

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

and

Review of Physical Conditions

OF THE FACILITIES OF

Triborough Bridge and Tunnel Authority

June 1, 2007

Prepared for the
Triborough Bridge and Tunnel Authority

By

URS

TABLE OF CONTENTS

	<u>Page</u>
TRANSPORTATION INFRASTRUCTURE	1
Triborough Bridge and Tunnel Authority (TBTA)	1
Metropolitan Area Arterial Network	3
Other Regional Toll Facilities	4
Regional Public Transportation	5
TOLL COLLECTION ON THE TBTA FACILITIES	5
Current Toll Structure and Operation	5
<i>E-ZPass</i> Electronic Toll Collection System	7
TBTA's Role in <i>E-ZPass</i>	9
Passenger Car Toll Rate Trends and Inflation	9
HISTORICAL TRAFFIC, REVENUES AND EXPENSES AND ESTIMATED/BUDGETED NUMBERS FOR 2007	12
Traffic and Toll Revenue, 1996 to 2006	12
Traffic by Facility and Vehicle Class, 2006	15
Monthly Traffic, 2006	17
Changes in Monthly Traffic 2005 to 2006	17
Estimated Traffic and Toll Revenue, 2007	18
Operating Expenses 1996 to 2006	20
2007 Budget	22
FACTORS AFFECTING TRAFFIC GROWTH	23
Employment, Population and Motor Vehicle Registrations	23
Fuel Conditions	26
Toll Impacts and Elasticity	28
Bridge and Tunnel Capacities	30
TBTA and Regional Operational and Construction Impacts	31
Other Considerations	38
Summary of Assumptions and Conditions	40
PROJECTED TRAFFIC, REVENUES AND EXPENSES	43
Traffic and Toll Revenue at Current Tolls	43
Traffic and Toll Revenue with Periodic Toll Increases	44
Effects of Second Avenue Subway Construction in Forecast Years	47
Operating Expenses	47
Net Revenues from Toll Operations	49
REVIEW OF PHYSICAL CONDITION	51
Review of Inspection Reports	53
Long-Term Outlook for TBTA Facilities	60

TABLES

<u>Table</u>	<u>Page</u>
Table 1. Toll Rates at TBTA Facilities, Effective March 13, 2005	6
Table 2. <i>E-ZPass</i> Participation Rates	8
Table 3. Historical Trends in Non-Discounted Cash Passenger Car Toll Rates	10
Table 4. Cash Passenger Toll Rates Versus Consumer Price Index	11
Table 5. Annual Toll-Paying Traffic and Toll Revenue: 1996 to 2006	14
Table 6. Summary of Annual Paid Traffic and Toll Revenue: 1996 to 2006	15
Table 7. Traffic by Facility and Vehicle Class, 2006	16
Table 8. Monthly Traffic Variations, 2006	17
Table 9. Changes in Monthly Traffic – 2005 to 2006	18
Table 10. Estimated Changes in Annual Traffic – 2006 to 2007	19
Table 11. Estimated 2007 Toll-Paying Traffic and Toll Revenue	19
Table 12. Historical Operating Expenses: 1996 to 2006	21
Table 13. Employment Trends and Projections	24
Table 14. Population Trends and Projections	25
Table 15. Motor Vehicle Registrations	26
Table 16. Elasticity Factors	29
Table 17. Estimated Percent Change in Average Toll Rates and Traffic	30
Table 18. Comparison of 2006 Traffic with Highest Recorded Levels Since 1970	31
Table 19. Traffic and Toll Revenue Forecast, Constant Tolls	45
Table 20. Traffic and Toll Revenue Forecast, Periodic Toll Increases	46
Table 21. Projected Operating Expenses	48
Table 22. Net Toll Revenue Forecast	49
Table 23. Opening Dates of TBTA Facilities	51
Table 24. Capital Commitments by Facility, 1992 to 2009	52

FIGURES

<u>Figure</u>	<u>Page</u>
1. Location Map	2
2. Aggregated TBTA Facilities Paid Traffic and Toll Revenue, 1970 to 2006	13

June 1, 2007

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

In 2006, actual total toll revenues for the TBTA Bridges and Tunnels was \$1,241.6 million, or 0.8 percent lower than the URS forecast of \$1,252.0 million.

