

**HISTORY AND PROJECTION OF  
TRAFFIC, TOLL REVENUES  
AND EXPENSES**

**and**

**REVIEW OF PHYSICAL CONDITIONS**

**Of the Facilities of**

**TRIBOROUGH BRIDGE AND TUNNEL AUTHORITY**

**April 27, 2006**

Prepared for the  
**Triborough Bridge and Tunnel Authority**

By

**URS**

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April 27, 2006

To Triborough Bridge and Tunnel Authority:

In accordance with your request, URS Corporation-New York (URS) conducted this annual study to develop projections of traffic, revenues and expenses for the toll bridge and tunnel facilities operated by TBTA, and to provide an overview of the physical conditions of each facility. We have reviewed the bridge and tunnel inspection reports provided by TBTA, toured the facilities in light of these inspection reports with TBTA Engineering and Facilities staff, and discussed TBTA's on-going maintenance and capital programs with its engineering staff.

Our projections have taken into account: (1) the general physical condition of TBTA's toll facilities; (2) traffic and revenue data, reflecting the 12 toll increases since 1972; (3) the impact of the *E-ZPass* electronic toll collection system; (4) the toll structure; (5) possible future toll increases; (6) population, employment and other demographic forecasts in the New York Metropolitan Area; (7) the traffic capacities of the bridges and tunnels and the existing roadway network that feeds the facilities in terms of the potential for future growth of peak versus non-peak period traffic; (8) construction conditions on the arterial highway network serving the New York Metropolitan Area, including the toll-free East River bridges; (9) mass transit network projects; and (10) the impacts of recent economic and political events on metropolitan area traffic.

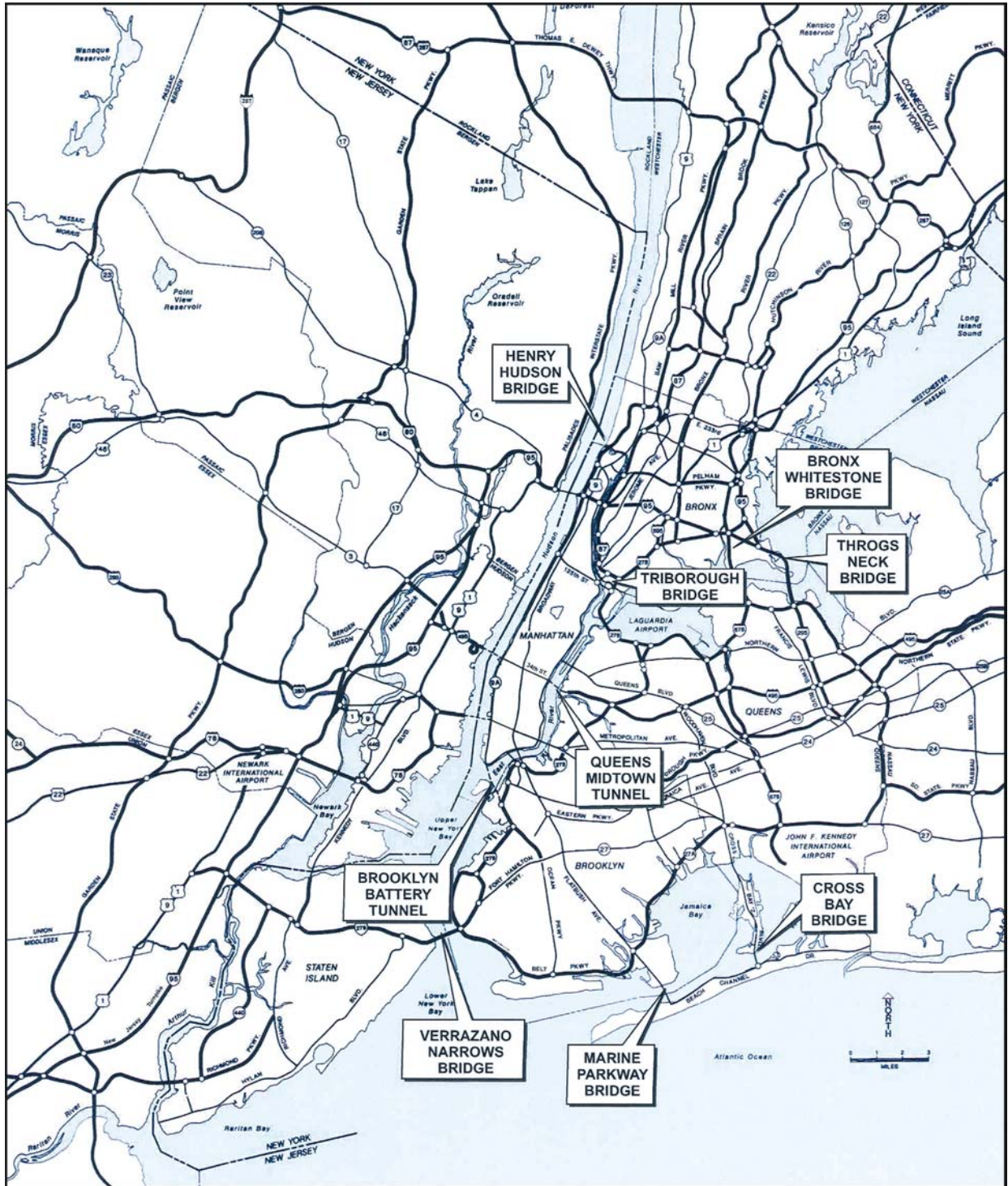
## **TRANSPORTATION INFRASTRUCTURE**

The New York Metropolitan Area's transportation infrastructure consists of an extensive network of highways, tunnels and bridges (both tolled and toll-free), regional commuter rail and the New York City transit system.

### **Triborough Bridge and Tunnel Authority (TBTA)**

TBTA operates nine toll facilities within New York City (the "City"), consisting of seven bridges and two tunnels that provide vital links across the City's rivers and bays. In 2005, these facilities carried 303.9 million total vehicles, of which 300.4 million were toll paying, and generated \$1.2 billion in toll revenue. (Non-revenue transactions include police, emergency and TBTA vehicles.) The locations of the facilities are shown on the following map in the context of the regional highway network.

Figure 1: Location Map





The facilities are briefly described as follows:

*Verrazano-Narrows Bridge* - a two-level suspension bridge, with three lanes of traffic in each direction on both decks. It crosses the entrance to New York Harbor and connects Brooklyn and Staten Island.

*Triborough Bridge* - a complex of three bridges connecting Manhattan, the Bronx and Queens, with a central connecting interchange on Randall's Island. Manhattan is reached via a six-lane vertical lift bridge over the Harlem River. The Bronx is accessed via a six-lane truss bridge over the Bronx Kill. An eight-lane suspension bridge over the East River leads to Queens.

*Bronx-Whitestone Bridge* - a suspension bridge, with three lanes of traffic in each direction, which crosses the East River connecting the boroughs of Queens and the Bronx.

*Throgs Neck Bridge* - a suspension bridge, with three lanes of traffic in each direction, which crosses the upper East River also connecting the boroughs of Queens and the Bronx.

*Queens Midtown Tunnel* - a twin-tube tunnel with each tube carrying two lanes of traffic under the East River between the boroughs of Queens and Manhattan. During normal morning commuting hours, three lanes are operated in the peak traffic direction.

*Brooklyn-Battery Tunnel* - a twin-tube tunnel with each tube carrying two lanes of traffic under the East River connecting the southern tip of Manhattan with Brooklyn. During normal morning commuting hours, three lanes are operated in the peak traffic direction.

*Henry Hudson Bridge* - a two-level steel arch bridge, with four southbound lanes on its lower deck and three northbound lanes on its upper deck, that crosses the Harlem River to connect the northern tip of Manhattan with the Spuyten Duyvil section of the Bronx.

*Marine Parkway - Gil Hodges Memorial Bridge* - a four-lane crossing of the Rockaway Inlet that connects the Rockaway peninsula in Queens with Brooklyn.

*Cross Bay Veterans' Memorial Bridge* - a pre-stressed concrete viaduct with three lanes of traffic in each direction crossing Beach Channel in Jamaica Bay, connecting the Rockaway peninsula in Queens with the Queens mainland, via Broad Channel.

### **Metropolitan Area Arterial Network**

The New York Metropolitan Area is served by an extensive network of highway facilities. Many of the bridges and tunnels operated by TBTA are links in the Interstate highway network, as these limited-access expressways pass through New York City to serve both local and long distance traffic. These regional facilities are shown on the map on page E-2.

The Verrazano-Narrows Bridge is part of I-278 (Staten Island, Gowanus and Brooklyn-Queens Expressways), which connects with the Brooklyn-Battery Tunnel and the Triborough Bridge. The Queens Midtown Tunnel carries I-495 (Long Island Expressway) into Manhattan. The



Triborough Bridge joins I-87 (Major Deegan Expressway) and I-278 (Bruckner Expressway) with I-278/Grand Central Parkway in Queens and the FDR Drive in Manhattan. The Bronx-Whitestone Bridge carries traffic between the Hutchinson River and Merritt Parkways and Long Island via I-678 (Whitestone and Van Wyck Expressways) and the Cross Island Parkway. The Throgs Neck Bridge carries traffic between I-95 (New England Thruway and George Washington Bridge) and Long Island via I-295.

The Henry Hudson Bridge is part of the Henry Hudson Parkway, a major commuter route into Manhattan from the extensive parkway network in western Westchester County and beyond.

In addition to TBTA facilities and their expressway/parkway connections, New York City's toll-free East River bridges — Brooklyn, Manhattan, Williamsburg and Queensboro — also connect Manhattan with Brooklyn and Queens; and nine toll-free bridges over the Harlem River connect Manhattan with the Bronx. Unlike the TBTA facilities, the approaches to these bridges are mostly surface arterials, such as Flatbush Avenue and Queens Boulevard. Only a few have expressway ramp connections (such as the Brooklyn-Queens Expressway connection to the Williamsburg Bridge), and the Alexander Hamilton Bridge, or I-95, is part of the Cross Bronx Expressway.

### **Other Regional Toll Facilities**

TBTA is one of a number of toll authorities that operate bridge, tunnel and highway facilities in the New York Metropolitan Area. The agency whose facilities are geographically closest to TBTA's bridges and tunnels is the Port Authority of New York and New Jersey. The Port Authority's George Washington Bridge is linked to the Triborough, Bronx-Whitestone and Throgs Neck bridges via the expressway system in the Bronx (plus the George Washington-Triborough Bridge connection in Manhattan via the Harlem River Drive and the George Washington-Henry Hudson Bridge connection in Manhattan via the Henry Hudson Parkway); while the Bayonne Bridge, Goethals Bridge and Outerbridge Crossing are linked to the Verrazano-Narrows Bridge via the expressway system in Staten Island. Only motorists using the Port Authority's two tunnels — Holland and Lincoln — must traverse surface streets (in Manhattan) to reach TBTA's and the City's East River crossings.

The other toll authorities in the region are the New York State Thruway Authority (Tappan Zee Bridge and several Thruway sections), New York State Bridge Authority (five Hudson River bridges) and the New Jersey Turnpike Authority (Garden State Parkway and New Jersey Turnpike).

All of these authorities, together with seventeen others beyond the New York Metropolitan Area, are linked through the *E-ZPass* Interagency Group (IAG) to better serve the regional traveler. *E-ZPass* and its impact on the TBTA facilities are discussed further in this report.

### **Regional Public Transportation**

In addition to the TBTA facilities, most of the public transportation facilities within the City and the suburban counties north and east of the City are part of the Metropolitan Transportation

Authority (MTA) system. These include the New York City Transit Authority subway and buses, MTA Bus Company, Staten Island Rapid Transit, Metro-North Commuter Railroad, Long Island Rail Road, and the Long Island Bus system (in Nassau County, and serves adjacent portions of Queens and Suffolk County). The MTA has also taken over the operations of seven private bus lines that operated under franchises from the City of New York and operates such service through its affiliate MTA Bus Company. These operations include service to the Bronx and Queens. The take-over of the private bus lines was completed in February 2006. For those major TBTA facilities directly serving Manhattan — Triborough Bridge, Queens Midtown Tunnel and Brooklyn-Battery Tunnel — the motorist can, for the most part, choose to use transit; but for the outlying bridges, the choice is more difficult, due to a reduced level of transit service or different trip characteristics.

## **TOLL COLLECTION ON THE TBTA FACILITIES**

The nine TBTA toll facilities have three toll structures, in terms of toll levels and methods of collection: major, minor and the Verrazano-Narrows Bridge. The major crossings include the Triborough Bridge, Bronx-Whitestone Bridge, Throgs Neck Bridge, Queens Midtown Tunnel and Brooklyn-Battery Tunnel. The minor crossings are the Henry Hudson Bridge, Marine Parkway-Gil Hodges Memorial Bridge and Cross Bay Veterans' Memorial Bridge. The Verrazano-Narrows Bridge is the only facility on which tolls are collected in one direction only, while the cash tolls for passenger cars on the minor bridges are half the level of those on the major facilities.

### **Current Toll Structure and Operation**

The current toll structure, in place since March 13, 2005, is shown in Table 1. Tolls are determined using a basic rate as modified by variables specific to a number of factors. These factors include:

- crossing used
- vehicle classification
- toll payment method
- place of residence
- vehicle occupancy

**Table 1. Toll Rates at TBTA Facilities, Effective March 13, 2005**

Classification	Verrazano-Narrows Bridge <sup>(a)</sup>		Triborough Bridge Bronx-Whitestone Bridge Throgs Neck Bridge Queens Midtown Tunnel Brooklyn-Battery Tunnel		Henry Hudson Bridge		Marine Parkway- Gil Hodges Memorial Bridge Cross Bay Veterans' Memorial Bridge	
	Cash	<i>E-ZPass</i>	Cash	<i>E-ZPass</i>	Cash	<i>E-ZPass</i>	Cash	<i>E-ZPass</i>
Two-axle vehicles, including: Passenger vehicles, SUVs, station wagons, self-propelled mobile homes, ambulances, hearses, vehicles with seating capacity of not more than 15 adult persons (including the driver) and trucks with maximum gross weight of 7,000 lbs. and under Each additional axle costs	\$4.50 2.00	\$4.00 2.00	\$ 4.50 2.00	\$4.00 2.00	\$2.25 \$1.25	\$1.75 \$1.25	\$2.25 \$1.25	\$1.50 \$1.25
The following discounted prepaid charges are presently available for the two-axle vehicles referenced above:								
Prepaid charges through token roll purchases							1.50 <sup>(b)</sup>	
Prepaid charges per crossing for registered Staten Island Residents using an eligible vehicle with three or more occupants	1.125							
Prepaid charges per crossing for registered Staten Island Residents using an eligible vehicle through token roll purchase	3.20 <sup>(b)</sup>							
Registered Staten Island Residents using an eligible vehicle		2.40						
Prepaid charges per crossing for registered Rockaway Peninsula/Broad Channel Residents using an eligible vehicle							1.333 <sup>(b)</sup>	1.00 <sup>(c)</sup>
All two axle vehicles greater than 7,000 lbs. and buses (other than franchise buses and motor homes) Each additional axle	9.00 5.00	7.20 4.00	9.00 5.00	7.20 4.00	(d) (d)	(d) (d)	4.50 2.50	3.60 2.00
Two-axle franchise buses	3.50	2.80	3.50	2.80	(d)	(d)	1.75	1.40
Three-axle franchise buses	4.25	3.40	4.25	3.40	(d)	(d)	2.25	1.80
Motorcycles Each additional axle costs	2.00 1.00	1.75 1.00	2.00 1.00	1.75 1.00	2.00 1.00	1.25 1.00	2.00 1.00	1.25 1.00

Notes:

- (a) Under the Verrazano-Narrows one-way crossing charge collection program, all per crossing charges shown should be doubled; toll is collected in the westbound direction only.
- (b) Prepaid discount token roll sales may be discontinued when permissible.
- (c) Rockaway Peninsula and Broad Channel residents using *E-ZPass* at the Cross Bay Veterans' Memorial Bridge receive a rebate of this amount, reimbursed to TBTA by MTA. This program was instituted January 1, 1998.
- (d) Passage prohibited.

### *Passenger Car Tolls*

TBTA crossings are separated into major and minor categories for toll classification purposes. The passenger car cash toll is \$4.50 for the major crossings. The minor crossing passenger car cash toll is \$2.25. All tolls are collected in each direction except on the Verrazano-Narrows Bridge where the round-trip tolls are collected only in the westbound (Staten Island-bound) direction in order to comply with a provision of Federal law.

Tolls for passenger cars are discounted under the following programs: (1) *E-ZPass* and tokens; (2) place of residence/crossing used; (3) place of residence/vehicle occupancy; and (4) some combination of the foregoing. *E-ZPass* electronic toll collection is available on all TBTA toll facilities (see the following section for a more complete description of *E-ZPass* and its impact). Motorists open a pre-paid *E-ZPass* account and receive a transponder that they mount on their windshields. TBTA toll plazas are all equipped with *E-ZPass* antennas that identify and read the on-board tags and electronically debit the toll from the motorist's prepaid account. Passenger cars equipped with *E-ZPass* are allowed a \$0.50 discount per trip at all major facilities (\$1.00 for Verrazano-Narrows Bridge westbound only) and the Henry Hudson Bridge, and \$0.75 at the Cross Bay and Marine Parkway-Gil Hodges Memorial Bridges.

Toll payment by token had provided a \$0.50 discount per trip at major facilities and the Henry Hudson Bridge; a discount proportionate to the cash toll was provided at the Cross Bay and Marine Parkway-Gil Hodges Memorial Bridges. *E-ZPass*, which has replaced the tokens at most facilities, continues these discounts. A separate discount program is in place for registered Staten Island residents on the Verrazano-Narrows Bridge and for registered Rockaway peninsula and Broad Channel residents on the Cross Bay and Marine Parkway-Gil Hodges Memorial bridges. A toll-rebate program for the benefit of *E-ZPass* customers who are residents of Broad Channel and the Rockaway peninsula was implemented on January 1, 1998 for use on the Cross Bay Bridge. MTA reimburses the TBTA in the amount of approximately \$3 million annually in toll rebates.

### *Tolls for Vehicles over 7,000 Pounds*

The toll charges for vehicles over 7,000 pounds are a function of weight/number of axles as well as the crossing used. For the major crossings (except for the Verrazano-Narrows Bridge), the cash rate for these vehicles is \$9.00 and is \$5.00 for each additional axle over two. For the Verrazano-Narrows Bridge, the cash rate for vehicles over 7,000 pounds is the same; however rates should be doubled, since the toll is collected in the westbound direction only. These vehicles are eligible for a 20 percent discount with *E-ZPass*.

For the minor crossings, the two-axle cash rate for vehicles over 7,000 pounds is \$4.50, with an additional per axle rate of \$2.50. These vehicles are eligible for a 20 percent discount with *E-ZPass*. Commercial vehicles are not permitted on the Henry Hudson Bridge.

### ***E-ZPass* Electronic Toll Collection System**

The *E-ZPass* Electronic Toll Collection (ETC) system has been fully installed at all TBTA bridges and tunnels since December 1996. *E-ZPass* usage at each facility has shown strong growth as motorists have become more familiar with the system and its time saving advantages. Unlike cash transactions, vehicles equipped with *E-ZPass* tags can use the gated *E-ZPass*-only lanes. An electronic reader identifies the tag code at the toll plaza and the toll is deducted from the customer's pre-paid account. TBTA has approximately 3.3 million *E-ZPass* tags in use. Currently, participation rates are at 71.5 percent of toll-paying traffic system-wide. The total number of active IAG tags in use for all agencies in the Group as of December 31, 2005 was approximately 14.5 million.

