. The Division administered and supervised this work.



High Bridge Pedestrian Bridge in 2004. (Credit: Michele N. Vulcan)

The \$61.73 million restoration of the bridge is being managed by the New York City Department of Design and Construction in partnership with DPR. The reopened High Bridge will be an essential link in New York City's expanding waterfront Greenway. It will allow Bronx residents to reach the Highbridge Pool and Recreation Center, and Manhattan residents to reach the Harlem River shoreline. Planned improvements will make the bridge more accessible and safe. The rehabilitation will follow historic preservation principles to restore the architectural details of this landmarked structure for public enjoyment.

Both the central steel span and the stone arches will be cleaned and repaired; the steel span will be repainted and the masonry structure will be repointed and strengthened. Architectural lighting will be installed beneath both spans. The brick paver walkway on top of the structure will be removed and reconditioned, new waterproofing and concrete will be installed, then the historic brickwork will be reinstalled. The aqueduct running beneath the structure will be repaired and stabilized. New lampposts and safety fencing will be installed and the original iron railing will be repaired. Barrier-free access ramps will be built on both sides of the bridge to allow access for the disabled. Three viewing platforms with bench seating will be installed along the length of the bridge.

The design of the restoration of the bridge was completed in December 2011. Construction began in August 2012, and is expected to be complete in summer 2014.

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Rendering of the Restored High Bridge. View From the Bronx to Manhattan. View From Manhattan to the Bronx.

HIGHLAND PARK PEDESTRIAN BRIDGE OVER PEDESTRIAN PATH (QUEENS)

The Highland Park Pedestrian Bridge, built in 1935, is a single span arch structure with a clear opening of 60 feet under the bridge. Unlike a conventional steel or concrete bridge structure, the main structure is a brick masonry arch, with wing walls and parapet walls consisting of stacks of random size rocks set in mortar. The height of the parapet walls from the roadway surface varies from two to four feet. The bridge, located inside Highland Park, spans a hiking trail, and carries pedestrian and bicycle traffic. It is 27 feet wide with neither sidewalks nor shoulders.

A recent inspection revealed significant deterioration of the masonry arch. The project, currently in the preliminary design phase, will include the rehabilitation of the existing brick masonry arch structure and the specialized wearing surface. The bridge will be closed to all traffic and will be reconstructed in one stage. Construction is expected to begin in July 2014, and is expected to be complete in eighteen months.



Highland Park Bridge.

METROPOLITAN AVENUE (FRESH POND) BRIDGE OVER LIRR -NY&ATL (QUEENS)

This bridge is a two span structure built between 1914 and 1915. It spans over the Long Island Railroad (LIRR) Montauk Branch and carries the roadway that is part of the intersection of Metropolitan Avenue with Fresh Pond Road and the adjoining property of the former Mobil gasoline station which was acquired by the City. The superstructure consists of concrete encased steel beams with a concrete deck and varying depths of asphalt wearing surface. The substructure consists of a reinforced concrete pier and gravity type plain concrete abutments and wing walls.

Currently the project is on hold pending resolution of the railroad vertical clearance issue. The existing vertical clearance over LIRR tracks is 15 feet 9 inches. Per New York State Railroad Law Section 51-a (7), a minimum clearance of 22 feet is required over a railroad whenever a structure built prior to 1959 is to be reconstructed unless a waiver is granted by NYSDOT. Since a 22 foot clearance was not achievable due to the existing grades of the bridge being restricted by adjacent buildings and the constraint from an existing sewer line under the tracks, the waiver

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request was not granted by NYSDOT. However, NYSDOT agreed to a clearance of 20 feet 6 inches.

One alternative to achieve the required 20 feet 6 inches clearance is to lower the railroad tracks. The primary obstruction to lowering the railroad tracks is the existing 60" diameter combined sewer which runs along the centerline of Fresh Pond Road. The sewer crosses beneath the tracks and is approximately 3 feet below the top of rail. To lower the tracks, the combined sewer must be rerouted or reconfigured (or both).

In September 2012, the LIRR and NY Atlantic Railways agreed to have 17 feet 6 inches clearance as an immediate goal and 20 feet 6 inches as a future goal. NYSDOT then recommended that both railroads should proceed to file a clearance waiver request to NYSDOT for the required 17 feet 6 inches. The new waiver request will outline the provisions that would be incorporated into the current design to achieve the future 20 feet 6 inches clearance with minimal impact to the new bridge structure. Construction is expected to begin in July 2014, and is expected to be complete in the summer of 2017.



Metropolitan Avenue Bridge in 2009.
(Credit: NYSDOT)

ROOSEVELT AVENUE BRIDGE OVER VAN WYCK EXPRESSWAY (QUEENS)

The existing bridge is a two level dual-use steel viaduct consisting of 27 spans. The first level, which carries Roosevelt Avenue, consists of a plate girder floor beam system supported by steel columns, intermediate piers supporting a bascule span spanning over the Van Wyck Expressway, and end abutments. The second level of the viaduct supports and carries the overhead NYC Transit Authority's #7 – Flushing line subway structure. It is an essential regional facility and truck route that links communities east and west over the Grand Central Parkway and provides access to Flushing Meadows Park, the National Tennis Center, and Citifield, home of the New York Mets.

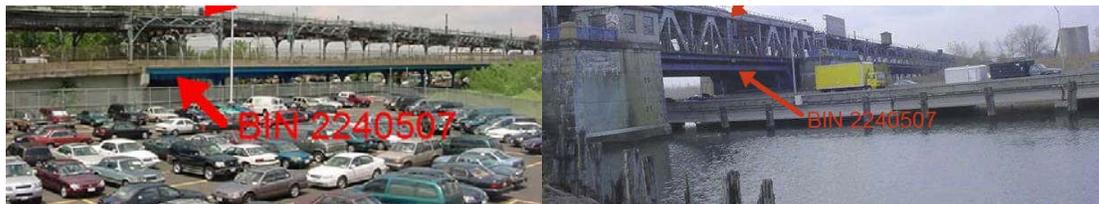
Concrete deck repairs were performed in July, August, and October of 2003, June and July of 2004, April, May, June, and July of 2005, and June and July of 2006. In the summer of 2005, the When and Where contractor repaired red and yellow flag conditions caused by damage by oversized trucks using the Van Wyck Expressway. Red-flagged steel shoring and yellow-flagged cracked stringer connection angles were repaired in the spring of 2008.

The project, currently in the final design phase, will include the construction of a new concrete-filled steel grid deck, rehabilitation of the existing east and west viaduct sections, bascule span, piers, abutments, and painting of the entire bridge. In addition, a new bicycle/pedestrian path will be constructed on the north and south sides of the bridge.

The lower level carrying Roosevelt Avenue will be reconstructed in three stages. Both vehicular and pedestrian traffic will be maintained throughout the construction of the bridge, with one lane in each direction.

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This federally-funded project is currently in the final design phase with construction anticipated to start in February 2014 and to be complete in October 2017.



Roosevelt Avenue Bridge (#2240507) in 2002 and 2004. (Credit: NYSDOT)

SHORE ROAD CIRCLE BRIDGE OVER AMTRAK (BRONX)

This project will include the removal of the existing two span bridge and the construction of a new single span bridge structure with a reinforced concrete deck over steel girders. The work will also include the construction of new reinforced concrete abutments and wing walls, as well as new parapet walls with protective steel fences. The bridge will be reconstructed in three stages, with one lane of traffic maintained in each direction during construction. A Notice to Proceed for the project was issued to the contractor with a start date of May 18, 2008.



Shore Road Circle Bridge in June 2009 and August 2010. (Credit: NYSDOT)

Construction was expected to begin in May 2008, however, due to Amtrak's inability to provide the electric traction crew services for track outage, the construction activities on this project were on hold from September 21, 2008 until April 15, 2009.

Construction activity during 2010 included the following: High voltage overhead cables were relocated, allowing construction work to proceed at the west abutment; temporary shoring towers were erected to allow the demolition of the super structure; and soldier piles were drilled behind the abutments and excavation supporting systems installed prior to start of the removal of the existing stone abutments. In the fall of 2010, the contractor started excavating behind the abutments to prepare for the removal of the old abutments and wing walls.

Construction activity during 2011 included the following: Removal of existing sidewalk and steel beams for Stage-1B; installation of protective shielding for Stage-2; demolition of Stage-1A/3A and 1B/3B east and west abutments; pouring of concrete for abutments Stage-1A/3A and 1B/3B; installation of prefabricated structural drain behind Stage-1A/3A and 1B/3B abutments; backfilling behind Stage-1A/3A and 1B/3B east and west abutments; application of protective sealant for Stage-1A/3A and 1B/3B substructure; erection of steel beams for Stage-1A and Stage-1B superstructure; installation of protective shielding for Stage-1A and 1B; pouring of concrete for Stage 1A and Stage 1B superstructure slabs; installation of conduits for Street lighting, high voltage, and communications; and placement of temporary asphalt concrete pavement for stage-1A and Stage-1B east and west approaches.

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Shore Road Circle Bridge in April 2011 – July 2011. November 2011: Deck Placement.

Stage 1A/1B was completed in January 2012. This included new footings, abutments, wing walls, steel stringers and reinforced concrete decks at the north and south fascias. Vehicular traffic was detoured onto the newly constructed portions of the bridge in February 2012. During the remainder of 2012, the contractor began and completed the demolition of the remaining portion of the existing bridge, construction of the final section of new reinforced concrete substructures, the steel superstructure supporting reinforced concrete deck slab, reinforced concrete approach slabs, installation of conduits for street lighting, high voltage line, and communication lines and placement of temporary asphalt concrete pavement for Stage-1A and Stage-1B. Work in progress includes the installation of the armor joint system and preparatory work for placement of concrete for the two closure pour on the bridge concrete deck slab. Construction is expected to be complete in spring 2013.



Shore Road Circle Bridge in April 2012: Placing Concrete for Stage 2 West Abutment Footing. May 2012: Stage 2 Backfill Behind East Abutment. East Abutment Backwall Rebar Installation. June 2012: Backfill Behind Stage 2 West Abutment. Painting of East Abutment Back Wall and Pedestals. June 2012: Removing Brackets from Stage 1A/1B. Installing Expansion Bearings at East Abutment in Stage 2.



Steel Girder and Shielding Plank Installation on June 14: June 2012: Installing Brackets for Superstructure Slab.



June 2012: Removing Soldier Piles Behind the West Abutment. June 2012: Formwork for Stage 2 Superstructure Slab. July 2012: Formwork for Stage 2 Deck.