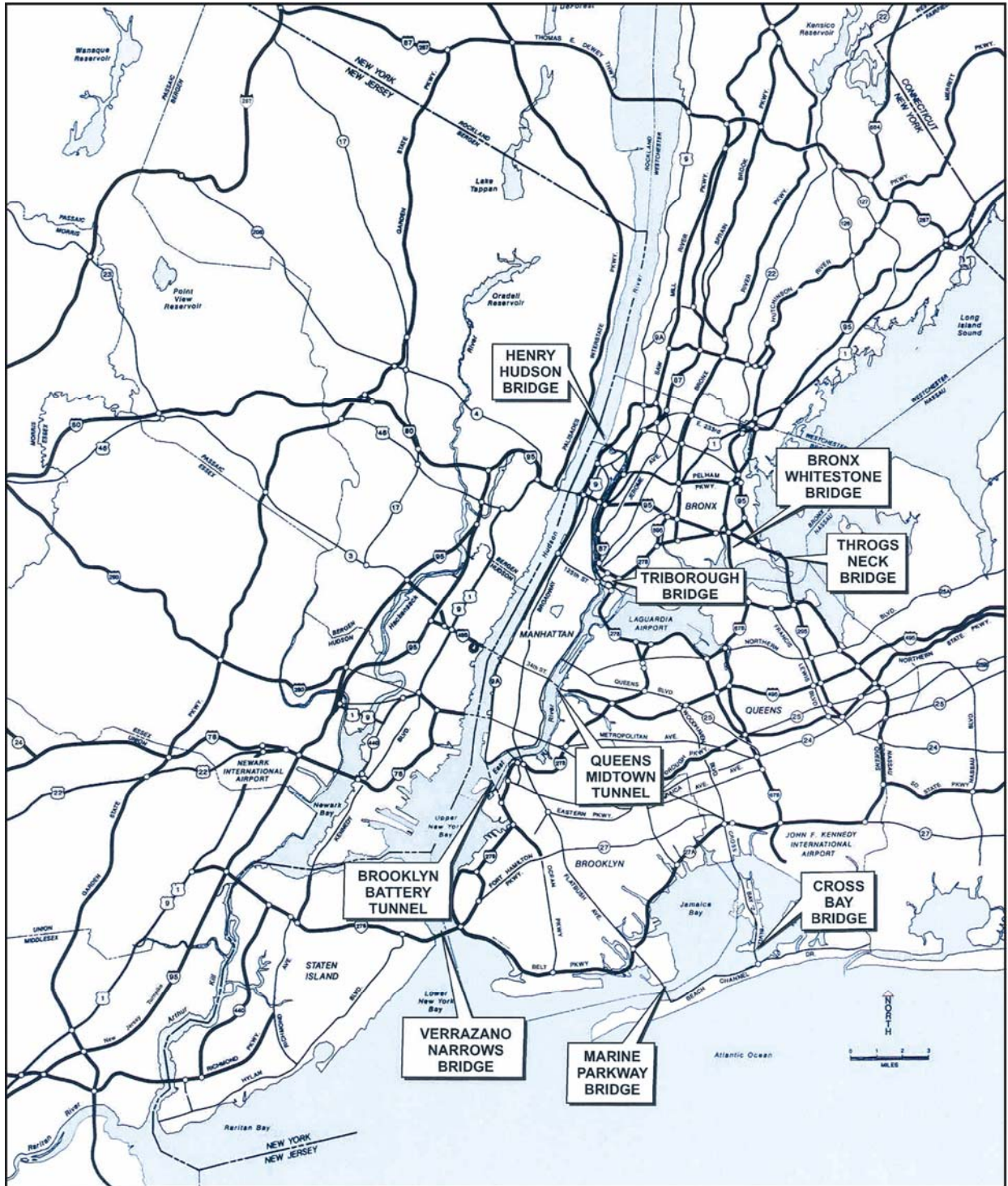
TRANSPORTATION INFRASTRUCTURE

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 2006, these facilities carried 305.6 million total vehicles, of which 302.1 million were toll paying, and generated \$1.2 billion in toll revenue. (Non-revenue transactions include police, emergency and TBTA vehicles.) The locations of the facilities are shown on the following map in the context of the regional highway network.

Figure 1: Location Map





The facilities are briefly described as follows:

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

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

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

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

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

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

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

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

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

Metropolitan Area Arterial Network

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

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



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

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

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

Other Regional Toll Facilities

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

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

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

Regional Public Transportation

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



Authority (MTA) system. These include the New York City Transit Authority subway and buses, MTA Bus Company, Staten Island Rapid Transit, Metro-North Commuter Railroad, Long Island Rail Road, and the Long Island Bus system (in Nassau County, and serves adjacent portions of Queens and Suffolk County).

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.

