APPENDIX E

HISTORY AND PROJECTION OF TRAFFIC, TOLL REVENUES AND EXPENSES

and

Review of Physical Conditions

Of the Facilities of

Triborough Bridge and Tunnel Authority

April 29, 2008

Prepared for the
Triborough Bridge and Tunnel Authority

By

URS

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April 29, 2008

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 Triborough Bridge and Tunnel Authority (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 13 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) current and programmed construction activities on TBTA's facilities and 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.

In 2007, actual total toll revenues for the TBTA were $1,250.5 million, or 0.2 percent lower than the URS forecast of $1,253.0 million.

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 2007, these facilities carried 307.8 million total vehicles, of which 304.2 million were toll paying, and generated $1,250.5 million 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.

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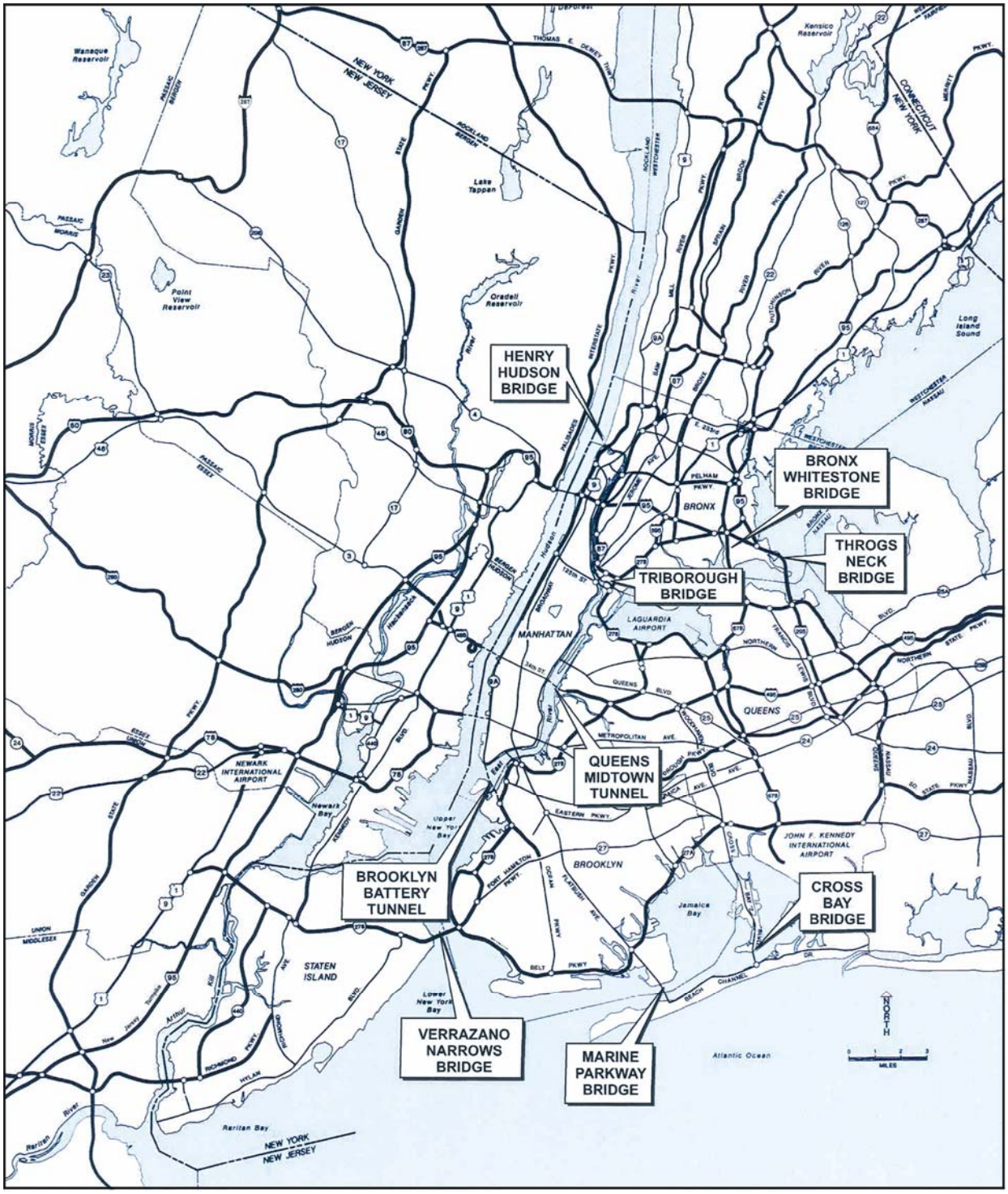
Figure 1: Location Map



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 (Marine Parkway) - a four-lane crossing of the Rockaway Inlet that connects the Rockaway peninsula in Queens with Brooklyn.

Cross Bay Veterans Memorial Bridge (Cross Bay) - 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 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 eighteen 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).

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. For the outlying bridges, however, 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, with the exception of the Henry Hudson Bridge.

Current Toll Structure and Operation

The current toll structure, in place since March 16, 2008, 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

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Table 1 Toll Rates at TBTA Facilities, Effective March 16, 2008

Classification	Verrazano-Narrows Bridge [a]		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	*E-ZPass*	Cash	*E-ZPass*	Cash	*E-ZPass*	Cash	*E-ZPass*
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	$5.00	$4.15	$ 5.00	$4.15	$2.75	$1.90	$2.50	$1.55
Each additional axle costs	2.25	2.25	2.25	2.25	1.50	1.50	1.50	1.50
The following discounted prepaid charges are presently available for the two-axle vehicles referenced above:								
Prepaid charges through token roll purchases							1.67[b]	
Prepaid charges per crossing for registered Staten Island Residents using an eligible vehicle with three or more occupants	1.165							
Prepaid charges per crossing for registered Staten Island Residents using an eligible vehicle through token roll purchase	3.35[b]							
Registered Staten Island Residents using an eligible vehicle		2.49						
Prepaid charges per crossing for registered Rockaway Peninsula/Broad Channel Residents using an eligible vehicle							1.40[b]	1.03[c]
All two axle vehicles greater than 7,000 lbs. and buses (other than franchise buses and motor homes)	10.00	7.50	10.00	7.50	(d)	(d)	5.00	3.75
3 Axle	16.00	12.00	16.00	12.00			8.00	6.00
4 Axle	21.00	15.75	21.00	15.75			10.50	7.88
5 Axle	27.00	20.25	27.00	20.25			13.50	10.13
6 Axle	32.00	24.00	32.00	24.00			16.00	12.00
7 Axle	38.00	28.50	38.00	28.50			19.00	14.25
Each additional axle above 7	6.00	4.50	6.00	4.50			3.00	2.25
Two-axle franchise buses	4.00	3.00	4.00	3.00	(d)	(d)	2.00	1.50
Three-axle franchise buses	4.75	3.56	4.75	3.56	(d)	(d)	2.50	1.88
Motorcycles	2.25	1.86	2.25	1.81	2.25	1.29	2.25	1.29
Each additional axle costs	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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 $5.00 for the major crossings. The minor crossing passenger car cash toll is $2.50 on the Gil Hodges Memorial and Cross Bay Bridges and $2.75 on the Henry Hudson Bridge. 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 $0.85 discount per trip at all major facilities ($1.70 for Verrazano-Narrows Bridge westbound only) and the Henry Hudson Bridge, and $0.95 at the Cross Bay Veterans Memorial and Marine Parkway-Gil Hodges Memorial bridges.

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 $4.0 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 $10.00 for two axles and is $6.00 for each additional axle over seven. Vehicles with three to seven axles pay varying rates, as shown in Table 1. 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 25 percent discount with *E-ZPass.*

For the minor crossings, the two-axle cash rate for vehicles over 7,000 pounds is $5.00, with an additional per axle rate over seven axles of $3.00. Vehicles with three to seven axles pay varying rates, as shown in Table 1. These vehicles are eligible for a 25 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 over 2.9 million *E-ZPass* tags in use. Currently, participation rates are at 73.5 percent of toll-paying traffic system-wide. The total number of active Interagency Group (IAG) tags in use for all agencies in the extended region as of December 31, 2007 was over 17 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 1999, the third year since 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 2007.

Table 2 *E ZPass* Participation Rates

Yearly Average	1999	2000	2001	2002	2003	2004	2005	2006	2007
Percent Participation (All Facilities)	60.1%	63.7%	67.4%	68.5%	69.8%	70.1%	71.5%	72.6%	73.5%
Facility	Triborough	Bronx-Whitestone	Henry Hudson	Marine Parkway	Cross Bay	Queens Midtown	Brooklyn Battery	Throgs Neck	Verrazano-Narrows
Percent Participation (2007)	66.4%	66.5%	80.2%	79.5%	74.8%	78.0%	81.4%	73.3%	77.0%

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.

E-ZPass is fully integrated at facilities operated by 24 agencies located in 12 states. The transportation network includes 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, eight bridges between New Jersey and Pennsylvania operated by the Burlington County Bridge Commission, the toll roads maintained by the Illinois State Toll Highway Authority, the Chicago Skyway Bridge operated by the Skyway Concession Company, LLC, the Indiana Toll Road Concession Company and the Chesapeake Bay Bridge and Tunnel Commission. In addition, the Ohio Turnpike Commission joined the IAG in 2008 and they are expected to be fully operable by the end of 2009.

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 the IAG now includes Maryland, Massachusetts, Virginia, West Virginia, New Hampshire, Illinois, Indiana and Maine, as well as 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 2007, TBTA transferred $370.5 million to other members and received $246.3 million from other members within the IAG.

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 37 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 Veterans Memorial 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[(a)]	1.75	1.75	1.00	1.00
1987 – 1989	2.00[(a)]	2.00	2.00	1.00	1.00
1989 – 1993	2.50[(a)]	2.50	2.50	1.25	1.25
1993 – 1996	3.00[(a)]	3.00	3.00	1.50	1.50
1996 – 2003	3.50[(a)]	3.50	3.50	1.75	1.75
2003 – 2005	4.00[(a)]	4.00	4.00	2.00	2.00
2005 – 2008	4.50[(a)]	4.50	4.50	2.25	2.25
2008[(b)] – Present	5.00[(a)]	5.00	5.00	2.75	2.50

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 16, 2008.

On the minor crossings, cash tolls on the Henry Hudson Bridge are $2.75 and cash tolls on the Gil Hodges Memorial and Cross Bay Bridges are $2.50, collected in each direction.

Verrazano-Narrows Bridge

The Verrazano-Narrows Bridge one-way cash toll of $10.00 is collected westbound only. The current one-way cash passenger car toll rate, effective March 16, 2008, for the major crossings is $5.00, 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. Effective March 16, 2008, the cost of 24 coupons increased $1.92 to $55.92.

In general, tolls for vehicles over 7,000 pounds have also been adjusted upward whenever passenger car toll rates were increased. Notable exceptions occurred in 1987 and 1989 when these toll rates were not raised while there was a general increase for passenger cars. 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 $5.00 set in 2008, alongside the CPI.

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[(a)]	Tolls Adjusted to 1982-84 Dollars[(b)]
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
2005	4.50	212.7	2.12
March 2008	5.00[(c)]	233.1[(d)]	2.15
Ratio 2008/1971	20.0	5.3	3.8

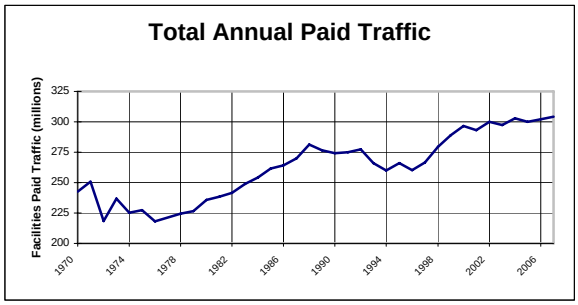
Notes: (a) New York Metropolitan Statistical Area: New York–Northern New Jersey-Long Island, NY-NJ-CT-PA, All Urban Consumers, All Items. Base period: 1982-1984 = 100.0. Source: US Department of Labor, Bureau of Labor Statistics.
(b) The current toll divided by the CPI and expressed as a decimal.
(c) Effective March 16, 2008.
(d) Not seasonally adjusted. Seasonally adjusted data not available at the MSA level.

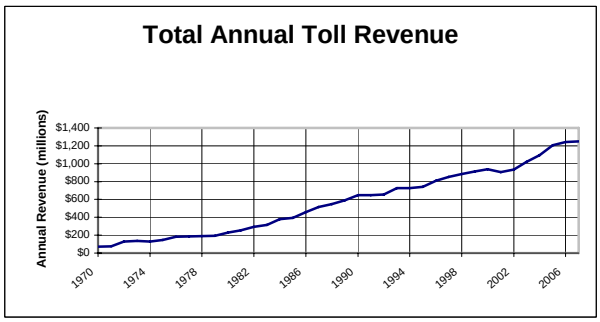
As indicated in the table, TBTA tolls in current dollars have risen faster than the CPI during the 37-year period. As can be seen in Table 4, the current $5.00 toll in 2008 dollars is equivalent to a toll of $2.15 in 1982-1984 dollars. The actual (current) 2008 cash toll for passenger cars is 20 times the actual toll in 1971. However, if adjusted for inflation, the toll today is only 3.8 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 2008

Historical traffic, revenues and expenses were reviewed for the nine TBTA bridges and tunnels. Over the last 37 years, paid traffic volumes on the crossings have ranged from approximately 220 million in the 1970s to 304 million in 2007. 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 2007, with tolls having been increased again in 2003 and 2005, revenue reached $1,251 million, $9 million greater than revenues in 2006.

