

**New York State  
Department of Transportation**

**Bridge Safety in New York City**

**Testimony Presented By:**

**Stanley Gee  
Executive Deputy Commissioner**

**New York City Council Committee on Transportation  
Oversight Hearing on Bridge Safety in New York City**

**September 17, 2007**

## **I. Introduction**

Thank you for the invitation to participate in this important hearing regarding "Bridge Safety in New York City."

My name is Stanley Gee. I am the Executive Deputy Commissioner of the New York State Department of Transportation, and I look forward to discussing the Department's comprehensive bridge inspection and safety assurance program this morning.

I am joined today by Douglas Currey. For the past seven years, Mr. Currey has served as Regional Director for our New York City Region. Also with me today is George Christian, our Director of the Office of Structures. Mr. Christian has 35 years of extensive experience in bridge design, construction, and evaluation. He is a nationally known expert and serves on the American Association of State Highway and Transportation Officials Subcommittee on Bridges and Structures.

## **II. Governor's Initiative**

In response to the tragic collapse of the I-35W Bridge in Minneapolis on August 1, 2007, Governor Spitzer established a State Bridge Task Force comprised of participants from the New York State Department of Transportation, New York State Thruway Authority, New York State Bridge Authority, and the Metropolitan Transportation Authority. The Task Force, which I chair, was directed to:

- determine whether bridges in New York State of similar design and type as the I-35W bridge continue to be safe to use;
- review the State's bridge inspection standards and procedures; and
- report back to the Governor in 30 days.

Minneapolis's I-35W bridge was a deck truss highway bridge. There are 49 deck truss highway bridges in New York State, eight of which are located within New York City. At the Governor's direction, all of these bridges were visually inspected by August 31<sup>st</sup>. More detailed follow-up inspections will be done by November 1, 2007. The Task Force has coordinated its activities with the New York City Department of Transportation.

When it was learned that the I-35W bridge was under construction before collapsing, Task Force member agencies issued instructions to their construction staffs and contractors reminding them to prohibit stockpiling materials and parking unused equipment on bridges in order to prevent overloading during construction.

Last Monday, September 10<sup>th</sup>, the Task Force released its initial report to the Governor, which verified that the deck truss bridges in New York State remain safe for travel by the public. The Task Force has also demonstrated that the bridge inspection protocols used in New York are appropriate and are effective.

The visual inspections, preceded by a review of all bridge inspection files, and the detailed inspections completed to date have found that these bridges are generally structurally sound with no serious problems. Five of these bridges had some structural issues requiring further investigation, and one requires remedial action within six weeks; none were in New York City.

The Task Force report is available on a new Department website, which was developed in response to heightened public interest following the Minneapolis bridge collapse. The website ([www.nysdot.gov/bridgedata](http://www.nysdot.gov/bridgedata)) describes the State Bridge Inspection Program and provides condition information on all of the more than 17,000 bridges in the State.

The Task Force will issue another report in November, summarizing the condition of New York's 49 deck truss bridges, based upon the results of the detailed inspections currently underway.

### **III. NYS Department of Transportation Bridge Inspection Program**

The Department is responsible for ensuring that all highway bridges in the State are inspected as required under Federal regulations and State law. The Department's inspection program exceeds federal requirements and consistently receives high marks in annual Federal Highway Administration management reviews.

All publicly owned highway bridges receive a general inspection at least once every two years. In addition, New York is one of only a few states in the nation that requires bridge inspection teams to be led by licensed professional engineers who have undergone specific training. Bridges that meet certain condition deficiency criteria or are posted for limited truck weights are inspected annually.

Of the more than 17,000 highway bridges in New York State, about 44% are owned by the State, 50% by municipalities, and the rest by authorities, commissions, and railroads. The Department inspects the 94% of the highway bridges in the State that are either state or municipally owned using its own work force and consultants. Toll authorities and commissions are responsible for their own inspections and are required to submit their inspection data to the Department.

In New York City, New York State inspects 1,395 bridges, with 676 owned by the State, and 719 owned by the City.

In a typical calendar year, about 70 two-person teams conduct inspections on approximately 9,500 State and local government-owned bridges throughout the State. Underwater inspections are conducted by another nine teams each year.

Nineteen consultant teams inspect the 1,200 State and City-owned bridges in New York City at an annual cost of \$10 million. The bridges in the City are among the largest in the State as well as some of the most structurally and logistically complex. Inspections of many New York City bridges are subject to traffic-access restrictions and must be conducted during off-peak hours, including at night.

In addition, 10 consultant teams are required to inspect the four major East River Bridges every two years at a cost of more than \$5.5 million.

In New York State, bridge inspectors assess all of a bridge's individual components. They are required to evaluate, assign a condition score, and document the condition of up to 47 structural elements, including rating 25 components of each individual bridge span. They also rate 22 general components common to all bridges and bridge approaches. For certain critical structural elements, special "hands-on" inspections are required.

To evaluate and report on the structural condition of bridges, the Department uses a numerical condition rating scale, which ranges from 1 to 7. A rating of 5 or greater is considered good condition, with 7 indicating a bridge in new condition. The State Bridge Inspection Program, one of the more rigorous in the country, is designed to identify problems and address them before a bridge becomes unsafe. There is an established procedure for responding to inspection findings by reporting conditions requiring timely attention regarding a potentially unsafe condition and by increasing the inspection frequency. Any bridge deemed to be unsafe is immediately closed.

In addition to subjecting all bridges to regular condition inspections, the Department analyzes all bridges for their capacity to carry vehicular loads. Critical measurements needed to support these analyses are recorded during bridge inspections. Bridges that cannot safely carry heavy vehicles, such as some tractor trailers, are posted with weight limits. Bridges that cannot carry adequate loads are closed to traffic.

The requirements of the State's Graber Law go beyond inspection-driven actions to a proactive approach to bridge safety, based upon the identification of vulnerabilities related to the design of the bridge, the component materials, traffic loads, seismic and hydraulic conditions, or any other factors that might cause a bridge failure. An example is the seismic vulnerability assessment of 450 bridges on various emergency routes in New York City.

Under the Graber Law, the Department is required to submit to the Governor and Legislature an annual report on the status of our bridge management and inspection programs.

Bridge condition information is used to establish preventative and corrective maintenance programs, as well as bridge rehabilitation and replacement programs. It also is used to help measure program performance.