Current Toll Structure and Operation

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

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

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

Classification	Verrazano-Narrows Bridge ^(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	<i>E-ZPass</i>	Cash	<i>E-ZPass</i>	Cash	<i>E-ZPass</i>	Cash	<i>E-ZPass</i>
Two-axle vehicles, including: Passenger vehicles, SUVs, station wagons, self-propelled mobile homes, ambulances, hearses, vehicles with seating capacity of not more than 15 adult persons (including the driver) and trucks with maximum gross weight of 7,000 lbs. and under	\$4.50	\$4.00	\$ 4.50	\$4.00	\$2.25	\$1.75	\$2.25	\$1.50
Each additional axle costs	2.00	2.00	2.00	2.00	\$1.25	\$1.25	\$1.25	\$1.25
The following discounted prepaid charges are presently available for the two-axle vehicles referenced above:								
Prepaid charges through token roll purchases							1.50 ^(b)	
Prepaid charges per crossing for registered Staten Island Residents using an eligible vehicle with three or more occupants	1.125							
Prepaid charges per crossing for registered Staten Island Residents using an eligible vehicle through token roll purchase	3.20 ^(b)							
Registered Staten Island Residents using an eligible vehicle		2.40						
Prepaid charges per crossing for registered Rockaway Peninsula/Broad Channel Residents using an eligible vehicle							1.33 ^(b)	1.00 ^(c)
All two axle vehicles greater than 7,000 lbs. and buses (other than franchise buses and motor homes)	9.00	7.20	9.00	7.20	(d)	(d)	4.50	3.60
Each additional axle	5.00	4.00	5.00	4.00			2.50	2.00
Two-axle franchise buses	3.50	2.80	3.50	2.80	(d)	(d)	1.75	1.40
Three-axle franchise buses	4.25	3.40	4.25	3.40	(d)	(d)	2.25	1.80
Motorcycles	2.00	1.75	2.00	1.75	2.00	1.25	2.00	1.25
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 \$4.50 for the major crossings. The minor crossing passenger car cash toll is \$2.25. All tolls are collected in each direction except on the Verrazano-Narrows Bridge where the round-trip tolls are collected only in the westbound (Staten Island-bound) direction in order to comply with a provision of Federal law.

Tolls for passenger cars are discounted under the following programs: (1) *E-ZPass* and tokens; (2) place of residence/crossing used; (3) place of residence/vehicle occupancy; and (4) some combination of the foregoing. *E-ZPass* electronic toll collection is available on all TBTA toll facilities (see the following section for a more complete description of *E-ZPass* and its impact). Motorists open a pre-paid *E-ZPass* account and receive a transponder that they mount on their windshields. TBTA toll plazas are all equipped with *E-ZPass* antennas that identify and read the on-board tags and electronically debit the toll from the motorist's prepaid account. Passenger cars equipped with *E-ZPass* are allowed a \$0.50 discount per trip at all major facilities (\$1.00 for Verrazano-Narrows Bridge westbound only) and the Henry Hudson Bridge, and \$0.75 at the Cross Bay 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 \$3.5 million annually in toll rebates.

Tolls for Vehicles over 7,000 Pounds

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

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

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

The *E-ZPass* Electronic Toll Collection (ETC) system has been fully installed at all TBTA bridges and tunnels since December 1996. *E-ZPass* usage at each facility has shown strong growth as motorists have become more familiar with the system and its time saving advantages. Unlike cash transactions, vehicles equipped with *E-ZPass* tags can use the gated *E-ZPass*-only lanes. An electronic reader identifies the tag code at the toll plaza and the toll is deducted from

the customer’s pre-paid account. TBTA has approximately 3.4 million *E-ZPass* tags in use. Currently, participation rates are at 72.6 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, 2006 was approximately 15.8 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 1998, the second 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 2006.

Table 2. E-ZPass Participation Rates

Yearly Average	1998	1999	2000	2001	2002	2003	2004	2005	2006
Percent Participation (All Facilities)	56.8%	60.1%	63.7%	67.4%	68.5%	69.8%	70.1%	71.5%	72.6%
Facility	Triborough	Bronx-Whitestone	Henry Hudson	Marine Parkway	Cross Bay	Queens Midtown	Brooklyn Battery	Throgs Neck	Verrazano-Narrows
Percent Participation (2006)	65.5%	64.4%	79.5%	78.7%	73.7%	77.3%	80.8%	72.9%	76.3%

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 22 agencies located in 11 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, and the Chicago Skyway Bridge operated by the Skyway Concession Company, LLC. In addition, the Indiana Toll Road Concession Company became a member of the Inter-Agency Group (IAG) in 2007 and is expected to be on-line by the end of the year.

TBTA's Role in *E-ZPass*

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

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

TBTA customers must pre-pay their *E-ZPass* accounts. These pre-payments are based on a customer's *E-ZPass* usage at both TBTA and other IAG member facilities. Through the IAG system, TBTA and other member agencies transfer payments associated with inter-operability to each other on a routine basis. For 2006, TBTA transferred \$366.3 million to other members and received \$236.4 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 35 years.