Figure 2: Aggregated TBTA Facilities Paid Traffic and Toll Revenue, 1970 to 2007





Since 1970, annual operating expenses for the toll facilities have risen by a multiple of 15, from $25 million to $369 million in 2007, during which time the CPI for the New York Metropolitan Statistical Area increased a multiple of 5.5. Among the significant increases over this period were additional expenses to maintain the facilities and increased security costs after the events of September 11, 2001.

Traffic and Toll Revenue, 1997 to 2007

Table 5 lists the traffic and toll revenue record for each of the nine crossings for the 1997-2007 period. Total TBTA traffic and toll revenue are shown in Table 6. The peak in toll-paying traffic during this period, 304 million crossings, occurred in 2007. 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 (prior to the 2008 toll increase) shown in this table, in 2003 and 2005, are evident in the jump in average tolls in those years. The strong growth of almost 10 percent in revenues between 2004 and 2005 is due to the toll increase in March 2005.

In 1997, toll revenue was reported at $852 million. As stated above, revenues rose to $941 million in 2000, an increase of approximately 16 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. Also in 2002, the positive impact on the Verrazano-Narrows Bridge was brought about by 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 14th 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, 2005 traffic volumes decreased 0.9 percent and revenue rose to $1,205 million in 2005 and then increased to $1,242 million in 2006 and increased further to $1,251 in 2007.

Traffic on the Bronx-Whitestone and Throgs Neck Bridges was nearly equal in 2007. These two bridges generally serve the same areas in the Bronx and Queens, and historically traffic has shifted back and forth to the crossing providing the better level of service.

The Triborough Bridge reported the highest toll revenue for 2007 at $285.8 million, while the Marine Parkway-Gil Hodges Memorial Bridge registered the lowest revenue at $11.6 million.

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Table 5 Annual Toll-Paying Traffic and Toll Revenue: 1997 to 2007
(000's)[a]

Year	Verrazano-Narrows Bridge				Triborough Bridge				Bronx-Whitestone Bridge			
	Traffic		Revenue	Average Toll[c]	Traffic		Revenue	Average Toll	Traffic		Revenue	Average Toll
	Volume[b]	Change			Volume	Change			Volume	Change		
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[d]	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[d]	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[d]	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
2006	70,381	0.6	274,100	3.89	63,063	0.4	288,300	4.57	39,488	–4.2	186,384	4.72
2007[f]	70,349	0.0	272,837	3.88	62,491	–0.9	285,847	4.57	42,372	7.3	200,076	4.72

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		
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[d]	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[d]	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[d]	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[e]	–22.8	52,188	3.17	26,177[e]	–1.5	87,067	3.33
2002	39,687	5.0	157,988	3.98	15,447[e]	–6.1	48,880	3.16	26,901[e]	2.8	88,865	3.30
2003	39,082	–1.5	172,603	4.42	17,806[e]	15.3	61,810	3.47	27,512[e]	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
2006	43,186	4.8	223,756	5.18	17,718	1.7	73,868	4.17	28,966	0.7	127,075	4.39
2007[f]	41,914	–2.9	217,958	5.20	18,132	2.3	75,980	4.19	29,366	1.4	129,348	4.40

Year	Henry Hudson Bridge				Marine Parkway-Gil Hodges Memorial Bridge				Cross Bay Veterans Memorial Bridge			
	Traffic		Revenue	Average Toll	Traffic		Revenue	Average Toll	Traffic		Revenue	Average Toll
	Volume	Change			Volume	Change			Volume	Change		
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[d]	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[d]	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[d]	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
2006	24,159	0.1	44,901	1.86	7,737	0.8	11,536	1.49	7,361	2.5	11,630	1.58
2007[f]	24,110	–0.2	44,779	1.86	7,831	1.2	11,635	1.49	7,676	4.3	12,090	1.57

Notes:
(a) Toll rate increases occurred on 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) Traffic numbers are preliminary and subject to final audit.

Total annual TBTA toll traffic volume and revenue are shown in Table 6 for the period 1997 through 2007.

Table 6 Summary of Annual Paid Traffic and Toll Revenue: 1997 to 2007

Year	Total Paying Traffic Volume (000)	Total Toll Revenue (000)
1997	266,520	$851,993
1998	279,463	884,439[(b)]
1999	289,107	912,793[(b)]
2000	296,633	940,607[(c)]
2001	293,220	914,856
2002	299,995	933,134
2003[(a)]	297,465	1,021,937
2004	302,995	1,096,989
2005[(a)]	300,385	1,204,944
2006	302,059	1,241,551
2007[(d)]	304,240	1,250,549

Notes: (a) Toll rate increases occurred on 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.
(d) Traffic numbers are preliminary and subject to final audit.
Source: TBTA

Traffic by Facility and Vehicle Class, 2007

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 2007 traffic volumes by facility. Passenger cars totaled 282 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 70.3 million toll-paying vehicles. The lowest toll-paying volume, 7.7 million vehicles, was recorded at the Cross Bay Veterans Memorial Bridge.

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Table 7 Traffic by Facility and Vehicle Class, 2007

(000's)

Facility	1 Passenger 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	37,307	51	45	1,726	2	0	360	368
Bronx-Whitestone Bridge	39,243	13	8	1,402	161	1	342	225
Triborough Bridge	57,662	25	11	2,927	105	259	592	116
Queens Midtown Tunnel	26,976	6	6	1,696	94	85	399	33
Brooklyn-Battery Tunnel	16,614	2	1	670	33	535	189	14
Verrazano-Narrows Bridge[(a)]	65,745	31	26	1,948	143	401	435	237
Henry Hudson Bridge[(b)]	23,932	1	1	122	0	0	3	1
Marine Parkway Bridge	7,574	2	1	181	26	0	21	3
Cross Bay Bridge	7,200	3	1	330	37	4	58	5
Total	282,253	134	101	11,001	600	1,285	2,398	1,001
Percent of Paid Vehicles	92.8%	0.0%	0.0%	3.6%	0.2%	0.4%	0.8%	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[(c)]	Total Vehicles
Throgs Neck Bridge	1,898	75	79	1	2	41,914	256	42,170
Bronx-Whitestone Bridge	892	66	19	0	1	42,372	217	42,589
Triborough Bridge	647	104	42	0	1	62,491	1,212	63,704
Queens Midtown Tunnel	17	50	3	0	0	29,366	409	29,774
Brooklyn-Battery Tunnel	8	65	2	0	0	18,132	498	18,630
Verrazano-Narrows Bridge[(a)]	1,191	149	42	1	2	70,349	685	71,034
Henry Hudson Bridge[(b)]	1	49	0	0	0	24,110	91	24,201
Marine Parkway Bridge	9	13	1	0	0	7,831	88	7,919
Cross Bay Bridge	17	18	2	0	0	7,676	129	7,806
Total	4,681	589	189	2	5	304,240	3,585	307,825
Percent of Paid Vehicles	1.5%	0.2%	0.1%	0.0%	0.0%	100.0%		

Notes: Totals may not add due to rounding.
Traffic numbers are preliminary and subject to final audit.
(a) Westbound traffic doubled.
(b) Truck passage prohibited.
(c) Includes police, fire and other emergency vehicles and TBTA vehicles.

Source: TBTA

Monthly Traffic, 2007

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 the facility itself or its approaches and 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.

The data in Table 8 indicate that total traffic on the nine crossings in 2007 peaked in June. August was the second highest month in 2007. For the combined facilities, the monthly variations in 2007 ranged from 8 percent below the annual average in February to 8 percent above in June. This is indicative of a stable traffic mix comprised of a solid base of commuting and commercial traffic.

Table 8 Monthly Traffic Variations, 2007

Month	Average Daily Toll-Paying Traffic										Ratio to AADT
	Throgs Neck	Bronx-Whitestone	Tri-borough	Queens Midtown	B'klyn Battery	Verrazano-Narrows[a]	Henry Hudson	Marine Pkwy	Cross Bay	Total	
January	104,960	105,591	156,550	75,441	48,084	182,489	61,735	18,743	19,037	772,632	0.93
February	103,940	105,389	156,173	76,504	49,120	180,484	61,320	18,007	18,399	769,336	0.92
March	109,289	110,691	168,117	81,118	52,195	189,922	64,989	19,783	19,910	816,014	0.98
April	113,667	114,223	173,060	80,733	49,432	193,081	65,512	19,370	19,824	828,902	0.99
May	121,090	120,184	181,481	83,099	51,695	200,938	70,539	22,695	22,246	873,967	1.05
June	123,187	125,179	185,566	84,741	53,607	206,577	70,569	25,317	24,063	898,806	1.08
July	121,967	123,042	175,851	77,229	47,556	196,728	65,032	26,108	23,610	857,122	1.03
August	125,256	125,454	178,526	82,204	49,758	201,539	66,303	25,526	22,946	877,512	1.05
September	119,302	119,812	174,888	81,001	47,738	193,558	67,257	22,269	21,753	847,577	1.02
October	116,559	115,880	174,200	84,036	50,783	191,944	69,564	20,459	21,260	844,685	1.01
November	113,627	116,247	169,481	82,046	48,806	188,100	67,777	19,648	20,037	825,769	0.99
December	104,425	110,676	159,749	77,125	47,318	186,642	61,808	19,222	19,084	786,048	0.94
AADT[b]	114,832	116,087	171,209	80,454	49,676	192,738	66,053	21,455	21,031	833,535	1.00

Notes: May not add due to rounding.
Traffic numbers are preliminary and subject to final audit.
(a) Westbound traffic doubled.
(b) Annual Average Daily Traffic

Changes in Monthly Traffic, 2006 to 2007

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 and on the lower level of the George Washington Bridge. 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 2000 level due to the loss of employment in lower Manhattan.

Table 9 lists the monthly traffic changes that have occurred between 2006 and 2007.

Table 9 Changes in Monthly Traffic – 2006 to 2007

Month	Percent Change Comparing 2007 Monthly Traffic to 2006								
	Throgs Neck	Bronx-Whitestone	Triborough	Queens Midtown	Brooklyn-Battery	Verrazano-Narrows	Henry Hudson	Marine Parkway	Cross Bay Bridge
January	1.2%	3.6%	0.5%	4.4%	6.9%	2.0%	1.7%	3.9%	7.3%
February	–0.9	2.6	1.0	3.7	6.5	1.8	0.8	2.3	4.8
March	–4.2	5.4	–1.9	1.1	3.1	–0.4	–0.8	0.4	3.7
April	–3.9	6.5	–1.6	0.0	3.7	–0.3	–3.3	0.8	4.0
May	–1.9	10.7	0.2	3.3	5.8	2.6	3.3	3.0	7.7
June	–2.3	13.1	0.4	1.3	6.6	1.8	1.7	7.8	9.6
July	–5.4	13.6	0.1	–0.3	4.7	0.3	2.1	–0.2	0.1
August	–4.2	14.6	–0.3	2.1	1.8	0.5	0.8	2.1	5.1
September	–2.6	10.9	–1.0	0.9	–1.7	–0.7	–1.0	2.4	6.5
October	–1.2	3.5	–0.1	1.5	1.4	–0.7	0.6	0.3	5.6
November	–1.9	2.9	–2.2	1.2	–3.5	–2.5	–1.2	–3.9	0.3
December	–7.0	–0.3	–5.8	–1.9	–5.8	–4.6	–6.8	–4.9	–2.8
Annual	–2.9	7.3	–0.9	1.4	2.3	0.0	–0.2	1.2	4.3

Reasons for monthly traffic changes include:

- Following major construction at the Bronx-Whitestone Bridge in 2006, traffic returned to more normally distributed levels between that facility and the Throgs Neck Bridge in 2007. Many drivers who diverted to the Throgs Neck Bridge in 2006 went back to the Bronx-Whitestone Bridge in 2007, as can be seen from the percentage declines at the Throgs Neck Bridge and the gains at the Bronx-Whitestone Bridge through most of the latter year;
- Traffic was also down through much of 2007 at the Triborough-Bronx plaza, which also saw unusually large volumes in 2006 due to diversions from the Bronx-Whitestone Bridge;
- Traffic was up at all facilities in January, and at all but the Throgs Neck Bridge in February (for the reasons discussed above) primarily due to relatively favorable winter weather in 2007. Conversely, the weather was harsher in December 2007 vs. 2006, which resulted in volume declines across all facilities;
- Considerable traffic growth occurred in May and June largely due to less rainfall compared to 2006; and
- Traffic declines occurred in November 2007 despite more favorable weather. Gas prices, however, were much higher compared to the prior year. For the New York-Northern New Jersey-Long Island area, gas averaged $3.13 per gallon in November 2007, vs. $2.28 per gallon in November 2006.

Estimated Traffic and Toll Revenue, 2008

The development of the traffic and toll revenue estimates for 2008 took into account the forecast of normal growth, as well as the impact of the latest toll increase of March 16, 2008. The results for 2007 fully reflected the effects of the toll increase implemented in 2005; therefore, no additional adjustments were necessary. The impacts in the long term, regarding the national and regional economies, projected employment in lower Manhattan and the traffic and revenue forecasts beyond 2008, are covered in the following sections of the report. In developing the traffic and toll revenue estimates for 2008, we assumed that traffic changes for 2007 to 2008 would be at the same rate as the change in traffic for the last six months of 2006 to the same period in 2007. By using this time period, the impacts of the changes in the economy that took place in the latter half of 2007 were taken into account in the analysis. The growth rates projected in this manner were further adjusted for the latest toll increase of March 16, 2008 using the historic elasticities observed from the previous 12 toll increases. The forecast percent changes are shown in Table 10. The percentages reflect normal growth and the estimated effect of the latest toll increase.