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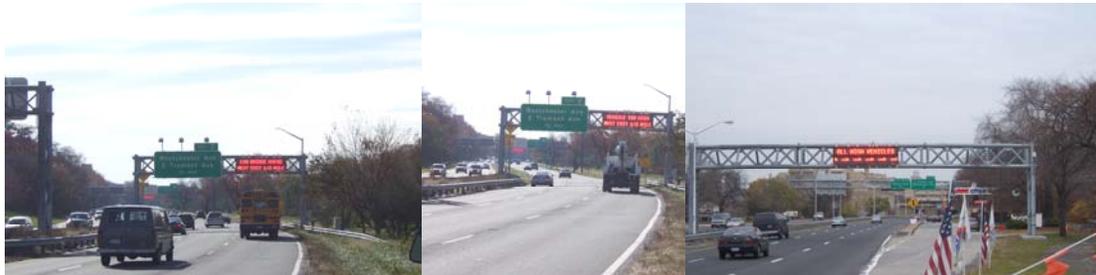
July 2012: Formwork for Stage 2 Deck. December 2012: Removing Shielding and Formwork.

WESTCHESTER AVENUE BRIDGE OVER THE HUTCHINSON RIVER PARKWAY (BRONX)

This two span continuous multi-stringer bridge is supported by reinforced piers and abutments. The bridge spans over the Hutchinson River Parkway and it supports the NYCT elevated subway structure of the Pelham Bay Line. It was built in 1940 by the Triborough Bridge and Tunnel Authority. No major modifications to the bridge are recorded except for minor repairs at the south approach sidewalk and temporary flag repairs to bridge girders damaged by vehicle impacts in the southbound and northbound roadway. A project to install an ITS solution, which includes an overheight vehicle detection system that flashes signs directing vehicles identified as being over 9' in height to exit the parkway, was substantially completed on December 3, 2004. The contractor completed extra work associated with landscaping in the spring of 2006. The underdeck at both spans is currently covered by approximately 154 square feet of timber planking. In addition, the underdeck at span 1 is covered with approximately 18 square feet of steel wire mesh netting.



Westchester Avenue Bridge in 2001 and 2006. (Credit: NYSDOT) Overheight Sensor Unit on the Hutchinson River Parkway. (Credit: Roly Parroco)



Vehicle Detection System.

The Westchester Avenue Bridge's vertical clearance over the Hutchinson River Parkway is sub-standard. Due to the number of truck and bus vehicles that mistakenly enter the Hutchinson River Parkway, where commercial vehicles are not allowed, the fascia steel girders of the bridge have been severely impacted and damaged numerous times.

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Damaged Bridge, Cargo Container, and Contractor Truck After An Over-Height Trailer Struck the Bridge in January 2012.

The rehabilitation of the bridge will include the replacement of the existing reinforced concrete deck slab with a new reinforced concrete deck, steel faced curbs, a new parapet wall and protective screenings, concrete sidewalks, rehabilitation of the damaged steel fascia girders, and replacement of the diaphragms and other bridge elements, including a new steel water main.

In March 2011, a value engineering study was conducted in which it was recommended that further studies of alternative options be performed to raise the bridge clearance through a shallower bridge structure and/or by raising the roadway profile above the bridge. The consultant is currently investigating the feasibility of the study's recommendations to modify the bridge superstructure in order to improve the vertical clearance under the bridge without lowering the highway.

The designer is currently studying ways to increase the vertical clearance of the bridge over the parkway without adversely impacting the NYCT elevated structure and its transit train operations. This may entail temporary support of the transit structure in order to replace the existing roadway bridge structure in stages with a thinner more efficient structure to gain additional clearance over the parkway below.

This rehabilitation project is currently in final design. Construction is expected to begin in September 2015, and is expected to be complete in May 2018.

WHITESTONE EXPRESSWAY/VAN WYCK EXPRESSWAY (SB) TO CROSS ISLAND PARKWAY EB) OVER ACCESS ROAD FROM WHITESTONE EXPRESSWAY/VAN WYCK EXPRESSWAY (QUEENS)

The bridge is a multi-girder, single span, simply supported structure with a span length of 77 feet and is 24 feet wide curb to curb. There are two lanes (one way) on the bridge. The substructure consists of two gravity type concrete abutments. The west and east abutments of the existing bridge are a continuation of the abutments of the overhead bridge. Construction is expected to begin in August 2018, and is expected to be completed in 2020.



Bridge (Lower Structure) in 2010. (Credit: NYSDOT)

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EAST 175TH STREET BRIDGE OVER METRO NORTH (BRONX)

The East 175th Street Bridge over Metro North was originally built in 1889 and it underwent reconstruction in 1938. The reconstruction work included a new steel superstructure, concrete deck slab and sidewalk in conjunction with repairs to the existing stone masonry substructure and relocation of various utilities. It is a single span multi-girder steel structure with a steel reinforced concrete deck, and it measures 61.68 feet long from abutment to abutment and 60 feet wide from parapet to parapet. Construction is expected to begin in 2019.



East 175th Street Bridge in 2002. (Credit: NYSDOT) South Sidewalk.

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Specialty Engineering and Construction

Design-Build

In 2012 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.

BRUCKNER EXPRESSWAY BRIDGES (NB AND SB) OVER AMTRAK & CSX (BRONX)

The Bruckner Expressway, named in honor of former Bronx Borough President and Congressman, Henry Bruckner (1871-1942), opened in 1973 and was one of the last roads on the New York City Expressway system to be built. It is a major connecting link between the Robert F. Kennedy (Triborough) Bridge and the New England Thruway. The Bruckner Expressway Bridges are single span bridges on the Bruckner Expressway which run over the Amtrak/CSX railroads. Built over 60 years ago, the Bruckner Expressway Bridges carry over 140,000 motorists and cyclists daily. The existing northbound bridge is a 124-foot single-span multi-girder steel superstructure with a cast-in-place concrete deck.

Amtrak operates their Northeast Corridor commuter rail lines on two tracks underneath the Northbound and Southbound Bridges. The tracks provide service between Penn Station in New York City and South Station in Boston. CSX operates freight trains on two tracks underneath the Northbound and Southbound Bridges. The tracks facilitate transportation of freight throughout the region.

The new bridge consists of precast concrete deck panels supported by new steel girders. The existing southbound bridge is a 115-foot single-span steel superstructure consisting of three thru-type trusses. The floor beams hang from the truss bottom chords and steel stringers span between floor beams. The existing cast-in-place concrete deck was supported by the steel stringers. The new deck is a precast concrete deck which spans the floor beams.

A tanker truck carrying home heating fuel overturned and caught fire on the northbound bridge on the evening of October 4, 2005. The traffic on the bridge, and on the Amtrak and CSX railroad lines below, was adversely affected. The bridge was inspected and core samples of the concrete from the fire-affected deck were tested. Division crews assisted in emergency repairs and clean-up, re-setting all expansion plates on the abutment, and performing deck repair. The crews worked continuously, and the roadway was reopened in time for the morning rush hour on October 6, 2005.

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Bruckner Expressway Bridge NB in 2002. Bruckner Expressway Bridge SB in 2008. (Credit: NYSDOT)
2005: The Tanker Truck. (Credit: Bojidar Yanev)

To protect the trains and railroad facilities below the bridge after the October 4, 2005 tanker truck fire, contractor crews began the nighttime installation of protective timber shielding under the bridge on October 5, 2005. The project was completed on November 8, 2005. The Division's Surveying Unit assisted the Inspections Unit in monitoring the deflection of the bridge.

The fire on the bridge weakened its members. While the immediate results of the fire were addressed by in-house forces, the aftereffects remain unresolved. The inspection conducted on September 14, 2006 revealed that at least four girders have sagged and they are hit by CSX railroad cars below. The concrete deck has separated from the steel girder and there is a one to two inch gap between the top of the flange and the bottom of the haunches. In addition, the diaphragms between the girders have been burned and their capacity has been weakened. Repairs requiring immediate attention were handled by the When and Where contractor. The contractor installed additional timber bracing of the bridge's timber shielding in January and February 2007, performed emergency removal of loose underdeck concrete in July and August 2007, and repaired a red flag condition at the bridge stringers in September 2007. The replacement of the bridge's northbound superstructure and the southbound deck is being done under a Design-Build contract. The scope of work for the northbound bridge includes superstructure replacement, reconstruction of abutment back walls and bridge seats, bearing replacement, highway reconstruction 200 feet from the beginning and end abutments, and the installation of a new 20-inch diameter water main and new electrical ducts. The scope of work for the southbound bridge includes deck replacement, bearing replacement, back wall reconstruction, rehabilitation and painting of the existing steel truss superstructure, highway reconstruction 200 feet from the beginning and end abutments, and the installation of a new 12-inch diameter water main and electrical ducts.

A Notice to Proceed was issued to the contractor with a start date of October 27, 2008. Due to delays in obtaining the railroad force account agreements, the contractor focused on work off-structure, such as the water main and the installation of complex maintenance and protection of traffic. Demolition of the northbound structure commenced in November 2009.

Girder removal for Stage 1 and the lead paint removal were completed in February 2010. Demolition of the northbound back wall at both the beginning and end abutments was completed in March. The precast back wall and bridge seats were installed, and bearing placement on the northbound bridge was completed in April. The southbound bridge floor beam encasement removal was completed in June, as was installation of northbound deck panels.

Stage II on the northbound bridge began in August 2010. Painting of the southbound bridge floor beams and counter weight work was completed in September. South bound bridge shielding and deck panel removal was completed. Installation of the precast back wall of the northbound bridge was completed and northbound girders were installed in November. Stage II deck panels were placed in December.

Excavation of the east approach for the new roadway alignment was completed in January 2011. Steel repairs on the southbound structure and deck panel installation were completed in April. Bridge bearing removals and replacement, lead abatement and the excavation of the west side approach on the southbound bridge were completed in May. Installation of the sidewalk on the south bound bridge was completed in June. Southbound Stage 2 saw-cutting of deck panels, northbound Stage 3 approach work, asbestos removal, water main removal, and Installation of

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the temporary deck panels for the southbound bridge were completed in August. Installation of the Stage 3 northbound bridge formwork for the beginning abutment back wall concrete, and demolition of the southbound bridge were completed in December 2011. Other southbound and northbound Stage 3 work was in progress by the end of the year, as well.



Southbound Bridge Existing Deck Demolition and Deck Panel Installation. August 2011: Stage 2 Assembling and Welding Steel Packs for Southbound Bridge.

Girder installation on the northbound bridge was completed in January 2012. Stage 3 deck panel installation on the northbound bridge and installation of sidewalk deck panels on the southbound bridge was completed in April. Stage 3 sidewalk and curb work for the southbound bridge was completed in May. The design-build reconstruction of these bridges was substantially completed on November 20, 2012.



May 2012: Southbound Mainline Roadwork. June 2012: Northbound Service Road Beginning Approach.



Painting of the Southbound Bridge Truss in September 2012. (Credit: Richard Solomon). Associate Project Manager Richard Solomon Inspecting Inside the Containment.

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Completed Bruckner Expressway Bridges in November 2012.