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

- Major crossings - Triborough, Bronx-Whitestone and Throgs Neck bridges, and the Queens Midtown and Brooklyn-Battery tunnels;
- Minor crossings - Henry Hudson, Marine Parkway-Gil Hodges Memorial and Cross Bay 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 ^(b) – Present	4.50 ^(a)	4.50	4.50	2.25	2.25

Notes:

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

(b) Last toll rate increase effective March 13, 2005.

Verrazano-Narrows Bridge

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

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

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

Inflation

The Consumer Price Index (CPI), compiled by the US Department of Labor, Bureau of Labor Statistics for United States Cities, is intended to represent the average inflation rate for all urban consumers. Table 4 displays the TBTA major crossing passenger car toll rates from the 1971 level of \$0.25 to the toll rate of \$4.50 set in 2005, alongside the CPI. Also shown is the CPI for April 2007 alongside the \$4.50 toll.

Table 4. Cash Passenger Toll Rates Versus Consumer Price Index

Year	Triborough, Bronx-Whitestone and Throgs Neck Bridges and Queens Midtown Tunnel	Consumer Price Index ^(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
April 2007	4.50 ^(c)	225.8 ^(d)	\$1.99
Ratio 2007/1971	18.0	5.18	3.49

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

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

(c) Effective March 13, 2005.

(d) Not seasonally adjusted. Seasonally adjusted data not available at the MSA level.

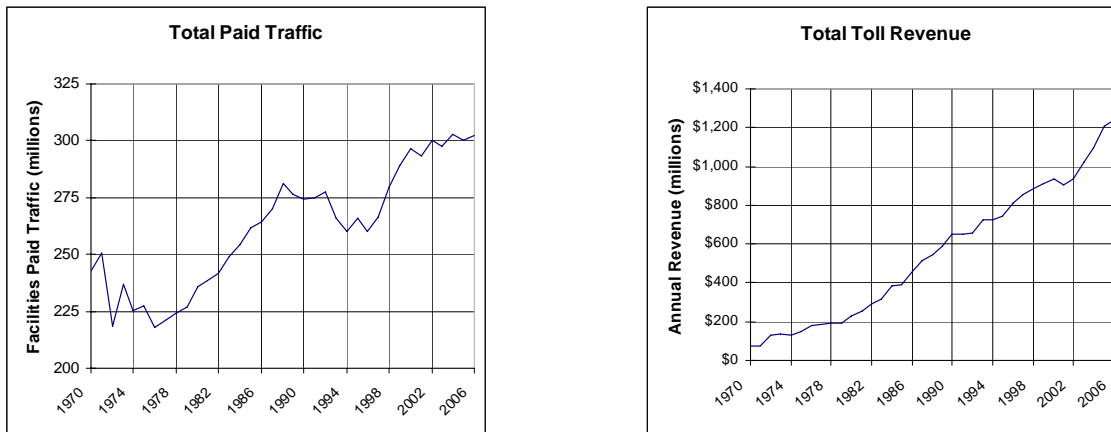
Source: US Department of Labor, Bureau of Labor Statistics.

As indicated in the table, TBTA tolls in current dollars have risen faster than the CPI during the 36-year period. As can be seen in Table 4, the current \$4.50 toll in 2007 dollars is equivalent to a toll of \$2.00 in 1982-1984 dollars. The actual (current) 2007 cash toll for passenger cars is 18 times the actual toll in 1971. However, if adjusted for inflation, the toll today is only 3.49 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 2007

Historical traffic, revenues and expenses were reviewed for the nine TBTA bridges and tunnels. Over the last 36 years, paid traffic volumes on the crossings have ranged from approximately 220 million in the 1970s to 303 million in 2004. In 2006, total annual volume was 302 million. 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 2006, with tolls having been increased again in 2003 and 2005, revenue reached \$1,242 million, \$37 million greater than revenues in 2005.

Figure 2: Aggregated TBTA Facilities Paid Traffic and Toll Revenue, 1970 to 2006



Since 1970, annual operating expenses for the toll facilities have risen by a multiple of 14, from \$25 million to \$353 million in 2006, during which time the CPI increased a multiple of 5.1. A significant part of the increase in annual operating expenses is due to the creation of new security positions after the events of September 11, 2001.