Table10 Estimated Changes in Annual Traffic – 2007 to 2008

Facility	Percent Change
Throgs Neck Bridge	–4.0%
Bronx-Whitestone Bridge	1.6
Triborough Bridge	–2.2
Queens Midtown Tunnel	–0.2
Brooklyn-Battery Tunnel	–2.0
Verrazano-Narrows Bridge	–1.5
Henry Hudson Bridge	–3.2
Marine Parkway-Gil Hodges Mem. Bridge	0.3
Cross Bay Veterans Memorial Bridge	2.4

The traffic and toll revenue estimates for 2008 are presented in Table 11.

Table 11 Estimated 2008 Toll-Paying Traffic and Toll Revenue

Facility	Traffic (000s)	Average Toll	Revenue(*) (000s)
Throgs Neck Bridge	40,258	$5.50	$221,340
Bronx Whitestone Bridge	43,045	5.02	216,186
Triborough Bridge	61,097	4.86	296,748
Queens Midtown Tunnel	29,310	4.63	135,808
Brooklyn Battery Tunnel	17,776	4.46	79,181
Verrazano-Narrows Bridge	69,307	4.14	287,036
Henry Hudson Bridge	23,337	2.03	47,484
Marine Parkway Bridge	7,851	1.57	12,350
Cross Bay Bridge	7,864	1.69	13,315
Total	299,844	$4.37	$1,309,449

(*) Includes adjustment for increase in E-ZPass usage.

The 1.4 percent decrease in traffic and the overall increase in revenue of 4.7 percent reflect actual performance through January 31, 2008, the toll increase of March 16, 2008 and anticipated growth for the remainder of the year.

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 beyond 2008 is discussed under the "Projected Traffic, Revenue and Expenses" section of this report.

Operating Expenses 1997 to 2007

Table 12 displays the historical operating expenses for the TBTA facilities from 1997 through 2007. TBTA divides operating expenses into two major categories: labor and non-labor. Labor includes salaries, overtime and fringe benefits, net of capital reimbursements. Major maintenance, bridge painting, 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 non-labor.

TBTA labor expenses increased from $111.7 million in 1997 to 196.8 million in 2007. 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.

Non-labor expenses increased from $112.2 million in 1997 to $172.3 million in 2007. The primary driving factors in TBTA's non-labor expense growth were inflation, an increase in major maintenance and bridge painting activities.

Timing of major expenses and other 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 Non-labor expenses starting in 1995.

E-ZPass startup costs for tags and customer service center operations were primarily responsible for non-labor 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 non-labor costs in 1999, and rental expenses for TBTA administrative offices at 2 Broadway that were formerly in the New York Coliseum office building increased non-labor costs in 1999 and 2000.

Table 12 Historical Operating Expenses: 1997 to 2007

Year	Operating Expenses (000s)			Percent Change[(c)]
	Labor [(a)]	Non-Labor [(b)]	Total	
1997	$111,651	$112,222	$223,873	–
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
2006	183,268	169,642	352,910	2.7
2007	196,755	172,270	369,025	4.6

Notes:
(a) Includes salaries, overtime and fringe benefits, net of capital reimbursements.
(b) Non-labor includes the following categories: major maintenance and supplies, bridge painting, outside services, insurance, power, leases and rentals and other expenses.
(c) For discussion on expense fluctuations, see accompanying 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. Some of the increases associated with these additional costs have been reimbursed to TBTA through MTA 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 labor costs was caused by additional expenditures for security staff, worker's compensation adjustments and health and welfare benefits rate increases. The 2003 increase in labor 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* Customer Service Center (CSC) costs and other business expenses.

In 2004, non-labor expenses were 4.9 percent lower than 2003 due to a decrease in the number of *E-ZPass* tag purchases. In 2005, expenses reflected a continuation of the security measures noted above, *E-ZPass* tag replacement, and increases in major maintenance and bridge painting, offset by a reduction in 2 Broadway lease charges. Labor costs increased in 2006 primarily due to rising payroll, pension and health and welfare expenses. Regarding non-labor expenses, increased funding for additional bridge painting needs in 2006 was offset by a decrease in *E-ZPass* tag purchases and lower insurance costs. In 2007, labor costs increased 7.3 percent primarily due to rising payroll and related expenses, while non-labor expenses increased less than two percent as the bridge painting program costs were less costly than in 2006 and the non-labor costs associated with the transition to the new contract for the *E-ZPass* CSC that were anticipated for 2007 were deferred to 2008.

2008 Budget

Operating expenses have been budgeted by TBTA for 2008 at $426.9 million. These expenses are divided into the following two categories: labor of $211.0 million and non-labor at $215.9 million. Personnel costs are expected to rise another 7 percent in 2008 due to in-filling of some positions that were vacant in 2007. The non-labor portion is 25 percent higher than 2007 because of the afore-mentioned *E-ZPass* CSC transition costs and increased major maintenance and bridge painting expenses anticipated for 2008.

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. 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 regard-

ing employment and population history and projections from 1970 to 2035 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. 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 4,066,500 in 1970 to 3,614,000 in 1980. Staten Island, where employment increased by 3.5 percent per year, was the exception. The most recent employment forecasts were released by NYMTC in March 2008. The latest data show that employment was the highest it has been since 1970. Projections show a steady growth through 2035.

Between 1970 and 2005, employment increased in the New York suburbs, in Northern and Central New Jersey and in Southern Connecticut. NYMTC projected that employment in the region (including New York City) as a whole, would grow during their forecast period through 2035, in the range of 0.7 to 1.4 percent annually.

In the New York Metropolitan Statistical Area (MSA), the unemployment rate (as calculated from the monthly data) for 2007 was 4.4 percent, down from the 4.5 percent in 2006 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. These data correspond 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 experienced steady decline. In 2007, the vacancy rate stood at 5.3 percent, and asking rents jumped 33 percent. According to the city's Office of Management and Budget Monthly Report on Economic Conditions, released March 4, 2008:

> "There are some signs that the New York City office market has started to show the impact of the national economic malaise and Wall Street turbulence. One sign of loosening is that leasing activity in the City has steadily decelerated. From January 2007 to January 2008, leasing activity in Class A buildings fell to its lowest twelve month total since 2004. One explanation is that there is simply little available space to lease and what is left is prohibitively expensive." The report goes on to say that "The other more worrisome explanation for the deceleration in leasing activity is that demand has weakened."

As noted in the report, the real estate industry anticipates that vacancy rates will increase over the next five years to an estimated 7.4 percent in 2012 and employment will increase 0.5 percent per year during that time period. This estimate is slightly more conservative than NYMTC's as shown in Table 13.

Table 13 Employment Trends and Projections
(000s)

Year	New York City						New York Region [b]	New Jersey Region [c]	Connecticut Region [d]
	Manhattan	Bronx	Brooklyn	Queens	Staten Island	Total [a]			
1970	2,550.3	251.3	631.9	586.0	47.1	4,066.5	1,554.6	2,447.6	727.4
1980	2,277.5	216.9	516.4	536.7	66.4	3,614.0	1,918.6	2,828.2	869.3
1990	2,565.1	237.8	504.5	567.3	91.6	3,966.1	2,339.0	3,403.9	1,008.9
2000	2,682.2	269.4	584.6	624.1	116.9	4,277.3	2,537.5	3,676.3	1,065.5
2005	2,680.7	306.1	605.4	646.1	122.6	4,360.9	2,715.9	3,894.6	1,099.6
2010 - Projected	2,824.2	342.1	707.7	724.4	149.3	4,747.8	2,888.6	4,148.3	1,176.6
2015 - Projected	2,885.1	367.6	760.3	751.2	164.5	4,928.8	3,017.7	4,352.9	1,229.7
2020 - Projected	2,948.0	388.9	809.3	776.7	177.8	5,100.7	3,129.1	4,521.5	1,277.0
2025 - Projected	3,069.7	408.8	855.2	806.6	192.0	5,332.4	3,250.5	4,717.2	1,324.9
2030 - Projected	3,171.5	425.8	896.1	831.5	205.1	5,530.0	3,367.0	4,905.4	1,378.8
2035 - Projected	3,288.7	442.3	936.7	858.2	218.4	5,744.3	3,491.8	5,078.7	1,440.9
Average Annual Percent Change									
1970 to 1980	–1.1%	–1.5%	–2.0%	–0.9%	3.5%	–1.2%	2.1%	1.5%	1.8%
1980 to 1990	1.2	0.9	–0.2	0.6	3.3	0.9	2.0	1.9	1.5
1990 to 2000	0.4	1.3	1.5	1.0	2.5	0.8	0.8	0.8	0.5
2000 to 2005	0.0	2.6	0.7	0.7	1.0	0.4	1.4	1.2	0.6
2005 to 2010	1.0	2.2	3.2	2.3	4.0	1.7	1.2	1.3	1.4
2010 to 2015	0.4	1.4	1.4	0.7	1.9	0.8	0.9	1.0	0.9
2015 to 2020	0.4	1.1	1.3	0.7	1.6	0.7	0.7	0.8	0.8
2020 to 2025	0.8	1.0	1.1	0.8	1.5	0.9	0.8	0.9	0.7
2025 to 2030	0.7	0.8	0.9	0.6	1.3	0.7	0.7	0.8	0.8
2030 to 2035	0.7	0.8	0.9	0.6	1.3	0.8	0.7	0.7	0.9

Notes: (a) Totals may not add due to rounding.
(b) Consists of the following counties: Dutchess, Nassau, Orange, Putnam, Rockland, Suffolk, Sullivan, Ulster and Westchester.
(c) Consists of the following counties: The 13 counties of the North Jersey Transportation Planning Authority (Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, Warren) plus Mercer.
(d) Consists of the following counties: Fairfield, Litchfield, New Haven.

Source: New York Metropolitan Transportation Council, March 2008.

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, New Jersey and Connecticut counties also show increased growth.

Table 14 Population Trends and Projections

(000s)

Year	New York City						New York Region [b]	New Jersey Region [c]	Connecticut Region [d]
	Manhattan	Bronx	Brooklyn	Queens	Staten Island	Total [a]			
1970	1,539	1,472	2,602	1,987	296	7,895	4,372	5,800	1,682
1980	1,428	1,169	2,231	1,891	352	7,072	4,537	5,857	1,725
1990	1,488	1,204	2,301	1,952	379	7,323	4,635	6,097	1,806
2000	1,537	1,333	2,465	2,229	444	8,008	4,933	6,662	1,889
2005	1,606	1,365	2,511	2,257	475	8,214	5,072	6,874	1,935
2010 - Projected	1,663	1,372	2,525	2,279	481	8,320	5,188	6,994	1,968
2015 – Projected	1,691	1,382	2,534	2,297	487	8,391	5,314	7,184	2,018
2020 - Projected	1,743	1,415	2,609	2,370	509	8,646	5,467	7,422	2,079
2025 - Projected	1,778	1,450	2,694	2,462	528	8,911	5,664	7,656	2,151
2030 - Projected	1,820	1,489	2,778	2,585	546	9,218	5,898	7,940	2,249
2035 - Projected	1,885	1,528	2,860	2,752	561	9,586	6,123	8,230	2,368
Average Annual Percent Change									
1970 to 1980	–0.7%	–2.3%	–1.5%	–0.5%	1.8%	–1.1%	0.4%	0.1%	0.3%
1980 to 1990	0.4	0.3	0.3	0.3	0.7	0.3	0.2	0.4	0.5
1990 to 2000	0.3	1.0	0.7	1.3	1.6	0.9	0.6	0.9	0.4
2000 to 2005	0.9	0.5	0.4	0.2	1.4	0.5	0.6	0.6	0.5
2005 to 2010	0.7	0.1	0.1	0.2	0.3	0.3	0.5	0.3	0.3
2010 to 2015	0.3	0.1	0.1	0.2	0.3	0.2	0.5	0.5	0.5
2015 to 2020	0.6	0.5	0.6	0.6	0.9	0.6	0.6	0.7	0.6
2020 to 2025	0.4	0.5	0.6	0.8	0.7	0.6	0.7	0.6	0.7
2025 to 2030	0.5	0.5	0.6	1.0	0.7	0.7	0.8	0.7	0.9
2030 to 2035	0.7	0.5	0.6	1.3	0.5	0.8	0.7	0.7	1.0

Notes: (a) Totals may not add due to rounding.
(b) Consists of the following counties: Dutchess, Nassau, Orange, Putnam, Rockland, Suffolk, Sullivan, Ulster and Westchester.
(c) Consists of the following counties: The 13 counties of the North Jersey Transportation Planning Authority (Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, Warren) plus Mercer.
(e) Consists of the following counties: Fairfield, Litchfield, New Haven.

Source: New York Metropolitan Transportation Council, March 2008.

NYMTC's latest population projections for the region as a whole (including New York City) for 2010 to 2035 were released in March 2008. NYMTC projects steady population growth throughout the entire region as a whole ranging from 0.3 percent to 0.8 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. NYMTC's most recent projection is for a population of over 9 million for New York City by 2030.