With the introduction of *E-ZPass* at all TBTA crossings, toll plaza operations have improved and vehicle-hours of delay have been reduced. This, in turn, has led to even more motorists enrolling in *E-ZPass*. Electronic payment of tolls has accelerated vehicle processing through the *E-ZPass* lanes, thereby reducing the overall vehicle queue at the plazas. TBTA estimates that manual toll lanes are able to process approximately 250 vehicles per hour, and dedicated *E-ZPass* lanes are able to process approximately 900 to 1,000 vehicles per hour. Prior to implementation of *E-ZPass*, vehicle processing through the TBTA toll plazas during peak periods was a primary cause of congestion at the crossings.

Table 2 lists the *E-ZPass* annual system-wide participation rates starting in 1997, when all nine crossings had *E-ZPass* in operation. Implementation of *E-ZPass* started in October 1995 on the Verrazano-Narrows Bridge and was phased in gradually on the remaining crossings through December 1996. Also shown are the participation rates for each of the facilities for 2005.

**Table 2. *E-ZPass* Participation Rates**

Yearly Average	1997	1998	1999	2000	2001	2002	2003	2004	2005
Percent Participation (All Facilities)	43.9%	56.8%	60.1%	63.7%	67.4%	68.5%	69.8%	70.1%	71.5%
Facility	Triborough	Bronx-Whitestone	Henry Hudson	Marine Parkway	Cross Bay	Queens Midtown	Brooklyn Battery	Throgs Neck	Verrazano-Narrows
Percent Participation (2005)	64.2%	64.0%	78.1%	77.4%	72.4%	75.9%	79.6%	71.8%	75.2%

Source: TBTA

Based on customer acceptance of the technology, TBTA expects that the *E-ZPass* share of total transactions will continue to increase, albeit marginally, over time.

Implementation of the *E-ZPass* system also continues, through IAG, to occur on other regional toll facilities, e.g., the six interstate crossings of the Port Authority of New York and New Jersey, the New Jersey Turnpike, the Garden State Parkway, the New York State Thruway including its Tappan Zee Bridge, the five bridges of the New York State Bridge Authority (from Bear Mountain northward), the Buffalo and Fort Erie Public Bridge Authority's Peace Bridge, the Atlantic City Expressway, the four toll bridges between New Jersey and Pennsylvania operated by the Delaware River Port Authority, the seven toll bridges between New Jersey and Pennsylvania operated by the Delaware River Joint Toll Bridge Commission, the Delaware Memorial Bridge between New Jersey and Delaware operated by the Delaware River and Bay Authority, the two toll roads in Delaware, toll facilities in Virginia and Maryland, the West Virginia Turnpike, the Maine Turnpike, the Massachusetts Turnpike, the Tobin Bridge operated by the Massachusetts Port Authority, the Pennsylvania Turnpike, the New Hampshire Turnpike System, and the eight bridges between New Jersey and Pennsylvania operated by the Burlington County Bridge Commission. Illinois facilities are also now on line. The growing number of *E-ZPass*-equipped toll plazas has resulted in an increasing number of tag-equipped vehicles.

### **TBTA's Role in *E-ZPass***

TBTA was a founding member of the *E-ZPass* IAG, originally comprised of toll authorities in Delaware, Pennsylvania, New Jersey and New York, and now including Maryland, Massachusetts, Virginia, West Virginia, New Hampshire, Illinois, Maine and the Peace Bridge between Buffalo and Fort Erie, Ontario. The IAG has been working since 1991 toward the development and delivery of a compatible electronic toll collection system for the entire region. In July 1998, TBTA entered into an inter-operability agreement with the IAG.

Customers of the member IAG agencies are able to use their tags at any *E-ZPass*-equipped facility operated by an IAG member. All IAG members provide inter-operability among agencies for their customers. As IAG members implement electronic toll collection systems, the *E-ZPass* customer base will increase, which will help increase usage of *E-ZPass* on TBTA facilities.

TBTA customers must pre-pay their *E-ZPass* accounts. These pre-payments are based on a customer's *E-ZPass* usage at both TBTA and other IAG member facilities. Through the IAG system, TBTA and other member agencies transfer payments associated with inter-operability to each other on a routine basis. For 2005, TBTA transferred \$347.8 million to other members and received \$219.7 million from other members within the IAG.

In 2005, TBTA instituted a \$1.00 per month account maintenance fee to all their subscribers. This fee is accounted for by TBTA as other income and is not included as toll revenue. Legislation accompanying the State's budget for State Fiscal Year 2006-2007 would prohibit TBTA from charging this account maintenance fee effective approximately June 1, 2006.

### ***E-ZPass Plus***

*E-ZPass Plus* is a faster, more convenient way to pay for airport parking. It is currently available to *E-ZPass* customers who replenish their accounts with a credit card and established

their accounts through the New York or New Jersey Customer Service Centers. It is in use at Albany International Airport, John F. Kennedy International Airport, LaGuardia Airport and Newark International Airport to pay for parking. If the parking fee is less than \$20.00, it will appear as a charge on the user’s monthly *E-ZPass* statement and will be deducted from the user’s *E-ZPass* account balance. If the fee is greater than \$20.00, it will be charged directly to the credit card used to replenish the *E-ZPass* account.

### Passenger Car Toll Rate Trends and Inflation

Since 1971, toll rates have been increased periodically on the TBTA facilities. Table 3 displays passenger car toll rates for the nine TBTA bridges and tunnels over the past 35 years.

Since 1982, passenger car toll rates have been separated into three categories, as follows:

- Major crossings - Triborough, Bronx-Whitestone and Throgs Neck bridges, and the Queens Midtown and Brooklyn-Battery tunnels;
- Minor crossings - Henry Hudson, Marine Parkway-Gil Hodges Memorial and Cross Bay bridges; and
- Verrazano-Narrows Bridge - a major crossing with one-way toll collection.

**Table 3. Historical Trends in Non-Discounted Cash Passenger Car Toll Rates**

	Verrazano-Narrows Bridge	Triborough, Bronx-Whitestone and Throgs Neck Bridges and Queens Midtown Tunnel	Brooklyn-Battery Tunnel	Henry Hudson Bridge	Marine Parkway-Gil Hodges Memorial & Cross Bay Bridges
1971	\$0.50	\$0.25	\$0.35	\$0.10	\$0.10
1972 – 1975	0.75	0.50	0.70	0.25	0.25
1975 – 1980	1.00	0.75	0.75	0.50	0.50
1980 – 1982	1.00	1.00	1.00	0.60	0.75
1982 – 1984	1.25	1.25	1.25	0.90	0.90
1984 – 1986	1.50	1.50	1.50	0.90	0.90
1986 – 1987	1.75 <sup>(a)</sup>	1.75	1.75	1.00	1.00
1987 – 1989	2.00 <sup>(a)</sup>	2.00	2.00	1.00	1.00
1989 – 1993	2.50 <sup>(a)</sup>	2.50	2.50	1.25	1.25
1993 – 1996	3.00 <sup>(a)</sup>	3.00	3.00	1.50	1.50
1996 – 2003	3.50 <sup>(a)</sup>	3.50	3.50	1.75	1.75
2003 – 2005	4.00 <sup>(a)</sup>	4.00	4.00	2.00	2.00
2005 <sup>(b)</sup>	4.50 <sup>(a)</sup>	4.50	4.50	2.25	2.25

Notes:

- (a) Effective March 20, 1986, round-trip tolls (twice the amount shown) have been collected on the Verrazano-Narrows Bridge in the westbound direction only in compliance with a Federal legislative mandate. Eastbound traffic uses the bridge toll-free. These amounts are the equivalents of collecting tolls in each direction.
- (b) Last toll rate increase effective March 13, 2005.

### *Verrazano-Narrows Bridge*

The Verrazano-Narrows Bridge one-way cash toll of \$9.00 is collected westbound only. The current one-way cash passenger car toll rate, effective March 13, 2005, for the major crossings is \$4.50, collected in each direction. Cash tolls on the three minor crossings are \$2.25, collected in each direction.

Over the years, various discount programs have been introduced. In March 1987, the Staten Island Carpool Program was initiated. Staten Island residents were offered 30-round trip coupons for vehicles with three or more occupants at a discounted price of \$30.00. This program was revised to 24 coupons for \$30.00 in July 1989, to 24 coupons for \$42.00 in May 2003, and to 24 coupons for \$54.00 in March 2005.

In general, tolls for vehicles over 7,000 pounds have also been adjusted upward whenever passenger car toll rates were increased. A notable exception was 1987 when these toll rates were not raised while there was a general increase for passenger cars. In 1989, tolls for vehicles over 7,000 pounds on the Verrazano-Narrows Bridge remained constant while all other tolls were raised. Historically, these vehicles received discounts on any TBTA facility when they used pre-paid accounts. This plan continues with *E-ZPass*.

### *Inflation*

The Consumer Price Index (CPI), compiled by the US Department of Labor, Bureau of Labor Statistics for United States Cities, is intended to represent the average inflation rate for all urban consumers. Table 4 displays the TBTA major crossing passenger car toll rates from the 1971 level of \$0.25 to the toll rate of \$4.50 set in 2005, alongside the CPI. Also shown is the CPI for January 2006 alongside the \$4.50 toll.

**Table 4. Cash Passenger Toll Rates Versus Consumer Price Index**

Year	Triborough, Bronx-Whitestone and Throgs Neck Bridges and Queens Midtown Tunnel	Consumer Price Index <sup>(a)</sup>	Tolls Adjusted to 1982-84 Dollars <sup>(b)</sup>
1971	\$0.25	43.6	\$0.57
1972	0.50	45.5	1.10
1975	0.75	57.6	1.30
1980	1.00	82.1	1.22
1982	1.25	95.3	1.31
1984	1.50	104.8	1.43
1986	1.75	112.3	1.56
1987	2.00	118.0	1.69
1989	2.50	130.6	1.91
1993	3.00	154.5	1.94
1996	3.50	166.9	2.10
2003	4.00	197.8	2.02
February 2006	4.50 <sup>(c)</sup>	216.4	\$2.08
Ratio 2006/1971	18.0	4.96	3.65

Notes: (a) New York–Northern New Jersey–Long Island, NY-NJ-CT-PA, All Urban Consumers, All Items.

Base period: 1982-1984 = 100.0

(b) The nominal toll divided by the CPI and expressed as a decimal.

(c) Effective March 13, 2005.

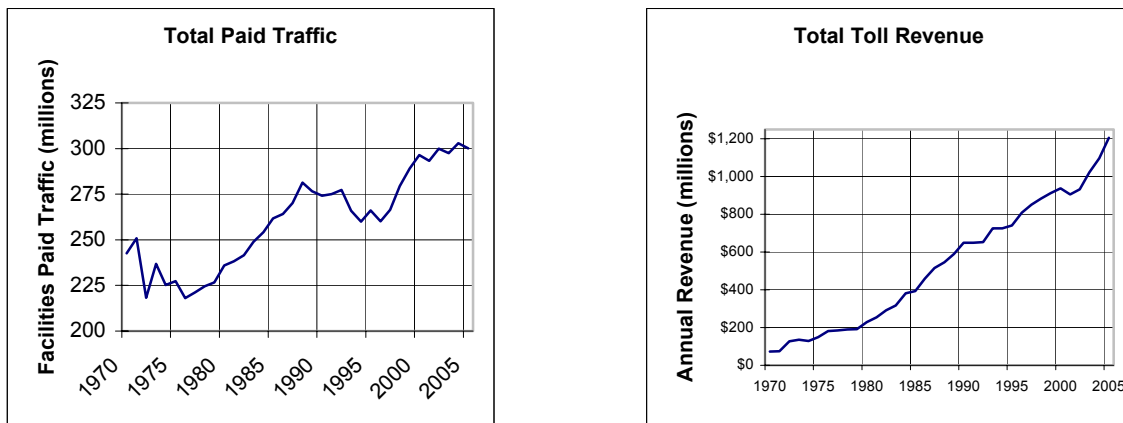
Source: US Department of Labor, Bureau of Labor Statistics.

As indicated in the table, TBTA tolls in nominal dollars have risen faster than the CPI during the 34-year period. As can be seen in Table 4, the current \$4.50 toll in 2006 dollars is equivalent to a toll of \$2.08 in 1982-1984 dollars. The actual 2006 cash toll for passenger cars is 18 times the actual toll in 1971. However, if adjusted for inflation, the toll today is only 3.65 times that in 1971 (in each case based on 1982-1984 dollars). Notwithstanding the aforementioned rise in tolls, traffic volumes have remained strong.

**HISTORICAL TRAFFIC, REVENUES AND EXPENSES AND ESTIMATED/BUDGETED NUMBERS FOR 2006**

Historical traffic, revenues and expenses were reviewed for the nine TBTA bridges and tunnels. Over the last 35 years, paid traffic volumes on the crossings have ranged from approximately 220 million in the 1970s to 300 million in 2005. As displayed in Figure 2, the growth of traffic reflects the region’s moderate overall growth in population and employment, offset by the impact of 12 periodic toll increases. By 2000, with tolls at 14 times the 1971 level, toll revenues had increased more than 13-fold, from \$72 million to a high of \$941 million in 2000. Revenues then declined to \$915 million in 2001 primarily due to the closures and restrictions on TBTA facilities following the September 11 terrorist attack on the World Trade Center and the regional decline in employment. In 2005, with tolls having been increased again in 2003 and 2005, revenue reached \$1.2 billion, which is greater than the previous peak of \$1.1 billion, in 2004.

**Figure 2: Aggregated TBTA Facilities Paid Traffic and Toll Revenue, 1970 to 2005**



Since 1970, annual operating expenses for the toll facilities have risen by 14 times, from \$25 million to \$344 million in 2005, during which time the CPI increased by 4.9 times. A significant part of the increase in annual operating expenses is due to the creation of new security positions after the events of September 11, 2001.

**Traffic and Toll Revenue, 1995 to 2005**

Table 5 lists the traffic and toll revenue record for each of the nine crossings for the 1995-2005 period. Total TBTA traffic and toll revenue are shown in Table 6. The peak in toll-paying traffic during this period, 303 million crossings, occurred in 2004. The general system-wide pattern has been that when toll rates are increased, traffic declines moderately and then traffic begins to rise until the next rate increase. (The relationship between toll increases and traffic volume is described in the *Toll Impacts and Elasticity* section of this report.) The two most recent toll increases shown in this table, in 2003 and 2005, are evident in the jump in average tolls in such years. The strong growth of almost 10 percent in revenues between 2004 and 2005 is due in part to the toll increase in March 2005.

In 1995, toll revenue was reported at \$742 million. As stated above, revenues rose to \$941 million in 2000, an increase of approximately 27 percent, and then declined in 2001 due to the impact of September 11 and a decline in regional employment. The greatest impact from September 11 was due to closures and restrictions at the Brooklyn-Battery Tunnel, with negative impacts also occurring at the Queens Midtown Tunnel and at the Triborough Bridge. In 2002, residual effects due to September 11-related traffic restrictions were seen particularly in the results for the Brooklyn-Battery Tunnel and in the positive impact on the Verrazano-Narrows Bridge due to the truck restrictions at the Holland Tunnel as well as New York City's single occupancy vehicle restrictions. Since November 17, 2003, when the morning peak-period ban on Manhattan – bound single occupancy vehicles south of 14 Street was lifted, there have been no externally imposed traffic restrictions on any of TBTA's facilities. Revenue in 2003 topped \$1 billion, as a result of the May 18, 2003 toll increase. After the March 13, 2005 toll increase, 2004-2005 traffic volumes decreased 0.9 percent and revenue rose to a high of \$1.2 billion in 2005.

The Triborough Bridge reported the highest toll revenue for 2005 at \$281 million, while the Cross Bay Bridge registered the lowest revenue at \$11 million.

**Table 5. Annual Toll-Paying Traffic and Toll Revenue:<sup>(a)</sup> 1995 to 2005**  
(000's)

Year	Verrazano-Narrows Bridge				Triborough Bridge				Bronx-Whitestone Bridge			
	Traffic		Revenue	Average Toll <sup>(c)</sup>	Traffic		Revenue	Average Toll	Traffic		Revenue	Average Toll
	Volume <sup>(b)</sup>	Change			Volume	Change			Volume	Change		
1995	61,351	1.9	\$169,766	\$2.77	56,913	3.7	\$171,103	\$3.01	40,213	11.6	\$125,106	\$3.11
1996	60,176	-1.9	177,655	2.95	54,975	-3.4	186,051	3.38	37,258	-7.3	132,264	3.55
1997	62,848	4.4	185,131	2.95	56,766	3.3	200,451	3.53	36,372	-2.4	135,593	3.73
1998 <sup>(d)</sup>	65,886	4.8	192,788	2.93	59,524	4.9	208,324	3.50	38,112	4.8	140,083	3.68
1999 <sup>(d)</sup>	67,496	2.4	196,556	2.91	61,943	4.1	216,414	3.49	40,155	5.4	147,597	3.68
2000 <sup>(d)</sup>	69,107	2.4	203,172	2.94	63,677	2.8	222,612	3.50	42,334	5.4	155,938	3.68
2001	70,929	2.6	208,164	2.93	62,506	-1.8	215,241	3.44	42,090	-0.6	152,881	3.63
2002	73,361	3.4	216,312	2.95	60,747	-2.8	208,905	3.44	44,359	+5.4	160,730	3.62
2003	71,108	-3.1	233,482	3.28	58,339	-4.0	222,224	3.81	44,413	0.1	175,393	3.95
2004	71,404	0.4	246,322	3.45	61,638	5.7	247,937	4.02	45,223	1.8	187,231	4.14
2005	69,980	-2.0	267,276	3.82	62,841	2.0	280,516	4.46	41,198	-8.9	188,808	4.58

Year	Throgs Neck Bridge				Brooklyn-Battery Tunnel				Queens Midtown Tunnel			
	Traffic		Revenue	Average Toll	Traffic		Revenue	Average Toll	Traffic		Revenue	Average Toll
	Volume	Change			Volume	Change			Volume	Change		
1995	33,440	-6.3	\$116,732	\$3.49	18,400	-0.8	\$52,742	\$2.87	22,813	-1.0	\$66,671	\$2.92
1996	35,208	5.3	136,691	3.88	17,064	-7.3	54,880	3.22	23,507	3.0	77,485	3.30
1997	36,711	4.3	147,106	4.01	17,029	-0.2	56,166	3.30	24,600	4.6	83,543	3.40
1998 <sup>(d)</sup>	37,660	2.6	149,711	3.98	19,651	15.4	63,578	3.24	25,362	3.1	85,626	3.38
1999 <sup>(d)</sup>	38,076	1.1	152,134	4.00	20,778	5.7	67,080	3.23	25,969	2.4	87,284	3.36
2000 <sup>(d)</sup>	37,535	-1.4	152,453	4.06	21,298	2.5	69,018	3.24	26,573	2.3	89,451	3.37
2001	37,802	0.7	150,764	3.99	16,452 <sup>(f)</sup>	-22.8	52,188	3.17	26,177 <sup>(e)</sup>	-1.5	87,067	3.33
2002	39,687	5.0	157,988	3.98	15,447 <sup>(e)</sup>	-6.1	48,880	3.16	26,901 <sup>(e)</sup>	2.8	88,865	3.30
2003	39,082	-1.5	172,603	4.42	17,806	15.3	61,810	3.47	27,512	2.3	99,994	3.63
2004	39,439	0.9	184,338	4.67	17,700	-0.6	64,366	3.64	28,181	2.4	107,067	3.80
2005	41,199	4.5	210,242	5.10	17,426	-1.5	70,294	4.03	28,751	2.0	121,666	4.23

Year	Henry Hudson Bridge				Marine Parkway-Gil Hodges Memorial Bridge				Cross Bay Bridge			
	Traffic		Revenue	Average Toll	Traffic		Revenue	Average Toll	Traffic		Revenue	Average Toll
	Volume	Change			Volume	Change			Volume	Change		
1995	20,364	8.2	\$25,303	\$1.24	7,385	-1.0	\$8,178	\$1.11	5,184	-0.5	\$6,214	\$1.20
1996	19,922	-2.2	27,915	1.40	7,086	-4.0	8,231	1.16	4,967	-4.2	6,446	1.30
1997	19,757	-0.8	28,687	1.45	7,304	3.1	8,589	1.18	5,133	3.3	6,727	1.31
1998 <sup>(d)</sup>	20,300	2.7	28,731	1.42	7,322	0.2	8,577	1.17	5,647	10.0	7,021	1.24
1999 <sup>(d)</sup>	21,287	4.9	30,068	1.41	7,391	0.9	8,461	1.14	6,012	6.5	7,199	1.20
2000 <sup>(d)</sup>	22,546	5.9	31,938	1.42	7,207	-2.5	8,374	1.16	6,356	5.7	7,651	1.20
2001	23,290	3.3	32,242	1.38	7,263	0.8	8,344	1.15	6,712	5.6	7,965	1.19
2002	24,657	5.9	34,045	1.38	7,745	6.6	8,938	1.15	7,091	5.6	8,471	1.19
2003	24,582	-0.3	37,744	1.54	7,704	-0.5	9,694	1.26	6,919	-2.4	8,993	1.30
2004	24,703	0.5	40,149	1.63	7,719	0.2	10,102	1.31	6,989	1.0	9,477	1.36
2005	24,136	-2.3	43,920	1.82	7,673	-0.6	11,234	1.46	7,182	2.8	10,988	1.53

- Notes:
- (a) Toll rate increases occurred on March 24, 1996, May 18, 2003 and March 13, 2005.
  - (b) Westbound toll traffic volume doubled.
  - (c) Average toll on basis of revenues divided by doubled westbound volume.
  - (d) Includes write-offs due to unredeemed tokens and tickets.
  - (e) Reflects traffic restrictions and closures beginning September 11, 2001 and ending gradually through November 17, 2003.
  - (f) Reflects traffic restrictions and closures beginning September 11, 2001 and ending gradually through November 17, 2003.