Traffic and Toll Revenue, 1996 to 2006

Table 5 lists the traffic and toll revenue record for each of the nine crossings for the 1996-2006 period. Total TBTA traffic and toll revenue are shown in Table 6. The peak in toll-paying traffic during this period, 303 million crossings, occurred in 2004. The general system-wide pattern has been that when toll rates are increased, traffic declines moderately and then traffic begins to rise until the next rate increase. (The relationship between toll increases and traffic volume is described in the *Toll Impacts and Elasticity* section of this report.) The two most recent toll increases shown in this table, in 2003 and 2005, are evident in the jump in average tolls in such years. The strong growth of almost 10 percent in revenues between 2004 and 2005 is due to the toll increase in March 2005.

In 1996, toll revenue was reported at \$808 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.

Most recently (2005-2006), with construction on the Bronx-Whitestone Bridge, some traffic has diverted to the Throgs Neck Bridge. 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 2006 at \$288.3 million, while the Marine Parkway-Gil Hodges Memorial Bridge registered the lowest revenue at \$11.5 million.

Table 5. Annual Toll-Paying Traffic and Toll Revenue:^(a) 1996 to 2006
(000's)

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		
1996	60,176	-1.9%	\$177,655	\$2.95	54,975	-3.4%	\$186,051	\$3.38	37,258	-7.3%	\$132,264	\$3.55
1997	62,848	4.4	185,131	2.95	56,766	3.3	200,451	3.53	36,372	-2.4	135,593	3.73
1998 ^(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

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		
1996	35,208	5.3%	\$136,691	\$3.88	17,064	-7.3%	\$54,880	\$3.22	23,507	3.0%	\$77,485	\$3.30
1997	36,711	4.3	147,106	4.01	17,029	-0.2	56,166	3.30	24,600	4.6	83,543	3.40
1998 ^(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	15.3	61,810	3.47	27,512	2.3	99,994	3.63
2004	39,439	0.9	184,338	4.67	17,700	-0.6	64,366	3.64	28,181	2.4	107,067	3.80
2005	41,199	4.5	210,242	5.10	17,426	-1.5	70,294	4.03	28,751	2.0	121,666	4.23
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

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		
1996	19,922	-2.2%	\$27,915	\$1.40	7,086	-4.0%	\$8,231	\$1.16	4,967	-4.2%	\$6,446	\$1.30
1997	19,757	-0.8	28,687	1.45	7,304	3.1	8,589	1.18	5,133	3.3	6,727	1.31
1998 ^(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

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

Total annual TBTA toll traffic volume and revenue are shown in Table 6 for the period 1996 through 2006.

Table 6. Summary of Annual Paid Traffic and Toll Revenue:^(a) 1996 to 2006

Year	Total Paying Traffic Volume (000)	Total Toll Revenue (000)
1996	260,163	\$807,618
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	297,465	1,021,937
2004	302,995	1,096,989
2005	300,385	1,204,944
2006	302,059	1,241,551

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

Traffic by Facility and Vehicle Class, 2006

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 2006 traffic volumes by facility. Passenger cars totaled 281 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 70.4 million toll-paying vehicles. The lowest toll-paying volume, 7.4 million vehicles, was recorded at the Cross Bay Veterans Memorial Bridge.

Table 7. Traffic by Facility and Vehicle Class, 2006
(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	38,537	49	44	1,736	2	0	358	392
Bronx-Whitestone Bridge	36,607	13	9	1,305	157	0	300	205
Triborough Bridge	58,323	25	13	2,866	158	187	574	122
Queens Midtown Tunnel	26,672	5	6	1,634	109	72	374	26
Brooklyn-Battery Tunnel	16,265	2	2	621	52	535	166	11
Verrazano-Narrows Bridge ^(a)	65,740	33	28	1,925	134	402	437	250
Henry Hudson Bridge ^(b)	23,994	2	2	112	0	0	1	0
Marine Parkway Bridge	7,481	2	1	165	39	0	21	3
Cross Bay Bridge	6,922	3	1	305	36	0	55	5
Total	280,541	134	106	10,669	687	1,196	2,286	1,014
Percent of Paid Vehicles	92.9%	0.0%	0.0%	3.5%	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	1,909	73	85	1	2	43,188	274	43,462
Bronx-Whitestone Bridge	816	57	18	0	0	39,487	229	39,716
Triborough Bridge	644	97	51	0	0	63,060	1,194	64,254
Queens Midtown Tunnel	18	48	2	0	0	28,966	407	29,373
Brooklyn-Battery Tunnel	7	57	1	0	0	17,719	473	18,192
Verrazano-Narrows Bridge ^(a)	1,227	145	56	1	1	70,379	697	71,076
Henry Hudson Bridge ^(b)	1	47	0	0	0	24,159	92	24,251
Marine Parkway Bridge	10	14	1	0	0	7,737	83	7,820
Cross Bay Bridge	17	16	2	0	0	7,362	133	7,495
Total	4,649	554	216	2	3	302,059	3,582	305,639
Percent of Paid Vehicles	1.5%	0.2%	0.1%	0.0%	0.0%	100.0%		

Notes: Totals may not add due to rounding.