FDR DRIVE AT HOUSTON STREET OVERPASS (MANHATTAN)

The overpass consists of three bridge structures. The main bridge is a two-span reinforced concrete slab structure spanning over the FDR Drive's northbound and southbound roadways. Two approach ramp structures provide access to and from the FDR Drive northbound roadway and the main bridge. Each of these structures is also a reinforced concrete slab structure supported on longitudinal concrete walls that run adjacent to the FDR Drive's northbound roadway. These bridges were constructed circa 1953, and are thus almost 60 years old. On the main bridge, the superstructure slab is supported on bearing wall abutments continuously founded on piles, and on one pier at the center of the FDR Drive that consists of a steel cap beam supported on multi-steel columns continuously founded on piles. The structural slabs have asphalt overlays, and the main bridge has three sections of concrete sidewalks. The project is expected to begin in summer 2015.



The Three Structures of the FDR Drive at Houston Street Overpass. (Credit: NYSDOT)

HARLEM RIVER DRIVE BRIDGE AT EAST 127TH STREET (MANHATTAN)

The Harlem River Drive Bridge over the ramp from East 127th Street is an eleven-span structure consisting of seven main spans of multiple steel stringers and concrete deck and four approach spans of reinforced concrete structural slabs supported by reinforced concrete girders and retaining walls. The bridge currently carries three traffic lanes in the southbound direction and two lanes plus a wide striped shoulder in the northbound direction. The parkway is not subject to truck traffic with the exception of emergency vehicles and school buses.

The existing bridge was designed and built by the Department from 1955 to 1958 as part of the Harlem River Drive Improvement Project from East 125th Street to East 132nd Street. The bridge is an eleven-span structure consisting of seven main spans of multiple steel stringers and concrete deck and four approach spans of reinforced concrete structural slabs supported by

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reinforced concrete girders and retaining walls. The bridge is owned and maintained by the Department; the rest of the Drive is owned by the New York State Department of Transportation.

This project involves the replacement of the existing 11 span bridge and the reconstruction of the Harlem River Drive between the Willis Avenue and Third Avenue Bridges, 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. One weave (from the Third Avenue Bridge to the Harlem River Drive mainline) is accomplished by some vehicles with no lane change, and the other weave (from the Harlem River Drive mainline to Second Avenue) requiring at least two lane changes of all weaving vehicles. The project will also allow 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. The viaduct currently serves approximately 79,000 vehicles per day. This area currently has 40 times the State average number of accidents. Construction is expected to begin in late spring 2014, and is expected to be complete in spring 2017.



Harlem River Drive Bridge at East 127th Street.



Rendering of New Harlem River Drive Bridge.



Looking East at the 127th Street Off-Ramp: Current and Proposed View. Looking East at 2nd Avenue: Current and Proposed View. Looking South From 3rd Avenue Bridge: Current Harlem River Drive and 2nd Avenue Exit and Proposed Harlem River Drive With Left Lane Exit to 2nd Avenue.

ACCOMPLISHMENTS & PLANNED PROJECTS

EIGHT RAMPS AND ONE PEDESTRIAN BRIDGE AT THE ST. GEORGE STATEN ISLAND FERRY TERMINAL (STATEN ISLAND)

Ferry service between Staten Island and Manhattan began in 1898, and its operations were taken over by the City's Department of Docks and Ferries in 1905. Today it is run by NYCDOT's Passenger Transport Division and services more than 19 million passengers each year, according to Captain James C. DeSimone, the ferry's Chief Operations Officer. The St. George Ferry Terminal itself recently underwent a major reconstruction project. The old drab, dingy building was converted into a well-lit, modern multi-modal facility. In addition to ferry service, the terminal also includes a very active MTA bus station and a Staten Island Railway Station. The ramps that will be rehabilitated serve 23 NYC Transit bus routes that contribute significantly to ferry ridership. To complete the make-over of the St. George Terminal, the Division's Design-Build Unit is undertaking a major rehabilitation project to upgrade vehicular access to the site.

Currently a series of eight ramps carry bus and passenger car traffic in and out of the facility. The eight vehicular ramp structures consist of 73 spans that provide access to the Staten Island Ferry Terminal for pedestrians, private vehicles, taxis, and New York City Transit buses. The ramps span over the Staten Island Railway, terminal buildings, and terminal parking. Two of the structures serve as a bus station as well as providing a roof over the rail station below. Limited parking is provided on several of the ramps. The North Ramp provides access to the North Municipal Parking Field and the Richmond County Bank Stadium and stadium parking lot, which provides supplemental parking to the Ferry Terminal. The five span pedestrian bridge provides access between the main Ferry Terminal building and the 69th Street Terminal building as well as access to the Bus Entrance Ramp (Ramp B) above and the Commuter Pick-Up and Drop-Off Area below.

Seven of the eight ramps were constructed in 1948, with the eighth dating back to the early part of the 20th century. The last major structural work on these bridges was a deck replacement project in 1985 that only addressed three of the eight bridge structures. The planned design-build project will upgrade these eight vehicular structures (and one pedestrian bridge), and provide a design life of 75 years. For seven of the ramps, the project will provide new decks and eliminate joints where feasible, retrofit poorly detailed steel connections, and rehabilitate/replace deteriorated steel superstructure and substructure members, as well as install new paint systems. Lead paint removal and the installation of a new drainage system as well as a pigeon deterrent system will also be included. The eighth ramp is the existing load-restricted north ramp adjacent to the Richmond County Bank Stadium. It will be demolished and reconstructed on a more efficient alignment in order to alleviate traffic congestion at the intersection of Richmond Terrace and Wall Street. In addition, this project will replace the superstructure of a pedestrian bridge (the 69th Street Terminal Building Overpass) connecting the terminal to an office facility, and will address traffic improvements for the entire stretch of Richmond Terrace outside the terminal.

A Notice to Proceed for the reconstruction of these structures was issued to the contractor with a start date of July 27, 2009. During the demolition of the concrete encasement at the old viaduct, which began in October 2009, lead paint on the underlying structural steel was discovered. Lead paint and underlying rust is being removed from all structures and non-lead paint is being reapplied. This protective coating is an essential preventive maintenance operation used to protect and extend the life of bridge infrastructure. All lead paint removal work is being performed within an entirely sealed Class 1A Containment System which prevents materials from leaving the work zone. Soil and air in the St. George area are being monitored and tested in accordance with safety requirements set forth by the United States Environmental Protection Agency and Occupational Safety and Health Administration, New York City Departments of Health and Environmental Protection and the New York State Departments of Health and Environmental Conservation.

Active construction began in early 2010 when modifications were made to the Kiss and Ride area. These modifications allowed the area to accommodate the closure of Ramp D (Kiss and Ride exit ramp) for demolition (on June 21, 2010) and the resulting two-way operation of Ramp C (Kiss and Ride entrance ramp). Ramp A and D demolition was completed in September. Bus

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gates A and B were relocated as of September 12, and the south half of the old viaduct was closed on September 13. The buses were relocated and pedestrians were routed to the opposite sidewalk. By the end of the year, the reconstruction of Ramp A and rehabilitation of Ramp D were underway. The pedestrian breezeway, located above the Kiss and Ride and linking the ferry terminal with the Ferry Administration building, is also being rehabilitated. Demolition was completed in March of 2011 and the structure is currently being rebuilt.



January 2011: Panoramic View. March 2011: Ramp D South Side Fascia Repair. Existing North Ramp (Foreground) and New North Ramp (Background).



August 2011: Bus Ramp A Canopy. North Ramp Center Pier. December 2011: Bus Ramp D.

Shielding installation and red flag repairs were completed in August 2011. Construction of the new north ramp's T-wall and piers was completed in September. Ramps A and D were completed in November. Ramp D opened on November 17, and Bus Ramps A and B opened on November 18. Stage 1 of the Old Viaduct was opened on November 18, as well. The North Ramp (leading into the North Municipal Parking Lot and NYCEDC Parking facilities), closed for construction on December 1, and demolition began. A new ramp is currently being constructed on a new alignment, adjacent to the Richmond County Bank Ball Park. By the end of the year, the reconstruction of Bus Gates A and B and the Old Viaduct were underway.

The new North Ramp, located at Richmond Terrace and Wall Street, providing access to the North Municipal Parking Lot and NYCEDC stadium parking lots re-opened during the early morning hours of June 16, 2012. The ramp was constructed on a new alignment and included a full-width pedestrian walkway.

By the end of 2012, chipping of spalls at the retaining wall of Ramp A was moving ahead. At Ramp B, the longitudinal saw cut grooving operation was complete; installation for anchor bolts for precast concrete barriers and reconstruction of west approach sidewalk were in progress; and blast cleaning and painting operations and expansion joint system installation were also in progress. At Stage 2 on the south half of Ramp C, the longitudinal saw cut grooving operation, installation of precast barriers and concrete placement for sidewalk at south side were complete, and the reconstruction of the west approach sidewalk and chipping of spalls on the retaining wall were in progress. At Ramp D, the removal of the platform shielding was in progress, as well as the chipping of spalls on the retaining wall. At the Bus Station North (BSN) and Bus Station South (BSS), the sidewalk concrete placement (BSN) was complete; blast cleaning and painting operations and expansion joint system installation were in progress; and the installation of the new roofing system and installation of bricks for the canopy were in progress. At Stage 3 on the old viaduct, the concrete placement for the approach slab was complete; structural steel repairs were in progress; and the temporary support system installation and blast cleaning and painting operations were in progress. At the pedestrian breezeway, electrical fixtures installation and drainage downspout installation were in progress, as was the installation of a bird deterrent system. At the TWIC area and the north municipal parking lot, the installation of the drainage

ACCOMPLISHMENTS & PLANNED PROJECTS

system and restoration of the roadway are in progress. At the Bay Street Landing connector, sidewalk reconstruction was in progress. The North Municipal parking lot was opened for traffic on December 12, 2012. Construction is expected to be complete by spring 2013.



January 2012: Ramp A Looking East. North Ramp Span 1. Bus Station Overview.
February 2012: Breezeway. Taxi Ramp. Mini Pile Installation. Ramp C. March 2012:
Bus Ramp D.



April 2012: BSN Overlay, Towards South. North Ramp, East Approach. June 2012: Ramp B, Looking East.
September 2012: BSS West. Old Viaduct West. BSS, Span 2 East. Ramp B Span 19 Southwest. November
2012: BSS Ramp C Containment. Bay Landing Drainage Work.



June 2012: New North Ramp.



December 2012: Project Site.