#### **IV. New York City Bridge Conditions**

The total population of 1,400 highway bridges in New York City represents about eight percent of all highway bridges in the State, yet comprises nearly one-third of the State's total highway bridge deck or surface area. As a population, 56% of the highway bridges in New York City are classified as deficient by the State condition rating system, as compared to 35% statewide.

Part of the reason bridge conditions are found to be worse in New York City when compared to the statewide average is because of the way condition ratings are determined. If a bridge has multiple spans, each element common to the spans is rated and the lowest individual span element rating is used to determine the bridge's overall condition. As a result, large multi-span bridges tend to get lower condition scores.

A deficient condition rating indicates deterioration at a level that requires corrective maintenance or rehabilitation to restore the bridge to its fully functional, non-deficient condition. It does not mean that the bridge is unsafe.

The Federal rating system, which measures average conditions for the entire bridge regardless of bridge size or complexity, shows about 11% of bridges in New York City are classified as structurally deficient, slightly below the statewide and national averages of 12%. A structural deficiency rating under the Federal rating system makes a bridge a candidate for major rehabilitation or replacement.

The Federal system also includes a functionally obsolete designation, which refers to a bridge's inability to meet contemporary standards for managing the volume of traffic it carries or its geometric design, not to its structural integrity. In New York City, 65% of the highway bridges are classified as functionally obsolete, compared to 26% statewide. This high percentage can be attributed to the age and substandard geometrics of the New York City bridge population, combined with the high traffic demands.

## **V. NYS Department of Transportation Bridge Capital Program**

The Department has spent an average of approximately \$750 million annually on bridge improvement and maintenance during the past five years. This includes bridge replacement, rehabilitation, design, construction inspection, maintenance activities, safety inspection, and safety assurance. Of that amount, approximately 45% (\$340 million) is spent on bridges in New York City.

As required by the recent congestion pricing legislation, and as part of the development of next year's Executive Budget for the State, the Department is undertaking a comprehensive review of highway and bridge capital requirements and funding needs. Bridge and highway improvement needs in New York City will be a significant factor in the new capital plan. This effort could also include an enhanced bridge maintenance program aimed at keeping critical bridge elements from deteriorating further, thereby slowing the rate bridges become deficient. The Department will share more of the details of this effort in the Task Force's next report to the Governor.

## **VI. Conclusion**

The Minneapolis bridge collapse was a sobering reminder to agencies charged with stewardship of the State's bridges that these structures are critically important to commerce and public safety. Managing them is serious business, which requires vigilance, foresight, and significant attention and funding to ensure that these bridges continue to safely serve the traveling public.

Thank you very much for providing me with the opportunity to discuss New York State's bridge inspection and safety assurance efforts.

I hope the information presented to you this morning is helpful in your deliberations.

I will be happy to answer any questions.

**STATEMENT BY FRANCIS J. LOMBARDI, P.E.  
CHIEF ENGINEER  
THE PORT AUTHORITY OF NEW YORK & NEW JERSEY**

**THE NEW YORK CITY COUNCIL  
COMMITTEE ON TRANSPORTATION**

**SEPTEMBER 17, 2007**

- This statement is to assure the New York City Council Committee on Transportation that Port Authority Bridges are safe and are in good condition. Public Safety was, is and will always be the highest priority within the Port Authority.
- The Port Authority has a cyclical Condition Survey Program to ensure that all Port Authority structures (including tenant facilities) are structurally sound for public use. A structure is defined as "structurally sound" if it functions as originally designed and does not pose a potentially unsafe condition to the public.
- The Port Authority's condition survey program was established in 1984. Under this program, structural inspections are performed to identify all structural and non-structural deficiencies and make recommendations for all necessary repairs. The annual budget to implement this program is approximately \$10 million.
- Port Authority bridges, which include the George Washington Bridge, Bayonne Bridge, Goethals Bridge, the Outerbridge Crossing, the Lincoln Tunnel approach roadways and bridges at JFK & LGA, are inspected every 2 years in full compliance with the requirements of both New York State Department of Transportation and Federal Highway Administration. Interim inspections will be performed if a condition is found that warrants additional investigation.
- The Port Authority Condition Survey Program also includes structures, which are not mandated to be inspected by law, such as the Holland and Lincoln Tunnels, Waterfront Structures, JFK Light Rail System and the PA Bus Terminal & GWB Bus Station. These structures are inspected every 2, 3, 3, and 6 years respectively to ensure they are also structurally sound and safe for public use.
- Structural priority repair recommendations are made to prevent further deterioration and restore structures to function as originally designed. If a structural deficiency develops from a priority repair, it is handled by taking immediate remedial action to ensure public safety. As a result of these remedial actions taken, 100% of all PA structures are maintained as structurally sound for public use.

- The Port Authority bridge inspections focus on the condition of the bridge deck, the primary structural elements of the span and the underwater infrastructure, with special emphasis placed on areas of concern such as non-redundant members, fracture critical members and fatigue prone details.
- All deficiencies identified that require immediate remedial action are repaired immediately to ensure public safety. These conditions are addressed by Port Authority Structural Immediate "Call-In" Contractors assigned to various PA facilities.
- Repairs that do not require immediate attention are included in the capital plan or are undertaken as part of the scheduled bridge maintenance program. These repairs are tracked to ensure appropriate remedial action be taken in a timely manner.
- In the Port Authority's 2007-2016 Capital Plan, \$1.7B has been earmarked for state-of-good repair projects at all of the agency's bridges.
- In addition to the conditions survey program, PA facility staff performs day-to-day routine maintenance of the bridges. The budget in 2007 for routine maintenance of all Port Authority bridges is approximately \$1.7M.
- At the George Washington Bridge there are 145 structural maintenance routines performed. An additional 70 routines are performed amongst the three Staten Island bridge facilities. Major components examined annually include the approach ramps, the abutments, the anchorage, structural steel members, deck surface, sidewalks, and suspender cable. Additionally, finger joints are examined 6 times per year.
- In closing, I assure you again that all Port Authority Bridges are now and will remain structurally sound and safe for public use for many years to come.
- Thank you.

**JANETTE SADIK-KHAN  
COMMISSIONER  
NEW YORK CITY DEPARTMENT OF TRANSPORTATION**

**HEARING BEFORE THE CITY COUNCIL  
COMMITTEE ON TRANSPORTATION  
SEPTEMBER 17, 2007**

Good morning Chairman Liu and Members of the Transportation Committee. I am Janette Sadik-Khan, Commissioner of the New York City Department of Transportation (DOT) and with me here today is Henry Perahia, DOT's Chief Bridge Officer. Thank you for inviting us here today to this oversight hearing on bridge safety. In the wake of the tragic bridge failure that occurred in Minnesota last month, attention has focused on the condition of our bridges, and in New York, where bridges represent such an important component of our infrastructure, such scrutiny is appropriate and welcome.