(a) Westbound traffic doubled.

(b) Truck passage prohibited.

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

Source: TBTA

Monthly Traffic, 2006

Monthly traffic variations on the nine crossings are normally attributed to several factors. Traffic volumes historically have been weather-related, e.g., severe winter weather may result in

lower volumes. Conversely, traffic reaches its highest levels during the summer months when recreational travel peaks. Toll rate increases have also affected the traffic volumes in the aftermath of a toll increase. Furthermore, individual facilities can be affected by construction projects on adjacent arterials or competing bridges. The limited number of crossings in the region sustains the overall demand for TBTA's bridges and tunnels. In addition to these normal impacts, there are extraordinary events such as the effects of September 11.

The data in Table 8 indicate that total traffic on the nine crossings in 2006 peaked in June. August was the second highest month in 2006. For the combined facilities, the monthly variations in 2006 ranged from 9 percent below the annual average in January and February to 6 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, 2006

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	103,703	101,958	155,795	72,288	44,977	178,835	60,707	18,041	17,738	754,042	0.91
February	104,889	102,763	154,661	73,792	46,124	177,288	60,833	17,601	17,559	755,510	0.91
March	114,097	104,979	171,329	80,239	50,635	190,643	65,500	19,698	19,206	816,326	0.99
April	118,267	107,263	175,922	80,753	47,679	193,754	67,781	19,212	19,059	829,690	1.00
May	123,389	108,561	181,166	80,460	48,881	195,773	68,307	22,027	20,664	849,229	1.03
June	126,135	110,690	184,757	83,684	50,272	202,853	69,408	23,478	21,949	873,225	1.06
July	128,944	108,276	175,644	77,496	45,419	196,191	63,679	26,154	23,590	845,393	1.02
August	130,789	109,481	179,100	80,552	48,859	200,494	65,757	25,005	21,836	861,873	1.04
September	122,534	108,070	176,575	80,250	48,565	194,966	67,969	21,739	20,430	841,098	1.02
October	118,010	111,952	174,431	82,830	50,103	193,361	69,161	20,402	20,141	840,392	1.02
November	115,825	112,918	173,212	81,044	50,596	192,946	68,615	20,451	19,977	835,584	1.01
December	112,241	110,996	169,598	78,647	50,248	195,702	66,316	20,211	19,636	823,596	1.00
AADT ^(b)	118,318	108,186	172,777	79,359	48,541	192,824	66,188	21,197	20,168	827,558	1.00

Notes: May not add due to rounding.
 (a) Westbound traffic doubled.
 (b) Annual Average Daily Traffic

Changes in Monthly Traffic, 2005 to 2006

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

Table 9 lists the monthly traffic changes that have occurred between 2005 and 2006. Data are also compared for the first three months of 2006 and 2007.

Table 9. Changes in Monthly Traffic – 2005 to 2006

Month	Percent Change Comparing 2006 Monthly Traffic to 2005								
	Throgs Neck	Bronx-Whitestone	Triborough	Queens Midtown	Brooklyn-Battery	Verrazano-Narrows	Henry Hudson	Marine Parkway	Cross Bay Bridge
January 2006	13.9%	-5.0%	3.2%	2.9%	3.1%	4.1%	3.2%	4.8%	7.5%
February	6.7	-10.2	-5.8	-4.2	-3.6	-3.9	-6.9	-2.6	1.1
March	11.9	-10.1	2.1	0.2	1.9	0.4	-0.4	3.2	4.9
April	10.8	-11.7	0.2	-0.4	-1.9	-0.2	-3.0	-3.5	-1.2
May	10.5	-12.1	0.1	-0.5	-0.2	-1.1	4.2	1.7	2.8
June	0.5	-4.7	-1.8	-1.5	-1.0	-1.3	-3.1	-6.5	-7.6
July	2.3	-6.6	-1.6	-0.6	-0.9	-1.4	-3.3	0.7	3.7
August	2.4	-5.5	0.4	1.1	3.8	0.5	-1.0	0.7	0.6
September	1.5	-0.3	0.4	1.0	2.4	1.2	0.0	-3.2	-0.5
October	3.3	8.2	4.5	5.0	9.3	4.6	4.1	8.7	9.1
November	-2.1	6.5	1.4	0.8	2.5	1.4	-0.3	4.0	6.3
December	0.9	5.3	1.0	5.2	4.5	2.7	8.0	4.5	6.4
Annual	4.8	-4.2	0.4	0.8	1.7	0.6	0.1	0.8	2.5
January 2007	1.0	3.2	0.2	4.2	6.6	1.8	1.5	3.8	7.1
February	-1.2	2.2	0.7	3.4	6.1	1.6	0.6	2.0	4.2
March	-4.4	5.0	-2.0	0.9	2.7	-0.7	-0.9	0.3	3.4
1 st 3 months	-1.6	3.5	-0.4	2.7	5.0	0.9	0.3	2.0	4.9