Traffic volumes and toll revenues on the Throgs Neck Bridge and Bronx-Whitestone Bridge should be considered together since they serve many of the same trips; and, when there is construction activity in the area, traffic shifts between the two facilities. For example, in 1995 some traffic diverted from the Throgs Neck Bridge to the Bronx-Whitestone Bridge when the approach ramps from the Cross Island Parkway to the Throgs Neck Bridge were rehabilitated. Since 2000, traffic again diverted from the Throgs Neck Bridge to the Bronx-Whitestone Bridge due to reconstruction activities on the Cross Bronx Expressway in the vicinity of the Throgs Neck Bridge. In 2005, construction on the Bronx-Whitestone Bridge caused a shift of traffic to the Throgs Neck Bridge. There was a loss in traffic in 2005 of approximately 2.8 percent combined for both facilities. In previous years, the Bronx-Whitestone Bridge carried more traffic than the Throgs Neck, however, in 2005 they both had almost exactly the same number of toll paying vehicles, 41 million.

Total annual TBTA toll traffic volume and revenue are shown in Table 6 for the period 1995 through 2005.

**Table 6. Summary of Annual Paid Traffic and Toll Revenue:<sup>(a)</sup> 1995 to 2005**

Year	Total Paying Traffic Volume (000)	Total Toll Revenue (000)
1995	266,063	\$741,815
1996	260,163	807,618
1997	266,520	851,993
1998	279,463	884,439 <sup>(b)</sup>
1999	289,107	912,793 <sup>(b)</sup>
2000	296,633	940,607 <sup>(c)</sup>
2001	293,220	914,856
2002	299,995	933,134
2003	297,465	1,021,937
2004	302,995	1,096,989
2005	300,385	1,204,944

- Notes: (a) Toll rate increases occurred on March 24, 1996, May 18, 2003, and March 13, 2005.  
 (b) Includes \$2.5 million relating to the write-off of unredeemed tokens and tickets.  
 (c) Includes \$9.7 million relating to the write-off of unredeemed tokens and tickets.

Source: TBTA

### Traffic by Facility and Vehicle Class, 2005

TBTA maintains traffic counts for each crossing in 13 toll-paying categories, ranging from passenger cars to trucks with seven axles. Displayed in Table 7 are the 2005 traffic volumes by facility. Passenger cars totaled 280 million crossings and represented 93 percent (which has

remained relatively constant over time) of the total toll-paying vehicles. Of the TBTA facilities, the Verrazano-Narrows Bridge registered the highest two-way traffic volume of 70.0 million toll-paying vehicles. The lowest volume, 7.3 million vehicles, was recorded at the Cross Bay Bridge.

**Table 7. Traffic by Facility and Vehicle Class, 2005**  
(000's)

Facility	1 Passen- ger Cars	2 Pass. Cars w/one-axle Trailer	3 Pass. Cars w/two-axle Trailer	4 Trucks 2 Axles	Franchise Buses		6 Trucks 3 Axles	7 Trucks 4 Axles
					5 2 Axles	11 3 Axles		
Throgs Neck Bridge	36,688	47	43	1,669	2	0	336	394
Bronx-Whitestone Bridge	38,342	15	10	1,298	150	0	291	209
Triborough Bridge	58,257	25	15	2,793	209	60	587	115
Queens Midtown Tunnel	26,547	7	7	1,560	202	89	249	24
Brooklyn-Battery Tunnel	16,074	2	2	570	94	523	98	5
Verrazano-Narrows Bridge <sup>(a)</sup>	65,408	33	30	1,876	127	376	444	247
Henry Hudson Bridge <sup>(b)</sup>	23,985	2	3	99	0	-	1	0
Marine Parkway Bridge	7,429	2	1	152	46	0	17	3
Cross Bay Bridge	6,776	3	1	251	74	0	37	6
Total	279,506	136	112	10,268	904	1,048	2,060	1,003
Percent of Paid Vehicles	93.0%	0.0%	0.0%	3.4%	0.3%	0.3%	0.7%	0.3%

Facility	8 Trucks 5 Axles	9 Motor- cycles	12 Trucks 6 Axles	13 Trucks 7 Axles	14 Other Vehicles	Total Toll- Paying Vehicles	10 Non-Rev Vehicles <sup>(c)</sup>	Total Vehicles
Throgs Neck Bridge	1,861	65	92	1	1	41,199	279	41,478
Bronx-Whitestone Bridge	813	54	15	1	0	41,198	265	41,463
Triborough Bridge	647	92	41	0	0	62,841	1,153	63,994
Queens Midtown Tunnel	18	46	1	0	1	28,751	400	29,151
Brooklyn-Battery Tunnel	7	49	1	0	1	17,426	463	17,889
Verrazano-Narrows Bridge <sup>(a)</sup>	1,249	132	57	0	1	69,980	670	70,650
Henry Hudson Bridge <sup>(b)</sup>	1	45	0	0	0	24,136	91	24,227
Marine Parkway Bridge	9	13	1	0	0	7,673	86	7,759
Cross Bay Bridge	17	16	1	0	0	7,182	139	7,321
Total	4,621	512	209	2	4	300,385	3,546	303,932
Percent of Paid Vehicles	1.5%	0.2%	0.1%	0.0%	0.0%	100.0%		

Notes: Totals may not add due to rounding.

(a) Westbound traffic doubled.

(b) Truck passage prohibited.

(c) Includes police, fire and other emergency vehicles and TBTA vehicles.

Source: TBTA

## Monthly Traffic, 2005

Monthly traffic variations on the nine crossings are normally attributed to several factors. Traffic volumes historically have been weather-related, e.g., severe winter weather may result in lower volumes. Conversely, traffic reaches its highest levels during the summer months when recreational travel peaks. Toll rate increases have also affected the traffic volumes in the aftermath of a toll increase. Furthermore, individual facilities can be affected by construction projects on adjacent arterials or competing bridges. The limited number of crossings in the region sustains the overall demand for TBTA's bridges and tunnels. In addition to these normal impacts, there are extraordinary events such as the effects of September 11.

**Table 8. Monthly Traffic Variations, 2005**

Month	Average Daily Toll-Paying Traffic										Ratio to AADT <sup>(b)</sup>
	Throgs Neck	Bronx-Whitestone	Tri-borough	Queens Midtown	B'klyn Battery	Verrazano-Narrows <sup>(a)</sup>	Henry Hudson	Marine Pkwy	Cross Bay	Total	
January	91,038	107,276	151,005	70,260	43,618	171,752	58,846	17,217	16,498	727,510	0.88
February	98,272	114,439	164,159	77,058	47,820	184,488	65,329	18,067	17,373	787,003	0.96
March	101,991	116,783	167,761	80,061	49,680	189,837	65,731	19,087	18,310	809,241	0.98
April	106,720	121,446	175,608	81,036	48,601	194,218	69,844	19,906	19,290	836,669	1.02
May	111,707	123,463	181,073	80,826	48,977	197,992	65,581	21,661	20,104	851,383	1.03
June	125,559	116,110	188,060	84,983	50,797	205,520	71,601	25,112	23,756	891,500	1.08
July	126,079	115,973	178,491	77,984	45,815	198,887	65,879	25,973	22,743	857,825	1.04
August	127,730	115,813	178,376	79,696	47,079	199,531	66,445	24,837	21,702	861,209	1.05
September	120,722	108,384	175,817	79,430	47,425	192,648	67,956	22,447	20,526	835,355	1.02
October	114,282	103,430	166,894	78,877	45,829	184,894	66,455	18,768	18,468	797,897	0.97
November	118,364	106,033	170,832	80,430	49,341	190,251	68,812	19,665	18,798	822,526	1.00
December	111,254	105,463	167,846	74,771	48,088	190,505	61,398	19,341	18,452	797,117	0.97
AADT <sup>(c)</sup>	112,874	112,871	172,167	78,769	47,741	191,726	66,126	21,022	19,677	822,973	1.00

Notes: May not add due to rounding.  
 (a) Westbound traffic doubled.  
 (b) For total traffic on the nine crossings.  
 (c) Annual Average Daily Traffic.

The data in Table 8 indicate that total traffic on the nine crossings in 2005 peaked in June. August was the second highest month in 2005. For the combined facilities, the monthly variations in 2005 ranged from 12 percent below the annual average in January to 8 percent above in June. This is indicative of a stable traffic mix comprised of a solid base of commuting and commercial traffic.

## Changes in Monthly Traffic 2004 to 2005

All of the traffic restrictions that were introduced at TBTA facilities following the September 11, 2001 attack have been removed. However, a ban on large commercial vehicles remains in effect at the Holland Tunnel. The recovery of traffic has differed considerably between the crossings depending on the timing of the lifting of restrictions, but by now, traffic at most facilities has returned to or exceeded pre-September 2001 levels. At the Brooklyn-Battery Tunnel, traffic volumes are below the level of 2000 due to the loss of employment in lower Manhattan.

Due to inclement weather, there was an almost 3 percent drop in toll paying traffic on TBTA facilities for the month of December 2005 compared to 2004. During the three-day transit strike, there was a slight increase in volume on some TBTA facilities, but this did not have a significant effect.

Table 9 lists the monthly traffic changes that have occurred between 2004 and 2005.

**Table 9. Changes in Monthly Traffic – 2004 to 2005**

Month	Percent Change Comparing 2005 Monthly Traffic to 2004								
	Throgs Neck	Bronx-Whitestone	Triborough	Queens Midtown	Brooklyn-Battery	Verrazano-Narrows	Henry Hudson	Marine Parkway	Cross Bay Bridge
January	0.78%	0.48%	6.60%	6.35%	0.44%	-0.81%	0.49%	0.10%	2.80%
February <sup>(a)</sup>	-0.07	-2.34	5.43	4.06	-3.70	-1.41	0.70	-1.42	1.73
March	0.28	-3.35	2.47	2.19	-2.38	-1.26	-1.36	-3.18	-0.38
April	-1.85	-3.30	3.17	1.46	-2.72	-2.03	-1.75	0.67	3.80
May	-0.61	-3.80	3.80	1.57	2.22	-1.01	-6.95	-0.85	2.25
June	6.80	-11.65	3.72	1.82	-2.78	-0.78	-0.30	1.70	9.69
July	7.90	-11.02	4.53	0.82	-3.45	-1.06	-0.65	1.13	3.24
August	9.30	-12.77	3.22	8.66	4.64	-1.20	2.33	2.31	4.46
September	8.10	-14.05	1.47	4.50	2.17	-1.80	2.32	2.22	3.96
October	3.26	-15.25	-5.24	-0.35	-5.74	-5.54	-6.83	-5.58	-2.04
November	11.99	-13.40	0.01	1.72	0.69	-1.28	-2.06	-0.53	2.50
December	9.00	-11.26	-1.25	-3.89	-3.78	-2.56	-8.87	-2.46	2.83
Annual	4.99	-8.38	2.35	2.45	-0.79	-1.40	-1.78	-0.01	3.16

(a) February toll paying vehicles corrected for Leap Year.

Reasons for monthly traffic changes include:

- Weather, including blizzards, in January, 2004;
- The Republican National Convention in August, 2004;
- Construction on Bronx-Whitestone Bridge in 2005 caused shift to Throgs Neck Bridge;
- Snow in December 2005;
- Drop in traffic on Henry Hudson Bridge in May 2005 due to collapse of retaining wall adjacent to Henry Hudson Parkway near the Cloisters;
- 2004 was a Leap Year; and
- Record heavy rains in October 2005 reduced vehicle volumes.

## Estimated Traffic and Toll Revenue, 2006

The development of the traffic and toll revenue estimates for 2006 took into account the forecast of normal growth and adjustments due to the toll revision implemented in 2005. The impacts in the long term, regarding the national and regional economies, projected employment in lower Manhattan and the traffic and revenue forecasts beyond 2006, are covered in the following chapters of the report. In developing the traffic and toll revenue estimates from 2006, we assumed that traffic changes for 2005 to 2006 would be at the same rate as the change in traffic from 2004 to 2005, adjusted to reflect the March 13, 2005 toll rate increase. Due to construction at the Bronx-Whitestone Bridge, the forecast for the Bronx-Whitestone Bridge and the Throgs Neck Bridge was estimated based on the total volume at the two facilities. The forecasted percent changes are shown in Table 10. The percentages reflect the toll increase in March 2005, ongoing construction, and the effects of an improving economy.

**Table 10. Estimated Changes in Annual Traffic – 2005 to 2006**

Facility	Percent Change
Throgs Neck Bridge <sup>(a)</sup>	0.39%
Bronx-Whitestone Bridge <sup>(a)</sup>	0.39
Triborough Bridge	5.24
Queens Midtown Tunnel	2.68
Brooklyn-Battery Tunnel	-0.34
Verrazano-Narrows Bridge	0.19
Henry Hudson Bridge	0.08
Marine Parkway Bridge	0.05
Cross Bay Bridge	3.23

(a) Due to the effects of construction on the Bronx-Whitestone Bridge, analysis of these two bridges was combined.

The traffic and toll revenue estimates for 2006 are presented in Table 11.

**Table 11. Estimated 2006 Toll-Paying Traffic and Toll Revenue**

Facility	Traffic (000s)	Average Toll	Revenue (000s)
Throgs Neck Bridge	40,375	\$5.19	\$ 209,588
Bronx Whitestone Bridge	42,306	4.69	198,453
Triborough Bridge	66,135	4.56	301,552
Queens Midtown Tunnel	29,521	4.33	127,844
Brooklyn Battery Tunnel	17,367	4.13	71,741
Verrazano-Narrows Bridge	70,114	3.92	274,609
Henry Hudson Bridge	24,155	1.87	45,051
Marine Parkway Bridge	7,677	1.50	11,513
Cross Bay Bridge	7,414	1.57	11,632
Total	305,064	\$4.10	\$1,251,983

Accordingly, the \$1.25 billion revenue estimate for 2006 in Table 11 reflects the impact of the March 13, 2005 toll increase. The 1.55 percent increase in traffic reflects growth, partially offset by the continuing effects of the 2005 toll increase. The overall increase in revenue is 3.90 percent.

Table 11 provides the transition between the historical traffic and revenue data presented on the preceding pages and the 10-year forecasts in Tables 19 and 20. The methodology used to develop the estimated growth rates starting in 2007 is discussed on pages E-41 through E-43.

### **Operating Expenses 1995 to 2005**

Table 12 displays the historical operating expenses for the TBTA facilities from 1995 through 2005. TBTA divides operating expenses into two major categories: Personnel Services and Other Than Personnel Services (OTPS). Personnel services include salaries, overtime and fringe benefits, net of capital reimbursements. Maintenance, outside services, insurance, Coliseum operations (until its sale in 1999), TBTA's share of the *E-ZPass* Customer Service Center, and other non-personnel expenses are included in OTPS.

TBTA personnel services expenses increased from \$112.2 million in 1995 to \$173.5 million in 2005. A significant part of this increase was due to the creation of 265 new security positions after the events of September 11, 2001. Because of the introduction of the *E-ZPass* system, TBTA was able to eliminate over 200 bridge and tunnel officer positions through attrition with *E-ZPass*, and these reductions were the primary offset to growth in wage and fringe benefit expenses in recent years.

OTPS expenses increased from \$84.9 million in 1995 to \$170.1 million in 2005. The primary driving factors in TBTA's OTPS expense growth were inflation, an increase in major maintenance and bridge painting activities; costs associated with *E-ZPass* including, particularly, the issuance of new tags-and replacement of tags that will soon reach the end of their service life.

Timing of major expenses and extraordinary items has also resulted in some year-to-year fluctuations. An enhanced bridge painting program, including lead paint removal, implemented as part of TBTA's effort to extend the useful life of the structural elements of its facilities, began to increase OTPS expenses starting in 1995.

*E-ZPass* startup costs for tags and customer service center operations were primarily responsible for OTPS growth in 1996 and 1997. In 1998, *E-ZPass* startup costs eased and bridge painting activities were delayed due to an extensive evaluation of contractor experience. Resumption of the planned level of bridge painting increased OTPS costs in 1999, and rental expenses for TBTA administrative offices at 2 Broadway that were formerly in the New York Coliseum office building increased OTPS costs in 1999 and 2000.

**Table 12. Historical Operating Expenses: 1995 to 2005**

Year	Operating Expenses (000s)			Percent Change <sup>(c)</sup>
	Personnel <sup>(a)</sup>	OTPS <sup>(b)</sup>	Total	
1995	\$112,212	\$84,858	\$197,070	
1996	109,256	95,915	205,171	4.1%
1997	111,651	112,222	223,873	9.1
1998	106,603	101,587	208,190	-7.0
1999	107,430	120,561	227,991	9.5
2000	112,256	129,002	241,258	5.8
2001	123,316	133,198	256,514	6.3
2002	140,967	159,229	300,196	17.0
2003	159,976	169,039	329,015	9.6
2004	158,403	160,811	319,214	-3.0
2005	173,549	170,123	343,672	7.7

Notes:

(a) Includes salaries, overtime and fringe benefits, net of capital reimbursements.

(b) OTPS is Other Than Personnel Services and includes the following categories: maintenance and supplies, outside services, insurance, power, leases and rentals and other expenses.