My main point to you today is to assure you and the people of New York that the City's bridges are safe and in their best condition in generations. Our bridges are extremely well managed, they are being rebuilt and upgraded by experts and are subject to one of the strongest inspection systems in the United States. We have a very strong bridge capital investment program, which has turned overall City bridge conditions around and will continue to bring more bridges into good repair. City DOT has been an early adopter of high-tech bridge monitoring equipment and techniques, and DOT's Division of Bridges is now further enhancing its inspection capabilities with additional technology and expertise. Bridge conditions and bridge management in New York are a good news story, and I am pleased to be here to share it with you.

There are over 2,000 bridges here in the City of New York that serve a vital transportation role in linking all five boroughs together. DOT's Bridges Division, which is supervised by Deputy Commissioner Perahia, includes 809 DOT employees, who manage the City's capital bridge program and conduct bridge inspections, monitoring and maintenance. Our bridges include, among many others, the notable East River and Harlem River Bridges, the Belt Parkway Bridges, and pedestrian

bridges and elevated roadways located City-wide. The rest of the 1,213 bridges found in the City fall under the responsibility of either State DOT, the MTA or the Port Authority.

As a densely populated City surrounded by water at all corners, we have an enormous reliance on these bridges. Many of these structures were built decades and even over a century ago, and so maintaining them has been a real challenge. Despite this, however, the City has done a tremendous job in making sure that they are properly maintained and safe. In fact, the condition of our bridges has consistently been improving through the years. To illustrate this let me point out the number of bridges rated “poor” has fallen by 92.5% from 40 in 1997 to 3 in 2006; and the number of bridges rated “fair” has fallen 14% from 530 in 1997 to 456 in 2006.

Clearly, while bridges rated “poor” and “fair” have fallen over this time period, bridges rated “good” and “very good” have increased. In 1997, 145 City bridges were rated “good” and by 2006 this number increased 45% to 210 bridges with this rating. The percentage increase in bridges rated “very good” is even more dramatic. In 1997, 55 City bridges were rated “very good” and by 2006 this number increased to 118 bridges – a 115% increase.

As I noted earlier, today our bridges are in the best condition they have been in generations and these impressive percentages can be attributed to the City’s realization years ago that substantial investment in our bridges was needed. Many of us recall the troubles the City experienced with its bridges in the 70’s and ‘80’s with the collapse of the West Side highway and the closing of the Williamsburg Bridge. Since this time, we have made tremendous strides in maintaining and investing in our bridge infrastructure. Since 2000, the City has invested about \$3 billion in bridge capital reconstruction projects which has included a number of projects to rehabilitate the East River Bridges, namely the Brooklyn, Manhattan, Williamsburg and Queensboro Bridges. Over the last few years DOT has also completely replaced other major bridges, including the Third Avenue, Macombs Dam and 145th Street spans over the Harlem River.

Looking forward over the next two years we will be investing more than \$2 billion in additional capital reconstruction projects on our bridges, including the Willis Avenue Bridge, the Brooklyn

Bridge ramps and painting, the Manhattan Bridge, the Belt Parkway bridges, the ramps at the St. George Ferry Terminal and the 153<sup>rd</sup> Street Bridge in the Bronx, a new vehicular cable-stayed bridge and the first of its kind in New York State. Over the next ten years, DOT has \$5.8 billion in the Ten Year Capital Strategy plan to spend on bridge reconstruction projects, including \$309 million provided as part of PlaNYC 2030 for bridge infrastructure state of good repair.

To get important construction projects completed more quickly, we have used innovative procurement techniques such as contracts with incentive and disincentive payments. To encourage efficient work, the contractor receives a monetary incentive for each day the project is completed ahead of schedule. Conversely, if delays are attributable to the contractor, the contractor makes a payment to the City for every day of delay. This has been an effective tool to ensure the timely -- and at times early -- completion of challenging projects on bridges with high traffic volumes. Incentives/disincentives are particularly useful where we have multiple crossings, like the East and Harlem Rivers, where the early completion of one bridge permits an early start on an adjacent bridge. 90 percent of the projects utilizing this strategy have been completed ahead of schedule and none to date have been late as a result of conditions within the contractors' control.

Reconstructing and replacing bridges are one part of our efforts to protect this critical infrastructure. Equally important is ensuring inspections, monitoring and maintenance. Bridge inspections determine the condition rating of every bridge and its components and provide us with important information on where we should be focusing our monitoring. Our in-house Bridge Inspection and Bridge Management Unit inspects all pedestrian bridges and manages our bridge data. The City's vehicular bridges are inspected by State DOT who also inspects all of the State's vehicular bridges every two years as required by Federal law. Our in-house team conducts follow-up inspections and monitoring and we use the same rating criteria as the State.

It is noteworthy to point out that New York State's criteria are more rigorous than Federal requirements and inspections done in other States in that they are more thorough and the inspectors more qualified. State DOT conducts span-by-span inspection, evaluation and rating for many different

bridge elements, while the Federal inspection system, which is followed by most states, only requires the reporting of ratings for the entire bridge and only for a few generalized elements such as superstructure, substructure and deck. Additionally, the State requires bridge inspection Team Leaders to be licensed professional engineers with at least three years of bridge experience, while the Federal government and most states, do not have this requirement. Lastly, all City bridge inspectors complete a special course given by State DOT.

As I noted earlier, the City has three bridges that were rated "poor" after their last inspections. A poor rating means that there are components of the bridge that must be rehabilitated; it does not mean that the bridge is unsafe. If a bridge was deemed unsafe, let me say in no uncertain terms -- it would be closed. I think it is also worth mentioning that the term "structural deficiency" that has been widely used in relation to the Minnesota collapse is an engineering term-of-art used by the Federal government to indicate a defect requiring corrective action. According to the FHWA, "'structurally deficient' means there are elements of the bridge that need to be monitored and/or repaired. The fact that a bridge is 'deficient' does not imply that it is likely to collapse or that it is unsafe. It means they must be monitored, inspected, and maintained." Because we use the New York State rating system, we do not use that term and instead use the terms "very good", "good", "fair" and "poor". As with the Federal term, the terms "fair" and "poor" describe the condition of bridge elements and whether they are functioning as designed. Although these elements are not considered hazardous, the ratings are used to determine whether the elements require repair or rehabilitation. Again, any bridge deemed unsafe would be shut to the public.