Reasons for monthly traffic changes include:

- Continued construction on Bronx-Whitestone Bridge in 2005 caused shift to Throgs Neck Bridge, but note a re-shift back to the Bronx-Whitestone Bridge beginning in October 2006;
- Snow in December 2005 and an unusually mild December in 2006;
- Drop in traffic on Henry Hudson Bridge in May 2005 due to collapse of retaining wall adjacent to Henry Hudson Parkway near the Cloisters;
- Record heavy rains in October 2005 reduced vehicle volumes; and
- Record blizzard in February 2006.

Estimated Traffic and Toll Revenue, 2007

The development of the traffic and toll revenue estimates for 2007 took into account the forecast of normal growth. The results for 2006 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 2007, are covered in the following chapters of the report. In developing the traffic and toll revenue estimates for 2007, we assumed that traffic

changes for 2006 to 2007 would be at the same rate as the change in traffic for the last six months of 2005 to the same period in 2006. By using this time period, the impacts of the 2005 toll increase reflected in traffic for the first half of 2006 were not included in the analysis. The forecast for the Bronx-Whitestone Bridge and the Throgs Neck Bridge was adjusted to reflect construction at the Bronx-Whitestone Bridge. The forecasted percent changes are shown in Table 10. The percentages reflect normal growth and ongoing construction projects.

Table 10. Estimated Changes in Annual Traffic – 2006 to 2007

Facility	Percent Change
Throgs Neck Bridge ^(a)	-0.1%
Bronx-Whitestone Bridge ^(a)	1.8
Triborough Bridge	0.3
Queens Midtown Tunnel	1.3
Brooklyn-Battery Tunnel	3.1
Verrazano-Narrows Bridge	1.0
Henry Hudson Bridge	0.5
Marine Parkway-Gil Hodges Mem. Bridge	1.1
Cross Bay Veterans Memorial Bridge	2.8

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

The traffic and toll revenue estimates for 2007 are presented in Table 11.

Table 11. Estimated 2007 Toll-Paying Traffic and Toll Revenue

Facility	Traffic (000s)	Average Toll	Revenue (000s)
Throgs Neck Bridge	43,129	\$5.18	\$ 223,459
Bronx Whitestone Bridge	40,197	4.72	189,728
Triborough Bridge	63,281	4.57	289,296
Queens Midtown Tunnel	29,351	4.39	128,765
Brooklyn Battery Tunnel	18,265	4.17	76,149
Verrazano-Narrows Bridge	71,093	3.89	276,874
Henry Hudson Bridge	24,276	1.86	45,119
Marine Parkway Bridge	7,823	1.49	11,664
Cross Bay Bridge	7,568	1.58	11,956
Total	304,982	\$4.11	\$1,253,012

The 1.0 percent increase in traffic and the overall increase in revenue of 0.9 percent reflect actual performance through March 31, 2007 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 starting in 2008 is discussed under the “Projected Traffic, Revenue and Expenses” section of this report.

Operating Expenses 1996 to 2006

Table 12 displays the historical operating expenses for the TBTA facilities from 1996 through 2006. TBTA divides operating expenses into two major categories: Labor and Non-labor. Labor includes salaries, overtime and fringe benefits, net of capital reimbursements. Maintenance, outside services, insurance, Coliseum operations (until its sale in 1999), TBTA’s share of the *E-ZPass* Customer Service Center, and other non-personnel expenses are included in Non-labor.

TBTA labor expenses increased from \$109.3 million in 1996 to \$183.3 million in 2006. 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 \$95.9 million in 1996 to \$169.6 million in 2006. The primary driving factors in TBTA’s Non-labor expense growth were inflation, an increase in major maintenance and bridge painting activities; and costs associated with *E-ZPass* including, particularly, the issuance of new tags and replacement of tags that will soon reach the end of their service life.