(c) For discussion on expense fluctuations, see preceding text.

Source: TBTA

The 2001-2003 numbers reflect the additional expenses that were incurred in the aftermath of the attack on the World Trade Center. TBTA describes the added expenses as overtime labor costs for security, cleanup costs for the Brooklyn-Battery Tunnel and Battery Parking Garage, and emergency electricity generation for the Brooklyn-Battery Tunnel. Also included are costs associated with overtime incurred by represented employees required to make up for lost time as a result of the temporary closure of 2 Broadway. The increases associated with these additional costs have been reimbursed to TBTA from a combination of insurance proceeds and emergency grants from the Federal Emergency Management Agency (FEMA).

The 2002 results reflect the additional expenses incurred after the terrorist attack that include an upgrade of communication and electrical systems and the replacement of a radio communication system. Also included is a delay in bridge painting from 2001 to 2002, additional security at all facilities, and *E-ZPass* Tag replacement.

The 2003 increase in personnel costs was caused by additional expenditures for security staff, worker's compensation adjustments and health and welfare benefits rate increases. The 2003 increase in personnel costs was the result of the hiring of additional security staff, adjustments to worker's compensation and increases in health and welfare fringe benefit rates. In non-labor expenses, increases due to major maintenance and bridge painting were partially offset by decreases in insurance costs, *E-ZPass* Custom Service Center costs and other business expenses.

In 2004, non-labor expenses were 4.9 percent lower than 2003 due to a decrease in the required number of *E-ZPass* tag purchases. In 2005, expenses reflected a continuation of the security measures noted above and the replacement of outstanding *E-ZPass* tags approaching the end of their useful life.

### **2006 Budget**

Operating expenses have been budgeted by TBTA for 2006 at \$393.4 million. These expenses are divided into the following two categories: Personnel Services of \$183.2 million and OTPS of \$209.2 million.

## FACTORS AFFECTING TRAFFIC GROWTH

The previous section of the report set forth the historical traffic, revenue and expense data for the nine TBTA bridges and tunnels. Before developing the forecasts, several factors affecting future traffic were considered, including projected growth (population and other demographics), TBTA and regional construction impacts, capacity constraints in the regional highway network, and toll and elasticity impacts. *E-ZPass* improvements were discussed previously on pages E-8 and E-9.

This section of the report concludes with a summary of the assumptions and conditions upon which the traffic and toll revenue forecasts were based.

### Employment, Population and Motor Vehicle Registrations

Regional demographic data providing information on long-term trends are maintained by the New York Metropolitan Transportation Council (NYMTC). Information from NYMTC regarding employment and population history and projections from 1970 to 2015 is included in the following tables. In general, traffic volumes in the region are affected by changes in employment and population. Normally the demand on the TBTA facilities tends to be less influenced by regional demographic trends because water crossings are limited; however, the scale of the events of September 11 resulted in reduced traffic levels on the crossings serving lower Manhattan. The intermediate-term impacts of this event are discussed below based on information provided by regional agencies and organizations. Another indicator of trends in traffic volumes is motor vehicle registrations, which have continued on an upward trend since 1970 in the tri-state region. To better understand how these indicators may influence traffic volumes on the TBTA crossings, URS reviewed historical trends and forecasts by NYMTC and others.

#### *Employment Trends and Projections*

Jobs traditionally influence traffic generation. Generally, when the economy is robust and jobs are plentiful, there is an increase in traffic. Conversely, when employment trends are downward, traffic volumes generally decline.

The long-term trend in employment in the region is shown in Table 13. A downward trend in employment occurred between 1970 and 1980 in New York City. Jobs declined by 1.2 percent per year, from 4,084,000 in 1970 to 3,627,000 in 1980. Staten Island, where employment increased by 3.4 percent per year, was the exception. The most recent employment forecasts were released by NYMTC in September 2004. Year 2000 census data show that employment was the highest it has been since 1970. Projections show a slight decline in 2005 followed by steady growth through 2015.

Between 1970 and 1990, employment increased in the New York suburbs, in Northern New Jersey and in Southern Connecticut. NYMTC projected that employment in the region as a whole, would grow during the forecast period through 2015, in the range of 0.3 to 1.1 percent annually.

In New York City the preliminary unemployment rate for 2005 was 4.8 percent, down from the 5.7 percent in 2004 as reported by the Bureau of Labor Statistics. The unemployment rate has

been generally decreasing since hitting a high of 6.6 percent in September 2003. This data corresponds with the Class A commercial real estate vacancy rates for Manhattan from the City of New York's Office of Management and Budget. Vacancy rates were at their peak in mid-2003 and have since declined month over month from over 12 percent to 9.2 percent in October 2005, the most recent reported month. During this time period asking rents have remained constant. The real estate industry anticipates that vacancy rates will decrease slowly over the next three years to an estimated 8.7 percent in 2009 and employment will increase approximately 1.0 percent per year during that time period. This estimate is slightly more aggressive than NYMTC as shown in Table 13.

**Table 13. Employment Trends and Projections**

(000s)

Year	New York City						New York Region <sup>(b)</sup>	New Jersey Region <sup>(c)</sup>	Connecticut Region <sup>(d)</sup>
	Manhattan	Bronx	Brooklyn	Queens	Staten Island	Total <sup>(a)</sup>			
1970	2,654.9	247.3	592.2	543.1	45.9	4,083.7	1,493.8	2,182.4	731.5
1980	2,364.8	211.9	485.7	499.7	64.4	3,626.6	1,843.7	2,466.6	874.0
1990	2,565.1	237.8	504.5	567.3	91.6	3,966.1	2,231.1	2,899.0	1,028.0
2000	2,682.2	269.4	584.6	624.1	116.9	4,277.3	2,422.5	3,158.4	1,064.9
2005 - Projected	2,545.8	282.0	590.5	635.4	123.4	4,177.1	2,491.7	3,241.6	1,072.2
2010 - Projected	2,737.7	295.5	621.6	668.3	137.4	4,460.4	2,611.8	3,394.9	1,135.3
2015 - Projected	2,850.1	307.1	650.0	693.3	150.1	4,650.7	2,732.9	3,550.8	1,174.4
Average Annual Percent Change									
1970 to 1980	-1.2%	-1.5%	-2.0%	-0.8%	3.4%	-1.2%	2.1%	1.2%	1.8%
1980 to 1990	0.8	1.2	0.4	1.3	3.6	0.9	1.9	1.6	1.6
1990 to 2000	0.4	1.3	1.5	1.0	2.5	0.8	0.8	0.9	0.4
2000 to 2005	-0.5	0.5	0.1	0.2	0.5	-0.2	0.3	0.3	0.1
2005 to 2010	0.7	0.5	0.5	0.5	1.1	0.7	0.5	0.5	0.6
2010 to 2015	0.4	0.4	0.4	0.4	0.9	0.4	0.5	0.4	0.3

- Notes: (a) Totals may not add due to rounding.  
 (b) Consists of the following counties: Dutchess, Nassau, Orange, Putnam, Rockland, Suffolk and Westchester.  
 (c) Consists of the following counties: Bergen, Essex, Hudson, Middlesex, Monmouth, Morris, Passaic, Somerset and Union.  
 (d) Consists of the following counties: Fairfield, Litchfield, New Haven.

Source: New York Metropolitan Transportation Council, September 2004.

A review of historical traffic demand for the TBTA crossings indicated that volumes did fluctuate system-wide during the 1970s and increased through the 1980s. During the 15-year period from 1985 to 2000, and again in 2003 and 2005, fluctuations occurred in response to toll increases, when traffic declined while revenues increased.

### *Population Trends and Projections*

Between 1970 and 1980, population in New York City declined in the Bronx, Brooklyn, Manhattan and Queens, but increased on Staten Island. For the five boroughs, population totaled 7.9 million in 1970 and 7.1 million in 1980, as displayed in Table 14. The 1990 Census indicated that there was a turnaround and population grew at an average annual rate of approximately 0.3 percent. The Census results for the year 2000 show the population of New York City grew by

approximately one percent annually and now exceeds 8,000,000. Nearby New York and New Jersey counties also show increased growth. In Connecticut, population increases were in Fairfield County, the closest county to the TBTA facilities.

**Table 14. Population Trends and Projections**  
(000s)

Year	New York City						New York Region <sup>(b)</sup>	New Jersey Region <sup>(c)</sup>	Connecticut Region <sup>(d)</sup>
	Manhattan	Bronx	Brooklyn	Queens	Staten Island	Total <sup>(a)</sup>			
1970	1,539	1,472	2,602	1,987	296	7,895	4,178	5,066	1,682
1980	1,428	1,169	2,231	1,891	352	7,072	4,314	4,915	1,725
1990	1,488	1,204	2,301	1,952	379	7,323	4,401	5,008	1,806
2000	1,537	1,333	2,465	2,229	444	8,008	4,681	5,431	1,889
2005 - Projected	1,583	1,367	2,515	2,273	471	8,209	4,882	5,614	1,958
2010 - Projected	1,626	1,391	2,566	2,334	495	8,412	5,060	5,726	2,016
2015 - Projected	1,651	1,432	2,622	2,445	524	8,674	5,196	5,850	2,078
Average Annual Percent Change									
1970 to 1980	-0.7%	-2.3%	-1.5%	-0.5%	1.8%	-1.1%	0.3%	-0.3%	0.3%
1980 to 1990	0.4	0.3	0.3	0.3	0.7	0.3	0.2	0.2	0.5
1990 to 2000	0.3	1.0	0.7	1.3	1.6	0.9	0.6	0.8	0.4
2000 to 2005	0.3	0.3	0.2	0.2	0.6	0.2	0.4	0.3	0.4
2005 to 2010	0.3	0.2	0.2	0.3	0.5	0.2	0.4	0.2	0.3
2010 to 2015	0.2	0.3	0.2	0.5	0.6	0.3	0.3	0.2	0.3

- Notes: (a) Totals may not add due to rounding.  
 (b) Consists of the following counties: Dutchess, Nassau, Orange, Putnam, Rockland, Suffolk and Westchester.  
 (c) Consists of the following counties: Bergen, Essex, Hudson, Middlesex, Monmouth, Morris, Passaic, Somerset and Union.  
 (d) Consists of the following counties: Fairfield, Litchfield, New Haven.  
 Sources: New York Metropolitan Transportation Council, US Census Bureau.

NYMTC’s latest population projections for the region for 2005 to 2015 were prepared in 2004. NYMTC projects steady population growth throughout the region ranging from 0.2 percent to 0.6 percent.

With the 2000 Census exceeding previous expectations and population increases region-wide, population growth should have a positive effect on traffic demand on the TBTA crossings. The latest projection by the U.S. Bureau of the Census is for a population of 9 million for New York City in 2010.

*Motor Vehicle Registrations*

One of the indicators of traffic stability and/or growth in an area is the trend in the number of motor vehicle registrations. As shown in the following table, motor vehicle registrations increased slightly for the period 2000 through 2005 in New Jersey and Connecticut, decreased slightly in New York City and remained relatively constant throughout New York State. The most recent data available indicate that between 2000 and 2005 vehicle registrations grew by an average annual rate of growth of 1.4 percent in New Jersey and 1.9 percent in Connecticut. As illustrated in Table 15, these figures represent an upward trend in motor vehicle registration growth for the region.

Motor vehicle registrations are not projected for future years. However, based on past trends, it is expected that growth will continue in regional motor vehicle registrations in parallel with the demographic indicators.

**Table 15. Motor Vehicle Registrations**  
(000s)

Year	New York City	New York State <sup>(a)</sup>	New Jersey	Connecticut
1999	2,001	10,437	5,921	2,659
2000	2,044	10,661	5,951	2,735
2001	2,025	10,707	6,113	2,796
2002	1,946	10,445	6,275	2,893
2003	1,869	10,414	6,320	2,928
2004	1,849	10,450	6,361	2,989
2005	1,857	10,477	6,375	3,011
Average Annual Growth				
2000-2005	-1.9%	-0.3%	1.4%	1.9%

Notes: (a) Including New York City.

Sources: New York State Department of Motor Vehicles, Connecticut Department of Motor Vehicles and New Jersey Department of Motor Vehicles.

In summary, generally, employment indicators overall seem to have had a more noticeable effect on traffic volumes on the TBTA facilities than population growth. However, regional demographic trends are not always independently discernable relative to the yearly traffic variations. As discussed throughout this report, demand for the TBTA facilities has been strong overall, and NYMTC's regional population projections indicate an increasing trend throughout the forecast period. With regard to employment, a return to previous levels is anticipated within the short term with steady growth for the next 10 years.

### Fuel Conditions

The availability and pricing of motor fuel has historically affected the use of TBTA facilities. During the previous 35 years, fluctuations in traffic volumes occurred when fuel was either in short supply and/or prices increased rapidly. These conditions existed in 1973-1974, the summer of 1979, during the first war in the Persian Gulf in 1990-1991 and most recently during the second war in the Persian Gulf and in the aftermath of Hurricane Katrina.

In 1974, while the economy slowed and fuel prices rose, there was a 4.9 percent decline in TBTA traffic and lowering of traffic growth rates from 3.8 percent prior to 1974 to 1.5 percent after 1974. Succeeding fuel shortages caused temporary traffic decreases that resulted in no permanent effects on traffic growth in subsequent years. The lasting effect on the growth rate from Hurricane Katrina has yet to materialize as the impact occurred in September of 2005.

In the aftermath of the 1973-1974 Oil Embargo, the United States established the Strategic Petroleum Reserve (SPR) to provide protection against such short-term disruptions to petroleum supplies. The SPR can hold up to 727 million barrels of crude oil and as of January 17, 2006 had 684.3 million barrels. This will supply a total of 59 days of import protection. In the most recent drawdown, the SPR sold 11 million barrels and gave 9.8 million barrels in an emergency loan in response to Hurricane Katrina, which mitigated gasoline prices to some extent in September and October of 2005. Further, the International Energy Agency (IEA), a consortium of 26 industrialized nations, also encouraged its members to up their output to increase supply to U.S. markets. Gasoline prices spiked during the first week of September after Hurricane Katrina hit the Gulf Coast and temporarily closed eleven of the twenty oil refineries in the Gulf. During the first week of September 2005 the retail price for all formulations of regular gasoline for the United States was \$3.07 per gallon representing a 17.6 percent increase from the previous week and a 65.9 percent increase from the same week in 2004. Prices gradually decreased to a low point of \$2.15 per gallon by the first week of December 2005.

Since December, prices have steadily increased. As of April 24, 2006, the average price for a gallon of regular gasoline in the U.S. was \$2.91. This was up \$0.13 per gallon for the week (4.7 percent) and \$0.68 per gallon (30 percent) from a year ago. The price in the New York City area was \$2.98 per gallon, an increase of \$0.19 per gallon (6.8 percent) for the week and \$0.78 per gallon (34.8 percent) from the same time last year.

According to the Energy Information Administration, world oil market conditions, growth in U.S. demand, and ongoing implementation of domestic fuel quality requirements are expected to keep consumer prices for motor fuel high in 2006. It is anticipated that there will be future increases in gasoline prices due to increases in crude oil prices triggered by unrest in the Middle East, and because of supply problems from the phase out of the additive MTBE. MTBE accounts for about 10 percent of the volume of every gallon of gasoline, or 1.4 percent of the nationwide supply. Refiners plan to stop using it beginning in April because it has been found to contaminate groundwater and Congress has refused to grant the refiners protection from lawsuits if they continue to use it. MTBE will be replaced with ethanol, but there are doubts within the Energy Department and the oil industry about whether there will be enough of the corn-derived fuel to meet the anticipated surge in demand and whether the country's distribution system is ready to handle it.

Other factors putting upward pressure on gasoline prices are:

- Gasoline consumption is expected to grow solidly following weak growth in 2005;
- Gasoline quality requirements under the U.S. Environmental Protection Agency's (EPA) Tier 2 Vehicle and Gasoline Sulphur Program mandate further reduction in sulphur content this year. EPA estimates that the sulphur program will cost the refining industry about 2 cents per gallon to produce low-sulphur gasoline when the program is fully phased in;
- Higher diesel fuel prices are also expected because of the additional cost of producing ultra-low-sulphur diesel fuel later this year.

- Based on recent hurricane activity, news of any developing hurricanes and tropical storms with a potential to cause significant new outages could add to the volatility of near-term prices of motor fuel in the latter part of the summer.

During the latter part of 2005, transactions on TBTA facilities generally decreased. Much of the decrease in transactions can be attributed to the increase in tolls in March, record rainfall in October, and snow in December. While gasoline prices rose to over \$3.00 per gallon in September 2005, the effect the higher gas prices had on transactions was slight and seemed only to appear on Labor Day weekend and the following weekend.

Gasoline prices are again at or near \$3.00 per gallon. If this level is sustained for a prolonged period of time, it may have an effect on travel in the region. It is certainly possible that discretionary travel (vacation and recreational trips) may decline; however, most of the trips on the TBTA facilities are commuter or work-oriented, and there should not be a significant change in day-to-day commuter demand unless the price increases continue at a rate comparable to recent experience.

### **Toll Impacts and Elasticity**

Tolls that are increased periodically affect traffic usage, especially if they outpace the rate of inflation, as they have on the TBTA facilities, as well as in those instances where competing facilities provide a good alternative. Elasticity, as used herein, is the relationship between traffic volume and the toll rate change, and, represents the relative decrease in traffic corresponding to a given increase in toll. Elasticity is expressed as a negative value and the higher the absolute value, the more apt a facility is to lose traffic, which can be due to diversions to competing facilities, switches in travel modes, consolidation of trips and elimination of trips.

URS had developed a set of elasticity factors for each of the TBTA crossings based on the previous eleven toll increases. To estimate the impact on traffic and toll revenue when tolls are increased in the future, the impacts of the March 13, 2005 toll increase were factored into the historical data and a new set of factors calculated. Elasticity, in this sense, is used to analyze the relationship between tolls and use, i.e., when tolls are increased, motorists react and travel patterns may change. The previous historical and the new factors are shown in Table 16.

**Table 16. Elasticity Factors**

Location	Historical*	Updated
Bronx-Whitestone/Throgs Neck	-0.085	-0.105
Brooklyn-Battery Tunnel	-0.386	-0.358
Cross Bay Bridge	-0.149	-0.137
Henry Hudson Bridge	-0.298	-0.289
Marine Parkway Bridge	-0.110	-0.101
Queens Midtown Tunnel	-0.208	-0.192
Triborough Bridge	-0.196	-0.208
Verrazano-Narrows Bridge	-0.120	-0.126

\* Through 1996

Note: For each 1% increase in toll the volume is expected to decrease by the elasticity factor; e.g. for each 1% increase in the toll at the Queens-Midtown Tunnel, volume would decrease by .192%.

Elasticity factors were updated by averaging the observed elasticities of the eleven previous toll increases with the results of the March 13, 2005 toll increase. Elasticities for two of the facilities that gained traffic after the toll increase (Cross Bay Bridge and Marine Parkway Bridge) were considered zero in the averaging calculations.

With the exception of the Bronx-Whitestone and Throgs Neck bridges, the new elasticity factors changed less than 10 percent (3 to 8 percent) from the historical factors. Elasticity for the Bronx-Whitestone and Throgs Neck bridges, together, increased almost 25 percent. This may possibly represent a diversion of traffic due to the Bronx-Whitestone Bridge construction during 2005 rather than a reaction to the March 2005 toll increase.