The three City bridges that are rated "poor" include the Willow Lake Bridge in Flushing Corona Park, which is in a remote location, was damaged by fire and is closed. The second is a pedestrian bridge at 78<sup>th</sup> Street over the FDR Drive. The columns on this bridge have been shored and there is shielding under the concrete to protect against spalling. As a result, the bridge remains safe until its reconstruction which is expected to begin in about a year.

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

Nevertheless, we have instituted a new program whereby poorly rated components of poor bridges are inspected every three months. For example, we recently re-inspected the poorly rated components on the Brooklyn Bridge to assure that the bridge remains safe. We are also proposing an enhancement of bridge inspections so that we can monitor critical components on all bridges with a condition rating of 3.5 or below more frequently. We also propose to contract for underwater inspection service and we will add remote monitoring equipment on bridges as required.

In addition, the City has been at the forefront of utilizing new technology to assist us in the monitoring of our bridges. For example, utilizing strain gauges to monitor the orthotropic deck of the Williamsburg Bridge and crack propagation on the Manhattan and Brooklyn Bridges and X-ray diffraction to test stresses in critical steel members on the East River bridges. We are also using fiber optic sensors to monitor the forces in suspenders on the Manhattan Bridge and stresses in girders on the Paerdegat Bridges. Ultrasonic testing is another technology that we are applying on the eyebars of the Queensboro Bridge to examine the condition of the critical details in the top chord of the truss. Lastly, a new package of technologies will be tested for effectiveness on monitoring the condition of the high-strength wires in the Manhattan Bridge cables.

DOT's Bridges Division is also responsible for bridge preventive maintenance which serves to increase and preserve the life of our investments -- and safeguards the integrity of our bridges now so that we don't run into any problems later. Maintenance work includes everything from lubricating bridge joints and bearings, to spot and salt splash painting, to washing the East River Bridges after the

winter to remove salt, to cleaning drains and litter removal so that water does not collect and result in bridge rust.

In fiscal year 2006, DOT spent nearly \$67 million on bridge inspection and maintenance and since 1997, over \$630 million in annual bridge maintenance. This includes preventive maintenance funds obtained from the Federal government for the East River Bridges through its Highway Bridge Replacement and Rehabilitation Program (HBRR). The City was among the first to take advantage and receive funds under this program when it was established in 1997 to help cities and states maintain their investments in bridges. Previously, Federal funds were only available for capital work. Additionally, we have applied for and expect to receive funds under this program to assist in the preventative maintenance of the City's 25 movable bridges along the Harlem River and various other waterways throughout the City.

I cannot overstate the importance of the Federal funding for our bridge program. In fact, about two-thirds of the Federal transportation funding that the City receives from the Federal Highway Administration (FHWA) is directed towards our bridge program. We obtain approximately \$130 million annually through the Federal HBRR Program for both capital and maintenance expenses for the bridge program.

Of the over \$3 billion spent for capital work on the four East River Bridges, \$1.2 billion was provided by the Federal government. Furthermore, the Federal government contributed \$222 million of the \$620 million that the City needed to rehabilitate five Harlem River Bridges (Madison Avenue, Third Avenue Bridge, Macombs Dam Bridge, University Heights Bridge and 145th Street Bridge). In August 2007, DOT registered a \$612 million construction contract for the Willis Avenue Bridge of which \$282 million was provided by FHWA.

Over the next few years, DOT plans to rehabilitate seven Belt Parkway Projects for an estimated cost of over \$620 million of which \$400 million is Federally funded. Two additional construction contracts for the completion of work on the Brooklyn Bridge and Manhattan Bridge is expected to cost over \$435 million of which \$224 million is projected to be funded by the FHWA.

We will also be looking to Washington for not only additional funding but also policy changes as debate gets underway for the fourth reiteration of ISTEA in 2009. For example, we will be lobbying to make more funds available for bridge maintenance and for the elimination of the 10% cap, whereby currently no State can receive more than 10% of the total HBRR apportionment in any one Federal fiscal year. Additionally, with the expected implementation of congestion pricing, we anticipate receiving even more funding to ensure a good state of repair, including over \$300 million for infrastructure.

The City has done a great job investing in its bridges, using innovative procurement techniques, new state-of-the art technology to monitor our bridges and making use of available Federal funding and the numbers speak for themselves – our bridges are safe and are consistently improving. Can we do more – absolutely – with additional resources from Washington we can continue to improve upon our efforts to ensure a state of good repair of this critical infrastructure.

Again, thank you for the opportunity to be here today, at this time we would be happy to answer any questions you may have.

**Testimony of Tom Bach, Chief Engineer of MTA Bridges and Tunnel Before the City Council of the City of New York Monday, September 17, 2007**

Good morning. Thank you for inviting us here today. My name is Tom Bach, I am Chief Engineer of MTA Bridges and Tunnels. I have been a licensed professional engineer in New York State for 29 years and I've been with the Authority for almost 18 years. MTA operates seven bridges in New York City. They are the Triborough, Verrazano Narrows, Throgs Neck, Bronx Whitestone, Henry Hudson, Marine Parkway-Gil Hodges and Cross Bay Veterans Memorial Bridges. These structures include some of the oldest, largest, most complex, and heavily traveled structures in the nation. More than 300 million customers utilized B&T facilities in 2006, and B&T's \$1.2 billion annual toll revenue funds its own operations and capital program, and generates revenue for the transit services of the MTA.