ACCOMPLISHMENTS & PLANNED PROJECTS

Component Rehabilitation

UNION STREET BRIDGE OVER BROOKLYN-QUEENS EXPRESSWAY (BROOKLYN), BROOKLYN-QUEENS EXPRESSWAY OVER ADAMS STREET (NB) (BROOKLYN), BROOKLYN-QUEENS EXPRESSWAY OVER ADAMS STREET (SB) (BROOKLYN), 4TH AVENUE BRIDGE OVER BELT PARKWAY (BROOKLYN), BELT PARKWAY BRIDGE OVER BEDFORD AVENUE (BROOKLYN), CARROLL STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN), CROWN STREET BRIDGE OVER FRANKLIN SHUTTLE (BROOKLYN), BEDFORD AVENUE BRIDGE OVER LIRR BAY RIDGE (BROOKLYN), HILL DRIVE BRIDGE (CLEFT RIDGE SPAN) OVER PEDESTRIAN PATH SOUTH OF BOATHOUSE (BROOKLYN), AND 5TH AVENUE BRIDGE OVER GREENWOOD CEMETERY (BROOKLYN)

A Notice to Proceed for the component rehabilitation of these bridges was issued to the contractor with a start date of July 23, 2012.

The Union Street Bridge is a two span steel continuous stringer structure. The bridge carries eastbound two travel lanes. There is an unmarked parking lane on each side of the bridge. There is a sidewalk, a railing and protective screening on each side of the bridge. The scope of rehabilitation work shall include the following: remove and replace concrete overlay; replace seals at abutments; repair concrete deteriorated areas; replace corroded rivets; paint structural steel; clean abutments and pier walls; and restore bearings.

The Brooklyn-Queens Expressway over Adams Street (NB) is a one-span reinforced concrete arch structure. The bridge carries southbound three travel lanes. There is a safety walk on each side of the bridge. The scope of rehabilitation work shall include the following: Clean and seal cracks in asphalt overlay on top of bridge and approaches; remove unsound concrete and repair the underdeck concrete deteriorated areas; clean and seal cracks in brick finish at both abutments; clean the brick finish at abutments and wingwalls and apply an anti-graffiti protective coating; clean scupper; and restore the bridge expansion joint system between NB and SB structures.

The Brooklyn-Queens Expressway over Adams Street (SB) is a one-span reinforced concrete arch structure. The bridge carries northbound two travel lanes. The third travel lane is closed. There is a safety walk on each side of the bridge. The scope of rehabilitation work shall include the following: clean and seal cracks in asphalt overlay on top of bridge and approaches; remove unsound concrete and repair the underdeck-concrete deteriorated areas; clean and seal cracks in brick finish at both abutments; clean the brick finish at abutments and wingwalls and apply an anti-graffiti protective coating; clean scuppers; and remove deteriorated lamppost and install a new one.

The 4th Avenue Bridge over the Belt Parkway is a two span concrete rigid frame. The bridge carries a travel lane in each direction, divided by a concrete median. There are no parking lanes on the bridge and approaches. The west sidewalk is wide and the east sidewalk is narrow. There is a concrete parapet on each side of the bridge. The scope of rehabilitation work shall include the following: remove and the existing asphalt concrete on bridge and approaches; clean pressure relief joints; repair concrete deteriorated areas at sidewalks and median and apply a sealing protective coating; repair concrete deteriorated areas at abutments, pier, and underdeck; and clean masonry surfaces and apply an anti-graffiti protective coating.

The Belt Parkway Bridge over Bedford Avenue is a three span steel stringer structure. The bridge carries three travel lanes in each direction. There is a shoulder and a safety walk on each side of the bridge. The concrete median that divides the eastbound and westbound traffic has guide railing on both sides. The scope of rehabilitation work shall include the following: replace asphalt concrete over expansion joints and seal cracks in asphalt overlay; clean and paint replaced or rehabilitated steel items; replace seals at abutments; replace deteriorated structural steel; repair concrete deteriorated areas; clean masonry; apply an anti-graffiti protective coating on abutments, wingwalls and piers; and clean scuppers.

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The Carroll Street Bridge is a two span movable–retractile type bridge. The bridge roadway carries a single travel lane in the east direction. There are no parking lanes on the bridge. There is a sidewalk on each side of the bridge. The scope of rehabilitation work shall include the following: replace the deteriorated timber deck; restore the expansion joints; clean masonry walls at the west abutment; replace impacted stiffeners, angles, and plates; clean and paint structural steel; reset roadway paving units at west abutment and repair/replace concrete sidewalks at both approaches; install new timber curbs on both sides of the roadway; and install new rubber dock fenders at both abutments.

The Crown Street Bridge is a 3 span bridge that carries one travel lane and one parking lane in each direction. The bridge has protective screening and a bridge railing on the south side. There is a building adjacent to the bridge north fascia. The scope of rehabilitation work shall include the following: seal cracks in the concrete overlay; replace seals above abutments; repair, clean, and apply an anti-graffiti protection coating to the abutments, piers, and crashwalls; and clean existing gutters.

The Bedford Avenue Bridge is a 6 span structure. The bridge carries one travel lane in each direction. There is a parking lane and a bicycle lane on each side of the bridge. The scope of rehabilitation work shall include the following: seal and repair cracks and spalls at the deck, abutments and piers; replace compression seals; and clean concrete and apply an anti-graffiti protective coating on the abutments and piers.

The Hill Drive Bridge (Cleft Ridge Span) Bridge is a one span semi-circular arch type structure. The bridge carries one travel lane in each direction. There are no parking lanes on the bridge. The scope of rehabilitation work shall include the following: repair the asphalt wearing surface; repair spalled and cracked concrete at the wingwalls; clean the bridge and provide an anti-graffiti protective coating; and restore the under drain system behind the bridge fascias.

The 5th Avenue Bridge is a one span masonry arch structure. The brick arch can be classified as a gothic style arch. The bridge carries one travel lane and one parking lane in each direction. The sidewalk consists of grass and dirt on both side of a 5 feet wide concrete walkway. The scope of rehabilitation work shall include the following: remove and replace existing asphalt from the bridge and approach slabs; clean and seal cracks in asphalt at both approach pavements; remove existing 5 foot wide sidewalk on both sides of the bridge and replace with a 13 foot wide sidewalk; replace existing stone curb with cast-in-place concrete curb; clean, repair, tuck point and restore the stone masonry; and rehabilitate the brick arch.

When and Where Unit

In 2012, the following structures were worked on under the Division's When and Where contracts: Trans-Manhattan Expressway over Harlem River Drive Northbound Ramp, Ed Koch Queensboro Bridge, West 207th Street Bridge over Harlem River, Henry Hudson Parkway Northbound over Ramp to 96th Street, Broadway Bridge over Harlem River, Henry Hudson Parkway Southbound over Ramp to 96th Street, 11th Avenue Viaduct over LIRR Westside Yard, City Island Bridge over Eastchester Bay, Riverside Drive Viaduct over Wet 125th Street to West 134th Street, West 191st Street Pedestrian Tunnel over Broadway, East 233rd Street Bridge over Metro North, Nereid Avenue Bridge over Bronx River Parkway, Linden Boulevard Bridge over Cross Island Parkway, Hempstead Avenue Bridge over Cross Island Parkway Ramp Northbound, 49th Street Bridge over Grand Central Parkway, 150th Street Bridge over Cross Island Parkway, Arthur Kill Road Over SIRT SOUTH Shore, Northern Boulevard Bridge Westbound over Flushing River, 35th Street Bridge over Brooklyn-Queens Expressway, 44th Street Bridge over Brooklyn-Queens Expressway, Morningstar Road Bridge over B&O Railroad, Stillwell Avenue Bridge over Coney Island Creek, Knapp Street Bridge over Belt Parkway, Metropolitan Avenue Bridge over English Kills, 79th Street Traffic Circle over 79th Street Plaza, 79th Street Ramp to Garage over 79th Street, Forest Park Drive Bridge over Abandoned LIRR, 86th Street Bridge over Brooklyn-Queens

ACCOMPLISHMENTS & PLANNED PROJECTS

Expressway, Northern Boulevard Bridge Eastbound over Flushing River, East 174th Street Bridge over Sheridan Expressway/Amtrak, Depot Place Bridge over Conrail Hudson, Henry Hudson Parkway Viaduct over West 72nd Street to West 79th Street, Pedestrian Bridge at 73rd Street over Conrail, Boston Post Road Bridge over Hutchinson River, Brooklyn-Queens Expressway over Nassau Street, 37th Street Bridge over Brooklyn-Queens Expressway, 44th Street Bridge over Grand Central Parkway, 28th Avenue Pedestrian Bridge over Cross Island Parkway, 149th Street Bridge over Cross Island Parkway, 14th Avenue Bridge over Belt Parkway, Corlears Park Road Bridge over FDR Drive, Houston Street Bridge over FDR Drive, East 6th Street Pedestrian Bridge over FDR Drive, Promenade over FDR over FDR/East 79th Street- East 91st Street, East 120th Street Pedestrian Bridge over FDR Drive, Williamsburg Bridge over East River, Broadway Bridge over Harlem River, Concourse Village Avenue Bridge over Metro North Railroad, East 241st Street Bridge over BRP/Metro North, Hill Drive Bridge over Prospect Park Lake, West 34th Street Bridge over Amtrak 30th Street Branch, West 36th Street Bridge over Amtrak 30th Street Branch, Fort Tryon Park over Underpass, West 155th Street Pedestrian Bridge over Amtrak 30th Street Branch, Inwood Hill Park Foot Bridge over Amtrak 30th Street Branch, West 40th Street Bridge over Amtrak 30th Street Branch, East Drive Bridge over Transverse Road #3, Riverside Drive over West 158th Street, Motor Parkway Pedestrian Bridge over Francis Lewis Boulevard, Motor Parkway Pedestrian Bridge over Bell Boulevard, Motor Parkway Pedestrian Bridge over 73rd Avenue, Huguenot Avenue Bridge over SIRT South Shore, Hempstead Avenue Bridge over Cross Island Parkway, HRD Northbound Ramp over Harlem River Drive, Henry Hudson Parkway over Amtrak 30th Street Line, Brooklyn-Queens Expressway Eastbound over Brooklyn-Queens Expressway Westbound, Morris Street Pedestrian Bridge over Brooklyn-Battery Tunnel Plaza, West 8th Street Bridge over Surf Avenue, East 156th Street/Access to Housing, and Crocheron Park Pedestrian Bridge.

Currently scheduled projects include the 73rd Street Pedestrian Bridge over Conrail. In 2012, one red flag and two yellow flags were completed. The work consisted of reinforcing the floor beam web by installing a reinforcing plate and reinforcing angles after removing the diaphragms and installing new diaphragms. Ongoing work for two new red flags involves installing temporary shoring and reinforcing girder and two floor beams.



73rd Street Pedestrian Bridge over Conrail – General View of the Red Flag Work Site. Repairs at Hempstead Avenue Bridge over Cross Island Parkway.

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. These repairs 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 licensed underwater capability 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.