Elasticity factors vary, demonstrating that users react differently to toll increases depending on influencing conditions. On the TBTA crossings, elasticity tends to be influenced by the proximity of the toll-free City bridges and other considerations. The low factors for the Throgs Neck and Bronx-Whitestone bridges indicate their relative isolation from the nearest toll-free competitor, the Queensboro Bridge. Further south on the East River at the Triborough Bridge and the Queens Midtown and Brooklyn-Battery tunnels, elasticity increases as the degree of toll-free competition increases. The TBTA tunnels tend to lose traffic particularly when the competing crossings are operating under reasonable levels of traffic service and providing motorists with viable toll-free alternatives during non-peak periods. In addition, trip purpose influences demand, i.e., peak-period, work-related trips are less elastic than off-peak trips that have fewer travel-time constraints.

If the historical increase patterns continue, it can be expected that tolls will be increased again during the forecast period (through 2015). Accordingly, for the purposes of projecting traffic and toll revenue, URS has prepared two sets of forecasts: one at constant tolls (at the present level); and the other with toll increases in January 2007, 2009, 2011, 2013 and again in January 2015.

For the toll-increase alternative, it was assumed that the toll levels (i.e., the cash toll for passenger cars) on the major and minor crossings would be increased to \$4.70 and \$2.35, respectively, in January 2007, \$4.90 and \$2.45 in January 2009, \$5.15 and \$2.55 in January 2011, \$5.40 and \$2.70, in 2013 and \$5.65 and \$2.85 in 2015. It was also assumed that the truck tolls would be increased proportionately, and that the *E-ZPass* tolls for passenger cars would consistently be \$0.50 lower than the respective cash tolls. This is consistent with the experience of the March 2005 toll increase. The percent changes are shown in Table 17.

As for the impacts of the toll increases on traffic demand, the elasticity factors from Table 16 as described above were used to calculate traffic decreases as shown in Table 17. It was assumed the toll increases described previously would occur on January 1, 2007, 2009, 2011, 2013 and 2015. These traffic impacts represent the reduction in values from the corresponding annual traffic levels that would be expected if the tolls were not increased.

**Table 17. Estimated Percent Change in Average Toll Rates and Traffic**

Facility	Elasticity Factor	2007		2009		2011		2013		2015	
		Toll	Traffic	Toll	Traffic	Toll	Traffic	Toll	Traffic	Toll	Traffic
Bronx-Whitestone Bridge	-0.105	4.71%	-0.50%	4.50%	-0.47%	5.34%	-0.56%	5.07%	-0.53%	4.94%	-0.52%
Throgs Neck Bridge	-0.105	4.62	-0.49	4.52	-0.48	5.30	-0.56	5.22	-0.55	4.87	-0.51
Brooklyn Battery Tunnel	-0.358	4.72	-1.69	4.59	-1.64	5.41	-1.93	5.21	-1.86	4.95	-1.77
Cross Bay Bridge	-0.137	4.80	-0.66	4.58	-0.63	4.38	-0.60	6.38	-0.87	6.00	-0.82
Henry Hudson Bridge	-0.289	5.11	-1.48	4.86	-1.41	4.63	-1.34	6.76	-1.96	6.33	-1.83
Marine Parkway Bridge	-0.101	4.93	-0.50	4.60	-0.46	4.40	-0.44	6.44	-0.65	6.13	-0.62
Queens Midtown Tunnel	-0.192	4.84	-0.93	4.46	-0.86	5.67	-1.09	5.24	-1.01	4.91	-0.94
Triborough Bridge	-0.208	4.81	-1.00	4.45	-0.92	5.33	-1.11	5.12	-1.06	4.81	-1.00
Verrazano-Narrows Bridge	-0.126	4.79	-0.61	4.57	-0.58	5.46	-0.69	5.17	-0.65	4.92	-0.62

The periodic toll increases indicated above were selected to provide an average of a 5 percent increase in toll revenues, in each of the toll increase years, for the 10-year analysis period. Individual tolls were rounded to make the collection of the tolls as efficient as possible. Due to this rounding, toll increases for the minor toll bridges were slightly higher, on a percentage basis, than the increases for the major crossings for some of the future year toll rate changes.

### Bridge and Tunnel Capacities

URS assessed the peak-hour capacity level of each facility at the mid-point of the bridge or tunnel, based on a highway-type capacity analysis. We recognize, however, that the TBTA bridges and tunnels have different physical and operational characteristics than do highways. Therefore, in our capacity assessment, we considered operational factors such as ramp approaches, vehicle merges, grades, sight lines, lane widths, lack of shoulders, and vehicle spacing and lane configuration at toll plazas, including *E-ZPass* lanes.

The local street system feeding the TBTA crossings also becomes constrained during peak periods, with unstable traffic flows occurring on congested roadways.

We also reviewed toll plaza operations with the electronic toll payment system. Characteristics of the *E-ZPass* system are discussed throughout this report. The acceleration of vehicle throughput for *E-ZPass* customers has mitigated congestion at the toll plazas. With *E-ZPass* use an overall 71.5 percent during 2005, and the customer base increasing, efficient toll plaza operations are anticipated throughout the forecast period.

Additionally, we have reviewed past annual traffic volumes at each facility for comparison with the current traffic levels. URS conducted this review (in early 2006), matching the 2005 traffic volumes against the highest annual volumes recorded, by facility, going back to 1970. Note in Table 18 that the Throgs Neck Bridge and the Queens Midtown Tunnel carried their highest volumes in 2005.

**Table 18. Comparison of 2005 Traffic with Highest Recorded Levels Since 1970**

Facility	Highest Volume Since 1970		2005 Volume* (000s)	2005 Percent of Highest Volumes
	Year	Volume (000s)		
Throgs Neck Bridge	2005	41,199	41,199	100%
Bronx - Whitestone Bridge	2004	45,207	41,198	91
Triborough Bridge	1988	64,215	62,841	98
Queens Midtown Tunnel	2005	28,751	28,751	100
Brooklyn-Battery Tunnel	1971	22,920	17,426	76
Verrazano-Narrows Bridge	2002	73,334	69,980	95
Henry Hudson Bridge	2004	24,699	24,136	98
Marine-Parkway- Gil Hodges Bridge	1971	9,150	7,673	84
Cross Bay Bridge	1972	7,562	7,182	95

\* From Table 5

While traffic volumes during peak hours may approach capacity and limit traffic growth during these hours, there is room for traffic growth during non-peak conditions through peak spreading. Traffic volumes can continue to grow, but growth would be at a slower pace.

### **TBTA and Regional Operational and Construction Impacts**

Traffic volumes on TBTA facilities are influenced by construction and rehabilitation projects involving roadways and bridges in the New York City area. In addition to projects that are scheduled as part of long-term rehabilitation planning, any of the emergency measures that have been either implemented or proposed to address transportation deficiencies resulting from the events of September 11, 2001, and which are expected to remain in place beyond 2006, are discussed in this section.

Major projects that result in long-term closures on the competing bridges may increase volumes on TBTA's facilities. Also, long-term lane closures on the roadway network serving the TBTA crossings or on the TBTA crossing themselves may affect TBTA traffic volumes or cause traffic to shift from the affected crossing to another TBTA facility. For example, when the replacement of the deck on the Bronx-Whitestone Bridge began in June of 2005, some traffic diverted to the Throgs Neck Bridge.

A number of roadway construction/rehabilitation projects, over the past few years, have influenced traffic volumes on TBTA facilities, and future construction will also affect traffic. The following descriptions also highlight area construction activities and measures that have influenced TBTA volumes and other planned and proposed projects that may affect traffic during the forecast period. Information on future construction activity was obtained from the New York State Department of Transportation, New York City Department of Transportation, NYMTC, and the Port Authority of New York and New Jersey.

In general, the majority of construction activities programmed for the TBTA facilities themselves are scheduled to take place during off-peak hours, including nighttime lane closures in the tunnels. Therefore, they are expected to have no discernible effect on toll revenue.

On the Verrazano-Narrows Bridge, the replacement of the upper level suspended deck anticipated for the end of 2008 is not likely to have major traffic impacts since a movable barrier will be used to allow maintenance of traffic in the peak flow direction and because the lower deck will be unimpeded. Currently there is no commitment to re-deck the lower level of the bridge.

The Cross Bay Bridge re-decking will begin in 2006 and the roadway will be reduced to two lanes in each direction. Due to low traffic volumes, this is not anticipated to have a detrimental effect on traffic flows.

On the Bronx-Whitestone Bridge, the replacement of the deck on the suspended span with an orthotropic deck began in June 2005 and will be completed by the end of 2006. A movable barrier will be used to maintain three lanes in the peak direction; however, there may be an impact with some diversion to the Throgs Neck Bridge due to heavy volume in the reverse direction. Also, approach decks will be replaced in the Bronx in 2008 and in Queens under the next capital program. Three lanes will be maintained in each direction.

Redecking of the lower level of the Henry Hudson Bridge is scheduled for 2006-2009. Construction will be staged to minimize traffic impacts.

The Throgs Neck Bridge will have multiple rehabilitation projects through 2009. The concrete deck will be replaced and the orthotropic deck will be rehabilitated in 2007-2008. It is anticipated that traffic will divert to the Bronx-Whitestone Bridge during this construction project.

### *Operational Changes Resulting from September 11, 2001*

Of all the measures introduced following the events of September 11, only the following two remain in place as of April 2006:

- Brooklyn Ferry Service, which the New York City DOT implemented between Manhattan and Brooklyn on September 17, 2001, was funded until April 30, 2003. Since April 30, the ferry has continued in service as a fee based service.
- The ban on eastbound commercial vehicles remains in effect at the Holland Tunnel. Commercial vehicles may now use the westbound Tunnel to exit New York City.

### *Competing Ferry Service*

Following September 11, a comprehensive review of all transportation services between Manhattan, the other boroughs and New Jersey was undertaken by FEMA, and a number of changes to the existing transportation services have been implemented. Ferry ridership doubled after September 11, with ferry companies and agencies investing in new routes and infrastructure. However, as other transit such as the PATH and subway came back on line, ferry ridership dropped. This has been especially true for New York Waterway. On March 21, 2005 Billybey Ferry Company, LLC took over operations of New York Waterway service between Hoboken Ferry Terminal, Newport, Harborside and Port Liberty Terminals and Manhattan sites. Port Authority officials agreed in February 2005 to reduce sharply the monthly fee they had charged New York Waterway to carry passengers between Hoboken and Lower Manhattan.

New York Water Taxi, which serves East River routes, appears to be more financially stable. Currently, New York Water Taxi operates East River ferry service between Manhattan, Brooklyn and Queens from various locations including: Hunters Point, East 34<sup>th</sup> Street, Pier 11, Wall Street, Fulton Ferry Landing, Red Hook, South Street Seaport, Pier 45 Greenwich Village, Pier 63 Chelsea Pier/23<sup>rd</sup> Street, Pier 84 West 44<sup>th</sup> Street, World Financial Center and Slip 6 Battery Park. Service generally operates during peak periods and some routes do not operate during the winter. While the subsidy debate is ongoing, ferry service along East River routes seems to have stabilized over the past few years. Since routes are not likely to be added or dropped, ferry service will not likely affect TBTA facilities.

The City Council and the Port Authority of New York and New Jersey (PANYNJ) are currently debating to what extent ferry service should be subsidized and who will pay. They are also debating the form subsidies should take, e.g., fare subsidy vs. infrastructure upgrades. For example, PANYNJ is constructing a new \$40 million ferry terminal at the World Financial Center. It is anticipated that the terminal will open in 2007.

A proposal to institute new ferry service from Staten Island to Downtown Manhattan is currently being considered. This proposal would allow for the implementation of a new private ferry service from Staten Island's south shore to downtown Manhattan. The primary purpose of this proposed service is to provide an additional viable transportation service for residents who live in the central portion of Staten Island to access Manhattan.

*Competing East River Crossings Construction*

- Queensboro Bridge – Since 1989, numerous rehabilitation projects have involved the upper or lower levels, or ramp approaches to the bridge. Miscellaneous items at various locations throughout the bridge, approaches and ramps that were not addressed or were deleted from previous contracts were begun in November of 2003.

In addition, concurrent with these projects, the New York City DOT started to clean and repaint the structural steel of the main spans and approach roadways of the Queensboro Bridge in March 2004. The cleaning (removal of old paint) and painting of the bridge is performed in segments and is scheduled to be completed in January 2009. Throughout the Painting Contract, the North Lower Outer Roadway may be partially closed while providing a 5-foot access for bicyclists and pedestrians.

In early January 2006, construction began on the repair of both roadways of the upper level of the Queensboro Bridge. The surface of the existing roadway will be removed and replaced and is expected to be completed by November 2006. Any lane closures that are necessary will occur at night from 10:00 PM to 5:00 AM. Lane closures associated with the above may have resulted in some traffic diversions to the Queens-Midtown Tunnel and Triborough Bridge.

- Williamsburg Bridge - At present work is being performed for miscellaneous rehabilitation of the main bridge. This work began in March 2003 and is expected to be complete in September 2006. This \$173 million project will include the rehabilitation of the tower bearings, the truss system, the steel structure of all eight towers, and the north comfort station houses, the replacement or adjustment of the cable suspenders, the installation of maintenance travelers (inspection platforms) under the main span, and painting of the stiffening trusses.

Architectural work will include the restoration of decorative lights and the Brooklyn granite stone monument. Work inside the anchorage houses on both the Manhattan and Brooklyn sides will include the construction of new stairs, a hoisting system, ventilation and lighting, and oiling platforms. The project will also include the installation of an Intelligent Transportation System (ITS). The contractor is allowed to close two lanes for construction purposes, but will always maintain four lanes in the peak travel direction.

Whatever diversions to the Queens Midtown Tunnel that had occurred during earlier lane closures should have returned to routings based on normal driver preferences.

- Manhattan Bridge - Presently, the lower roadway is undergoing replacement. The contract to rehabilitate the lower roadway was started in January 2005 and is scheduled for completion in April 2008. The contract includes the complete removal and replacement of the lower roadway and these work items: replacement of the north upper roadway and lower roadway lighting, cleaning of more than 200,000 square feet of masonry at 16 structures in Brooklyn and Manhattan, restoration of the Brooklyn plaza

park at the entrance to the south walkway, milling of Sands Street in Brooklyn to create additional clearance for trucks, and rehabilitation of the interior of the anchorages.

The most significant item of this contract will be the replacement of the lower roadway. This task will begin in October 2006 and will require the closure of the roadway for one year. This should induce some traffic to divert to the Brooklyn-Battery Tunnel.

- Brooklyn Bridge – The maintenance and inspection of the travelers on the main span of the Brooklyn Bridge will begin in 2006 and will be completed in 2008. At that time, the rehabilitation of the approaches and ramps and the painting of the Bridge is scheduled to begin. Currently these projects are in the final design stage. The seismic retrofitting of the Bridge is in preliminary design and is anticipated to commence in 2010 with all construction projects completed by 2013.

It is unlikely any of the TBTA facilities will gain materially from these construction projects but it is possible that the Brooklyn-Battery Tunnel will experience slightly higher usage levels.

#### *Major Roadway Construction*

During the forecast period, several major roadway projects, which are part of NYMTC's Transportation Improvement Program (TIP) for 2006-2010, will potentially have traffic implications for the TBTA facilities. The TIP includes the planned year of construction; however, adherence to this schedule is not mandated. Some of these projects do not yet have lane closure plans, which will be developed in coordination with NYCDOT and local community boards. As a matter of policy, NYCDOT seeks to restrict lane closures to off-peak and nighttime hours.

Roads programmed for construction include:

- Willis Avenue Bridge – Connecting the FDR Drive, Major Deegan Expressway and Bruckner Expressway. The use of the contra-flow lane for passenger cars on business days has been discontinued. However, during intermittent roadway closures on the Third Avenue Bridge for purposes of testing and adjusting the machinery of the new span, the contra-flow lane will be implemented Manhattan-bound. According to the TIP, reconstruction is scheduled for Federal Fiscal Year 2006. Any restrictions on the Willis Avenue Bridge would induce some diversions to the Triborough Bridge.
- Third Avenue Bridge – The replacement of the span over the Harlem River is now in its final stages and is expected to be completed by late spring of 2006. At present, all five lanes are open to traffic and completion of the project includes the restoration of the service roads in the Bronx. Whatever diversions to the Triborough Bridge that had occurred during the reconstruction period should have returned to routings based on normal driver preferences.
- Major Deegan Expressway – Rehabilitation of various bridges along the Major Deegan Expressway between 138<sup>th</sup> Street and Mosholu Parkway are scheduled between 2006 and

2009. Safety improvements northbound at West Fordham Road and 230<sup>th</sup> Street are scheduled for 2006 and 2008 respectively. Traffic impacts at the Triborough Bridge should not be significant.

- Three Bridge Project in the Bronx - The Three Bridge Project includes the reconstruction of the following three bridges in the Bronx:
  1. I-295 (Cross Bronx Extension) Bridge over Randall Avenue;
  2. East Tremont Ave. over I-295 (CBE); and
  3. I-95 Bridge over I-695 (Throgs Neck Expressway).

These projects call for the demolition and reconstruction of these bridges to be fully completed by the fall of 2006. The first two projects necessitate the closing of one lane in each direction of the CBE between East Tremont Avenue and Randall Avenue during the construction period. This allows for two lanes in each direction during peak hours. More lane closures might occur during the off-peak and night hours to facilitate project work. Motorists will experience lane closures on I-95 northbound and I-695 north and southbound during off-peak hours due to the final bridge project. Service roads in this area will also be subject to shifts to temporary lanes. It is anticipated that traffic will shift from the Throgs Neck Bridge to the Bronx-Whitestone Bridge or possibly the Triborough Bridge because of these construction projects.

- Gowanus Expressway Viaduct Emergency Repairs - This project is expected to be completed in November 2006. The project has included repairs to the steel in the structure and the deteriorated concrete deck, the installation of a new median and the reinforcement of guide rails along the elevated highway. During this project, there will be single-lane closures in both directions during the mid-day weekday periods. During the next 8 months, some traffic (to/from New Jersey) could divert to the Holland Tunnel, avoiding the Verrazano-Narrows Bridge, and some passenger cars could divert to the Belt Parkway, but still use the Verrazano-Narrows Bridge.
- Brooklyn Queens Expressway - New York State Department of Transportation began the first phase of construction of the Brooklyn-Queens Expressway between Broadway and 25<sup>th</sup> Avenue in the spring of 2000 and is anticipated to be completed in early 2006. The second phase of the project runs from 61<sup>st</sup> Street to Broadway. Construction work began in the spring of 2005 is estimated to be completed in the fall of 2008. During construction, three lanes will generally be available for travel in each direction with many detour changes such as use of shoulders or use of median area to accommodate the rehabilitation project. Lane closures, if necessary, will only occur at night. It is anticipated that traffic diversion from the Triborough Bridge to the Bronx-Whitestone Bridge will be insignificant.
- Long Island Expressway (LIE) – The LIE interchange at the Cross Island Parkway improvement project has an expected completion date of June 2006. There will be occasional single-lane closures on the Cross Island Parkway in each direction on weekdays between 10:00 AM and 3:00 PM. There should be no significant effect on Throgs Neck

Bridge and Bronx-Whitestone Bridge traffic.