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 for the period 2000 through 2007 in New Jersey, decreased slightly in New York City and remained relatively constant throughout New York State. The most recent data available indicate that between 2000 and 2007 vehicle registrations grew by an average annual rate of growth of 1.6 percent in New Jersey. In Connecticut, registrations increased between 2006 and 2007, continuing an upward trend. From 2000 to 2007, registrations in Connecticut grew at an average rate of 1.5 percent per year. These data are illustrated in Table 15.

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 [(a)]	New Jersey	Connecticut
2000	2,044	10,661	6,907	2,735
2001	2,025	10,707	7,086	2,796
2002	1,946	10,445	7,325	2,893
2003	1,869	10,414	7,420	2,928
2004	1,849	10,450	7,475	2,989
2005	1,857	10,477	7,545	3,011
2006	1,833	10,551	7,621	3,016
2007	1,926	10,665	7,728	3,035
Average Annual Growth				
2000-2007	–0.8%	0.0%	1.6%	1.5%

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, there may be some years that will show declines, but there will be other years that will be characterized by significant growth. Overall growth is expected from 2008 to the end of NYMTC's forecast period in 2035.

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.

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. 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 that exceeded $3.00 per gallon in September and October of 2005. Gasoline prices spiked 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 regular gasoline for the United States was $3.07 per gallon representing a 66 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.

U.S. gasoline prices reached $3.22 for all formulations of regular the week of May 21, 2007. Prices for regular in the New York City area averaged $2.95 per gallon during the summer, with the maximum being $3.14 per gallon the week of May 28, 2007. As of April 14, 2008, the average price for a gallon of regular gasoline in the U.S. was $3.39—up $0.51 per gallon (17.8 percent) from a year ago. The price in the New York City area was $3.29 per gallon, an increase of $0.44 per gallon (15.3 percent) from the same time last year. The $3.39 per gallon still falls short of the all time high, set in March 1981, when a gallon of regular gasoline cost $3.41 in today's (March 2008) dollars.

Such fluctuations in gasoline prices have increased substantially since 1998. According to the Energy Information Administration (EIA): 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 2008. It is anticipated that there may be future increases in gasoline prices due to increases in crude oil prices triggered by potential unrest in producing areas, and because of supply adjustments due to phase out of the additive MTBE. MTBE is being 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. Conversely, U.S. refinery capacity is being increased, and refineries in the Netherlands and United Kingdom are supplying more gasoline to the U.S. since more Europeans are switching to diesel.

Other factors putting upward pressure on fuel prices are:

- Gasoline consumption is expected to continue to grow, albeit at moderate rates;
- Demand for gasoline and petroleum products from China and other developing nations;
- Volatility and political unrest in oil producing countries, particularly in the Middle East;
- Gasoline quality requirements under the U.S. Environmental Protection Agency's (EPA) Tier 2 Vehicle and Gasoline Sulfur Program mandate further reduction in sulfur content. EPA estimates that the sulfur program will cost the refining industry about 2 cents per gallon to produce low-sulfur gasoline;
- Higher diesel fuel prices are also expected because of the additional cost of producing ultra-low-sulfur diesel fuel;
- Hurricanes and tropical storms with a potential to cause significant outages could add to the volatility of prices of motor fuel.

During 2007, transactions on TBTA facilities increased, over 2006 even though gasoline prices continued to generally rise. 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.

From 1995 to 2000, TBTA traffic increased 2.3 percent per year when gasoline prices were relatively stable; whereas from 2000 to 2007 TBTA traffic increased 0.4 percent per year while New York City regular gasoline prices increased 8 percent per year. (One toll rate increase occurred in 1996 during the first period, and two during the second period—in 2003 and 2005).

Gasoline prices in New York City are now over $3.00 per gallon. If this level is exceeded for a prolonged period of time, it may have an adverse effect on travel in the region. Discretionary travel (vacation and recreational trips) may decline. Most of the trips on the TBTA facilities, however, are commuter or work-oriented, so there should not be a significant change in work travel unless the price increases continue at a rate comparable to previous years.

According to the EIA *Short-Term Energy Outlook*, released April 8, 2008:

> The projected higher costs for crude oil will contribute to higher petroleum product prices. Motor gasoline prices are projected to average $3.36 per gallon in 2008, up 55 cents from last year. Diesel prices are projected to show even larger increases in 2008, averaging $3.62 per gallon, or 74 cents above the 2007 average price. The monthly average gasoline price is projected to peak at about $3.60 per gallon this spring, while monthly diesel prices are expected to average about $3.90 per gallon in March and April. Weekly diesel prices have already crossed the $4.00-per-gallon threshold in many regions of the country.
>
> U.S. consumption of liquid fuels and other petroleum is expected to decline in 2008 by about 85,000 barrels per day (bbl/d) as a result of the economic slowdown and high petroleum prices. After accounting for increased ethanol use, U.S. petroleum consumption is projected to fall by 210,000 bbl/d in 2008.

> U.S. real gross domestic product (GDP) is expected to decline in the first half of the year and then start growing again, with annual growth in 2008 at 1.2 percent, the slowest annual rate since 2001. An expected modest economic recovery in 2009, combined with lower petroleum prices, is projected to boost total U.S. liquid fuels and other petroleum consumption by about 200,000 bbl/d.

This projection assumes no significant unplanned refinery outages or crude oil production losses.

According to the EIA's *This Week In Petroleum* of February 21, 2008 "both planned and unplanned refinery outages were high in early 2007." "EIA expects refinery outages in late spring and early fall, since that is the time between peak heating and driving seasons when refiners typically do most of their planned maintenance." However, while most hurricane-affected refinery capacity (from Katrina and Rita in 2005) recovered in 2006, more than half the unplanned loss in capacity in early 2007 was associated with BP's Texas City refinery and Valero's McKee refinery. The article goes on to state:

> Availability of refinery capacity for 2008 may be significantly improved over 2007. Given lower planned outages scheduled for this spring season, and assuming the return of unplanned outages to more typical levels, including the return of BP's Texas City refinery to full operation, gasoline production could increase from 100 to 200 thousand barrels per day over last year's level. The uncertainty behind the timing of the return of BP's Texas City refinery, and the recent tragedy at Alon's 67 thousand-barrel-per-day Big Spring refinery are a reminder of the seriousness of this business and of how quickly incidents can turn the supply situation around. Nevertheless, the likelihood of improved production availability over 2007 levels seems relatively high to EIA. At least some of the "lost" 2007 capacity appears likely to be "found."

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 developed a set of elasticity factors for each of the TBTA crossings based on twelve toll increases between 1997 and 2005. 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. These historic elasticity factors are shown in Table 16.

Table 16 Historical Elasticity Factors

Location	Elasticity Factors
Bronx-Whitestone/Throgs Neck	–0.106
Brooklyn-Battery Tunnel	–0.358
Cross Bay Bridge	–0.137
Henry Hudson Bridge	–0.289
Marine Parkway Bridge	–0.101
Queens Midtown Tunnel	–0.192
Triborough Bridge	–0.208
Verrazano-Narrows Bridge	–0.127

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 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.

A new toll increase was implemented on March 16, 2008. At this date, it is too early to evaluate the effects of this increase and to determine if the elasticity factors have changed. Revenue projections for 2008 have been calculated using the historical elasticity factors shown on Table 16.

It is our understanding that TBTA intends to implement future toll increases of 5 percent every two years in the future. For the forecast period of this report, this would be toll increases in 2010, 2012, 2014, 2016 and 2018. The 5 percent biennial increases (2.47 percent per year, compounded) will be at approximately the same level as recent general cost increases due to inflation. This relatively small increase coupled with the high usage of Electronic Toll Collection (ETC) on TBTA facilities would tend to reduce the historical elasticity. Also, the elasticities resulting from the 2003 and 2005 toll increases (the first two toll increases of the ETC era) were lower than the historical elasticities. Such results for TBTA – that show that ETC users are not as affected by toll increases as those who pay cash tolls – are consistent with results of other toll agencies with substantial ETC usage. Therefore, the elasticity factors used in projecting toll facility volumes for 2010 through 2018 have been assumed to be 60 percent of the historical elasticity factors. These are shown on Table 17.

Table 17 Elasticity Factors for 2010-2018

Location	Elasticity Factors
Bronx-Whitestone/Throgs Neck	–0.063
Brooklyn-Battery Tunnel	–0.215
Cross Bay Bridge	–0.082
Henry Hudson Bridge	–0.174
Marine Parkway Bridge	–0.061
Queens Midtown Tunnel	–0.115
Triborough Bridge	–0.125
Verrazano-Narrows Bridge	–0.076

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 .115%.

Two sets of forecasts have been prepared: one at constant tolls (at the present level); and the other with toll increases assumed by URS to occur in January 2010, 2012, 2014, 2016 and 2018.

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 by 5 percent every two years from 2010 to 2018. It was also assumed that the truck tolls would be increased proportionately, and that the relationships between cash and *E-ZPass* tolls for passenger cars would remain the same as those implemented for the latest toll increase on March 16, 2008.

As for the impacts of the toll increases on traffic demand, the elasticity factors from Table 17, as described above, were used to calculate traffic decreases, as shown in Table 18. 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 18 Estimated Percent Change in Average Toll Rates and Traffic

Facility	Elasticity Factor	2010		2012		2014		2016		2018	
		Toll	Traffic	Toll	Traffic	Toll	Traffic	Toll	Traffic	Toll	Traffic
Bronx–Whitestone/Throgs Neck Bridge	–0.063	5.00%	–0.32%	5.00%	–0.32%	5.00%	–0.32%	5.00%	–0.32%	5.00%	–0.32%
Brooklyn-Battery Tunnel	–0.215	5.00	–1.08	5.00	–1.08	5.00	–1.07	5.00	–1.07	5.00	–1.08
Cross Bay Bridge	–0.082	5.00	–0.41	5.00	–0.41	5.00	–0.41	5.00	–0.41	5.00	–0.41
Henry Hudson Bridge	–0.174	5.00	–0.87	4.50	–0.78	5.53	–0.96	4.74	–0.82	5.00	–0.87
Marine Parkway Bridge	–0.061	5.00	–0.30	5.00	–0.30	5.00	–0.30	5.00	–0.30	5.00	–0.30
Queens Midtown Tunnel	–0.115	5.00	–0.58	5.00	–0.58	5.00	–0.58	5.00	–0.58	5.00	–0.58
Triborough Bridge	–0.125	5.00	–0.62	5.00	–0.62	5.00	–0.62	5.00	–0.62	5.00	–0.62
Verrazano Narrows Bridge	–0.076	5.00	–0.38	5.00	–0.38	5.00	–0.38	5.00	–0.38	5.00	–0.38

The periodic toll increases indicated above were selected by URS to provide increases for cash passenger cars of 5 percent every two years on all facilities. These increases have been assumed by URS for forecasting purposes only. For the purposes of this analysis, it has been assumed that the annual rate of inflation over the forecast period will be three percent.

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* participation rate at 73.5 percent in 2007, 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 2008), matching the 2007 traffic volumes against the highest annual volumes recorded, by facility, going back to 1970. Note in Table 19 that the Cross Bay Bridge and the Queens Midtown Tunnel carried their highest volumes in 2007.

Table 19 Comparison of 2007 Traffic with Highest Recorded Levels Since 1970

Facility	Highest Volume Since 1970		2007 Volume* (000s)	2007 Percent of Highest Volumes
	Year	Volume (000s)		
Throgs Neck Bridge	2006	43,186	41,914	97%
Bronx - Whitestone Bridge	2004	45,223	42,372	94
Triborough Bridge	1988	64,215	62,491	97
Queens Midtown Tunnel	2007	29,366	29,366	100
Brooklyn-Battery Tunnel	1971	22,920	18,132	79
Verrazano-Narrows Bridge	2002	73,361	70,349	96
Henry Hudson Bridge	2004	24,703	24,110	98
Marine-Parkway- Gil Hodges Bridge	1971	9,150	7,831	86
Cross Bay Veterans Memorial Bridge	2007	7,676	7,676	100

* 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.

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 either another TBTA facility or to one of the City's toll-free bridges. 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 lower level approach deck rehabilitation will require the closure of one lane in each direction through August 2008.

- The **Cross Bay Veterans Memorial Bridge** superstructure/deck rehabilitation began in 2007. The roadway is to be reduced to two lanes in each direction through 2010. Due to low traffic volumes, this should not have a detrimental effect on traffic flows.

- The **Marine Parkway-Gil Hodges Memorial Bridge** will have daily lane closures until April 2009 for on-going construction.

- On the **Bronx-Whitestone Bridge**, the replacement of the approach decks will begin in the Bronx in 2008, and in Queens are expected to be scheduled in 2011-2012 once the Bronx approach is completed. Three lanes will be maintained in the peak direction, with two lanes in the reverse direction during staged construction.

- The **Throgs Neck Bridge** has multiple rehabilitation projects scheduled, including replacing the concrete deck. Installation of an orthotropic deck is expected to begin in 2012. With a contraflow lane, three lanes will be maintained in the peak direction. Cross

Island Parkway ramp closures are scheduled to occur during 2008 to 2009 (for 35 days on each ramp). It is anticipated that traffic will divert to the Bronx-Whitestone Bridge during these construction projects, or in the case of the Cross Island Parkway ramps, to the Clearview Expressway (Queens) approach to the Throgs Neck Bridge.