ACCOMPLISHMENTS & PLANNED PROJECTS

Marine bridge repairs addressed in 2012 include Broadway Bridge over Harlem River, Crocheron Park Pedestrian Bridge over Cross Island Parkway, Wards Island Pedestrian Bridge over Harlem River, Bruckner Expressway over Westchester Creek (Unionport Bridge), Shore Road Bridge over Hutchinson River, City Island Bridge over Eastchester Bay, and Hamilton Avenue Bridge over Gowanus Canal.

Some of these locations experience repeated damage due to heavy marine traffic and/or a narrow channel, such as the Shore Road (Pelham Parkway) Bridge over the Hutchinson River. The issuance of new flags occasionally necessitates new visits to even recently completed projects. Timber fender systems especially susceptible to recurring hits by barge traffic, and consequently require periodic restoration in relatively short time periods. In addition to damage due to impact, timber elements are also replaced because of deterioration and attack by marine borers, whose activity has vastly increased as the water quality in the New York City area has improved.

Numerous barge hits at the Shore Road Bridge occur repeatedly. As a result, a continuation and completion of previously reported work of replacing timber planking and walers took place at this location, as well as installation of a special plastic material called "UltraPoly" at the top portion of the fender planking and at selected dolphin piles. So far, this material has been shown to protect against rubbing damage. In addition, cleaning off and refurbishing was completed on the safety netting previously installed beneath the bridge decks to protect the waterway from falling deteriorated concrete. Special repairs were also made in areas where significant concrete in the arch spans had delaminated.

At the City Island Road Bridge over Eastchester Bay, resealing of masonry joints was performed at the western abutment in order to help ensure that this bridge will be in good condition until the planned replacement bridge can be put into service.

At the Bruckner Expressway over Westchester Creek (Unionport Bridge), massive deterioration had occurred in the fender system. The entire west side sheathing was replaced, along with many of the supporting walers. Similar to the Shore Road Bridge, "UltraPoly" panels were also installed to further safeguard the fender system against damage. Several significant areas of delaminated concrete wall along both sides were also repaired to prevent further deterioration.



Emergency Inspection on Wards Island Bridge Revealed that the Southwest Fender System Collapsed and Required Repairs.

ACCOMPLISHMENTS & PLANNED PROJECTS



Unionport Bridge – Rebuilt the West Wall Fender System to Stop Barges From Hitting the Side of the Bridge. Safety Flags on the Concrete East Parapet Wall Were Also Completed. (Credit: Thomas Leung)

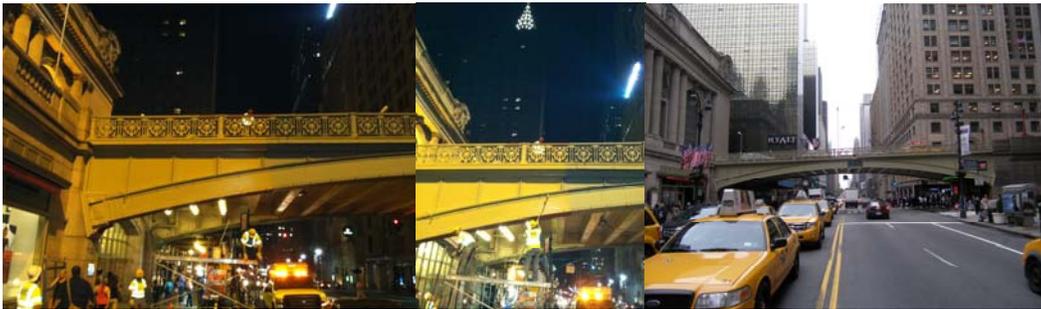
PAINTING

In 2012 the following bridges were painted: Chelsea Road Bridge over Sawmill Creek, Cohancy Street Bridge over Belt Parkway, Crotona Avenue Bridge over Bronx Pelham Parkway, Farmers Boulevard Bridge over Belt Parkway, Flushing Avenue Service Road over Flushing Avenue, Guy Brewer Boulevard Bridge over Belt Parkway, Henry Hudson Parkway Bridge over Broadway, Highland Boulevard Bridge Eastbound over Jackie Robinson Parkway, Hylan Boulevard Bridge over Lemon Creek, Knapp Street Bridge over Belt Parkway, Linden Boulevard Bridge over Conduit Avenue, Merrick Boulevard Bridge over Laurelton Parkway Eastbound, Merrick Boulevard Bridge over Laurelton Parkway Westbound, North Conduit Avenue Bridge Westbound over Belt Parkway Westbound, North Conduit Avenue Bridge Westbound over Belt Parkway Eastbound, Riverside Drive Bridge over West 96th Street, Service Road Turnaround over Flushing Avenue, Slater Boulevard Bridge over New Creek, Southern Boulevard Bridge over East Fordham Road, Travis Avenue Bridge over Main Creek, Whitelaw Pedestrian Bridge over Conduit Avenue, Woodside Avenue Bridge over Brooklyn-Queens Expressway, West 33rd Street Bridge over Land Adjacent to Amtrak, 41st Avenue Bridge Railing over Brooklyn-Queens Expressway, 65th Place Bridge Railing over Brooklyn-Queens Expressway, 69th Street Bridge over Brooklyn-Queens Expressway, 70th Street Bridge Railing over Brooklyn-Queens Expressway, 130th Avenue Bridge over Laurelton Parkway Eastbound, 130th Avenue Bridge over Laurelton Parkway Westbound, Belt Parkway Bridge over Nostrand Avenue, Braddock Avenue Bridge over Cross Island Parkway, Brooklyn-Queens Expressway (Eastbound and Westbound) over Cadman Plaza, Eliot Avenue Bridge over Queens Boulevard, Foster Avenue Bridge over BMT Subway, Grand Concourse over East 167th Street, Linden Boulevard Bridge over Cross Island Parkway, Newkirk Avenue Bridge over BMT Subway, Park Avenue Viaduct Bridge over East 42nd Street, Springfield Boulevard Bridge over Belt Parkway, Superior Road Bridge over Cross Island Parkway, 27th Avenue Pedestrian Bridge over Belt Parkway, West 128th Street Pedestrian Bridge over Third Avenue Bridge Approach, and East 129th Street Pedestrian Bridge over Third Avenue Bridge Ramp.

ACCOMPLISHMENTS & PLANNED PROJECTS



April 2012: Bridge Painter Juscelino Andrade at Knapp Street Bridge over Belt Parkway. Bridge Painters Andrew Law, Juscelino Andrade, Henry Bollin, Julio Perez, and Samuel Martinez, and Supervisor Bridge Painter David Yanolatos. Woodside Avenue Bridge over Brooklyn-Queens Expressway. Supervisor Bridge Painter Hughie Flood at the 69th Street Bridge over Brooklyn-Queens Expressway. (Credit: Earlene Powell)



September 2012: Test Painting a Section of the Park Avenue Bridge over 42nd Street with "Grand Central Terminal Green." (Credit: Earlene Powell) Completed Project in October 2012.



Contractor Engineer-in-Charge Scott Earl, Contractor Project Manager Tony Maracic, and Bridges Staff Analyst Antoinette Zeitoun at the Greenpoint Avenue Bridge. (Credit: Sergey Parayev) Construction Project Manager Sergey Parayev and Associate Project Manager Vadim Sokolovsky at the Macombs Dam Bridge in September 2012.

During 2012, the following structures were also painted: Battery Park Underpass of the FDR Drive motor and control rooms, Bruckner Expressway Bridge over Bronx River (a.k.a. Eastern Boulevard Bridge) Bridge Operator House, Department of Transportation Ironworker Shop and Garage at 59th Street, Greenpoint Avenue Bridge over Newtown Creek Bridge Operator House, Third Street Bridge over Gowanus Canal Bridge Operator House, FDR Drive Southbound over FDR Drive Northbound Underpass motor and control rooms, Department of Transportation Facility at Wythe Avenue, Department of Transportation Facilities at the Harper Street Yard, Department of Transportation Ironworker and Carpenter Shops at Kent Avenue, Department of Transportation Facilities at South 6th Street, Department of Transportation Facilities at the Greenpoint Avenue Yard, and the Department of Transportation Facility at Plymouth Street.

ACCOMPLISHMENTS & PLANNED PROJECTS

GRAFFITI REMOVAL

In 2012, 3,424,805 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.



Bridge Painter Herbert Rodriguez and Before and After Graffiti Removal on the Manhattan Bridge in August 2012. (Credit: Robert Avellino)

During 2012, graffiti was also removed from the following structures: Atlantic Avenue at Brooklyn-Queens Expressway, Atlantic Avenue over 57th Avenue, Austin Street over Grenfell Street, Cross Bay Boulevard south of the Cross Bay Bridge, Cross Island Parkway, FDR Drive, Furman Street, Grand Concourse over Burnside Avenue, Grand Concourse over East Tremont Avenue, Grand Concourse over East 204th Street, Harlem River Drive at Exit 21, Joseph P. Addabbo Memorial Bridge, Kneeland Avenue and Manilla Street, Lincoln Road and Flatbush Avenue, Macombs Dam Bridge, Metropolitan Avenue at Brooklyn-Queens Expressway, Monroe and Cherry Streets under the Manhattan Bridge, Old Fulton Street at Brooklyn-Queens Expressway, Pearl Street, Pennyfield Avenue, Prospect Avenue at Seeley Street, Pulaski Bridge over Newtown Creek, Queens Boulevard at Eliot Avenue, Richmond Parkway at Annadale Road, Victory Boulevard at Bay Street, Whitelaw Pedestrian Bridge over Conduit Avenue, Woodhaven Boulevard at 95th Street, Willis Avenue Bridge, West 53rd Street between 10th and 11th Avenues, East 191st Street and Broadway, West 191st Street Pedestrian Tunnel at Broadway (IRT #1 Subway), West 230th Street and Kappock Street, 74th Street at Long Island Expressway, Astoria Boulevard at Brooklyn-Queens Expressway, Cross Bay Boulevard at Joseph P. Addabbo Bridge, Ridge Boulevard, Queens Boulevard between Van Dam Street and Jackson Avenue, Lincoln Road, Westbound Long Island Expressway Entrance at Woodhaven Boulevard, Kneeland Avenue and Manilla Street, and the NYC Marathon route.

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April 2012: Supervisor Bridge Painter Robert Avellino, and Bridge Painters Louis Masucci and Goncalo Lima at Old Fulton Street over Brooklyn-Queens Expressway Wall. Bridge Painter William Budge.
(Credit: Earlene Powell)

ACCOMPLISHMENTS & PLANNED PROJECTS

Engineering Review and Support

IN-HOUSE DESIGN

In-House Design staff prepares plans and specifications for bridge replacement/rehabilitation projects that enable the Division to restore bridges considered “structurally deficient” to a “very good” condition rating. This unit handles urgent Division projects, as well as special projects under construction by the Bureau of Bridge Maintenance, Inspections and Operations.