- Whitestone Expressway Bridge over the Flushing River – Rehabilitation of the northbound roadway and pavement rehabilitation is expected to be completed in August 2006. There will be lane shifting with traffic maintained during the peak hours. There will also be sporadic mid-day lane closures from the eastbound Astoria Boulevard approach to the northbound expressway. There should be no significant effect on Bronx-Whitestone Bridge traffic.
- Throgs Neck Bridge/Expressway approach in the Bronx –Work continues on the Bruckner Expressway reconstruction between the Throgs Neck Expressway and Pelham Parkway. This project is scheduled for completion in summer 2006 and involves the closure of one of three lanes in a northbound or southbound direction on the Bruckner Expressway, as necessary, between the hours of 9:00 AM and 3:00 PM. Some passenger car traffic has diverted from the Throgs Neck Bridge to the Bronx-Whitestone Bridge and Hutchison River Parkway, but trucks are limited to their normal routings, whether that be via the Bronx-Whitestone or Throgs Neck Bridges.
- Grand Central Parkway – The installation of an Intelligent Transportation System is estimated to be completed on June 2006. Single lane closures are possible during the day and two-lane closures possible at night. Traffic impacts on the Triborough Bridge should not be significant.
- FDR Rehabilitation Project from 54<sup>th</sup> Street to 63<sup>rd</sup> Street - This project, expected to be complete by April 2007, will rehabilitate the three-level tiered FDR Drive structure. Work includes repaving, safety improvements to correct roadway geometry and add an acceleration lane to the 63rd Street entrance and new drainage, signage and lighting systems. Southbound traffic detours onto the northbound roadway while northbound traffic detours onto the outboard detour roadway. During Stage 5 (the present stage), there will be 23 consecutive weekend closures of the FDR Drive northbound between January 2006 and May 2006. After that, there will be some infrequent weekend closures. Some traffic shifts between the Triborough Bridge and the Queensboro Bridge could occur.
- Route 9A - Route 9A was heavily damaged when the World Trade Center was attacked in 2001 destroying two northbound lanes in the downtown area. On March 29, 2002, a six lane temporary road was opened offering interim restoration of Route 9A and allowing the Brooklyn-Battery Tunnel to re-open. Further construction to improve Route 9A from a temporary fix to a permanent solution is expected to be completed by December 2007. This will have a positive impact on traffic using the Brooklyn-Battery Tunnel as motorists achieve the comfort level with the permanent traffic patterns that will be in place after completion.
- Long Island Expressway - The Long Island Expressway from Van Wyck Expressway to the Grand Central Parkway and the interchanges therein are being studied in order to improve traffic operations in the area. Due to the design of roadway and interchanges,

motorists experience heavy congestion during the peak periods. The project is currently scheduled to begin construction in 2010 and the completion date has yet to be determined. This project has the possibility of creating modest diversion from the Queens Midtown Tunnel and might affect traffic off of the Bronx-Whitestone Bridge coming down the Van Wyck Expressway.

- Belt Parkway –Rehabilitation of seven bridges over four waterways and three roadways is scheduled to be carried out between fiscal years 2006 and 2008. Reconstruction of the Belt Parkway Bridge over Ocean Parkway was completed in November 2004. Included in this work was a reconfiguration of the interchange. Traffic impacts at the Verrazano-Narrows Bridge should not be significant.
- Staten Island Expressway - The Staten Island Expressway is currently undergoing bridge rehabilitation projects and the introduction of bus lanes, which are to be completed by July 2006. No lane closures are expected during the final stages of the projects. These projects will increase the life of the Expressway and once completed make the Verrazano-Narrows Bridge slightly more attractive to motorists.

Roads currently in the planning stages include:

- FDR – 34<sup>th</sup> Street Viaduct Project - This project stretches from 24<sup>th</sup> to 42<sup>nd</sup> Street on the FDR Viaduct. It is the early stages of planning and no schedule has been introduced. The project will essentially rehabilitate this section of the FDR to reasonable standards. It is anticipated that the construction schedule will resemble the current project on the FDR extending from 53<sup>rd</sup> to 64<sup>th</sup> Street. Again, since there is no schedule, the impact on the TBTA Facilities cannot be determined at this time. As this project progresses adjustments to forecasts will need to be made.
- Kosciuszko Bridge - Options for the rehabilitation or reconstruction of the Kosciuszko Bridge are now being studied to solve the traffic congestion, safety and the structural conditions of the bridge. This project is still in the planning stages and no design alternative or construction schedule has been adopted. It is possible the project will come online during the forecast period and depending on the scenario chosen traffic patterns could be altered.
- Bruckner/Sheridan Expressway Interchange - Studies are currently underway on the reconstruction of the interchange of the Bruckner Expressway (Interstate 278) and the Sheridan Expressway (Interstate 895). The project will relieve the traffic bottleneck at this interchange and improve access to the Hunts Point Peninsula. The scenarios include demapping the Sheridan Expressway. Again, this project is in the planning stages and if construction does occur during the forecast period, traffic patterns could alter.
- Gowanus Expressway Viaduct - The Gowanus Expressway Viaduct will be subject to continual emergency repairs in the short term as discussed previously and a more comprehensive construction project in the long term. Currently a Draft Environmental Impact Statement (EIS) is underway to study the impact of different alternatives to

improve the expressway including tunnels, a relief viaduct and a no-build scenario with maintenance or rehabilitation. It is anticipated that a Record of Decision will occur in late 2008. There is currently no construction schedule but it can be assumed that construction will occur within the forecast period and will divert some traffic to the Holland Tunnel from the Verrazano-Narrows Bridge.

- Goethals Bridge - In September 2003, the Board of Commissioners of the Port Authority of New York and New Jersey approved plans to explore future options for the modernization and expansion of the Goethals Bridge. An EIS is currently in process, studying options, and make recommendations for a preferred alternative to upgrade the bridge in terms of: improving customer service, providing capacity for transit options and enhancing the safety and reliability of the crossing. The draft EIS and public hearings are scheduled for early 2006. If the construction occurs, after completion, it will positively affect traffic volumes on the Verrazano-Narrows Bridge.

### **Other Considerations**

Other considerations in the development of traffic and revenue forecasts for the TBTA facilities include the potential impacts of transit improvements and Clean Air regulations in the metropolitan area.

- *Impact of Transit Improvements.* There are significant transit improvements that, when implemented, are expected to affect TBTA traffic levels during the forecast period through the year 2016.
  - Second Avenue Subway: work on the \$16 billion project will affect approximately nine miles of Second Avenue and adjacent side streets. No official construction commencement date has been announced. The Federal Transit Administration (FTA) issued a Record of Decision in July 2004 declaring that the National Environmental Policy Act of 1969 (NEPA) was satisfied. The MTA has requested to start Final Design from the FTA and has been considering innovative contract structures such as Design-Build to speed up the project's construction time and overall performance of the completed subway line. The 21-foot wide, 8.5-mile, twin tunnels from 125<sup>th</sup> Street at the north to Hanover Square on the southern tip of Manhattan will provide direct subway access to residents along the east side of Manhattan. The 16-year project will result in the creation of 16 new subway stations on Second Avenue.

For the duration of the project, at least one half of the lanes for three to five block segments of Second Avenue in the vicinity of the proposed stations would be closed. This would permit construction of temporary roadway decking that will provide areas for storage of material and equipment, removal of tunnel debris and construction of the stations. Relocation of on-street parking and temporary suspension of standing rules for trucks will also be required.

During construction on Second Avenue of the 34<sup>th</sup> Street Station there would be a loss of capacity on the access routes to the Queens Midtown Tunnel due to inefficient flow during peak hours and closure of side streets adjacent to the construction area. During the construction on the northern portion of Second Avenue adjacent to the Triborough Bridge, the 125<sup>th</sup> Street ramps between the Triborough Bridge and 125<sup>th</sup> Street would experience a loss of capacity. The high volume ramps between the FDR Drive and the Triborough Bridge would not be affected.

- The JFK *Airtrain* with connections to the subway line at Howard Beach and the LIRR and subway at Jamaica construction was completed in 2002 and the system became fully operational in December 2003.
- *Eastside Access Project* to bring LIRR trains into Grand Central Terminal, which LIRR anticipates will result in shifts from other modes, including TBTA facilities.
- Other long-range projects include the lower Manhattan-Brooklyn improvements to the existing subway tunnels (signalization, etc.).
- *Clean Air Regulations.* In response to Section 182(d)(1)(B) of the Clean Air Act, the State of New York imposes voluntary regulations aimed at increasing the average vehicle occupancy of work-related trips. Known as the Employee Commute Options (ECO) program, the plan encourages employers of 100 or more persons in the severe ozone non-attainment areas to submit a compliance plan that is aimed, through ride sharing, at reducing the number of employees that commute to work alone by automobile. Included in New York State's severe ozone non-attainment areas are all five boroughs of New York City, and the counties of Nassau, Suffolk, Rockland, Westchester, and portions of Orange. Similar programs are currently in place for severe non-attainment areas in New Jersey, Connecticut and Pennsylvania. Since URS' traffic estimates are derived from 2001 and 2002 annual levels that already take into account any impacts the ECO program may have, no further adjustments are necessary to reflect any negative effects this might have on TBTA revenues.

### **Summary of Assumptions and Conditions**

TBTA traffic, revenues and expenses have been projected by URS on the basis of the historical record of traffic, revenues and expenses, the capacities of the TBTA facilities, traffic growth forecasts, the estimated traffic elasticity due to toll variations, impacts of construction projects and the following assumptions and conditions, which we believe are reasonable.

- All TBTA facilities will be operated efficiently and maintained in good physical condition in order to attract customers and to sustain traffic demand levels.
- The TBTA adopted capital program for 2005-2009 will be implemented throughout the forecast period. Future capital programs sufficient to maintain the structural integrity of bridges and tunnels will be adopted and implemented throughout the forecast period.

- For the scenario with periodic toll increases, toll rate increases will be implemented in accordance with the schedule contained in this report.
- Elasticity factors, prepared by URS based on historical toll increases prior to and including 2005, are valid in their application to future toll rate increases to estimate future traffic and toll revenue.
- Electronic toll payment by *E-ZPass* will continue to be available on all TBTA crossings, and the payment of revenue in full to TBTA will continue to be in accordance with current interagency agreements.
- Capacity constraints in the arterial highway network will continue to limit traffic growth on the nine TBTA crossings.
- Highway/crossing improvements, in general, for the competing bridges and roadway network will be made in accordance with the plans and schedules described herein.
- Major TBTA roadway and structural improvements will continue to be performed during nighttime and non-peak hours, and/or in the off-peak direction, and approaches to the nine TBTA crossings will not be significantly impaired by construction work beyond the items discussed in this report.
- The forecasts are based on the assumption that *E-ZPass* usage will grow at the rate of 0.5 percent annually during the period included in these forecasts. While usage at a higher level would improve toll plaza operating conditions, it would also result in lower average tolls and, therefore, could reduce the level of increase in gross toll revenues. Growth in traffic volumes would be limited without *E-ZPass* at toll plazas.
- Competing East River crossings will continue to operate toll-free and to be maintained in efficient operating condition.
- The trends in regional employment and population, forecast by the New York Metropolitan Transportation Council and presented in this report, will be realized in the Tri-State area and in New York City.
- Over the past several months, motor fuel (and crude oil) prices have been steadily increasing until they are now at the \$3.00 per gallon level. If this trend continues and prices rise substantially above the \$3.00 level, discretionary travel could decline and there may be fewer recreational trips. In general, however, TBTA facilities carry regular commuters and other non-discretionary trips so that the overall impact on toll volumes and toll revenues is not expected to be significant.
- Public transportation systems will not undergo any major construction programs nor schedule changes that would materially alter regional commuter patterns and result in significant traffic diversions from TBTA facilities.

- Current toll discount programs remain in effect at current projected levels, including the \$0.50 discount for *E-ZPass* auto customers and the Staten Island residents' discount program for the Verrazano-Narrows Bridge.
- The effects of the toll-rebate program, implemented in January 1998, for the benefit of *E-ZPass* customers who are residents of Broad Channel and Rockaway peninsula traveling on the Cross Bay Bridge, are fully reflected in the results since 1998 and, therefore, no further impact will occur.
- No other toll discount programs will be introduced that would adversely affect the TBTA toll facilities' revenue stream.
- No material natural disaster, or local, state or national emergency will occur that would alter travel patterns and divert traffic from the TBTA facilities.

While the projections are made and presented year-by-year by URS, they are intended to show trends on the basis of its analysis of historical data and the assumptions and conditions set forth above. Variations in the year-to-year forecasted results may occur and such variations may be significant.

## PROJECTED TRAFFIC, REVENUES AND EXPENSES

Future traffic and toll revenues are estimated for the 10-year (2006-2016) forecast period for each TBTA facility based on historical trends in traffic and revenue, elasticity factors for future toll increases, toll collection operations, capacities of the nine crossings, facility maintenance, *E-ZPass* participation levels, externalities such as area roadway improvement plans and regional demographic projections, and the assumptions and conditions summarized previously. Changes in these factors, which may potentially affect future traffic and toll revenue, are detailed throughout this report.

Trends in operating expenses for the toll facilities, TBTA's 2006 budget, and growth estimates based on the CPI-U for "All Urban Consumers–New York PMSA" for labor items and CPI-U for "All Urban Consumers–U.S. City Average" for non-labor items are input to the future operating expense forecast. Future operating expense estimates are used to develop net revenue projections over the forecast period.

Traffic and toll revenues were first projected on the basis that the current tolls will be continued throughout the forecast period. Then, using these estimates as a base, URS applied the elasticity impact factors listed in Table 16 and adjusted the average tolls to develop the forecast with periodic toll increases.

### Traffic and Toll Revenue at Current Tolls

The methodology employed by URS to forecast traffic was based on the development of an annual growth rate for each facility (based on the historical traffic trends), modified by any residual impact of September 11, the construction activities (historical and projected) throughout the highway network (bridges, tunnels and arterials) and the traffic capacity constraints in the network. Regional demographic projections were also taken into consideration.

All indicators point to the potential for traffic increases in the future at modest rates of growth. URS estimates that traffic on the Throgs Neck, Triborough, Bronx-Whitestone, Henry Hudson and Verrazano-Narrows bridges and Queens Midtown Tunnel will increase primarily during the off-peak period, once these facilities exceed their capacity levels with respect to the highest recorded levels achieved since 1970 (from Table 18). Capacity constraints in the highway network are contributing factors.

The technique used in the forecast was to reduce the potential growth rates by 50 percent to reflect lower overall growth once the capacity level is reached in the peak period. This approach produces conservative forecasts inasmuch as the introduction of *E-ZPass* has provided some additional capacity at the toll plazas. If grown at its full growth rate, the Verrazano-Narrows Bridge will reach capacity in 2010. After that, an application of the 50 percent growth factor was used for the remainder of the forecast period. For the other facilities, the use of the selected growth rates will result in volume increases during the forecast period that will remain below the previous highest levels achieved.

On this basis, starting with the 2006 estimated traffic by facility from Table 11 (that now reflects the impact of the March 2005 toll increase and the impact of the use of *E-ZPass* on TBTA facilities as well as the traffic constraints in the highway network), URS projected the traffic by facility as shown in Table 19, and calculated the corresponding toll revenue based on the 2005 average tolls after the March 2005 toll increase by facility (also from Table 11).

General traffic growth in the range of 0.5 to 1.7 percent annually is estimated in the forecast period. This growth is based on the actual growth in traffic on each facility during the last 10 years, after the impact of toll increases were taken into account, and a review of actual and forecast population and employment growth in the region. An exception is the Brooklyn-Battery Tunnel, which has shown an overall negative trend since 2001 due to decreased activity in lower Manhattan. We have assumed that this negative trend will not continue and have projected future traffic to be at current levels with no growth.

### **Traffic and Toll Revenue with Periodic Toll Increases**

As mentioned previously, the traffic forecast with periodic toll increases was built upon the base (current tolls) forecast (from Table 19), to which the elasticity impacts (from Table 17) were applied. Adjustments were made to growth rates where traffic volumes fell below capacity due to toll increases. URS then applied the appropriate increased average tolls (the 2006 averages from Table 11 increased by the percentages in Table 17) in the years 2007, 2009, 2011, 2013 and 2015 (effective January 1) to calculate the corresponding toll revenues in the respective years. The traffic and revenue forecasts with periodic toll increases are listed in Table 20.

**Table 19. Traffic and Toll Revenue Forecast, Constant Tolls**

Year	Throgs Neck Bridge <sup>(b)</sup>	Bronx-White-stone Bridge <sup>(b)</sup>	Tri-borough Bridge <sup>(b)</sup>	Queens Midtown Tunnel <sup>(b)</sup>	Brooklyn Battery Tunnel	Verrazano-Narrows Bridge	Henry Hudson Bridge	Marine-Parkway-Gil Hodges Bridge	Cross Bay Bridge	Total
Annual Traffic (000s)										
2005	41,199	41,198	62,841	28,751	17,426	69,980	24,136	7,673	7,182	300,385
2006 <sup>(a)</sup>	40,375	42,306	66,135	29,521	17,367	70,114	24,155	7,677	7,414	305,064
2007	40,827	42,780	66,466	29,867	17,367	71,040	24,568	7,706	7,660	308,280
2008	41,285	43,259	66,798	30,216	17,367	71,978	24,780	7,735	7,787	311,203
2009	41,747	43,743	67,132	30,569	17,367	72,928	24,993	7,765	7,916	314,160
2010	42,214	44,233	67,468	30,927	17,367	73,890	25,208	7,794	8,048	317,149
2011	42,451	44,481	67,805	31,289	17,367	74,378	25,424	7,824	8,181	319,200
2012	42,689	44,730	68,144	31,655	17,367	74,869	25,643	7,854	8,317	321,267
2013	42,928	44,981	68,485	32,025	17,367	75,363	25,864	7,883	8,455	323,350
2014	43,168	45,233	68,827	32,400	17,367	75,860	26,086	7,913	8,595	325,450
2015	43,410	45,486	69,171	32,779	17,367	76,361	26,310	7,943	8,738	327,566
2016	43,653	45,741	69,517	33,163	17,367	76,865	26,537	7,974	8,883	329,698
Traffic Growth (Percent)										
2005-2006	-2.00%	2.69%	5.24%	2.68%	-0.34%	0.19%	0.08%	0.05%	3.23%	1.56%
2006-2007	1.12	1.12	0.50	1.17	0.00	1.32	1.71	0.38	3.31	1.05
2007-2008	1.12	1.12	0.50	1.17	0.00	1.32	1.71	0.38	1.66	0.98
2008-2009	1.12	1.12	0.50	1.17	0.00	1.32	0.86	0.38	1.66	0.79
2009-2010	1.12	1.12	0.50	1.17	0.00	1.32	0.86	0.38	1.66	0.95
2010-2011	0.56	0.56	0.50	1.17	0.00	0.66	0.86	0.38	1.66	0.65
2011-2012	0.56	0.56	0.50	1.17	0.00	0.66	0.86	0.38	1.66	0.65
2012-2013	0.56	0.56	0.50	1.17	0.00	0.66	0.86	0.38	1.66	0.65
2013-2014	0.56	0.56	0.50	1.17	0.00	0.66	0.86	0.38	1.66	0.65
2014-2015	0.56	0.56	0.50	1.17	0.00	0.66	0.86	0.38	1.66	0.65
2015-2016	0.56	0.56	0.50	1.17	0.00	0.66	0.86	0.38	1.66	0.65
Average Toll										
2005 <sup>(c)</sup>	\$5.10	\$4.58	\$4.46	\$4.23	\$4.03	\$3.82	\$1.82	\$1.46	\$1.53	\$4.01
2006 <sup>(d)</sup>	5.19	4.69	4.56	4.33	4.13	3.92	1.87	1.50	1.57	4.10
Toll Revenues (000s)										
2005	\$210,242	\$188,808	\$280,516	\$121,666	\$70,294	\$267,276	\$43,920	\$11,234	\$10,988	\$1,204,944
2006 <sup>(d)</sup>	209,562	198,428	301,514	127,828	71,732	274,575	45,045	11,512	11,630	1,251,826
2007 <sup>(d)</sup>	211,909	200,650	303,021	129,324	71,723	278,199	45,816	11,556	12,015	1,264,213
2008 <sup>(d)</sup>	214,282	202,898	304,537	130,837	71,714	281,872	46,210	11,600	12,214	1,276,163
2009 <sup>(d)</sup>	216,682	205,170	306,059	132,368	71,705	285,592	46,607	11,644	12,417	1,288,245
2010 <sup>(d)</sup>	219,109	207,468	307,590	133,917	71,696	289,362	47,008	11,688	12,623	1,300,461
2011 <sup>(d)</sup>	220,336	208,630	309,127	135,483	71,687	291,272	47,412	11,732	12,833	1,308,513
2012 <sup>(d)</sup>	221,570	209,798	310,673	137,069	71,678	293,194	47,820	11,777	13,046	1,316,625
2013 <sup>(d)</sup>	222,811	210,973	312,226	138,672	71,669	295,129	48,231	11,822	13,262	1,324,796
2014 <sup>(d)</sup>	224,058	212,154	313,788	140,295	71,660	297,077	48,646	11,867	13,483	1,333,028
2015 <sup>(d)</sup>	225,313	213,343	315,357	141,936	71,651	299,038	49,064	11,912	13,706	1,341,320
2016 <sup>(d)</sup>	226,575	214,537	316,933	143,597	71,642	301,012	49,486	11,957	13,934	1,349,674

(a) From Table 11.