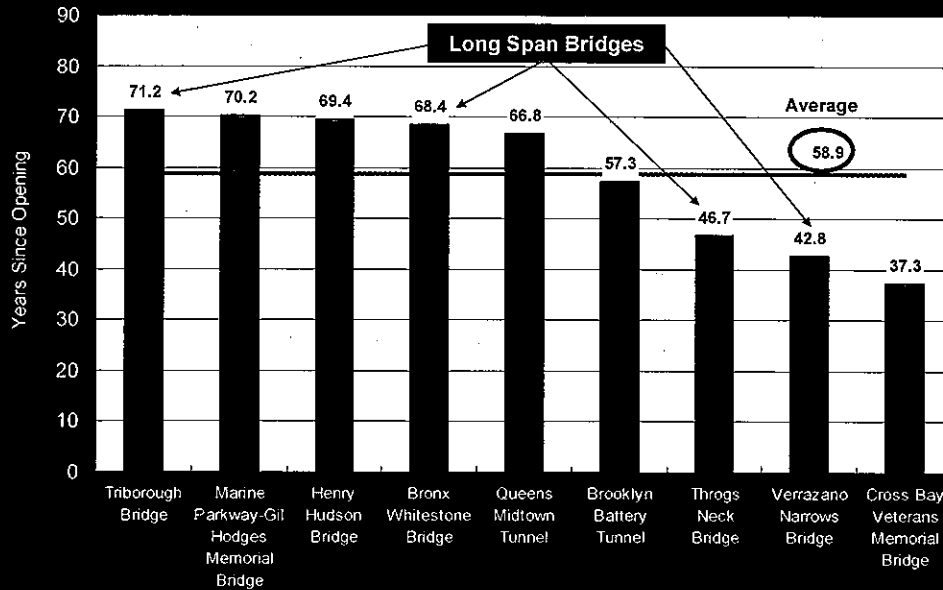
As a result of thorough inspections, dedicated on-site staff at each crossing, and constant reinvestment through our capital program, these structures are safe and in a state of good repair. This fact is evidenced by our most recent New York State General Recommendation ratings that average 4.7, with no rating being lower than 4. Our ratings are also improving, which indicates we are staying ahead of the age- vs.- deterioration curve.

In addition, we are part of the Governor's Bridge Task Force, which was assembled in response to the recent collapse of a deck truss bridge in Minneapolis. We had just completed a Biennial Inspection of the Marine Parkway Bridge, which has deck truss features, and we reinspected the bridge as part of the Task Force effort and again found it to be in good condition.

In a recent report to Governor Spitzer, New York State DOT aptly noted that the State "bridge structures are old and require vigilance, great effort, and significant funding to ensure that they continue to serve the traveling public."

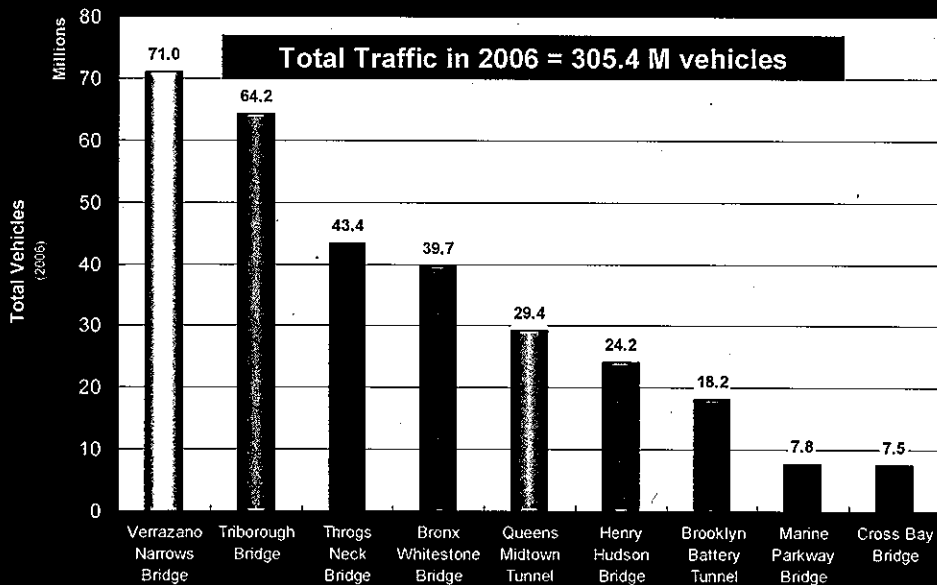
Five of our crossings were built in the 1930's, for example, and these structures have received the lion's share of our vigilance, effort and Capital Investment. These bridges continue to serve us well despite their advanced age and ever increasing traffic volumes. As indicated on the charts on the following page, our bridges range in age from 71 to 37 years old. Annual traffic on our crossings ranges from 71 million on the Verrazano Narrows Bridge to 7 million on each of our two Rockaway bridges.

**CHART A  
AGE OF B&T FACILITIES**



As of 6/30/07

**CHART B  
ANNUAL VEHICLE TRAFFIC  
(2006)**



We will continue to meet our responsibility to ensure that these critical structures are safe and sound today and maintained for future generations. We accomplish this through proven strategies that combine regular intensive inspections, which are complemented by the work of dedicated on-site engineering and maintenance personnel assigned to each facility. These employees have come to know B&T's facilities inside-and-out and care for it daily. The knowledge gained by our staff and through our inspections is in turn translated into a five year capital program, twenty year capital needs assessment, and annual maintenance and painting programs. These programs precisely target and address the specific needs of each facility

I would like to review components of these various strategies with you.

### **Biennial Bridge Inspections**

As you may know, the State Biennial Inspection program is extensive and is more rigorous than Federal requirements. New York is one of the few states in the nation that requires bridge inspection teams to be headed by licensed professional engineers who have undergone specific training. The Inspection Program is vital to identify facility needs, and is a key component to all capital planning.