- Redecking of the lower level of the **Henry Hudson Bridge** is underway, with completion scheduled by 2010. Construction is staged to minimize traffic impacts. Replacement of the Upper Level Deck in the vicinity of the toll plaza that was scheduled for 2008 is currently on hold.

- **Triborough Bridge** deck widening and repair on Wards and Randalls Islands and at the Bronx toll plaza requires off peak closures but no peak restrictions.

- **Queens-Midtown Tunnel** has no on-going work.

Operational Changes Resulting from September 11, 2001

- The ban on eastbound commercial vehicles remains in effect at the Holland Tunnel. Some commercial vehicles (classes 1,2 and 3 - 2 and 3-axle single unit trucks) may now use the westbound Holland Tunnel to exit New York City. Vehicle classes 4, 5 and 6 are banned in both directions. In addition, no trailers or towed vehicles are allowed in both directions.

Competing Ferry Service

- **New York Water Taxi** operates East River ferry service between Manhattan, Brooklyn and Queens. However, service on both the East River routes and the south Brooklyn route have been suspended due to decreased winter ridership coupled with increasing fuel prices. The East River service is scheduled to resume on May 1, 2008. The East River routes include Pier 11/Wall Street and East 34th Street to Fulton Ferry Landing, Hunters Point and Schaefer Landing. In addition to the East River routes, New York Water Taxi provides service between Yonkers and both the World Financial Center and Pier 11/Wall Street. Service generally operates during peak periods.

- NYC Department of Transportation (NYCDOT) operates the **Staten Island Ferry** between the Battery and St. George. Ferries carry vehicles and passengers on frequent schedules around the clock. Additional weekend service began in 2006 with 30-minute service during the day.

- PlaNYC, as further described in the section on "Other Considerations" below, proposes to expand ferry service to growing waterfront communities.

Since ferries have limited or no capacity for vehicles, ferry services will not significantly affect TBTA facilities.

Competing East River Crossings Construction

- **Queensboro Bridge** – Since 1981, 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. The rehabilitation of the north and south lower outer roadways was recently completed. Contract 6 was expected to be complete by June 2007. Cleaning and repainting structural steel of the main spans and approach roadways is scheduled to be completed in January 2009. Seismic retrofitting of the Queensboro Bridge is programmed to be completed in 2013.

- **Williamsburg Bridge** – Miscellaneous rehabilitation of the main span began in March 2003 and is expected to be completed in December 2008. This project includes rehabilitation of tower bearings, truss system and steel structure of the towers, replacement or adjustment of cable suspenders, installation of maintenance travelers (inspection platforms) under the main span, and painting of stiffening trusses. The project also includes installation of an Intelligent Transportation System (ITS). With the reopening of the lower roadway of the Manhattan Bridge in October 2007, new traffic patterns took effect on the Williamsburg Bridge, which includes four lanes of traffic in the peak direction. Seismic retrofitting of the Williamsburg Bridge is programmed to commence in 2011.

- **Manhattan Bridge** – The current contract is scheduled for completion in April 2008. The contract includes complete removal and replacement of the lower roadway and milling Sands Street in Brooklyn to create additional clearance for trucks. It also includes reconstruction of the lower roadway; rehabilitation of the anchorages; rehabilitation of the travelers; installation of new lighting on the north upper roadway and lower roadway; upgrading of the lower roadway lane control signals, installation of a fire protection system, and rehabilitation of the tower canopies and balconies. The work on the lower roadway began in October 2006 and was completed in October 2007. Closure of the lower roadway until October 2007 may have induced some traffic to divert to the Brooklyn-Battery Tunnel and Williamsburg Bridge. Replacement of the Manhattan Bridge suspender ropes and rewrapping all cables is expected to be complete in 2012. Seismic retrofitting is scheduled to be completed in 2014.

- **Brooklyn Bridge** – The reconstruction program that began in 1980 is expected to be complete in 2014.Maintenance and inspection of the maintenance travelers on the main span of the Brooklyn Bridge is expected to be completed in June 2009. At that time, rehabilitation of the approaches and ramps and the painting of the bridge is scheduled to begin. An Intelligent Transportation System is scheduled to be implemented after 2009. All construction projects, including seismic retrofitting of the Brooklyn Bridge, are programmed to be complete in 2014.

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.

Other Major Bridge and Roadway Construction

During the forecast period, several major roadway and bridge projects, which are part of NYMTC's Transportation Improvement Program (TIP) for 2008-2012, 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.

Other bridges, roads and overpasses programmed for construction include:

- **Willis Avenue Bridge** – Connects the FDR Drive, Major Deegan Expressway and Bruckner Expressway Construction of a new Willis Avenue Bridge started in 2007 and is scheduled to be completed by the end of 2012. A new off-line bridge is to be constructed south of the existing bridge, which will be maintained in service until the new bridge is opened to traffic. Any restrictions on the Willis Avenue Bridge or approach ramps would induce some diversions to the Triborough Bridge.

- **Third Avenue Bridge** – Replacement of the span over the Harlem River was completed in 2006. All five lanes are open to traffic, and approaches in the Bronx have been restored. Whatever diversions to the Triborough Bridge that had occurred during reconstruction should have returned to routings based on normal driver preferences.

- **Broadway Bridge —** Rehabilitation of the Broadway Bridge over the Harlem River is scheduled to begin in 2010, which may divert some traffic to the Henry Hudson Bridge.

- **Madison Avenue Bridge —** Rehabilitation of the Madison Avenue Bridge over the Harlem River is scheduled to begin in 2011.

- **Major Deegan Expressway** (I-87) – Rehabilitation of various overpasses along the Major Deegan Expressway between 138th Street and Mosholu Parkway is scheduled for completion in 2009. Safety improvements northbound at West 230th Street are scheduled for 2008. Traffic impacts at the Triborough Bridge should not be significant.

- **Three Bridges —** The Three Bridges Project in the Bronx included reconstruction of:
  - I-295 (Cross Bronx Extension) bridge over Randall Avenue;
  - East Tremont Ave. over I-295 (CBE); and
  - I-95 bridge over I-695 (Throgs Neck Expressway).

  Reconstruction of these overpasses has reached substantial completion. The first two projects necessitated the closing of one lane in each direction of the CBE between East Tremont Avenue and Randall Avenue during midday. This allowed for two lanes in each direction during peak hours. More lane closures occurred during the off-peak and night hours to facilitate project work. Motorists experienced lane closures on I-95 northbound and I-695 north and southbound during off-peak hours. Service roads in this

area were subject to shifts to temporary lanes. Because of these construction projects, traffic may have shifted from the Throgs Neck Bridge to the Bronx-Whitestone Bridge or possibly the Triborough Bridge. Intelligent Transportation System (ITS) components were installed.

- I-278 **Gowanus Expressway** Repair and Interim Deck Replacement — The project includes replacement of the concrete deck and deteriorated elements, until a permanent improvement is constructed. One construction contract between the Brooklyn-Battery Tunnel and Sixth Avenue was completed in 2007.Construction on the eastbound BQE Connector ramp, from the Brooklyn-Battery Tunnel to the Prospect Expressway, the Prospect Expressway to the Shore Parkway and the Lower Gowanus is currently underway and is scheduled for completion in the summer of 2009. Brooklyn-Battery Tunnel approaches and Prospect Expressway interchange construction are scheduled from summer 2008 to fall 2010. The Shore Parkway interchange is scheduled from 2009 to 2011. The project is being designed to minimize lane closures and traffic disruption. The Bus/HOV lane is being maintained from the Verrazano-Narrows Bridge to the Brooklyn-Battery Tunnel during the AM peak period, and a westbound Bus/HOV lane is to be operated from 2009 to 2010.

- I-278 **Brooklyn Queens Expressway —** Park Avenue Viaduct. New York State Department of Transportation (NYSDOT) began reconstruction of the Brooklyn Queens Expressway between Flushing Avenue and Sands Street in 2005, which is anticipated to be completed in 2009. Six travel lanes are available at all times except midnight to 5:00 AM.

- Reconstruction of the I-278 **Brooklyn Queens Expressway** cantilever section between Atlantic Avenue and Sands Street is programmed for design in 2010-2012.

- I-278 **BQE Kosciusko Bridge —** New York State Department of Transportation completed the Draft Environmental Impact Statement for the Kosciuszko Bridge Project. the project's final EIS is currently completing the agency review process and should be released in the Spring of 2008. Alternatives provide for maintaining all lanes on the Brooklyn Queens Expressway and local connections, while constructing a replacement bridge. Construction is programmed to begin no sooner than 2011.

- Another phase of the I-278 **Brooklyn Queens Expressway** reconstruction project runs from 61st Street to Broadway in the Woodside area of Queens. Construction work begun in the spring of 2005 is estimated to be completed by the end of 2008. During construction, three lanes will generally be available for travel in each direction with many lane shifts such as use of shoulders or use of median area to accommodate the rehabilitation projects. Lane closures, if necessary, will only occur at night or on weekends. It is anticipated that traffic diversion from the Triborough Bridge to the Bronx-Whitestone Bridge will be insignificant.

- **Whitestone Expressway** bridge (I-678) over the Flushing River – The estimated completion date of the project is mid-2009. All existing travel lanes will be maintained

during peak hours. Lane closures will take place during non-peak hours. There will be no lane closures two hours before and two hours after a New York Mets home game. Rehabilitation of the northbound and southbound Whitestone Expressway and construction of the new northbound Van Wyck Expressway ramp to the northbound Whitestone Expressway, as well as an Intelligent Transportation System, have been completed. There should be no significant effect on Bronx-Whitestone Bridge traffic.

- **Route 9A** – After Route 9A (West Street) was heavily damaged when the World Trade Center was attacked, a six lane temporary road was opened, allowing the Brooklyn-Battery Tunnel to re-open. Further construction to improve Route 9A to a six- to eight-lane urban highway is scheduled for completion in 2009. 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** (I-495) –Van Wyck Expressway to Grand Central Parkway **—** a Record of Decision is expected in March 2008. Alternatives include: (1) rehabilitation of overpasses, or (2) rehabilitation plus three new connecting ramps.

- **Brooklyn Queens Expressway** (I-278) **– Grand Central Parkway —** Rehabilitation from 25th Avenue to 71st Street is scheduled to begin in 2009 and from Astoria Boulevard to 44th Street in 2010.

- **Clearview Expressway** (I-295) **– Grand Central Parkway —** Rehabilitation of inter-change is scheduled to begin in 2010.

- **Van Wyck Expressway** (I-678) – Rehabilitation of Roosevelt Avenue bridge is scheduled to begin in 2010.

- **Belt Parkway** – Provides access to the Verrazano-Narrows Bridge from southern Brooklyn, JFK Airport, Queens and the Long Island parkway system. Rehabilitation of bridges over four waterways and three overpasses are underway or scheduled for 2008-2014. Traffic impacts should be limited to detours or alternative access routes during off-peak periods, when construction severely limits capacity.

- **Staten Island Expressway** (I-278) – NYSDOT is operating exclusive bus lanes in both directions in the median of the Staten Island Expressway on a 24-hour/7-day basis, between Slosson Avenue and the Verrazano-Narrows Bridge toll plaza. A recent Bus Lane / Priority Lane Study analyzed the feasibility of extending the bus lanes west to the Goethals Bridge toll plaza; and allowing use of the lanes by high-occupancy vehicles (HOV3+). These improvements would provide alternatives to single-occupant automobile use, particularly during peak periods. Construction between Slosson Avenue and Victory Boulevard is programmed to begin in 2011. One of the feasible scenarios would allow off-peak and weekend use of the lanes by all traffic, which would make the Verrazano-Narrows Bridge more attractive to motorists at those times.

- **Staten Island Expressway** (I-278) access improvement between the Verrazano-Narrows Bridge toll plaza and Renwick Avenue is programmed for construction beginning in 2010, to include 5 new ramps, relocating/reconfiguring 3 ramps and adding auxiliary lanes. These improvements will improve traffic flows between the Staten Island Expressway and Verrazano-Narrows Bridge**,** as well as reduce accidents**.**

- **FDR Drive – 34th Street Viaduct –** Design of reconstruction of the FDR viaduct from East 24th to East 42nd Street is scheduled to begin in 2008. The project will reconstruct this section of the FDR to reasonable standards and improve safety. It is anticipated that the construction schedule will resemble the current project on the FDR extending from East 53rd to East 64th Streets.

- **Harlem River Drive —** Design of safety alignment improvements between East 116th and East 125th Streets is scheduled to begin in 2009, followed in 2011 by reconstruction between East 125th and East 132nd Streets including a new entrance ramp from Third Avenue onto southbound Harlem River Drive.

- **Henry Hudson Parkway —** The viaduct from West 72nd to West 82nd Streets is programmed for rehabilitation beginning in 2009.

- **Bruckner/Sheridan Expressway Interchange -** Preliminary engineering and Draft Environmental Impact Statement are currently underway on reconstructing the interchange of Bruckner Expressway (I-278) and Sheridan Expressway (I-895). The project will relieve the four-lane bottleneck on the six-lane Bruckner Expressway and improve access to the Hunts Point peninsula. The scenarios include deconstructing the Sheridan Expressway. It is anticipated that construction will be completed by 2016. Traffic patterns to/from the Triborough Bridge would be altered somewhat, depending on the alternative selected.