(b) Growth rates reduced by 50 % because volume is at or near capacity level.

(c) Reflects toll increase on March 13, 2005.

(d) Adjusted for future increases in *E-ZPass* usage.

**Table 20. Traffic and Toll Revenue Forecast, Periodic Toll Increases**

Year	Throgs Neck Bridge <sup>(b)</sup>	Bronx-White-stone Bridge <sup>(b)</sup>	Tri-borough Bridge <sup>(b)</sup>	Queens Midtown Tunnel <sup>(b)</sup>	Brooklyn Battery Tunnel	Verrazano-Narrows Bridge	Henry Hudson Bridge	Marine-Parkway-Gil Hodges Bridge	Cross Bay Bridge	Total
Traffic Change (from Table 17) due to Toll Elasticity										
2007-2008	-0.49%	-0.50%	-1.00%	-0.93%	-1.69%	-0.61%	-1.48%	-0.50%	-0.66%	
2009-2010	-0.48	-0.47	-0.92	-0.86	-1.64	-0.58	-1.41	-0.46	-0.63	
2011-2012	-0.56	-0.56	-1.11	-1.09	-1.93	-0.69	-1.34	-0.44	-0.60	
2013-2014	-0.55	-0.53	-1.06	-1.01	-1.86	-0.65	-1.96	-0.65	-0.87	
2015-2016	-0.51	-0.52	-1.00	-0.94	-1.77	-0.62	-1.83	-0.62	-0.82	
Annual Traffic (000s)										
2005 <sup>(a)</sup>	41,199	41,198	62,841	28,751	17,426	69,980	24,136	7,673	7,182	300,385
2006	40,375	42,306	66,135	29,521	17,367	70,114	24,155	7,677	7,414	305,064
2007	40,629	42,568	65,802	29,589	17,074	70,610	24,205	7,668	7,609	305,753
2008	41,084	43,044	66,131	29,935	17,074	71,542	24,619	7,697	7,736	308,861
2009	41,346	43,320	65,847	30,026	16,793	72,068	24,688	7,690	7,815	309,594
2010	41,809	43,805	66,177	30,378	16,793	73,019	24,900	7,719	7,945	312,545
2011	42,041	44,047	65,771	30,399	16,469	73,473	24,777	7,714	8,028	312,720
2012	42,512	44,540	66,100	30,755	16,469	73,958	24,990	7,744	8,161	315,229
2013	42,515	44,550	65,723	30,802	16,162	73,960	24,712	7,723	8,225	314,371
2014	42,753	44,800	66,052	31,162	16,162	74,448	24,925	7,752	8,361	316,414
2015	42,772	44,816	65,719	31,229	15,876	74,474	24,678	7,733	8,430	315,727
2016	43,011	45,067	66,047	31,595	15,876	74,965	24,890	7,763	8,570	317,785
Average Toll										
2005 <sup>(c)</sup>	\$5.10	\$4.58	\$4.46	\$4.23	\$4.03	\$3.82	\$1.82	\$1.46	\$1.53	\$4.01
2006	5.19	4.69	4.56	4.33	4.13	3.92	1.87	1.50	1.57	4.10
2007-2008	5.44	4.91	4.78	4.54	4.33	4.10	1.96	1.57	1.64	4.30
2009-2010	5.68	5.13	4.99	4.74	4.52	4.29	2.06	1.65	1.72	4.49
2011-2012	5.98	5.41	5.26	5.01	4.77	4.53	2.15	1.72	1.79	4.73
2013-2014	6.29	5.68	5.53	5.27	5.02	4.76	2.30	1.83	1.91	4.98
2015-2016	6.60	5.96	5.79	5.53	5.27	4.99	2.44	1.94	2.02	5.23
Toll Revenue (000s)										
2005	\$210,242	\$188,808	\$280,516	\$121,666	\$70,294	\$267,276	\$43,920	\$11,234	\$10,988	\$1,204,944
2006 <sup>(d)</sup>	209,588	198,453	301,552	127,844	71,741	274,609	45,051	11,513	11,632	1,251,983
2007	220,831	209,079	314,420	134,324	73,848	289,769	47,444	12,065	12,510	1,314,289
2008	223,304	211,394	315,992	135,895	73,848	293,594	48,255	12,111	12,717	1,327,111
2009	234,833	222,313	328,631	142,385	75,971	309,278	50,741	12,658	13,436	1,390,245
2010	237,463	224,802	330,274	144,050	75,971	313,360	51,178	12,706	13,659	1,403,464
2011	251,525	238,105	345,741	152,319	78,531	332,513	53,285	13,256	14,408	1,479,684
2012	254,343	240,772	347,469	154,101	78,531	334,708	53,744	13,307	14,647	1,491,621
2013	267,248	253,029	363,194	162,422	81,083	352,034	56,738	14,125	15,702	1,565,574
2014	268,744	254,446	365,010	164,322	81,083	354,358	57,226	14,178	15,963	1,575,330
2015	282,134	267,105	380,643	172,766	83,592	371,919	60,248	15,011	17,060	1,650,479
2016	283,714	268,601	382,547	174,788	83,592	374,374	60,766	15,068	17,343	1,660,792

(a) From Table 11.

(b) Growth rates reduced by 50 percent because volume is at or near capacity level.

(c) Reflects toll increase on March 13, 2005.

(d) Adjusted for future increases in *E-ZPass* usage.



## Effects of Second Avenue Subway Construction in Forecast Years

The foregoing tables forecasting traffic and toll revenues do not incorporate the anticipated effects of the construction of the Second Avenue Subway. While no official construction commencement date has been announced, when commenced, activity associated with such construction will result in changes to traffic patterns, possibly resulting in a shift of traffic volumes to other TBTA facilities, as well as the untolled East River Bridges or a diversion to mass transit. Such changes in traffic patterns could have an adverse effect on the forecasts set forth in the foregoing tables as described in the following paragraphs.

Various stages of the project will result in visible construction activity on one or more three to five block segments of Second Avenue at any given time. In addition, tunnel construction, either through the use of a tunnel boring machine or cut-and-cover, will affect vehicular activity not only on Second Avenue, but also on adjacent north-south roadways.

The current MTA capital plan anticipates that the first phase of the project will begin at 96<sup>th</sup> Street and end at 63<sup>rd</sup> Street. While construction is anticipated to start in the vicinity of 96<sup>th</sup> Street, URS does not anticipate any changes to current traffic volumes for TBTA's facilities until approximately one year thereafter when construction begins on the new subway stations and subway tunnels, thereby necessitating the rerouting of some traffic, as well as a change of street rules (traffic movements, parking restrictions and enforcement). Accordingly, URS has made an order-of-magnitude estimate of potential impacts on TBTA traffic on the Triborough Bridge and Queens Midtown tunnel

For the Triborough Bridge, 27.6 percent of the traffic exits onto Second Avenue at 125<sup>th</sup> Street, 56.0 percent exits onto the FDR Drive, and 17.4 percent exits onto the Harlem River Drive via the 125<sup>th</sup> Street/Second Avenue intersection. Construction may result in a shift of traffic to the FDR Drive, if capacity were to be available during the peak. If capacity is not available, the Triborough Bridge may lose from 3 to 5 percent of total traffic (6 to 9 percent of traffic on the Manhattan span) for the period when construction is in the vicinity of the bridge.

During the first stage of the project, the relocation of utility lines beneath Second Avenue in the vicinity of the Queens Midtown Tunnel would affect traffic patterns. This will also have an impact on the access route to the Queensboro Bridge. As mentioned previously, a 33 percent decrease in access route capacity may be anticipated and could result in a decrease in total traffic of approximately 6 to 8 percent during the period when construction is in the vicinity of the tunnel.

In addition to the potential reduction in traffic noted, it is possible that construction activities limiting access to the toll-free East River crossings could result in traffic diversions to the TBTA facilities; however, it is not possible to estimate this impact until the construction plan is finalized.



## Operating Expenses

The projection of operating expenses is shown in Table 21. Total operating expenses, consisting of personnel and OTPS (other than personnel services), are estimated to increase from \$393.4 million in 2006 to \$508.1 million in 2016. Personnel expenses consist of wages, salaries, overtime and fringe benefits. OTPS includes items such as maintenance, supplies, utilities and other expenses.

The operating expense projections for the year 2006 through 2009 were based on TBTA estimates. For the remainder of the forecast period (2010-2016), URS estimated operating expenses related to labor based on the Consumer Price Index (CPI) (All Urban Consumers–New York PMSA and for non-labor items based on the CPI for “All Urban Consumers–U.S. City Average”) provided by TBTA. For personnel expenses estimated increases were 2.7 percent per year; OTPS estimated increases were 2.5 percent per year.

TBTA will continue to replace the outstanding *E-ZPass* tags that are approaching the end of their useful life through 2006. The remaining costs for this year are estimated at \$5.8 million. These costs have been included in the OTPS expenses for 2006.

Bridge painting expenses are anticipated to increase to \$48.4 million in 2007 for additional requirements at the Henry Hudson, Verrazano-Narrows and Triborough Bridges, which will continue through 2008.

URS does not project any variation in operating expenses resulting from the reduced traffic levels brought about by periodic toll increases.

**Table 21. Projected Operating Expenses<sup>(c)</sup>**  
(000s)

Year	Personnel <sup>(a)</sup>	OTPS <sup>(b)</sup>	Total <sup>(c)</sup>
2006 <sup>(d)</sup>	\$183,177	\$209,190	\$392,367
2007 <sup>(d)</sup>	192,585	208,260	400,845
2008 <sup>(d)</sup>	201,945	207,331	409,276
2009 <sup>(d)</sup>	212,128	212,574	424,702
2010 <sup>(e)</sup>	217,919	217,803	435,722
2011 <sup>(e)</sup>	223,868	223,161	447,030
2012 <sup>(e)</sup>	229,980	228,651	458,631
2013 <sup>(e)</sup>	236,258	234,276	470,534
2014 <sup>(e)</sup>	242,708	240,039	482,747
2015 <sup>(e)</sup>	249,334	245,944	495,278
2016 <sup>(e)</sup>	256,141	251,994	508,135

- (a) Includes salaries, overtime, and fringe benefits, net of capital reimbursement.
- (b) OTPS is Other Than Personnel Services and includes the following categories: maintenance and supplies, outside services, insurance, power, leases, rentals and other expenses.
- (c) Totals may not add due to rounding
- (d) From TBTA estimates.
- (e) Increases in Personnel expenses based on NY Region Average CPI, All Consumers; OTPS expenses based on All U.S. Cities Average CPI, All Consumers.

### Net Revenues from Toll Operations

Finally, the projected operating expenses were deducted from the respective toll revenue forecasts to produce the two sets of estimated net revenues, one at constant tolls and the other with periodic toll increases, as shown in Table 22. For 2006, net toll revenue under either scenario is estimated at \$859.6 million. In year 2016, net toll revenue at constant tolls is estimated to be \$841.8 million and, with periodic toll increases, net toll revenue is estimated to be \$1,152.7 million.

**Table 22. Net Toll Revenue Forecast**  
(000s)

Year	Gross Toll Revenues		Operating Expenses	Net Toll Revenues	
	Constant Tolls	Periodic Toll Increases		Constant Tolls	Periodic Toll Increases
2006	\$1,251,983	\$1,251,983	\$392,367	\$859,616	\$ 859,616
2007	1,264,380	1,314,289	400,845	863,535	913,444
2008	1,276,340	1,327,111	409,276	867,064	917,835
2009	1,288,433	1,390,245	424,702	863,731	965,543
2010	1,300,659	1,403,464	435,722	864,937	967,741
2011	1,308,722	1,479,684	447,030	861,692	1,032,654
2012	1,316,843	1,491,621	458,631	858,212	1,032,990
2013	1,325,025	1,565,574	470,534	854,491	1,095,040
2014	1,333,266	1,575,330	482,747	850,519	1,092,583
2015	1,341,569	1,650,479	495,278	846,290	1,155,201
2016	1,349,932	1,660,792	508,135	841,797	1,152,657

It is our opinion that the revenue and expense projections are reasonable and that they have been prepared in accordance with accepted practice for investment-grade studies. However, given the uncertainties within the current international and economic climate, it is important to note the following limitations:

1. This report presents the results of our consideration of the information available to us as of the date hereof and the application of our experience and professional judgment to that information. It is not a guarantee of any future events or trends.
2. The traffic, revenue and expense forecasts will be subject to future economic and social conditions, demographic developments and metropolitan area transportation construction activities that cannot be predicted with certainty.
3. The projections contained in this report, while presented with numerical specificity, are based on a number of estimates and assumptions which, though considered reasonable to us, are inherently subject to significant economic and competitive uncertainties and contingencies, many of which will be beyond the control of TBTA and cannot be predicted with certainty. In many instances, a broad range of alternative assumptions could be considered reasonable. Changes in the assumptions used could result in material differences in projected outcomes.
4. URS' net toll revenue projections only represent its best judgment and URS does not warrant or represent that actual net toll revenues will not vary from its projections, estimates and forecasts.
5. If, for any reason, any of these conditions should change due to changes in the economy or competitive environment, or other factors, URS' opinions or estimates may be affected.



Many statements contained in this report that are not historical facts are forward-looking statements, which are based on TBTA's and the Independent Engineers' beliefs, as well as assumptions made by, and information currently available to, the management and staff of TBTA and the Independent Engineers. Because the statements are based on expectations about future events and economic performance and are not statements of fact, actual results may differ materially from those projected. The words "anticipate," "assume," "estimate," "expect," "objective," "projection," "plan," "forecast," "goal," "budget" or similar words are intended to identify forward-looking statements. The words or phrases "to date," "now," "currently," and the like are intended to mean as of the date of this report.

## REVIEW OF PHYSICAL CONDITION

The facilities under TBTA’s jurisdiction include two tunnels and seven bridges listed in Table 23, together with Randall’s Island Facilities and a parking garage in Manhattan near the Brooklyn-Battery Tunnel. Some of these crossings have been in service since the 1930s, i.e., the Triborough, Henry Hudson, Marine Parkway-Gil Hodges Memorial and Bronx-Whitestone bridges. The Queens Midtown Tunnel opened to traffic in 1940, and the Brooklyn-Battery Tunnel in 1950. Two bridges opened to traffic in the 1960s: the Throgs Neck in 1961 and the Verrazano-Narrows in 1964 (lower level in 1969). The present Cross Bay Bridge opened to traffic in 1970. The aging of the TBTA facilities will influence the overall upkeep and capital improvements that will be necessary to maintain the infrastructure over the forecast period and beyond. Table 24 lists the Authority’s capital commitments for each facility from 1992 through 2004, and the current commitments for the period 2005 through 2009.

**Table 23. Opening Dates of TBTA Facilities**

Facility	Open to Traffic	Years in Use
Triborough Bridge	1936	70
Bronx-Whitestone Bridge	1939	67
Throgs Neck Bridge	1961	45
Henry Hudson Bridge	1936 <sup>(a)</sup>	70
Queens Midtown Tunnel	1940	66
Brooklyn-Battery Tunnel	1950	56
Verrazano-Narrows Bridge	1964 <sup>(b)</sup>	42
Cross Bay Bridge	1970 <sup>(c)</sup>	36
Marine Parkway-Gil Hodges Memorial Bridge	1937	69

- Notes: (a) Upper deck was added and opened in 1938.  
 (b) Lower level opened in 1969.  
 (c) The present structure replaced the previous structure that had been in service since 1939.

**Table 24. Capital Commitments by Facility, 1992 to 2009**  
(Millions of dollars)

Facility	Total by Facility 1992 through 2004 <sup>(a)</sup>	Total by Facility 2005 through 2009 <sup>(a)</sup>
Agency Wide <sup>(b)</sup>	\$252.3	\$91.2
Brooklyn-Battery Tunnel	270.3	39.4
Bronx-Whitestone Bridge	330.7	168.5
Cross Bay Bridge	14.2	65.8
Henry Hudson Bridge	85.0	83.2
Marine Parkway Bridge	123.9	28.1
Queens Midtown Tunnel	231.0	15.5
Triborough Bridge	598.3	394.6
Throgs Neck Bridge	145.0	124.9
Verrazano-Narrows Bridge	126.6	156.8
	\$ 2,177.5	\$ 1,167.9

Notes: (a) May not add due to rounding.  
(b) Agency-wide refers to projects that have been, or will be, carried out at two or more facilities.

Periodic contact with TBTA personnel is maintained by URS to monitor and review material, as it becomes available, pertaining to the physical condition of their seven bridges and two tunnels. This review material includes pertinent sections and updates of the following:

- Biennial Bridge Inspection Reports,
- Scheduled Tunnel Inspection Reports,
- Interim Inspection Reports,
- TBTA’s current Capital Program,
- Current Quality Assurance Plan, and
- TBTA’s Routine and Major Maintenance Program.

The review by URS of the pertinent material consists of the following subtasks:

- Comparison of Conclusions and Recommendations sections of the current inspection reports with the previous inspection reports to note significant changes in observed deterioration, if any;
- Review of the current Capital Program to verify that the repairs recommended by the latest inspection reports are being addressed; and
- Review of TBTA’s Routine Maintenance Program to verify that the maintenance-related recommendations of the current inspection reports are being addressed.



## Review of Inspection Reports

TBTA's seven bridges and two tunnel facilities undergo periodic, comprehensive condition inspections. Historically, the tunnel inspection frequency has been every ten years; however, TBTA, in accordance with their newly revised Engineering and Construction Procedure 318 (ECP-318), has implemented a new schedule for tunnel inspections, whereas they will be undergoing formal inspection on a regular basis every two years, with a comprehensive inspection every ten years.

The general condition inspection of the Queens Midtown Tunnel is complete. A more intensive inspection is planned this year. The Brooklyn-Battery Tunnel underwent an inspection in 2001. The next inspection of the Brooklyn-Battery Tunnel is scheduled for 2007.

The bridges are inspected every two years. The TBTA's bridges were last inspected and their physical condition appraised in 2004/2005 by various consultants, under the New York State Biennial Bridge Inspection Program. New cycles of NYSDOT Biennial Bridge Inspection are currently underway. In addition, separate underwater and substructure inspections were performed in accordance with the five-year cycles of NYSDOT to obtain riverbed contours and to assess potential scour conditions at the substructure.