The unit continued the design of the Bryant Avenue Bridge over Amtrak and CSXT in the Bronx. This is a one span structure constructed in 1908, with a span length of 90 feet. This project includes replacement of the steel superstructure, bearings, approaches, water mains, and rehabilitation of both abutments. The proposed superstructure will consist of a reinforced concrete deck over prestressed concrete adjacent box beams. The two existing water mains will be removed, and replaced with two new pipes. Both water mains will be installed on top of the north sidewalk in a fenced-off area. Six existing Con Edison electrical conduits will be removed from the bridge. The construction of this bridge is scheduled to commence in spring 2014, and is expected to last eighteen months.



Assistant Civil Engineer Evgenia Campbell Conducting Measurements in April 2012 at the Bryant Avenue Bridge. (Credit: Alexander Berens) At the Bridge in September 2012: Civil Engineers Kirolos Dimian and Jagdish Patel, Assistant Civil Engineer Leonid Sagalovskiy, Interim Director of In-House Design Ferdinand B. John, and Civil Engineers Gregory Novofastovsky and Svetlana Kaganovskaya. (Credit: Alexander Berens)

In-House Design prepared the contract documents for the installation of nearly one and a half miles of concrete barriers at Cross Bay Boulevard southbound along the west cub line from the Addabbo Bridge to East 1st Road in Queens. A portion of the concrete barrier has already been installed by the Bridge Maintenance, Inspections and Operations Bureau, with the rest expected to be installed in the coming months.

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August 2012: Installing the Guiderail Over the Gaps Left for the Drainage Channels in the Segmental Concrete Barrier. Highway Repairer Robert Tuite, Assistant City Highway Repairers Luis Baez, Thomas McKenzie, and Leshawn Elam, Highway Repairer Gaetano Messina, Supervisor Highway Repairer Joseph Salonia, and Highway Repairer Ronald Whytock. (Credit: Thomas Whitehouse) Observing the Newly Installed Concrete Barrier at Cross Bay Boulevard in September 2012: Acting Director of Bridge Preventive Maintenance Paul Schwartz, Civil Engineers Gregory Novofastovsky and Jagdish Patel, and Interim Director of In-House Design Ferdinand B. John. (Credit: Evgenia Campbell)

As the designer of the ongoing contract to replace the Belt Parkway Bridge over Paerdegat Basin, this unit is currently involved in the construction support services.

In-House Design staff supervised the remedial work performed as part of a settlement agreement by the Design-Build contractor at Belt Parkway over Ocean Parkway.



Inspecting the Construction of the Belt Parkway Bridge over Paerdegat Basin in September 2012: Acting Director of Bridge Preventive Maintenance Paul Schwartz, Assistant Civil Engineer Evgenia Campbell, Interim Director of In-House Design Ferdinand B. John, and Civil Engineers Jagdish Patel and Gregory Novofastovsky. (Credit: Serge Rigaud) Observing the Completed Remedial Work at the Belt Parkway Bridge over Ocean Parkway in September 2012: Civil Engineer Gregory Novofastovsky, Interim Director of In-House Design Ferdinand B. John, Acting Director of Bridge Preventive Maintenance Paul Schwartz, and Civil Engineer Jagdish Patel. (Credit: Evgenia Campbell)

This unit also handled the following emergency projects that required expeditious response by the Division: the design of collision protection beams adjacent to the Westchester Avenue Bridge over the Hutchinson River Parkway to protect the bridge's superstructure from strikes by illegal trucks on the parkway, and the design of a pedestrian fence on the Navy Street Pedestrian Bridge.

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Another project underway is the interim repair of the Henry Hudson Parkway Bridge from West 72nd Street to West 82nd Street. The Henry Hudson Parkway project was developed to the advanced design plans phase by NYSDOT, and then transferred to our Division. The In-House Design unit continued with the design. The rehabilitation work will include the repair or replacement of various deteriorated structural steel members, concrete deck, abutments, and the retaining walls. The construction work is scheduled to commence in the fall of 2015.

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 2012 included the Willis Avenue and Broadway Bridges over the Harlem River, the Wards Island Pedestrian Bridge over the Harlem River; the Union Street Bridge over the Gowanus Canal; the Belt Parkway Bridge over Paerdegat Basin in Brooklyn; the Roosevelt Island Bridge over East River Channel; the Manhattan Bridge, and the Ed Koch Queensboro Bridge.

ENGINEERING SUPPORT

BRIDGE PROJECT SPECIFICATIONS

In 2012, the Specifications Unit of the Engineering Support Section prepared and/or reviewed contract proposal books and/or specifications for 21 contracts, including 17 bridge rehabilitation and new construction/reconstruction contracts and 4 non-bridge contracts, in addition to replying to specification requests for 2 on-going construction projects. Four of the above contracts totaling approximately \$267 million in construction costs were advertised for bid and were bid in 2012.

Notable among the construction contracts prepared and /or reviewed, advertised and sent for bid were: the component rehabilitation of ten bridges citywide, the reconstruction of the Belt Parkway Bridge over Gerritsen Inlet, and the replacement of the City Island Bridge over Eastchester Bay.

The unit also updated the federal boiler plate to reflect 2012 FHWA-1273 and NYSDOT updates, updated the Guidelines for Preparation of Contract Proposal Book and advised the Department of Design and Construction and Agency Divisions on several contract related issues.

CONVERSION OF DIVISION ENGINEERING ARCHIVES

The Records Management Unit converted 77,244 TIFF (Tag Image File Format) drawings to PDF (Portable Document Format) format and completed the indexing of 51,932 drawings. Some 200,000 TIFF drawings will be converted to PDF format.

The switch to electronic media and server-based archiving will save money on drawing submissions as well, and will lead to the establishment of a unified electronic database for bridge archives. Digitizing documents and storing them online, where they are easy to access and print, will simplify contract submission process and cut project costs in a long run.

The Records Management unit also reviewed and approved as-built drawings and contract drawings for 22 contracts in 2012, including Hamilton Avenue Bridge over the Gowanus Canal, Annadale Road Bridge in Staten Island, East 78th Street Pedestrian Bridge over the FDR Drive, Borden Avenue Bridge over Dutch Kills, Greenpoint Avenue Bridge over Newtown Creek, Grand Concourse over 161st Street / Grand Concourse East 161st to 166th Street, and the Williamsburg Bridge.

ACCOMPLISHMENTS & PLANNED PROJECTS

SURVEYING AND LOAD RATING

Unit staff monitored five bridges and one retaining stone wall in 2012: Depot Place Bridge over Conrail Yard, Third Street Bridge over Gowanus Canal, Pelham Parkway Bridge, Stone Arch Bridge in Central Park, Ninth Street Bridge over Gowanus Canal, and the retaining stone wall on Cannon Place. The unit also conducted the measurements of the bridge clearance, field survey, elevations, and benchmarks set up for the Westchester Avenue Bridge over Hutchinson Parkway.

ENGINEERING REVIEW

MACY'S THANKSGIVING DAY PARADE

As in past years, the staff of the Engineering Review Section actively participated in the 2012 Macy's Thanksgiving Parade. Months before the parade, the engineers reviewed the balloon specifications and flight analyses, and were involved in walkthroughs along the parade route to ensure the adequacy of the available envelope and the removal of any obstructions. This project was coordinated with Macy's and various City agencies such as City Hall, NYPD, DOB, and OEM.

CRP/EXTELL PARCEL H PROJECT

The CRP/Extell Parcel H, LP project (Riverside Drive between 59th and 72nd Streets) includes the construction of seven new bridges, a ramp, two relieving platforms, and connector roads along Riverside Drive as a part of the residential and commercial development over the former Penn Central Rail Yard. The project also includes a half tunnel section in what was formerly known as the Miller Highway Tunnel. 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 bridges are substantially completed and open to traffic. The first phase of construction for the half tunnel section is complete and phase two is in progress.

RETAINING WALLS

646 City-owned retaining walls (along major streets and highways) have been inspected and inventoried since 2005, 45 of which have been estimated to be in fair to poor condition. Out of the 45 walls, 28 retaining walls have been scoped and forwarded to DDC with capital funding for rehabilitation. These retaining walls are now in various stages of design and construction. DDC has been requested to accelerate the rehabilitation of walls that are being forwarded to them. The retaining walls which are in fair to poor condition will be in a capital program for future rehabilitation.

ACCOMPLISHMENTS & PLANNED PROJECTS



Riverside Drive Retaining Walls: Riverside Drive Between West 99th Street and 104th Street, and Riverside Drive Between West 158th Street and West 165th Street. Riverside Drive Retaining Walls: Left Side of Riverside Drive Northbound, Holds Ramp to George Washington Bridge.

OVERWEIGHT TRUCK PERMIT REVIEWS

The Overweight Truck Permit Unit receives an average of 100 permit applications per week for overweight/over-dimensional trucks, self-propelled cranes, and occasional superload moves from utility companies crossing City-owned bridges, including critical bridges such as the Manhattan and Ed Koch Queensboro Bridges. Most of the permit requests must be reviewed and approved on the same day.

PROJECT SCOPING

The unit prepared the total design scope for the rehabilitation of the Riverside Drive Bridge over West 158th Street. This viaduct is located between West 153rd Street and West 161st Street. It is approximately 1,924 feet long and has 77 spans. It consists of intermittent straight portions, and six curves of different radii. The bridge carries four lanes (two each way). The superstructure is made of two types of framing. The northern part is a steel bent type structure, whereas the southern part is a steel cantilever type structure with half of the deck over Amtrak railroad tracks. The area below the entire bridge is utilized for storage of Agency vehicles and roadway maintenance materials. Construction is expected to begin in 2017.

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 a consultant 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

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workshops held in New York, where the senior officials from NYCDOT, NYSDOT, and the FHWA provided their input to the panel members.

The expert panel formulated recommendations regarding rock motions and corresponding time histories. Subsequently, the consultant derived soil generic response spectra, based on the hard rock motions and NEHRP amplification factors. The consultant also established bridge performance criteria to be used for critical, essential or other bridges undergoing structural analyses. The recommendations 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.

In 2002, the consultant convened a second panel of seismologists to update the 1998 Hazard Study and associated rock motions. On June 3, 2004, after the USGS national hazard maps were adopted by NEHRP, in a meeting attended by NYCDOT, NYSDOT and FHWA, it was unanimously agreed to adopt the new hard rock ground motions recommended by the panel of seismologists.