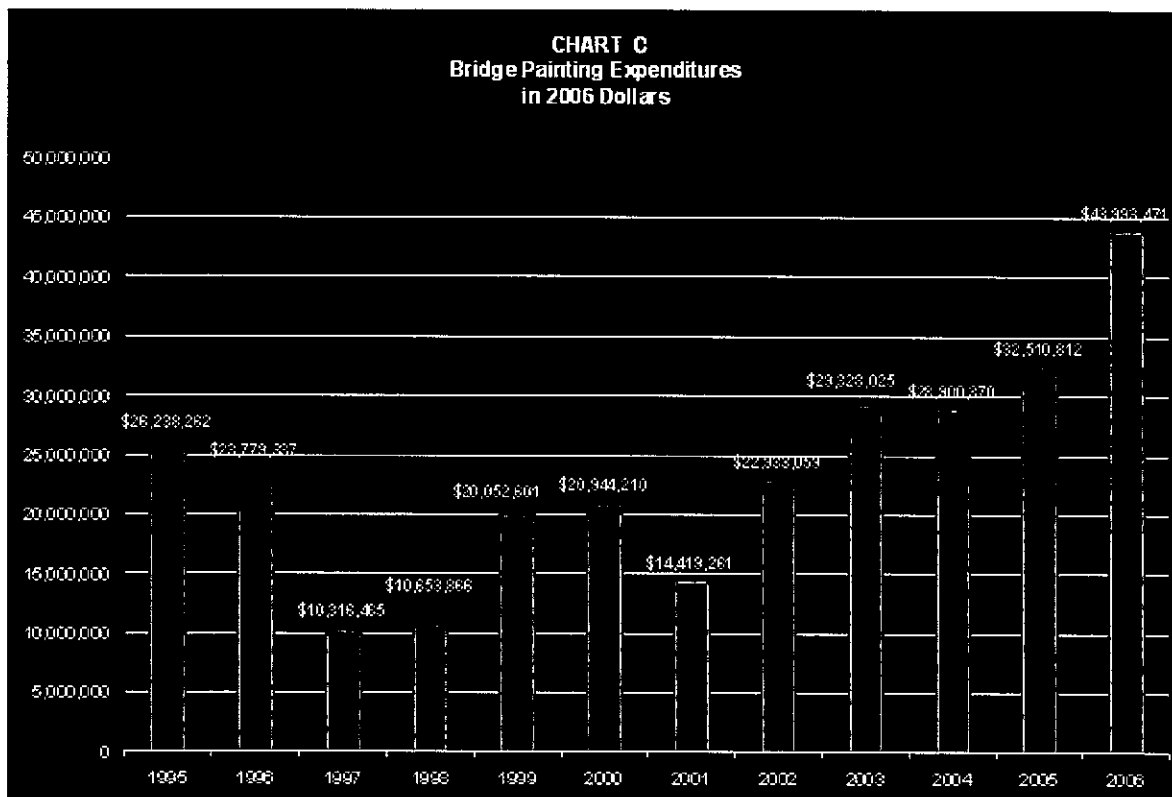
Like other NYS toll authorities and commissions, B&T is responsible for inspecting our own bridges every two years, and we are required to submit inspection data to NYSDOT for their review. Our inspections are carried out by professional engineering firms, take many months to complete and cost the Authority about \$5 million a year. B&T's outside consultants possess special expertise in the inspection of B&T's large, complex structures. The inspectors are required to evaluate, assign a condition score, and document the condition of up to 47 structural elements, including rating 25 components of each span of a bridge, in addition to general components common to all bridges.

In addition, in late 2006, the MTA awarded a contract to Wilbur Smith Associates to do an independent thorough review of B&T's inspection program. The final report in May of this year found the overall assessment of our bridge and tunnel inspection program is "very positive". The report states "...with respect to accuracy, clarity, and thoroughness of the reports generated, we find them to be of the highest quality....".

The Biennial Inspection program includes diving inspections of underwater structures and fathometric surveys that study underwater contours for the entire length of a bridge. Mechanical and electrical inspections are also performed on the vertical lift bridges at the Triborough and Marine Parkway Bridges. The bridge is observed during the lifting operations, and all mechanical systems and components are checked during bridge operation. The electrical inspection includes the operation of the traffic and navigation safety, systems, power supplies, motors, circuit breakers, wires and cables, relays, to name a few. Bridge elevators are also thoroughly inspected as part of the program. These inspections supplement B&T's on-going maintenance activity. Our lift bridges are regularly exercised and maintained in accordance with a rigorous preventative maintenance program.

Paint provides vital protection for our steel structures and the Biennial inspection consultant is also required to provide a Paint Condition Report which is used by the MTA Paint Group to evaluate the current paint condition, plan paint cycles and make capital program decisions.

From 1992 through 2006, the Authority will have spent \$317.9 million on the painting of our bridges. Expenditures for painting have been increasing over the years. As the chart indicates B&T invested \$49.9 million in painting in 2006.



### **In-House Engineering, Inspection and Maintenance Capabilities**

In addition to the inspection efforts of our Biennial Inspection program, B&T employs a full time staff of engineering professionals located at each facility to monitor the condition of the facility to plan, design and execute our Capital, Maintenance and Painting programs. This staff also provides a quality assurance check on the work of our third party consultants, who perform the great majority of our designs, and inspections.

They work closely with the Biennial inspectors, and are primarily responsible to assure that inspection findings and recommendations are implemented.

Each facility staff consists of a Facility Engineer and several engineers and support personnel under his supervision. Professional engineer licenses are required for many of these positions, and presently 46% of all B&T dedicated field engineering staff possess a professional engineer license. These personnel provide eyes and hands in the field and are an additional line of defense to prevent problems with Authority bridges. Through the years, each facility engineering staff has developed an understanding and sophistication regarding the needs of the facility along with the maintenance staff under the Maintenance Superintendent and General Manager that allows it to rapidly and effectively address problems.

The role of the maintenance crew assigned to the bridges is vital and includes such functions as cleaning bridge drains, scuppers and catch basins to prevent flooding, repair of roadway potholes and expansion joints, standpipe, lighting and other electrical, inspection, maintenance and repair, roadway sweeping and cleaning, application of deicer and snow removal, and maintenance of roadway temperature sensors. In addition, specialty crews in roadway, structural, electrical, machine shop and sign shop are available to the facilities from two Central Maintenance locations. As indicated, we have 43 engineers on site, 20 of whom are licensed professional engineers, and 143 maintainers either on site or available for rapid response.

<b>Authority Staff at Each Facility</b>			
Facility	Engineers	Engineers With PE's	Maintenance Personnel
TB	12	5	23
BW	7	2	14
TN	7	3	14
VN	8	5	21
MP/CB	4	3	14
HH	5	2	7
Central Maintenance South			18
Central Maintenance North			32