These ongoing inspections, performed by the inspection consultants, consisted of visual examination, sounding and chipping concrete, scraping and cleaning steel, and taking appropriate measurements to determine the physical conditions of the bridges and tunnels.

The inspection consultants also prioritized the necessary repairs and provided the TBTA with cost estimates. The results of these facility inspections and appraisals form the basis for much of the rehabilitation and improvement projects to be funded under the 2005-2009 and future TBTA Capital Programs. Results of inspections requiring priority action are addressed on an as needed basis as part of the TBTA maintenance program.

The consulting engineering firms who performed the 2004 and 2005 biennial inspections and those who performed the 2001 and 2005 tunnel inspections for each facility were/are:

<i>Facility</i>	<i>Consulting Firm</i>
Triborough Bridge	Hardesty & Hanover (2004)
Throgs Neck Bridge	Parsons Brinckerhoff (2005)
Bronx-Whitestone Bridge	Charles H. Sells (2005)
Henry Hudson Bridge	Lichtenstein Engineering Associates (2005)
Queens Midtown Tunnel	Parsons Brinckerhoff (2004-2005); facility approach bridges: Lichtenstein Engineering Assoc. (2005)
Brooklyn-Battery Tunnel	Parsons Brinckerhoff (2001)
Verrazano-Narrows Bridge	Charles H. Sells, Inc, (2004)
Marine Parkway/ Gil Hodges Mem. Br.	Hardesty and Hanover (2005)
Cross Bay Bridge	Hardesty and Hanover (2005)



These firms are well known in the field of structural inspection and appraisal. Copies of pertinent sections of the final inspection reports for the various facilities were requested and made available by TBTA. Bridges that are part of the even year inspection cycle listed above will be undergoing inspections this summer, but the results of these inspections are not available at this time. These results of these inspections, also done by experts in the field, will generally be available at the end of the year.

Funds programmed for TBTA's 2005-2009 Capital Program total approximately \$1.2 billion dollars. The plan breaks this amount into specific projects by facility as well as agency-wide projects. Comparisons between the Capital Program projects and total repair item lists for each facility, as prepared by inspection consultants, confirm that the Capital Program gives high priority to key rehabilitation projects. Conclusions, recommendations and cost estimates for each facility can be found in the latest biennial bridge and tunnel inspection reports. By prioritizing necessary facility rehabilitation projects, TBTA addresses all high priority recommendations in the current Capital Program or under maintenance programs that have not been addressed as part of the previous Capital Program.

Current major rehabilitation projects (and designs) addressing the recommendations of the latest inspection consultants' reports include:

*Triborough Bridge* - The design phase of the contract for the deck replacement for the Bronx toll plaza and ramps is underway with construction anticipated for 2010, and Manhattan toll plaza construction for 2015. Design of the Ward's Island and Randall's Island viaducts is complete, construction began in August 2005, and completion is anticipated for September 2008. This project will also include priority maintenance steel repair of components noted in the most recent inspection. The Ward's Island Approach Deck Replacement will include widening by one lane in each direction to help in staging work. All work will be done off peak to avoid traffic impacts. Maintenance painting of Ward's Island Viaduct and the superstructure of the suspended spans is ongoing. The mechanical work associated with the Harlem River and Manhattan lift span and deck replacement is complete. Projects completed within recent years include: the replacement of the suspender ropes at the East River suspended span; main cable rewinding and anchorage rehabilitation; bridge deck rehabilitation at the Queens approach; and numerous repair projects such as repair of the bridge deck joint drains, cracked deck, piers, superstructure, substructure, and suspended span deck replacement.

*Bronx-Whitestone Bridge* - A major program to paint the main cables, suspender ropes and towers is scheduled to occur in 2007 to 2009. Oiling of the cable strands in the anchorages is designed and will begin construction in 2007/2008 to avoid conflicts with ongoing construction projects at this facility. Portions of the recommendations from studies that investigated deck replacement with a lightweight deck and improving the aerodynamic and seismic performance of the bridge are being implemented through TBTA's capital projects. The following describes these projects and their status. The construction of the lightweight windfaring to replace the stiffening truss on the suspended span was completed in 2004. The design of a lightweight orthotropic deck, required to replace the roadway deck, is complete and actual installation is approximately 50 percent complete and scheduled to finish by August 2006. The feasibility study for complete replacement of the main cables, should that become necessary in the future, is

complete, and it has been concluded that replacement is feasible if it becomes necessary. There is no need to replace the cable in the near future, thus monitoring and maintenance of the main cables is ongoing. Repairs of flagged conditions noted in the most recent biennial inspection reports are substantially completed, and any new flags will be addressed in ongoing maintenance and capital programs. The conceptual design of the replacement of the Bronx/Queens approach spans and all on-grade approaches were completed with construction anticipated to be phased. The design of the Bronx Approach span began in 2005 with construction anticipated in early 2008. The Queens replacement design will begin in 2006 with construction in the next capital program. Projects completed within recent years include: painting and replacement of the collars of the suspender ropes, construction and testing of the prototype deck replacement for the suspended span, addition of three new tollbooths, the installation of acoustic sensors for cable monitoring at the main cables, and the rehabilitation of the Bronx/Queens approach ramps.

*Throgs Neck Bridge* - The orthotropic deck prototype construction and the testing associated with it is complete. The prototype was monitored, and full-scale design will begin in 2007, with construction to follow by 2008-2013. The design of the rehabilitation of the main cable, including lubrication and rewinding in the suspended span and suspender rope testing is complete. Construction will be let in 2006/2007, as part of a major rehabilitation contract to also include painting and steel repair of the suspended span superstructure, towers, main cables and suspender ropes and anchorage. The design of the scour backfilling at piers 20, 42, 47, 49, 52, 55 and 56 and protection of piers 19, 20, and 46 to 57 is substantially complete, with total construction completion scheduled by May of 2006, or sooner, weather permitting. The construction project including structural steel rehabilitation, drainage system improvements and roadway barrier painting is substantially complete. The monitoring of the prototype light pole and luminaire replacement project is ongoing, with full-scale lighting replacement on the structure scheduled to occur from 2008 to 2010. Design of deck rehabilitation and replacement on the Queens approach is scheduled for 2005 to 2007 with construction in 2007 or 2008. Design of rehabilitation of the fenders at the towers and anchorages will begin in April of 2006 with construction anticipated for January of 2009. Replacement of the slab on grade in the toll plazas is scheduled for award in June 2006. Installation of variable speed limit signs is scheduled for 2006. Projects completed within recent years include: the new bridge electrical system upgrade, including the installation of new electrical switchgear at the four electrical substations, reconstruction of the Bronx approach slab north of the tollbooths, rehabilitation of the Bronx approach, and deck rehabilitation at the suspended span.

*Henry Hudson Bridge* - The conceptual study for the southbound lower level toll plaza expansion and the south approach replacement are complete and design is anticipated to start in the 2010-2014 Capital Program. The design of the replacement of the upper level deck in the vicinity of the toll plaza is ongoing with construction anticipated in 2008. Design of the lower level deck replacement is ongoing with construction to be awarded in May 2006. Spall repairs in the decks are continuing until re-decking can be done. Comprehensive maintenance painting and steel repairs are complete for the entire bridge structure including the main span and approaches. The north approach replacement and south approach rehabilitation will be awarded under the next Capital Program. The design of the removal of the sidewalk and the curb stringers, and the widening of the bridge are ongoing with construction in 2008. The cross drainage of the approaches between Dyckman Street and the main span is undergoing rehabilitation/replacement design with construction in 2008. Major completed maintenance projects have included spall

repairs at the towers, resealing the upper level deck, and light pole rehabilitation. A major maintenance project that is ongoing is the jacking and repairing of bearings. Installation of safety ladders and platforms to the Dyckman Street electrical rooms is ongoing. On the bridge, steel stringer pedestal defects identified in the biennial inspections have been repaired. Projects completed within recent years include: replacement of deck joints at Staff Street and spall repairs on abutments, and rock bolting and scaling of the slopes adjacent to the approaches (netting design is ongoing).

*Queens Midtown Tunnel* - A contract for a study and the development of a master plan for a tunnel ventilation system and electrical controls project has been completed. As a result, a construction contract to replace the exhaust fans and to perform minor repair to the supply fans is ongoing and scheduled for completion in 2008. Design of electrical rehabilitation on the vent building is planned to occur later in the capital program, with construction in the next capital program. The design of the rehabilitation of two overpasses in Manhattan Approach area is complete, with construction planned in this capital program. This project will rehabilitate the decks from below and repair the encasement on the beams for both bridges, and replace the crash wall of one overpass including lighting. Replacement of the facility engineer's building with connection to the service building, and exterior rehabilitation of the service building is under design. Major maintenance projects include completion of the design of a new air conditioning system at the Queens Emergency building with construction to be awarded this year. Reconfiguration of the traffic island in the Manhattan entrance plaza to provide better traffic flow is also complete. Paving in portions of the tunnel and around tollbooths is complete and will continue periodically as necessary. Projects completed within recent years include the following: the rehabilitation of the pipe gallery connection between the service building garage, the repair and replacement of sidewalks at the ventilation and service buildings, replacement of drainage pumps inside the ventilation building and at the plazas, rehabilitation of tunnel ceiling and walls (tunnel finish and leak repairs and upgrading of the fire standpipe system), and various structural repairs in the ventilation building.

*Brooklyn-Battery Tunnel* - Construction of a second story addition with recladding, window replacement and masonry and roof repairs to the existing service building is 80 percent complete and will be completed by July 2006. Construction of tunnel roadway and drainage system rehabilitation, tunnel leakage repairs and wall tile replacement, and fire standpipe and waterline valve replacement is ongoing and is 90 percent complete and will be completed in November 2006. All work will be done off peak to avoid traffic impacts. In the ventilation structures the construction of the elevator upgrades, egress improvements and the replacement of the facade in the Governor's Island building is completed. The fresh air duct repairs are completed as well. The repair investigation and design of the Brooklyn plaza pipe chase is finished and construction will be awarded in August 2006. Installation of a new ethanol fuel tank is ongoing. The design of structural and architectural repairs for vent structures is almost complete and construction will start in 2006. Modernization and upgrade of the control room design is almost complete and construction will start in 2006. Design of new electrical generators design is almost complete and construction will start in 2007. On Governor's Island, a new pump system to get water runoff into the sanitary system will be designed with construction planned in 2006.

Projects completed within recent years include: replacement of the exhaust fans in the ventilation, pump replacement, traffic control and signal system replacement, repaving of the Brooklyn plaza and rehabilitation of the Manhattan plaza.

*Verrazano-Narrows Bridge* - Rehabilitation and upgrade of the electrical system in the suspended spans is complete. Design of the rehabilitation of the Staten Island and Brooklyn Approach viaducts (lower level) and the Lily Pond Avenue Bridge is ongoing with construction planned to begin in 2006. Detailed scoping analysis to replace the upper level suspended span deck has begun, with utility relocation construction planned for the end of 2008. Re-decking will be included in the next Capital Program. Rehabilitation of the service building roof began in 2005 and is ongoing. Maintenance painting of the Brooklyn approaches is 95 percent complete and tower painting including drainage rehabilitation of the lower level and top lower strut of the Brooklyn approaches will be completed by 2007. Rehabilitation of the traveler is to begin this year. The utility design is to be completed by 2008 and should be let by 2008 for 2009 construction. In 2010, the upper level is scheduled for re-decking as part of the next Capital Program. The design of the Salt Storage Facility in Staten Island is ongoing. The design of the rehabilitation of the electrical substation is ongoing. As part of the major maintenance program, miscellaneous concrete repairs at the service building and steel repairs near the towers of the bridge have been completed. Projects completed within recent years include: painting of the entire suspended spans except the towers and the side and center parapets of the upper roadways, Brooklyn approach pavement rehabilitation, feasibility study to investigate widening of the Belt Parkway ramps, a feasibility study for the rehabilitation of the tollbooths, plaza, pavement, utility and lighting systems and signage and traffic interchange in the vicinity of the toll plaza, dehumidifying of the Brooklyn and Staten Island anchorages and repaving of the Staten Island approach and toll plaza, and fire standpipe system rehabilitation. Rehabilitation and sealing of the anchorages is complete.

*Marine Parkway-Gil Hodges Memorial Bridge* - A contract to replace the elevators in the towers is complete. The design-build contract for a pre-engineered service building is underway. The refurbishing of the tollbooths is complete. Priority steel repairs have been completed and repairs on secondary members and at lower priority locations are in design and the construction will be awarded in 2006 through 2009. Bike path construction is ongoing and completion is scheduled for 2006. Projects completed within recent years include: major maintenance painting of the superstructure, east and west side structural steel repairs, deck replacement and bridge widening, boiler replacement, navigation lights and signs for mariners, replacement of on-grade slab prototype with pre-cast slab in the toll plaza, and main motor shaft west bearing replacement in the towers.

*Cross Bay Bridge* - The construction of structural and electrical rehabilitation of the concrete slab on grade at Ramp 'D' (southbound ramp extending from the main bridge lanes), and the replacement of the main high voltage feeders from the south abutment to the main service building is complete. The construction of the rehabilitation of the drainage system at the promenade at the Rockaway approach and the seawall is complete. The refurbishing of the tollbooths is complete. A contract to design deck superstructure and substructure rehabilitation including piles and pile caps is ongoing with construction to be awarded in 2006 through 2009. A new salt dome is completed at the facility. Projects completed within recent years include:

rehabilitation of the air conditioning system in the service building, boiler replacement, tollbooth painting, door replacement at Pier 8, installation of continuity plates in the median barrier, unit heater replacement inside the garage, and rumble strip repairs.

*Agency Wide* - Since the September 11 attack on the WTC, TBTA has engaged consultants to assess security risks of their facilities. As a result of this risk assessments, increased security improvements including various monitoring, surveillance and hardening projects have been implemented or will enter construction shortly at TBTA facilities. TBTA has also created a security department and incorporates mitigation measures into their operations, capital and maintenance programs.

This past year, TBTA defended a lawsuit initiated by the trucking industry, after TBTA tried to restrict illegal overweight trucks from passing over the Throgs Neck Bridge. An agreement was reached that allowed six-axle dump trucks to increase their allowable load from 80,000 lbs. to 105,000 lbs. According to the TBTA, this increase in allowable load was demonstrated by computations performed by their consultants to be within safe limits for the structure. Bridges generally can accommodate overweight vehicles safely, but over time, these vehicles can contribute to increased wear on the facility, requiring increased maintenance repairs. In order to mitigate this, future rehabilitation designs on all bridges will allow for heavier vehicles, which are currently being determined. Plans for these heavier design vehicles are being coordinated with other regional authorities.

The design for expansion of the Variable Message Sign System has been re-evaluated, and will be addressed on a facility-by-facility basis. Variable Speed Limit Signs prototypes have been tested, and installation is proceeding based upon the results of the tests. Construction of toll canopy Rotating Prism Signs have started at the Queens Midtown Tunnel and the Brooklyn-Battery Tunnel.

Intelligent Transportation System projects scheduled for the 2005-2009 Capital Program include:

- The installation of weather recording systems at the Cross Bay, Henry Hudson and Marine Parkway-Gil Hodges Memorial bridges which has been completed;
- The design for the upgrading and installation of a Closed Circuit Television (CCTV) network for effective monitoring and managing of traffic and incidents as well as upgrading of the communications network with fiber has been completed and a contract for the installation is ongoing;
- Upgrading of the operations centers at all TBTA's facilities is underway as well as internal integration with the Randall's Island Operations Control Center (RIOCC). The RIOCC has been upgraded and linked externally to regional transportation operations centers such as TRANSCOM, for improving transportation services both at TBTA facilities and the region as a whole and is operating at five facilities now, and will be operating at most by the end of 2006; and
- Installation and expansion of TRANSMIT (an *E-ZPass*-based system) and other incident detection systems, traveler information and traffic management systems at TBTA's



facilities, and upgrading of the toll registry system which will improve the efficiency and enhance the integrity and reliability of the toll revenue collection. The design is complete; construction to be let in 2006.

Projects completed within recent years include: the installation of the Computer Aided Drafting and Design system, traffic, safety improvements, tank testing and replacements, installation of weather recording system and inspection platform, Randall's Island Garage roof replacement, *E-ZPass* initial installation at 119 toll booths system wide, facility improvements to comply with Americans with Disabilities Act requirements, the installation of main electrical feeders to increase capacity at Randall's Island, and the installation of the Heating, Ventilation and Air Conditioning system at the Robert Moses Building. Restoration of the Robert Moses Building at Randall's Island, and the installation of CCTV to allow observation of traffic and activity at all bridges and tunnels were also completed.

A 20-year capital needs assessment is conducted every five years by TBTA personnel. The assessment is compiled from data from biennial inspections, and system improvements suggested by the technical departments, and includes factors such as service life of various structural components and normal replacement cycles. Plans for scheduling major maintenance under the 20-year capital needs assessment are developed with input from operating personnel which consider how to implement construction properly to maintain the optimal level of service to the traveling public both locally and system wide.

URS' review of pertinent sections of the recent facility inspection reports found them to be extensive and detailed. Report conclusions and rehabilitation recommendations, based on URS' limited review, appear in the opinion of URS to be reasonable appraisals of the required effort to maintain the operational integrity of each facility.

URS performed a facility review of each TBTA facility with the facility engineer. The review included an on-site meeting with each facility's engineer to obtain an update of the respective facility's status relative to the following issues:

- Ongoing rehabilitation projects;
- Ongoing maintenance projects;
- Rehabilitation projects addressing the recommendations of the previous inspection reports; and
- Repairs to alleviate the flagged conditions of the previous inspection reports.

The reviews proved informative. Facility projects and agency-wide projects specific to each structure were discussed.

It is important to note, however, that URS' testing or inspection of portions of the work of other parties shall not relieve such other parties from their responsibility for performing their work in accordance with applicable requirements and the customary standard of care. URS shall not be responsible for the acts or omissions of other parties engaged by TBTA.



## Long-Term Outlook for TBTA Facilities

The useful lives of bridges and tunnels, in general, may be cut short for two main reasons: (a) they are geometrically and functionally unsatisfactory because they are too narrow, too steep, lacking in clearance or sufficient spatial capacity to handle the traffic; or (b) they are structurally unsafe because of deterioration or because their load-carrying capacity is inadequate to handle the loads imposed under current conditions. Deterioration may occur for a variety of reasons, including aging, but it will occur sooner if there has been inadequate or improper maintenance.

On the basis of the foregoing review and information available to us, from reports of others, it is our opinion that the TBTA bridges, tunnels and approaches are all geometrically and functionally adequate and structurally sound and generally maintained to good standards. Ongoing maintenance requirements of the structures are assessed, prioritized, and addressed in an appropriate manner by TBTA to maintain a high level of safety to the traveling public, and maintain the structures for many years to come.

TBTA is looking forward, and planning to add lanes, and sometimes use peak counterflow principles on its structures, in addition to maintaining the structures, to ensure their future serviceability. We are of the opinion that all the TBTA facilities are and will be physically capable of accommodating traffic volumes at the levels projected for 2016 through the duration of the outstanding bonds that have been issued and future bonds to be issued based on a pledge of TBTA revenues through 2036, assuming maintenance consistent with past practice.

Respectfully,

**URS CORPORATION – NEW YORK**

Kathleen Massarelli, AICP  
Vice President

Arthur H. Goldberg, P.E.  
Vice President

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