Following the adoption of the very hard rock motions, the consultant started the preparation of a new edition of the NYCDOT Seismic Design Guidelines for Bridges. Data from geotechnical bridge studies performed within the five boroughs of NYC were compiled. A series of generalized subsurface soil and bedrock profiles were developed to be representative of the range of soil profiles, overburden thickness, and rock types found within NYC. A fully probabilistic approach, utilizing Random Vibration Theory (RVT) in conjunction with the new hard rock ground motions, (from the 2002 Hazard Study) and the generalized NYC subsurface profiles, was used to develop vertical and horizontal Uniform Hazard Spectra (UHS), which, in turn, served as the starting point to derive design rock and soil response spectra. The method allowed computation of soil UHS, while preserving the hazard level of the very hard rock UHS. It accounted, in a rigorous probabilistic manner, for variations and uncertainties in soil stiffness, stress-strain nonlinearity, and material damping; depth of soil to rock; and, stiffness of the rock under the soil.

Generic horizontal and vertical design spectra were derived using the calculated UHS as the starting point. Generic design V/H ratios to be used in site-specific studies to generate site specific vertical motions, were also produced. All the generic soil curves are presented as a function of three parameters: soil class; depth to rock; and, rock class under the soil.

The development of these parameters for the NYCDOT Guidelines represent a significant improvement to the previous guidelines and other codes, since it will result in better representation of the ground motions at a bridge site, bringing closer the generic ground motions to those that could be obtained from site-specific studies. The fact that the new guidelines better fit the specific characteristics of the NYC region, will permit the engineers to evaluate the need for retrofitting existing bridges or strengthening new ones at the right places.

Recommendations for liquefaction evaluation are also provided in the guidelines, including recommendations for earthquake magnitude and peak ground surface accelerations, which are critical parameters for evaluating liquefaction potential and which have not been included in previous guidelines. The new document also includes recommendations for site-specific studies, providing guidelines and minimum requirements that must be satisfied. These include: procedures to establish soil horizontal and vertical design motions; recommendations to evaluate the effects of the depth to the rock surface; recommendations to account for uncertainties in the soil properties; minimum requirements to establish lower bound horizontal design motions; recommendations for time history analysis of bridges; recommendations for the incorporation of spatial variation effects in the analysis; and different requirements for critical and non-critical bridges site-specific studies.

The final draft of the new NYCDOT Seismic Design Guidelines for Bridges was submitted to NYSDOT for peer review in September 2008. Upon completion of their review, these guidelines

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will be adopted for the seismic and retrofit design of bridges in New York State. The review is expected to be complete by the end of March 2013.

ENVIRONMENTAL ENGINEERING

In 2012, the Environmental Engineering staff of the Quality Assurance section continued to provide expertise and oversight of the various environmental issues of the reconstruction of the Paerdegat Basin Bridge, Rockaway Parkway Bridge and Fresh Creek Bridge in the Belt Parkway Project. This includes monitoring and oversight of wetland restorations, management of storm water erosion and run off controls, asbestos and lead paint abatement, hazardous waste management, spill control/management, and groundwater/soil management.

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Bridge Maintenance, Inspections and Operations

EAST RIVER BRIDGES ANTI-ICING PROGRAM

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

The Division's Anti-Icing Program uses the liquid chemical potassium acetate and aggregate chemical sodium acetate. The anti-icing fleet consists of twenty-two spray trucks, six plow trucks and several smaller plows. Ten of the spray trucks are combination spray/plow trucks with a 1,000 gallon tank capacity, and five are spray-spreader/plow trucks with a 360 gallon spray capacity, and a nine cubic yard spreader capacity. There are twenty chemical storage tanks, with a total storage capacity of 114,250 gallons.

New anti-icing yards storing both chemicals have been established under all four East River bridges. Supervisors monitor the bridge decks during storm events by traversing them and using thermal instrumentation installed in their vehicles to make informed decisions as to when to apply chemicals. GPS capabilities have been installed in key vehicles to assist supervisors with the decision making process.

In the winter of 2011-2012, a total of 12,800 gallons of potassium acetate and 43.5 tons of sodium acetate were applied on the roadways of all four East River Bridges.

INSPECTIONS

In 2012, Inspections covered 103 bridges and 622 spans. Emphasis was placed on ensuring public safety through the monitoring of potentially hazardous conditions and temporary repairs. The unit performed 479 monitoring inspections, and 105 special winter monitoring inspections of cellular structures, shorings, and potential fire hazards. In addition, 151 emergency inspections were conducted in response to hot line calls, in-house requests, or citizen complaints.



Inspecting the Belt Parkway Bridge over 26th Avenue in December 2012. (Credit: Artemio Angeles) Inspecting the Nereid Avenue Bridge over Bronx River Parkway in June 2012, Using a 60 Foot Boom With Outriggers. (Credit: Bojidar Yanev)

Beginning on October 30, 2012, Bridge Inspection staff responded to Hurricane Sandy with emergency inspections of all the potentially affected areas. Starting with the East River bridges, a number of structures were declared safe for travel throughout the day. Flooded areas were identified on the FDR Drive in Manhattan and on the Belt Parkway in Brooklyn and Queens. Post-hurricane emergency and monitoring inspections continued over the following weeks. As

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part of the upgrades following the storm, Bridge Inspection staff will relocate their field office in March 2013.

The Bridge Data System (BDS) allows inspection reports to be generated and transmitted electronically. It provides access to data from the latest inspection reports on all bridges to all Division units. In addition, when an emergency arises, our inspectors are able to send photographs and other information to the main office via a wireless connection to the internet. This feature enables bridge repair engineers to assess the condition and dispatch repair crews with the appropriate equipment in a timely manner. The updated version of the system was field tested by the contractor and the Bridge Management Unit in 2012 and is scheduled for full implementation in March 2013.

A future contract is anticipated to expand the BDS capabilities by incorporating data from capital reconstruction projects. Additional features will include in-depth inspection reports by consultants as well as GPS data.

Since 2002, the Division stores all bridge inspection reports in electronic format. Flag reports are now also transmitted electronically. As of September 2003, standard inspection work is funded by a federal grant. Emergency response inspections and administrative support remain city funded.

The Bridge Management Unit developed a map of truck routes and bridges under capital contracts for the purposes of the Truck Permits Unit. This unit also provided Bridge Maintenance with estimates of the life-cycle benefits of various maintenance tasks, obtained by the software package designed for that purpose.

NON-DESTRUCTIVE TESTING

The Bridge Inspection and Management Units have pioneered the use of various nondestructive tests on City bridges, including X-ray diffraction, fiber optics, strain-gauging, ground penetrating radar, and ultrasonic testing. Future applications of such technologies are under consideration. For demonstration purposes, the Manhattan Bridge was surveyed with a radar scanner. The results indicated that the stiffening of the bridge has reduced its torsional motion under subway traffic very significantly. The results matched independent measurements by Global Positioning Systems (GPS).

In November 2010, the cable research project moved to its final phase as sensors were installed on Cable "D" of the Manhattan Bridge with the help of bridge maintenance personnel. The data collection from the instruments in the cable was concluded in October 2011. The final report will recommend appropriate non-invasive technology for monitoring of suspension cables.

As part of the project, a unique magnetic flux field test was conducted on the cable. The method was developed by Japanese researchers specifically for this test. Its purpose is to estimate the amount of healthy steel in the cable without exposing the wires. The findings were presented at the Agency by the researchers in February 2011. This capability will be considered for future inspections of suspension cables.

In March 2012, Bridge Management staff organized a presentation on 3D Laser Scanning, known as LiDAR. LiDAR can take extremely accurate high resolution 3D images of structures in a static mode or, while mounted to a vehicle in a lower resolution, in a dynamic mode. This technology would be helpful in such areas as documenting the damage caused by extreme events, such as vehicular impact, earthquake, and flood. The technology is also considered for mapping the clearances over City bridges.

In 2012, the Bridge Management Unit awarded a contract for the design and installation of a real time on-line system monitoring of the abutments of three bridges in the Bronx identified as vulnerable to scour. As a first step, the consultant inspected the sites in-depth, and the findings

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resulted in emergency repairs conducted by the Where and When Unit.

Various inaccessible bridge details are inspected by borescope. The bridge carrying the Belt Parkway over Ocean Parkway was inspected with the borescope in order to assist the Engineering Review Section in developing appropriate repair recommendations. Based on the findings of the borescope inspection, the approaches of the bridge were scanned with ground penetrating radar, and the results formed a basis for the overall structural assessment.

CLEANING

In 2012, 9,719 cubic yards of debris were removed from bridges and their surrounding areas, and 1,492 drains were cleaned.



Water Spraying the 9th Street Bridge over Gowanus Canal in July 2012.

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, Cryptococcosis and Toxoplasmosis, when the spores are transmitted to humans who breathe in the harmful dust.

The Division utilizes a relatively low tech, and passive, approach to deterring pigeons. In 2006, the type of barrier used to cage out pigeons was changed from the drop ceiling method to netting. The netting is supported by steel cables that are clipped to the beams. This method is currently in use under the Brooklyn Queens Expressway (over Prospect Street), at the Pulaski Bridge, under the Brooklyn Bridge at "Ash Alley," and at the anti-icing tank storage area under the Brooklyn Bridge at Dover Street. In addition, a pigeon deterrent system involving low voltage wires is in place at the Belt Parkway Bridge over Ocean Parkway. The wires are installed along the web of the girders and are hardly visible, yet highly effective. The system has been in operation for over six years now and no pigeons have been observed under or by the bridge ever since. The community is pleased that we addressed one of their most serious and longstanding complaints. The system requires minimum maintenance and is extremely easy to operate.

In 2012, we experimented with a new method at the Cross Island Parkway Bridge over Totten Avenue: a gel, whose active ingredient is capsaicin, that is applied to the spots unwanted birds would normally perch. Our trial was given positive reviews by the constituents who use the treated overpass.

In 2012, pigeon dropping removal and/or pigeon proofing were performed at the Bruckner Expressway over Bronx River (a.k.a. Eastern Boulevard Bridge), the Whitestone Expressway and

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Cross Island Parkway Interchange, the Broadway Bridge, the Hutchinson River Parkway Bridge, the Cross Island Parkway Bridge over Totten Avenue, Queens Boulevard at Eliot Avenue, the FDR Drive at the South Street Viaduct, and Park Avenue over 41st Street.



Installing Pigeon Netting at Old Slip (FDR Drive at the South Street Viaduct) in June 2012: Carpenters Stephen Buckley, William Sic, and Joseph Moschella, and Supervisor Carpenter Joseph Vaccaro. (Credit: Thomas Whitehouse)



Nature's Pigeon Deterrent—A Falcon on the Brooklyn Bridge South Side Tower. Falcon at the Brooklyn Bridge Manhattan Tower Top in July 2010. Falcons Have Lived on the Brooklyn Bridge Since 1995. Falcon Family on the Williamsburg Bridge. According to the New York State Department of Environmental Conservation, New York State now has the largest population of peregrines in the eastern United States. There Are Now 17 Falcon Pairs in New York City. (Family Credit: Russell Holcomb)



"Owl" Guarding the Machinery Room of the Broadway Bridge. A Hawk on the Broadway Bridge. (Owl and Hawk Credit: Albert Hong)

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.