- I-278 – **Gowanus Project** – For long-term improvements, NYSDOT and the Federal Highway Administration (FHWA) are now preparing a Draft Environmental Impact Statement (DEIS). Several project alternatives are being explored: No-build/maintenance; relief viaduct; rehabilitation and tunnel. Construction is projected to begin in 2013 if funding is available, and to be finished by 2020-2022. It can be assumed that some traffic would divert to the Holland Tunnel from the Verrazano-Narrows Bridge and Brooklyn-Battery Tunnel.

- **Goethals Bridge** Replacement (I-278) **–** The Environmental Impact Statement is scheduled for completion in 2007. All alternatives would have six lanes. Construction might be completed by approximately 2015.

- **Staten Island Expressway–West Shore Expressway** (I-278/NY-440) interchange **—** Design of reconstruction is scheduled to begin in 2012. This project is to support potential Bus/HOV lanes on the Staten Island Expressway and reconstruction of the Goethals Bridge, and provide better connections to Howland Hook intermodal marine/rail/highway facilities.

The Goethals Bridge and Staten Island Expressway-West Shore Expressway improvements would positively affect traffic volumes on the Verrazano-Narrows Bridge.

- **Intelligent Transportation Systems** are scheduled to be installed beginning in 2008 in Brooklyn, including on the Gowanus Expressway (I-278), on State routes in Queens, on the New England Thruway (I-95), and fiber optic cable on the Henry Hudson Parkway. Substantial funds are programmed for ITS planning, coordination and management, and for operational support of NYCDOT's Traffic Management Center and Integrated Incident Management System. Active management of traffic and incidents should result in smoother flow on the highway system including TBTA facilities, and increase reliability and motorists' satisfaction.

Other Considerations

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

- On April 22, 2007 Mayor Bloomberg announced **PlaNYC** which proposes congestion pricing in Manhattan along with transit improvements, including:

  Provide more capacity for trips into Manhattan on **East River Bridges Bus/HOV Lanes** with priority given to the most space-efficient forms of transportation. New York City could dedicate roadway capacity on the three City-owned East River bridges that can accommodate buses (the Manhattan Bridge, Williamsburg Bridge and Queensboro Bridge) and high occupancy vehicles only. Access routes in Brooklyn and Queens may also be assigned bus lanes to ensure that buses would avoid congestion in accessing the bridges, buses could travel from areas of Brooklyn and Queens that now have limited transit service, cross the East River in a dedicated lane, and use the First and Second Avenue Bus Rapid Transit (BRT) system and other existing bus lanes in Manhattan. The bus and HOV lanes on the East River bridges could be in place by 2009.

  Expand **ferry service** to growing waterfront communities.

  Build a **rail link** to connect Lower Manhattan with Brooklyn, Jamaica, JFK Airport and Long Island.

  Implement a **congestion pricing** system to reduce traffic in the Manhattan Central Business District (CBD) and surrounding areas and encourage people to use alternatives to private automobiles. Drivers would be charged for traveling on interior streets in Manhattan south of 86th Street, between 6 AM and 6 PM weekdays.

  A Congestion Mitigation Commission to study plans to reduce traffic congestion and other related health and safety issues within the City of New York was created. The Commission evaluated the City's plan as well as a number of other proposals. They held public hearings in each of the five boroughs, as well as in Westchester and on Long

Island. The plan was voted on and approved by the City Council in April 2008. After this approval, it was submitted to the New York State Legislature. The State Legislature did not take any action on the plan before the federal deadline of April 7, 2008. The plan needs New York State legislative approval and therefore cannot be implemented at this time. It is possible that this plan or a similar plan could be submitted to the Legislature, for approval, at a future date.

- **Impact of Transit Improvements.** Significant transit improvements, when completed, are expected to affect TBTA traffic levels during the forecast period through the year 2017:

  MTA Second Avenue Subway: Construction of Phase 1 started in April 2007 and is scheduled for completion in 2013. Service from new stations at 96th, 86th and 72nd Streets along Second Avenue will connect to the 63rd Street line. Phases 2, 3 and 4 will extend service to 125th Street and to Lower Manhattan by 2018 as funding becomes available, resulting in the creation of 16 new subway stations on Second Avenue. Four traffic lanes will be maintained through construction zones, and cross streets will be kept open.

  The second section from 96th Street north to 125th Street is not yet funded and construction will probably be included in the 2010-2014 Capital Plan. Construction of the Second Avenue/34th Street station might result in 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 ramps between the Triborough Bridge and 125th Street may experience a loss of capacity. The high-volume ramps between the FDR Drive and the Triborough Bridge would not be affected.

  MTA/LIRR East Side Access: This project will result in a new connection from the LIRR mainline tracks in Queens under Sunnyside Yard, connecting to the 63rd Street Tunnel leading to Grand Central Terminal. New tunnels are being bored in Manhattan west from Second Avenue, then under Park Avenue and into the lower level of Grand Central Terminal. Completion is scheduled for 2013. MTA anticipates that some travelers to the East Side will shift to the LIRR from other modes, including TBTA facilities.

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 carried out 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.

- 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.

- Congestion pricing in Manhattan will not be implemented in the near future.

- For the scenario with periodic toll increases, tolls on TBTA facilities will be increased every other year by approximately five percent (2.47 percent per year compounded) beginning in 2010 and continuing through 2018. These increases are very close to recent increases due to normal inflation. Almost three-quarters of all tolls paid on TBTA facilities are ETC transactions. Toll elasticities for toll increases in 2003 and 2005 (the first two toll increases in the ETC era) were lower than historical elasticities. Such results for TBTA – that show that ETC users are not as affected by toll increases as those who pay cash tolls – are consistent with results of other toll agencies with substantial ETC usage. Therefore, it was assumed that elasticities for future toll increases will be 60 percent of historical toll elasticities.

- 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. (This would be affected by implementation of PlaNYC).

- 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 above 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.

- LIRR East Side Access will shift some auto commuters to rail. If PlaNYC is not implemented, public transportation systems will not undergo other major construction programs nor schedule changes that would materially alter regional commuter patterns and result in significant traffic diversions from TBTA facilities. Congestion Pricing proposed in PlaNYC could shift vehicle trips from toll-free bridges to TBTA facilities. Bus/HOV lanes on City bridges could accommodate diversion from single-occupant auto trips.

- Current toll discount programs remain in effect at current projected levels, including the discount for *E-ZPass* 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 (2008-2018) 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 2008 budget and 2009 through 2011 financial plans, and growth estimates based on the CPI-U for "All Urban Consumers–New York PMSA" for labor expenses 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 17 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), 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, Henry Hudson and Verrazano-Narrows, Cross Bay bridges and Queens Midtown Tunnel will increase primarily during the off-peak period, since these facilities are presently near (95 percent +) or at 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 previous highest annual 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. For example, if grown at its full growth rate, the Throgs Neck Bridge will reach the previous highest annual traffic volume in 2013. After that, an application of the 50 percent growth factor was used for the remainder of the forecast period. The Queens Midtown Tunnel exceeded its previous high traffic volume in 2007, so its growth rate was halved beginning in 2008.

On this basis, starting with the 2008 estimated traffic by facility from Table 11, URS projected the traffic by facility as shown in Table 20, and calculated the corresponding toll revenue based on the estimated 2008 average tolls (also from Table 11).

General overall traffic growth in the range of 0.57 to 0.65 percent annually is estimated in the forecast period. This growth is based on the actual growth in traffic on each facility during the last 11 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. Adjustments have been made to the forecast for the Triborough Bridge to reflect the impacts during construction of the Second Avenue Subway.

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 20), to which the elasticity impacts (from Table 17) were applied. URS then applied the appropriate increased average tolls increased by the percentages in Table 18, in the years 2010, 2012, 2014, 2016 and 2018 (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 21.

URS

Table 20 Traffic and Toll Revenue Forecast, Constant Tolls

Year	Throgs Neck [b]	Bronx-White-stone	Tri-borough	Queens Midtown [b]	Brooklyn Battery	Verrazano-Narrows	Henry Hudson	Marine Parkway-Gil Hodges Memorial Bridge	Cross Bay Veterans Memorial Bridge	Total
Annual Traffic (000s)										
2007[a]	**41,914**	**42,372**	**62,491**	**29,366**	**18,132**	**70,349**	**24,110**	**7,831**	**7,676**	**304,240**
2008[c]	40,258	43,045	61,097	29,310	17,776	69,307	23,337	7,851	7,864	299,844
2009[e]	40,719	43,261	61,402	29,570	17,859	69,654	23,454	7,868	7,992	301,777
2010	41,186	43,477	61,709	29,831	17,942	70,002	23,571	7,886	8,121	303,726
2011	41,658	43,694	62,018	30,096	18,026	70,352	23,689	7,903	8,253	305,689
2012	42,135	43,913	62,328	30,362	18,110	70,704	23,807	7,921	8,387	307,667
2013	42,618	44,132	62,639	30,631	18,195	71,058	23,926	7,939	8,524	309,661
2014	42,862	44,353	62,952	30,902	18,280	71,413	24,046	7,957	8,662	311,426
2015	43,107	44,575	63,267	31,176	18,365	71,770	24,166	7,974	8,803	313,203
2016	43,354	44,798	63,584	31,452	18,451	72,129	24,287	7,992	8,946	314,992
2017	43,603	45,022	63,902	31,730	18,537	72,489	24,408	8,010	9,091	316,792
2018	43,853	45,247	64,221	32,011	18,624	72,852	24,530	8,028	9,238	318,604
Traffic Growth										
2007-2008[c]	–3.95%	1.59%	–2.23%	–0.19%	–1.96%	–1.48%	–3.20%	0.25%	2.45%	–1.44%
2008-2009	1.15	0.50	0.50	0.89	0.47	0.50	0.50	0.22	1.62	0.64
2009-2010	1.15	0.50	0.50	0.89	0.47	0.50	0.50	0.22	1.62	0.65
2010-2011	1.15	0.50	0.50	0.89	0.47	0.50	0.50	0.22	1.62	0.65
2011-2012	1.15	0.50	0.50	0.89	0.47	0.50	0.50	0.22	1.62	0.65
2012-2013	1.15	0.50	0.50	0.89	0.47	0.50	0.50	0.22	1.62	0.65
2013-2014	0.57	0.50	0.50	0.89	0.47	0.50	0.50	0.22	1.62	0.57
2014-2015	0.57	0.50	0.50	0.89	0.47	0.50	0.50	0.22	1.62	0.57
2015-2016	0.57	0.50	0.50	0.89	0.47	0.50	0.50	0.22	1.62	0.57
2016-2017	0.57	0.50	0.50	0.89	0.47	0.50	0.50	0.22	1.62	0.57
2017-2018	0.57	0.50	0.50	0.89	0.47	0.50	0.50	0.22	1.62	0.57
Average Toll										
2007[a]	**$5.20**	**$4.72**	**$4.57**	**$4.40**	**$4.19**	**$3.88**	**$1.86**	**$1.49**	**$1.57**	**$4.11**
2008[c]	5.50	5.02	4.86	4.63	4.46	4.14	2.03	1.57	1.69	4.37
2009[e]	5.57	5.09	4.92	4.69	4.52	4.21	2.08	1.59	1.72	4.43
2010-2018	5.57	5.09	4.92	4.69	4.52	4.21	2.08	1.59	1.72	4.43
Toll Revenues (000s)										
2007[a]	**$217,958**	**$200,076**	**$285,847**	**$129,348**	**$75,980**	**$272,837**	**$44,779**	**$11,635**	**$12,090**	**$1,250,549**
2008[c][d]	221,340	216,186	296,748	135,808	79,181	287,036	47,484	12,350	13,315	1,309,449
2009[e]	226,628	220,131	302,204	138,544	80,732	293,083	48,733	12,547	13,759	1,336,361
2010	229,225	221,232	303,715	139,770	81,109	294,548	48,977	12,575	13,983	1,345,134
2011	231,851	222,338	305,234	141,008	81,488	296,021	49,222	12,603	14,210	1,353,974
2012	234,508	223,449	306,760	142,256	81,869	297,501	49,468	12,631	14,441	1,362,883
2013	237,195	224,567	308,294	143,516	82,251	298,989	49,715	12,660	14,675	1,371,861
2014	238,554	225,690	309,835	144,787	82,635	300,484	49,964	12,688	14,913	1,379,549
2015	239,921	226,818	311,384	146,069	83,022	301,986	50,213	12,716	15,156	1,387,285
2016	241,295	227,952	312,941	147,362	83,409	303,496	50,464	12,745	15,402	1,395,067
2017	242,678	229,092	314,506	148,667	83,799	305,014	50,717	12,773	15,652	1,402,897
2018	244,068	230,237	316,079	149,983	84,191	306,539	50,970	12,802	15,906	1,410,774

(a) Actual 2007. Traffic numbers are preliminary and subject to final audit.
(b) Growth rates reduced by 50 percent because volume is at or near capacity level.
(c) Reflects partial-year toll increase from March 16, 2008 through December 31, 2008.
(d) Toll revenue adjusted in 2008 and thereafter to reflect estimated increase in *E-ZPass* usage of 0.5 percent per year.
(e) Reflects full year of toll increase implemented on March 16, 2008 for 2009 and thereafter.