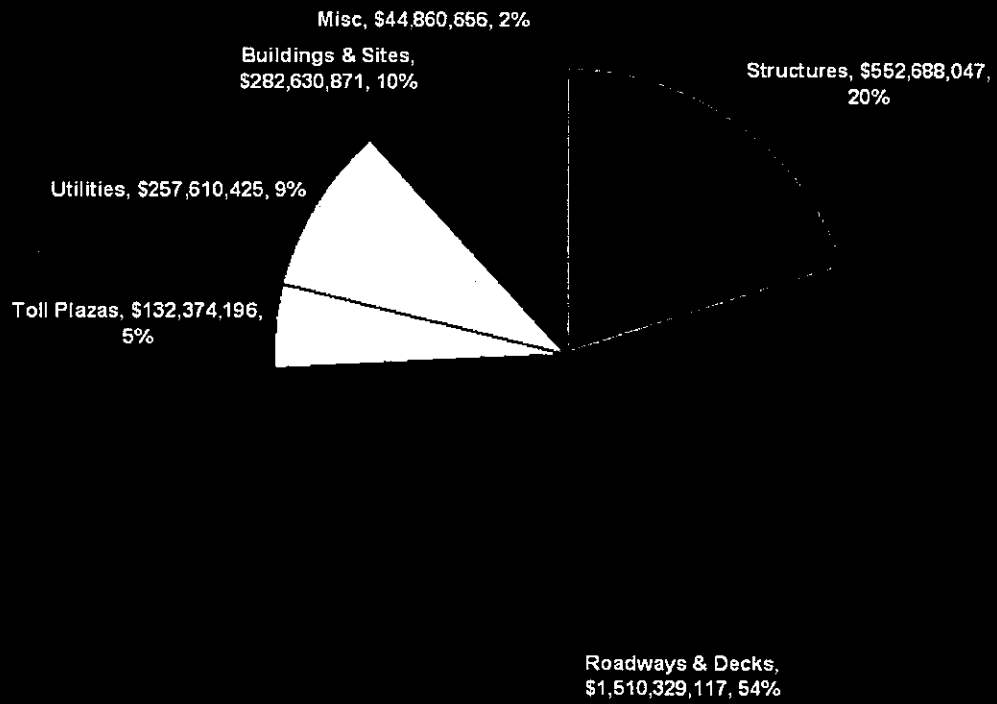
In addition to the field staff, the Authority employs also a Technical Service staff of 54 persons who operate from our Headquarters facilities at Randall's Island. This staff includes engineers with expertise in Structural Engineering, Electrical Engineering, Mechanical Engineering, Traffic Engineering, and Architecture as well as engineers experienced in Project Management. They also provide a vital function of plan and specification review, assuring that the plans being developed by third party Consultants are of the highest quality, modern, efficient and appropriate for Authority purposes. An in house Structural Inspection Unit works within this section of E&C comprised of 6 structural inspectors who are bridge climbing specialists and are extensively familiar with our structures. While B&T readily acknowledges the professionalism and ability of our Biennial inspection consultants, the inspection information gathered is so vital to B&T's operation that we perform this second level of quality assurance on our consultants. B&T policy is "trust but verify". This inspection effort helps us focus rehabilitation, repair and reconstruction efforts that are made through our Capital, Maintenance and Painting Programs. In total, B&T has nearly 200 full time, dedicated engineers and maintenance people assigned to our seven bridges, and many more engineers, maintainers and support personnel are available when required.

### **Capital and Maintenance Programs**

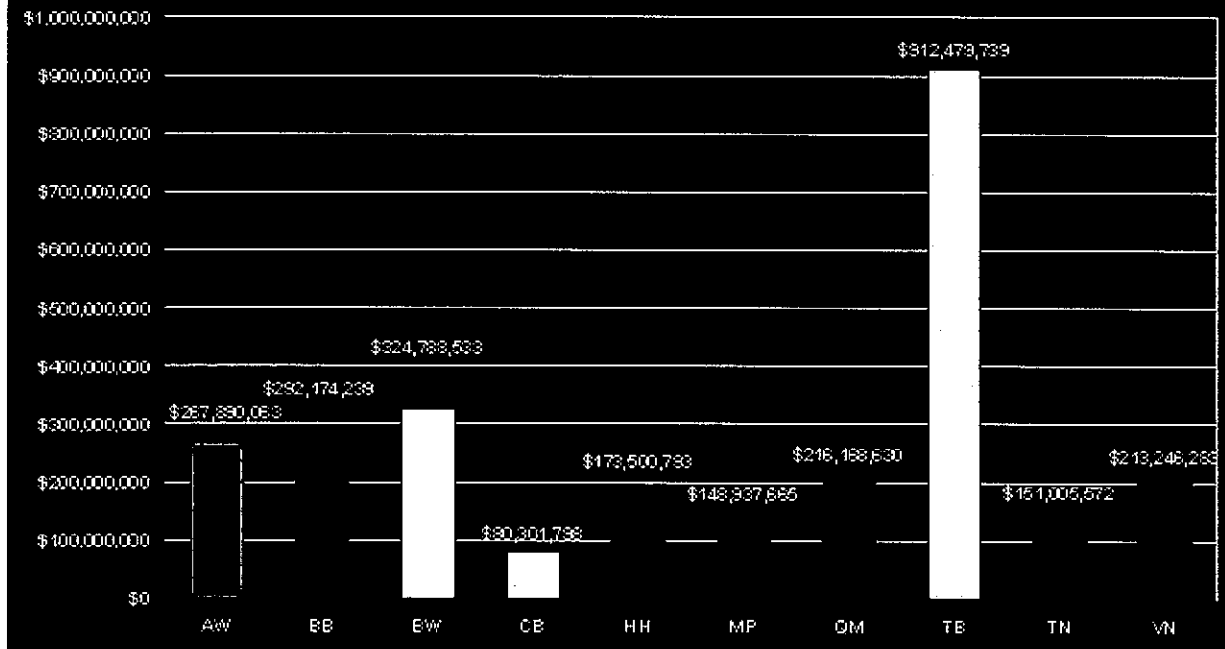
Since 1992, B&T has committed **\$2.8 Billion** in Capital Improvements to our structures and facilities. The following charts sorts these expenditures by the type of improvement, and by Facility. A total of \$1,640,000,000 will have been spent on roadway, plaza and deck rehabilitation and repair, and \$ 595,000,000 will have been spent on other structural repairs. As indicated on the next pages, the Triborough Bridge, our flagship facility and oldest crossing, which is actually comprised of three bridges and miles of elevated viaduct has received the lion's share of funds at \$912,000,000.