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Pulaski Bridge Opening in February 2010. (Credit: Bernard Ente) Third Street Bridge Opening in June 2012. (Credit: Nikita Gupta)

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 saves approximately \$1,042,480 annually. In addition, bridge operational capabilities, general maintenance, and debris and snow removal have been enhanced through the more efficient utilization of existing personnel.

Currently in its final design phase, the reconstruction of the Mill Basin Bridge (part of the second Belt Parkway Group) is scheduled to start in summer 2013. The new bridge will be a fixed structure with a 60-foot clearance over Mean High Water, obviating the need for opening and closing the structure to accommodate tall vessels.

The Shore Road Bridge over Hutchinson River will be replaced with a new bridge built with a higher clearance, thereby reducing the number of times the bridge must be opened. At that time, we can determine if advance notice is justified.

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Summary of Vessel Openings 1998 - 2012

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Brdn Ave. (Q)	0	3	0	28	0	0	0	1	0	0	0	0	0	0	0
Brdwy (B/M)	2	0	6	27	83	49	16	2	18	42	58	57	15	11	44
Brecknr Expwy (Estrn Blvd) (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brecknr Expwy (Unnprt Brdg) (B)	257	345	385	420	332	300	309	253	250	281	323	349	308	198	143
Carroll St. (K)	110	174	102	80	124	186	49	22	28	13	38	91	146	29	95
Grand St. (K/Q)	23	24	17	50	19	10	8	5	2	5	0	0	0	3	3
Grnpnt Ave. (K/Q)	669	787	688	641	659	738	1093	1045	905	641	485	428	388	667	733
Hmltn Ave. (K)	996	982	933	832	946	824	757	677	1077	354	0	150	905	1060	965
Hntrs Point Ave. (Q)	0	1	0	36	0	0	0	0	0	1	0	0	0	0	0
Htchnsn River Pkwy (B)	75	46	5	120	30	5	37	10	2	51	61	170	224	169	197
Macombs Dam (B/M)	0	0	0	0	0	0	0	0	0	4	2	0	3	1	22
Mdsn Ave. (B/M)	0	0	0	0	0	0	7	0	9	35	8	0	3	1	6
Metrpltn Ave. (K)	448	513	279	366	339	342	153	0	104	329	245	240	254	413	468
Mill Bsn (K)	591	433	336	317	142	173	164	162	174	182	190	183	197	236	277
Pulaski (K/Q)	332	383	276	208	308	599	694	734	433	489	639	611	467	591	476
Rsvlt Islnd (M/Q)	4	0	58	48	125	63	669	150	54	48	0	62	0	0	55
Shore Rd (Pelham Pky) (B)	2274	2162	2168	2222	1897	1910	2011	1683	1704	1645	1446	806	1197	811	613
Union St. (K)	103	144	85	101	62	24	21	11	9	5	10	28	32	4	36
Ward's Isnd Pdstrn (M)	1	0	0	279	0	0	7	2	8	4	6	3	5	0	0
Willis Ave. (B/M)	0	4	4	40	0	7	25	2	41	67	17	9	1	1	0
3 rd Ave. (B/M)	0	2	1	1	0	0	0	0	6	60	7	0	3	3	4
3 rd St. (K)	112	157	178	117	212	152	99	43	31	39	49	89	74	27	68
9th St. (K)	0	192	513	808	733	547	457	360	480	333	287	387	475	670	585
145 th St. (B/M)	0	0	1	6	0	0	9	0	0	0	0	0	0	1	6
W.207 th St. (B/M)	2	0	6	14	4	6	10	1	12	24	2	3	7	5	23
TOTAL	5999	6352	6041	6761	6015	5935	6595	5163	5347	4652	3873	3666	4704	4901	4819

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RESEARCH AND PRESENTATIONS

In 2012, research work and/or case histories of the Division were presented in the following proceedings:

Transportation Research Board 91st Annual Meeting, Washington D.C., 22 – 26 January 2012. Yanev, B. and Kroely, B. *The Bridge Data Management System of NYC DOT*.

Iranian-American Society of Architects and Engineers, New York City, 2 February 2012. Hedayati, A. *Replacement of the Willis Avenue Bridge over the Harlem River*.

Metals in Construction, Spring 2012, Pages 36 – 41. *Paerdegat Basin Bridge*.

2012 American Society of Highway Engineers National Conference: Life is a Highway. Seven Springs, Pennsylvania, June 7 - 10 2012. Nyman, W. E., with introduction by Collyer, R. *Replacement of the Willis Avenue Bridge over the Harlem River*.

29th Annual International Bridge Conference, Pittsburgh, Pennsylvania, 10 – 13 June 2012. Nyman, W. E. *IBC 12-47: Willis Avenue Bridge*.

SMT 2012 Conference: NDE/NDT for Highways and Bridges - Structural Materials Technology (SMT), New York City, 21 – 24 August 2012. Yanev, B. *The Value of Redundant NDE Evaluations in the Management of Long Span Bridges*.

Heavy Movable Structures 14th Biennial Movable Bridge Symposium, Orlando, Florida. 22 – 25 October 2012. Rahul, S. *Willis Avenue Swing Bridge Construction*.

In October 2012, Dr. Yanev was invited to Japan by the Metropolitan Expressway Company, who operate and maintain the Shuto Expressway, a network of toll expressways in the Greater Tokyo Area. He joined them in a discussion and inspection of bridges under consideration for rehabilitation or replacement.

International Jubilee Conference, UACEG2012: Science & Practice, Sofia, Bulgaria. 15 – 17 November 2012. Yanev, B. *Probability and Determinism in Bridge Management*.

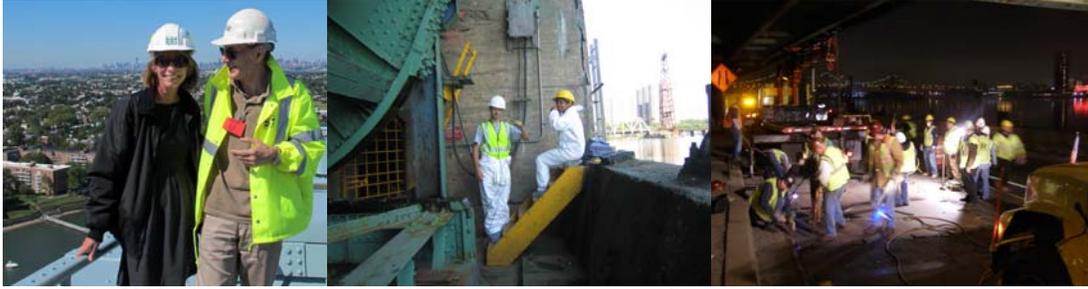
Conference on Cable-Supported Bridges, IFSTTAR, Département Structures et Ouvrages d'Art, Nantes, France. 27 – 28 November 2012. Yanev B. *Suspension Bridge Cables: A Balance of Empiricism, Analysis and Management*.

The FHWA project "Structural Safety Appraisal Guidelines for Suspension Bridge Cables" with principal investigator, Columbia University, in which Dr. Yanev and the Agency participated, was completed in 2012. The final report is due for publication in 2013.

Dr. Yanev is a member of the Transportation Research Board Committees on Bridge Maintenance, Management, and Seismic Design.

In addition, the Division sponsors an in-house lecture series, inviting speakers from industry and academia several times a month. Highlight topics of the presentations in 2012 included: Software solutions for inspections and asset management, bridge deck membranes, mobile and static scanning technology, galvanization, rust and enamel grips, monitoring of bridge dynamic response, asphaltic bridge joints, and SMART load rating technology.

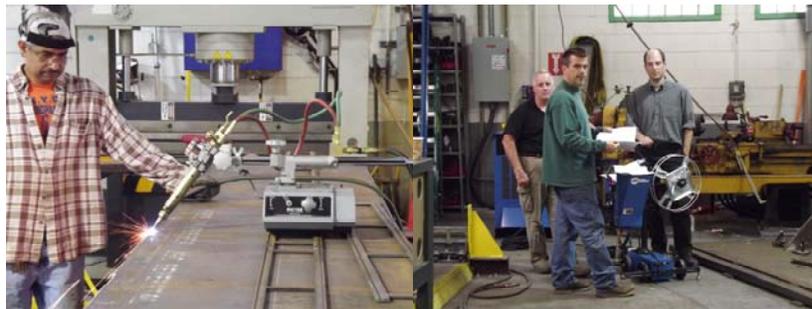
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August 2012 – Commissioner Janette Sadik-Khan and Executive Director of Bridge Inspections and Bridge Management Dr. Bojidar Yanev. July 2012 – Shore Road Bridge: Summer College Interns Kevin Hillery and Nikita Gupta Observing the Strain Gauge Wires During a Bridge Leaf Opening. (Credit: Vera Ovetskaya) March 2012 - FDR Drive at 40th Street, Northbound. With Con Ed Personnel in Attendance, Crews Removed Roadway Plates Over an Abandoned Con Ed Coal Tunnel. Spalled and Broken Concrete and Localized Settlement Were Observed. After the Inspection, the Plates Were Re-installed and Ramped. (Credit: Bojidar Yanev)



Bridge Maintenance Personnel Building a New Prototype Pedestrian Fence in April 2012. Standing: Director of Bridge Repair Pinakin Patel, Bridge Repairer and Riveter Charlie Zhao, Acting Director of Bridge Preventive Maintenance Paul Schwartz, and Bridge Repairer and Riveters Ignazio Trapani and James Philip. Foreground: Executive Director of Bridge Preventive Maintenance and Repair Thomas Whitehouse. Broadway Bridge Fender System Rehabilitation Work in August 2012: Administrative Engineer Sunil Desai, Assistant Civil Engineer Li Yi, and Civil Engineer Antoine Aubourg.



In September 2012, Bridge Maintenance Personnel Fabricated a Mock-Up Overheight Protection Beam for the Westchester Avenue Bridge over Hutchinson River Parkway. This Enabled the In-House Design Engineers to Prepare the Final Shop Drawings. Bridge Repairer and Riveter James Philip Using a Track-Mounted Torch to Bevel the Edge of the Steel Plate. Electrician Patrick Fitzgerald, Supervisor Bridge Repairer and Riveter John Jones, and Acting Director of Bridge Preventive Maintenance Paul Schwartz Discussing the Next Step in Setting up the Sub-Arc Welder for Fabrication of the Beam.

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The Sub-Arc Welder Provides a Purer Weld With Less Contaminants From the Atmosphere. The Beam. (Credit: Thomas Whitehouse)



December 2012: Preparing a Footing for a Concrete Pad That Will Hold Office Trailers and Storage Containers in the Vernon Boulevard Yard Under the Ed Koch - Queensboro Bridge. (Credit: Thomas Whitehouse)