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Table 21 Traffic and Toll Revenue Forecast, Periodic Toll Increases

Year	Throgs Neck	Bronx-Whitestone	Tri-borough	Queens Midtown[b]	Brooklyn Battery	Verrazano-Narrows	Henry Hudson	Marine Parkway-Gil Hodges Memorial Bridge	Cross Bay Veterans Memorial Bridge	Total
Traffic Change (from Table 17) due to Toll Elasticity										
2007-2008	–3.95%	1.59%	–2.23%	–0.19%	–1.96%	–1.48%	–3.20%	0.25%	2.45%	
2009-2010	–0.32	–0.32	–0.62	–0.58	–1.08	–0.38	–0.87	–0.30	–0.41	
2011-2012	–0.32	–0.32	–0.62	–0.58	–1.08	–0.38	–0.78	–0.30	–0.41	
2013-2014	–0.32	–0.32	–0.62	–0.58	–1.07	–0.38	–0.96	–0.30	–0.41	
2015-2016	–0.32	–0.32	–0.62	–0.58	–1.07	–0.38	–0.82	–0.30	–0.41	
2017-2018	–0.32	–0.32	–0.62	–0.58	–1.08	–0.38	–0.87	–0.30	–0.41	
Annual Traffic (000s)										
2007[a]	**41,914**	**42,372**	**62,491**	**29,366**	**18,132**	**70,349**	**24,110**	**7,831**	**7,676**	**304,240**
2008[c]	40,258	43,045	61,097	29,310	17,776	69,307	23,337	7,851	7,864	299,844
2009[e]	40,719	43,261	61,402	29,570	17,859	69,654	23,454	7,868	7,992	301,777
2010	41,055	43,339	61,324	29,659	17,749	69,737	23,366	7,862	8,088	302,179
2011	41,525	43,556	61,631	29,922	17,832	70,085	23,483	7,879	8,220	304,133
2012	41,868	43,634	61,553	30,013	17,723	70,168	23,416	7,873	8,319	304,566
2013	42,347	43,853	61,860	30,279	17,805	70,519	23,533	7,891	8,454	306,541
2014	42,455	43,932	61,781	30,370	17,697	70,602	23,424	7,885	8,556	306,702
2015	42,698	44,152	62,090	30,639	17,779	70,955	23,541	7,902	8,695	308,452
2016	42,806	44,231	62,011	30,732	17,670	71,039	23,464	7,896	8,800	308,650
2017	43,052	44,453	62,321	31,004	17,753	71,394	23,581	7,914	8,943	310,415
2018	43,161	44,533	62,242	31,098	17,644	71,479	23,493	7,907	9,051	310,608
Average Toll[d]										
2007[a]	**$5.20**	**$4.72**	**$4.57**	**$4.40**	**$4.19**	**$3.88**	**$1.86**	**$1.49**	**$1.57**	**$4.11**
2008[c]	5.50	5.02	4.86	4.63	4.46	4.14	2.03	1.57	1.69	4.37
2009[e]	5.57	5.09	4.92	4.69	4.52	4.21	2.08	1.59	1.72	4.43
2010-2011	5.59	5.59	5.17	4.92	4.75	4.42	2.18	1.67	1.81	4.65
2012-2013	5.87	5.87	5.43	5.17	4.99	4.64	2.28	1.76	1.90	4.89
2014-2015	6.17	6.17	5.70	5.42	5.23	4.87	2.41	1.85	1.99	5.13
2016-2017	6.48	6.48	5.98	5.70	5.50	5.12	2.52	1.94	2.09	5.39
2018	6.80	6.80	6.28	5.98	5.77	5.37	2.65	2.04	2.20	5.66
Toll Revenue (000s)										
2007[a]	**$217,958**	**$200,076**	**$285,847**	**$129,348**	**$75,980**	**$272,837**	**$44,779**	**$11,635**	**$12,090**	**$1,250,549**
2008[c][d]	221,340	216,186	296,748	135,808	79,181	287,036	47,484	12,350	13,315	1,309,449
2009[e]	226,628	220,131	302,204	138,544	80,732	293,083	48,733	12,547	13,759	1,336,361
2010	229,592	242,365	316,882	145,898	84,256	308,100	50,977	13,164	14,621	1,405,855
2011	232,222	243,577	318,466	147,190	84,650	309,641	51,232	13,193	14,858	1,415,029
2012	245,867	256,242	333,953	155,015	88,345	325,528	53,385	13,843	15,789	1,487,968
2013	248,685	257,523	335,623	156,388	88,758	327,156	53,652	13,874	16,045	1,497,703
2014	261,805	270,914	351,973	164,707	92,623	343,928	56,353	14,556	17,051	1,573,910
2015	263,305	272,268	353,733	166,165	93,056	345,648	56,635	14,589	17,328	1,582,727
2016	277,192	286,420	370,943	175,008	97,112	363,388	59,126	15,306	18,415	1,662,909
2017	278,780	287,852	372,798	176,558	97,566	365,205	59,421	15,340	18,714	1,672,233
2018	293,472	302,803	390,953	185,959	101,823	383,912	62,162	16,095	19,889	1,757,067

(a) Actual 2007. Traffic numbers are preliminary and subject to final audit.
(b) Growth rates reduced by 50 percent because volume is at or near capacity level.
(c) Reflects partial-year toll increase from March 16, 2008 through December 31, 2008.
(d) Toll revenue adjusted in 2008 and thereafter to reflect estimated increase in *E-ZPass* usage of 0.5 percent per year.
(e) Reflects full year of toll increase implemented on March 16, 2008 for 2009.

Effects of Second Avenue Subway Construction in Forecast Years

The foregoing tables forecasting traffic and toll revenues incorporate estimated effects of the construction of the Second Avenue Subway. Activity associated with such construction could 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 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 avenues and streets.

The first phase of the project will be between 96th Street and 63rd Street. URS anticipates some changes to current traffic volumes for TBTA's facilities when construction begins, 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.

For the Triborough Bridge, 27.6 percent of the traffic exits onto Second Avenue at 125th Street, 56.0 percent exits onto the FDR Drive, and 17.4 percent exits onto the Harlem River Drive via the 125th 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, it is estimated that the Triborough Bridge will lose up to 2 percent of total traffic (3 to 5 percent of traffic on the Manhattan span) for the period when construction is in the vicinity of the bridge.

The relocation of utility lines beneath Second Avenue in the vicinity of the Queens Midtown Tunnel would affect traffic patterns. This could also have an impact on the access route to the Queensboro Bridge. As mentioned previously, a 20 percent decrease in access route capacity may be anticipated and could result in a decrease in total traffic of approximately 3 to 6 percent during the period when construction is in the vicinity of the tunnel; however, this is not anticipated in the period included in the current estimates.

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.

Operating Expenses

The projection of operating expenses is shown in Table 22. Total operating expenses, consisting of labor and non-labor, are estimated to increase from $369.1 million in 2007 to $545.8 million in 2018. Labor expenses consist of wages, salaries, overtime and fringe benefits. Non-labor expenses include items such as maintenance, supplies, utilities and other expenses.

Operating expenses have been budgeted by TBTA for 2008 through 2011 as shown in Table 22. Nonrecurring costs include costs associated with the transition to a new contract for the *E-Zpass* Customer Service Center in 2008, additional bridge painting requirements in 2009 and the start of the next *E-ZPass* Replacement Program in 2010. The decrease in non-labor expenses from 2008 to 2009 is a result of decreases in budget for the Maintenance and Other Operating Contracts category.

The *E-ZPass* replacement program is estimated to be in effect for a five-year period, with an approximate cost of $20.3 million in 2010 and $23.1 million in 2011 and around half that level for 2012 through 2014. Other expenses are projected to increase at 4.5 percent in 2011, with growth tapering down to 3.0 percent in 2014 and then remaining at that level through 2018.

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

Table 22 Projected Operating Expenses
(000s)

Year	Labor[a]	Non-Labor[b]	Total[c]
2008[d]	$210,968	$215,894	$426,862
2009[d]	220,608	214,495	435,103
2010[d]	229,916	234,882	464,798
2011[d]	239,812	230,364	470,176
2012[e]	245,328	234,971	480,299
2013[e]	250,970	239,671	490,641
2014[e]	256,743	244,464	501,207
2015[e]	262,648	249,353	512,001
2016[e]	268,689	254,340	523,029
2017[e]	274,868	259,427	534,296
2018[e]	281,190	264,616	545,806

(a) Salaries, overtime and fringe benefits, net of capital reimbursement.
(b) Non-labor 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 labor expenses based on NY Region Average CPI, All Consumers; non-labor 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 23. For 2008, net toll revenue under either scenario is estimated at $882.6 million. In year 2018, net toll revenue at constant tolls is estimated to be $865.0 million and, with periodic toll increases, net toll revenue is estimated to be $1,211.3 million.

Table 23 Net Toll Revenue Forecast
(000s)

Year	Gross Toll Revenues		Operating Expenses	Net Toll Revenues	
	Constant Tolls	Periodic Toll Increases		Constant Tolls	Periodic Toll Increases
2008	$1,309,449	$1,309,449	$426,862	$882,587	$ 882,587
2009	1,336,361	1,336,361	435,103	901,258	901,258
2010	1,345,134	1,405,855	464,798	880,336	941,057
2011	1,353,974	1,415,029	470,176	883,798	944,853
2012	1,362,883	1,487,968	480,299	882,584	1,007,669
2013	1,371,861	1,497,703	490,641	881,220	1,007,062
2014	1,379,549	1,573,910	501,207	878,343	1,072,704
2015	1,387,285	1,582,727	512,001	875,284	1,070,726
2016	1,395,067	1,662,909	523,029	872,038	1,139,880
2017	1,402,897	1,672,233	534,296	868,601	1,137,937
2018	1,410,774	1,757,067	545,806	864,968	1,211,261

REVIEW OF PHYSICAL CONDITION

The facilities under TBTA's jurisdiction include two tunnels and seven bridges listed in Table 24, 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 Veterans Memorial Bridge, replacing the previous span, 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 25 lists TBTA's capital commitments for each facility from 2005 through 2009 (as amended in December 2006).

Table 24 Opening Dates of TBTA Facilities

Facility	Open to Traffic	Years in Use
Triborough Bridge	1936	72
Bronx-Whitestone Bridge	1939	69
Throgs Neck Bridge	1961	47
Henry Hudson Bridge	1936[(a)]	72
Queens Midtown Tunnel	1940	68
Brooklyn-Battery Tunnel	1950	58
Verrazano-Narrows Bridge	1964[(b)]	44
Cross Bay Veterans Memorial Bridge	1970[(c)]	38
Marine Parkway-Gil Hodges Memorial Bridge	1937	71

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 25 Capital Commitments by Facility, 2005 to 2009
(Millions of dollars)

Facility	Total by Facility 2005 through 2009[a, b]
Agency Wide[c]	$89.7
Brooklyn-Battery Tunnel	51.3
Bronx-Whitestone Bridge	174.9
Cross Bay Bridge	67.9
Henry Hudson Bridge	111.6
Marine Parkway Bridge	22.8
Queens Midtown Tunnel	16.3
Triborough Bridge	407.3
Throgs Neck Bridge	105.7
Verrazano-Narrows Bridge	154.6
Total	$1,202.1

Notes: (a) Does not add due to rounding.
(b) Amended December 2006.
(c) 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 with the facility engineers 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 condition inspections. Bridges are inspected biennially per federal and state mandate, with interim yearly inspections of any components that require monitoring. The purpose of the biennial inspection program is to maintain the safety and structural integrity of bridges. A recent report which assessed the TBTA's Bridge Inspection Program by an independent engineering firm well known in the field of structural inspection and appraisal, noted that "the program is meeting the minimum state and federal standards" and "In several respects the program exceeds the minimum standards" and "with respect to the accuracy, clarity, and thoroughness of the reports generated, we find them to be of the highest quality".

While there is no federal or state mandate, TBTA has decided that it will adopt biennial inspections for their tunnels as well, with more comprehensive inspections every ten years. The FHA/FTA Tunnel Inspection Manual recommends an interval of 2-5 years between inspections, thus TBTA is in conformance with this guideline. The regular biennial inspection of the Queens Midtown Tunnel was awarded in 2007 and will be completed this year. The Brooklyn-Battery Tunnel will undergo a comprehensive condition inspection in 2008.

The TBTA bridges were last inspected and their physical condition appraised in 2006/2007 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 under-water 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 close visual examination, 100% hands on inspection of designated critical elements, sounding and chipping concrete, scraping and cleaning steel, and taking appropriate measurements to determine the physical conditions of the bridges and tunnels. The biennial bridge inspection is performed per the guidelines of the New York State Bridge Inspection Manual and the Federal Guidelines. Under these guidelines, each bridge component is inspected and assigned a rating. Any priority conditions are reported immediately to the TBTA for prompt attention. The ratings are reviewed by TBTA personnel to assess what components of the bridge require more comprehensive inspection and rehabilitation, which is then awarded as contracts under the Capital and Maintenance Programs.

The biennial inspections of the tunnels will fill a similar function. The biennial tunnel inspections will consist of an overall assessment and rating of the various tunnel components, as documented in TBTA's ECP-318 guidelines, and will provide the function of ongoing monitoring of the tunnels for safety, operations and overall structural integrity. Since some tunnel components are not as readily accessible as bridge components, the comprehensive inspections will complement the biennials by providing a more in-depth assessment at regularly spaced intervals.