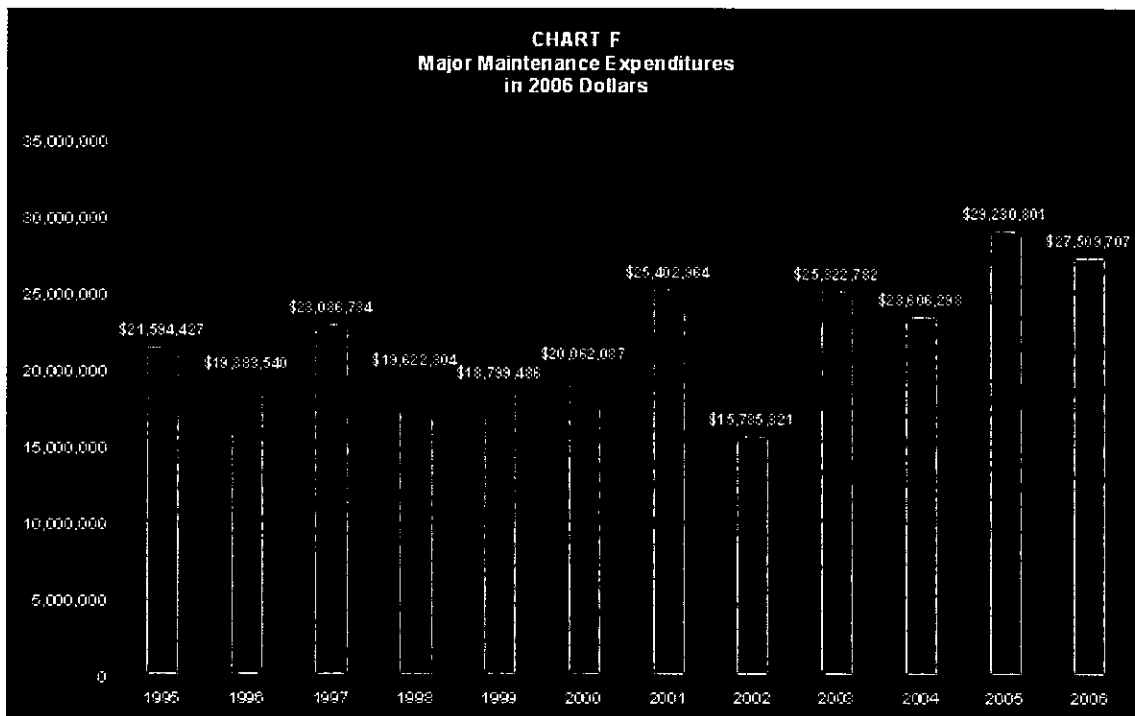
B&T also annually prepares a Maintenance Program and more than \$27 million was expended in 2006.

**CHART D**  
**MTA Bridges & Tunnels**  
**Actual 1992-2007 Capital Commitments**  
**By Category**



**CHART E**  
**MTA Bridges & Tunnels**  
**Actual Capital Commitments By Facility**  
**1992-2007**





Looking ahead, partly because of increased scrutiny of trucks post 9/11, the Authority has become aware that numerous overweight trucks have been using our facilities. We've taken action to understand the problem and better protect our bridges, including increased enforcement to supplement City and State enforcement efforts and studies to determine the scope of the problem.

In conclusion, B&T believes that our structures are safe, and that continuation of the inspection, maintenance and capital reinvestment programs along with the on site personnel resources we have outlined here will assure safety in the future.

Testimony re: Safety of New York City's Bridges  
Submitted by Hope Cohen, Deputy Director, CRD  
September 17, 2007

Thank you, Mr. Chairman for inviting me to testify on the safety of New York City's bridges.

I am Hope Cohen, Deputy Director of the Center for Rethinking Development at the Manhattan Institute.

By this point in the hearing, we have heard – rightly – many reassurances from transportation officials that our bridges are safe enough for use. “If/when they get dangerous, we shut them down.” And, indeed, two weeks from now, the lower roadway of the Manhattan Bridge will reopen fully to traffic of all vehicle types. Under repair since 1982, various lanes at various times have been closed when dangerous; just before Christmas in 1987, Samuel Schwartz, then the First Deputy Commissioner of Transportation, closed a lane to all traffic and the entire lower roadway to trucks and buses, when inspectors found 20 floor beams with cracks longer than 15 inches. And now, \$800 million later, the Manhattan Bridge job is almost done. (By the way that number does not include all the capital work to reconstruct the subway line across the bridge. Many in this room remember the years of disruption to transit service because of the subway work required.) So yes,

bridges are closed before pieces of them start falling into the city's rivers and bays.

It's great that DOT's engineers are able to catch these problems in the nick of time.

But do we really want to be living this close to the river's edge?

New York's bridges are operated and maintained by three different entities:

1. Hudson River crossings by the Port Authority of New York and New Jersey
2. seven scattered among the five boroughs (along with two tunnels crossing the East River) by MTA Bridges & Tunnels (successor to the Triborough Bridge & Tunnel Authority)
3. all the rest, big and small, through the city, by the Department of Transportation.

The first two categories are tolled, regularly and fully maintained, and in good condition. It can be annoying to drivers that as soon as they finish painting the Throgs Neck Bridge, they start over again, but actually, that's what bridges need when exposed to water and wind and salt – and auto exhaust. The third category, which includes the Manhattan Bridge, along with many far less well known, is not tolled. Having no dedicated revenue stream for maintenance, they simply cannot be maintained at the level that the Port Authority and Bridges & Tunnels maintain their facilities.

Last December, we hosted a forum at the Center for Rethinking Development on public acceptance of congestion pricing – yes, we were a bit ahead of the curve on that. One of the panelists was Sam Schwartz – the same Sam Schwartz who shut down a dangerous Manhattan Bridge in 1987 – who is now a sought-after transportation consultant as well as *The Daily News*’ “Gridlock Sam.” He argued that congestion pricing would benefit the city in multiple ways: reducing traffic, redistributing traffic in a more balanced manner, and yielding revenue for transportation maintenance and improvement. Some crossings are free and some are tolled, with the following result, in Sam’s words: “The Queensboro Bridge, which should be used by 110,000 vehicles a day, is used by 150,000 vehicles a day, and those additional vehicles come from the Midtown Tunnel and from the Triborough Bridge, with no revenue stream to fix the Queensboro Bridge. It’s been crumbling, and all our bridges have been crumbling because there has been no revenue base. So it’s been bad for us to have those extra 40,000 vehicles pounding the bridge with no revenue stream to maintain the bridge.”

All of the city’s bridges need regular – even constant – maintenance, and the city needs the funds to ensure that occurs. The funds are not negligible by any means. But they’re a lot less – in both straightforward construction dollars and in lost economic activity – than taking roadways and subways out of service for years at



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AT THE MANHATTAN INSTITUTE

a time. Constant monitoring and early intervention are essential. Responsible budgeting and allocation is part of the answer. Perhaps congestion pricing is part of the answer too.