The consulting engineering firms who performed the 2006 and 2007 biennial inspections and those who performed or are performing the 2001 and 2008 tunnel inspections for each facility were/are:

Facility	*Consulting Firm*
Triborough Bridge	Charles H. Sells, Inc. (2006/2007)
Throgs Neck Bridge	Charles H. Sells, Inc. (2007)
Bronx-Whitestone Bridge	Hardesty and Hanover (2007)
Henry Hudson Bridge	HAKS (2007)
Queens Midtown Tunnel	Jenny Engineering (2008) facility approach bridges: HAKS (2007))
Brooklyn-Battery Tunnel	Parsons Brinckerhoff (2001)
Verrazano-Narrows Bridge	Lichtenstein Engineering Associates (2006/2007)
Marine Parkway/Gil Hodges Mem. Br.	HNTB (2007)
Cross Bay Bridge	HNTB (2007)

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, and therefore the results of these inspections are not available at this time. The 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 2011/2012, and Manhattan toll plaza construction anticipated for 2015. Deck widening and replacement construction of Ward's Island and Randall's Island viaducts began in August 2005, and completion is anticipated for spring 2009. The Ward's Island Approach Deck Replacement will include widening by one lane in each direction to minimize the traffic impacts. Minor priority maintenance steel repairs of components noted in the most recent inspection are being incorporated into the on-going work at the facility. Maintenance painting of Ward's Island Viaduct and the superstructure of the suspended spans are ongoing and is nearing completion. A contract to perform anchorage

rehabilitation and dehumidification was awarded in August 2006 and should be complete by spring of 2009. Projects completed within recent years include the main cable rewrapping and anchorage rehabilitation, and bridge deck replacement at the Queens approach. Numerous repair projects such as repair of the bridge deck joint drains, cracked deck, piers, superstructure, substructure, and suspended span deck replacement, and mechanical rehabilitation associated with the Harlem River and Manhattan lift span have also been completed.

Bronx-Whitestone Bridge - A major program to paint the main cables, suspender ropes and towers was awarded in October of 2007 and will continue through 2009. Design of interior and exterior anchorage rehabilitation is ongoing and construction is scheduled to begin in 2010. 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 continuing to be 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 installation of a lightweight orthotropic deck, required to replace the roadway deck, was recently completed. 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. Several replacement options are being studied, including some that could increase the structure's traffic capacity. There is no need to replace the cable in the near future, thus monitoring and maintenance of the main cables is ongoing. The design for the replacement of the Bronx approach span is complete, with construction anticipated to begin in fall of 2008. The Queens approach span replacement design will begin in summer of 2008, with construction in 2011-2015. Flag repairs in the approaches will continue until the approaches are replaced. Projects completed within recent years include: replacement of the stiffening truss with lightweight windfaring, painting and replacement of the collars of the suspender ropes, construction and testing of the prototype deck replacement for the suspended span, installation of orthotropic bridge deck in 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 - A full-scale design study of how to best implement orthotropic deck replacement has been awarded, with design anticipated for 2012. Construction of a major rehabilitation contract is ongoing that includes tower and structural steel painting, steel repairs of the suspended span superstructure, main cables and suspender ropes investigation and catwalk replacement, with completion anticipated in 2009. Full-scale lighting replacement on the structure will begin in 2008, phased with the deck replacements. Design for deck rehabilitation and replacement on the Queens approach is completed with construction expected to start in 2008. Design for rehabilitation of the fenders at the towers and anchorages began in April of 2006 with construction anticipated for spring of 2009. Structural repairs to address flag conditions from the most recent biennial inspection will be completed in spring/summer 2009. 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, south of the tollbooths, scour backfilling at piers 20, 42, 47, 49, 52, 55 and 56 and protection of piers 19, 20, and 46 to 57, structural steel rehabilitation, drainage system improvements, roadway barrier painting and replacement of the slab on grade in the toll plazas.

Henry Hudson Bridge - The study for the southbound lower level toll plaza expansion, replacement of the garage and the south approach replacement is in the scoping phase, and design is anticipated to start in 2010. The garage and south approach is expected to be replaced in 2015. The lower level toll plaza expansion is expected to take place in 2020-2023. The design for the replacement of the upper level deck in the vicinity of the toll plaza is on hold pending discussions of how to implement new tolling options. Funds for this work are programmed in the 2010-2014 Capital Program. Construction of the lower level deck replacement will continue through 2010. The design for the removal of the sidewalk and the curb stringers on the upper level, and the widening of the bridge is ongoing with construction anticipated for 2010. The cross drainage of the approaches between Dyckman Street and the main span are undergoing rehabilitation/replacement design with construction anticipated in August of 2008. Construction for the replacement of pier caps in the approaches is ongoing to address flagged conditions from a previous biennial inspection. Full depth deck repairs are ongoing and will be complete before summer. Ongoing major maintenance includes limited rehabilitation of the lower level garage consisting of concrete repairs, and repaving and waterproofing the roadway above the garage which will be complete in 2009. Miscellaneous rehabilitation of the Staff Street. and Dyckman Street. bridges and the northbound parkway are scheduled. Projects completed within recent years include: replacement of deck joints at Staff Street and spall repairs on abutments, and rock bolting, netting and scaling of the slopes adjacent to the approaches, comprehensive maintenance painting and steel repairs for the entire bridge structure including the main span and approaches, and major maintenance projects including spall repairs at the towers, resealing the upper level deck, and light pole rehabilitation on the parkway approaches. The stone wall guide rail was repaired, repair of steel stringer pedestal defects on the main bridge were completed, as well as the repair of bearings and installation of safety ladders and platforms to the Dyckman Street electrical rooms.

Queens Midtown Tunnel -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 for the electrical rehabilitation on the vent building is in procurement, with construction planned in the next capital program. The rehabilitation of two overpasses including deck repair and beam encasement repair in the Manhattan approach area was completed. Construction of an annex to the service building and replacement of the facility engineer's building with connection to the Service Building, and exterior rehabilitation of the Service Building is under design with construction scheduled to begin in 2008. Major maintenance projects include paving in portions of the tunnel and plazas, which is ongoing. Projects completed within recent years include the following: the rehabilitation of the pipe gallery connection between the Service Building and the Queens Emergency garage, 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), reconfiguration of the traffic island in the Manhattan entrance plaza to provide better traffic flow, and various structural repairs in the ventilation buildings.

Brooklyn-Battery Tunnel - The rehabilitation of the Brooklyn plaza pipe chase is complete. The design of structural and architectural repairs for vent structures is complete and construction is to be awarded in phases from 2007 through 2011. The second phase of rehabilitation of the tunnel walls and fire suppression system is anticipated for award in the next capital program.

Modernization and upgrade of the control room is ongoing and construction is scheduled for completion in fall of 2008. On Governor's Island, a new pump system to get water runoff into the sanitary system was designed with construction to be completed in summer of 2008. Design for repair of the exhaust fans in the ventilation structure is ongoing with construction planned for 2009 through 2012. Electrical design to replace the tunnel feeders and switchgears is ongoing with construction planned for the next capital program. Projects completed within recent years include: the construction of the elevator upgrades in the ventilation structures, egress improvements and the replacement of the facade in the Governor's Island building, construction of a second story addition with recladding, window replacement and masonry and roof repairs to the existing service building, construction of tunnel roadway and drainage system rehabilitation, tunnel leakage repairs and wall tile replacement, fire standpipe and waterline valve replacement, installation of a new ethanol fuel tank, and installation of new electrical generators.

Verrazano-Narrows Bridge - Lower Level and Lily Pond Avenue bridge have ongoing deck replacement projects that will finish this year. Design for the widening of the Belt Parkway ramps is scheduled for 2009. The toll plaza east and west bound ramps are currently in design and are scheduled to be re-decked in 2010-2012. Design for the utility relocation necessary for re-decking of the upper level suspended span is complete with construction to be awarded in 2008/2009. Redecking is planned for 2010. Design for tower/suspended spans seismic retrofit is scheduled for 2010. Miscellaneous steel repairs to address priority conditions noted in the most recent biennial inspection reports are being addressed in ongoing maintenance and capital programs. Rehabilitation and expansion of the service building is being considered. General maintenance paving is ongoing. Rehabilitation of the traveler is ongoing. The rehabilitation of the electrical substation design is expected to be complete and construction should be awarded in 2011. The Salt Storage Facility in Staten Island is in construction, and should be complete by the end of 2008. The installation of sensors with the provision of real time under bridge clearance is under development. Projects completed within recent years include: maintenance bridge painting of the entire suspended spans, rehabilitation, sealing and dehumidifying of the Brooklyn and Staten Island anchorages, rehabilitation of the service building roof , and maintenance painting of the Brooklyn approaches and tower painting including drainage rehabilitation of the lower level and top lower strut of the Brooklyn approaches.

Marine Parkway-Gil Hodges Memorial Bridge - The design-build contract for a pre-engineered service building is complete. Repairs of secondary members and at lower priority locations are in construction and are expected to be completed in spring of 2009. Ongoing maintenance work includes replacement of the span locks, painting of the deck trusses and repairs to the steel roadway and grating, which will be complete in spring of 2009. 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, priority steel repairs, refurbishing of the tollbooths and main motor shaft west, bearing replacement in the towers and replacement of the elevators in the towers.

Cross Bay Veterans Memorial Bridge - A contract to rehabilitate the deck and superstructure is ongoing with construction scheduled to be completed in 2010. A design to rehabilitate the substructure of the bridge, including the concrete piles and pile caps is complete and will be bid

with construction scheduled for 2010. A facility engineer's trailer was installed in 2007. Painting and refurbishing of the exteriors of the tollbooths is planned. Fender repair, and bike path rehabilitation are planned for the next capital program. Projects completed within recent years include: a salt dome, rehabilitation of the air conditioning system in the service building, boiler replacement, installation of continuity plates in the median barrier, the construction of structural and electrical rehabilitation of the concrete slab on grade at Ramp 'D' (southbound ramp extending from the main bridge lanes), the replacement of the main high voltage feeders from the south abutment to the main service building, the rehabilitation of the drainage system at the promenade at the Rockaway approach, repair to the office trailers, refurbishing of the interior of the tollbooths, and the complete concrete and drainage rehabilitation of the promenade and seawall.

Other Systemwide Improvements

Agency-Wide - Since the September 11 attack on the World Trade Center, TBTA has engaged consultants to assess security risks of their facilities. As a result of these 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 maintains a security department and incorporates mitigation measures into their operations, capital and maintenance programs.

TBTA is currently in the process of conducting a Weigh-In-Motion (WIM) project, which uses WIM technology to identify and restrict the passage of overweight vehicles on their facilities to dissuade illegal overweight vehicles from using their structures. Trucks up to the bridge formula with a maximum weight of 80,000 lbs are currently allowed by permit on TBTA facilities. Heavier trucks are allowed on the Throgs Neck Bridge only, driving in the center lane with their speed restricted to 30 mph, for a type T6 configuration up to 105,000 pounds, and five axle milk trucks up to 100,000 pounds. Three and four axle concrete trucks with up to 11 cubic yards of concrete are allowed through the Queens Midtown and Brooklyn Battery tunnels. Overload trucks, above these limits, may be allowed on and through TBTA facilities with special handling and a permit. According to the TBTA, these increases in allowable load were demonstrated by computations performed by its consultants to be within safe limits for the structures. 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 bridges, where feasible, will allow for heavier vehicles on some facilities, while more stringent enforcement is maintained.

Current Intelligent Transportation System project initiatives include:

- Further enhancements (additional sensors, redundant communication paths) to the previously completed weather recording systems at all facilities.
- Installation of additional Closed Circuit Television (CCTV) equipment for effective monitoring and managing of traffic and incidents as well as upgrading of the communications network with fiber.

- Installation of Video Incident Detection Systems (VIDS) is complete at the Brooklyn-Battery and Queens Midtown Tunnels, and the Throgs Neck Bridge. This system uses video feeds from in-tunnel cameras to automatically detect stopped traffic and alert facility personnel of possible traffic or security issues.
- Upgrading of the operations centers at all TBTA's facilities as well as internal integration with the Randall's Island Operations Control Center (RIOCC) is complete. The RIOCC has also 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. Installation and expansion of TRANSMIT (an *E-ZPass*-based system) and other incident detection systems is also proceeding well. TRANSMIT is now operational at 6 facilities and under construction at three more.
- The Variable Message Sign (VMS) program is proceeding well. Seven new VMS have been installed and approximately 23 more are in various stages of design and procurement. Even more are planned in the next capital program.
- Seven Variable Speed Limit Signs have now been installed. Approximately 64 additional are in various stages of design and construction.
- With respect to the E-ZPass toll collection system, a number of major improvements are now complete. All lane controllers and Plaza Host computers have been replaced. New Central Toll Registry (CTR) computers are being tested prior to installation. Further, TBTA is in the process of replacing a number of sensor devices in each toll lane.

Other 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 tollbooths systemwide, 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.

As part of the Capital Program planning process, TBTA personnel conduct a 20-year capital needs assessment every five years. The assessment is compiled from data from biennial inspections, and system improvements suggested by the technical departments, and include 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, could possibly 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.

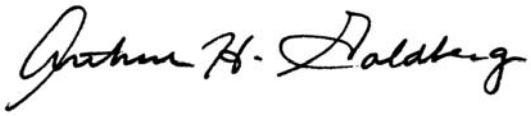
On the basis of the foregoing review and information available to us, from reports of others, it is our opinion that the TBTA bridges, tunnels and approaches are all geometrically and functionally adequate and structurally sound and generally maintained to good standards. Ongoing maintenance requirements 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 2018 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 2038, assuming maintenance consistent with past practice.

URS

Respectfully,

URS CORPORATION – NEW YORK



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