Timing of major expenses and extraordinary items has also resulted in some year-to-year fluctuations. An enhanced bridge painting program, including lead paint removal, implemented as part of TBTA’s effort to extend the useful life of the structural elements of its facilities, began to increase 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: 1996 to 2006

Year	Operating Expenses (000s)			Percent Change ^(c)
	Labor ^(a)	Non-Labor ^(b)	Total	
1996	\$109,256	\$95,915	\$205,171	–
1997	111,651	112,222	223,873	9.1%
1998	106,603	101,587	208,190	–7.0
1999	107,430	120,561	227,991	9.5
2000	112,256	129,002	241,258	5.8
2001	123,316	133,198	256,514	6.3
2002	140,967	159,229	300,196	17.0
2003	159,976	169,039	329,015	9.6
2004	158,403	160,811	319,214	–3.0
2005	173,549	170,123	343,672	7.7
2006	183,268	169,642	352,910	2.7

Notes:

- (a) Includes salaries, overtime and fringe benefits, net of capital reimbursements.
- (b) Non-labor includes the following categories: maintenance and supplies, outside services, insurance, power, leases and rentals and other expenses.
- (c) For discussion on expense fluctuations, see preceding text.

Source: TBTA

The 2001-2003 numbers reflect the additional expenses that were incurred in the aftermath of the attack on the World Trade Center. TBTA describes the added expenses as overtime labor costs for security, cleanup costs for the Brooklyn-Battery Tunnel and Battery Parking Garage, and emergency electricity generation for the Brooklyn-Battery Tunnel. Also included are costs associated with overtime incurred by represented employees required to make up for lost time as a result of the temporary closure of 2 Broadway. 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 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.

2007 Budget

Operating expenses have been budgeted by TBTA for 2007 at \$407.8 million and include nonrecurring cost estimates associated with the transition to a new contract for the *E-ZPass* Customer Service Center. These expenses are divided into the following two categories: Labor of \$192.8 million and Non-labor at \$215.0 million.

FACTORS AFFECTING TRAFFIC GROWTH

The previous section of the report set forth the historical traffic, revenue and expense data for the nine TBTA bridges and tunnels. Before developing the forecasts, several factors affecting future traffic were considered, including projected growth (population and other demographics), TBTA and regional construction impacts, capacity constraints in the regional highway network, and toll and elasticity impacts. *E-ZPass* improvements were discussed previously on pages 7,8 and 9. This section of the report concludes with a summary of the assumptions and conditions upon which the traffic and toll revenue forecasts were based.

Employment, Population and Motor Vehicle Registrations

Regional demographic data providing information on long-term trends are maintained by the New York Metropolitan Transportation Council (NYMTC). Information from NYMTC regarding employment and population history and projections from 1970 to 2020 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 4,084,000 in 1970 to 3,627,000 in 1980. Staten Island, where employment increased by 3.4 percent per year, was the exception. The most recent employment forecasts were released by NYMTC in September 2004. Year 2000 census data show that employment was the highest it has been since 1970. Projections show a slight decline in 2005 followed by steady growth through 2020.

Between 1970 and 2000, employment increased in the New York suburbs, in Northern New Jersey and in Southern Connecticut. NYMTC projected that employment in the region as a whole, would grow during the forecast period through 2015, in the range of 0.3 to 1.1 percent annually.

In the New York Metropolitan Statistical Area (MSA), the preliminary unemployment rate for 2006 was 4.5 percent, down from the 4.9 percent in 2005 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 2006, the vacancy rate stood at 6.3 percent, and asking rents jumped 30 percent. The real estate industry anticipates that vacancy rates will decrease over the next four years to an estimated 5.3 percent in 2011 and employment will increase 0.9 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	2,654.9	247.3	592.2	543.1	45.9	4,083.7	1,493.8	2,182.4	731.5
1980	2,364.8	211.9	485.7	499.7	64.4	3,626.6	1,843.7	2,466.6	874.0
1990	2,565.1	237.8	504.5	567.3	91.6	3,966.1	2,231.1	2,899.0	1,028.0
2000	2,682.2	269.4	584.6	624.1	116.9	4,277.3	2,422.5	3,158.4	1,064.9
2005 - Projected	2,545.8	282.0	590.5	635.4	123.4	4,177.1	2,491.7	3,241.6	1,072.2
2010 - Projected	2,737.7	295.5	621.6	668.3	137.4	4,460.4	2,611.8	3,394.9	1,135.3
2015 - Projected	2,850.1	307.1	650.0	693.3	150.1	4,650.7	2,732.9	3,550.8	1,174.4
2020 - Projected	2,966.7	320.2	681.8	718.5	162.5	4,849.6	2849.3	3735.7	1,207.8
Average Annual Percent Change									
1970 to 1980	-1.2%	-1.5%	-2.0%	-0.8%	3.4%	-1.2%	2.1%	1.2%	1.8%
1980 to 1990	0.8	1.2	0.4	1.3	3.6	0.9	1.9	1.6	1.6
1990 to 2000	0.4	1.3	1.5	1.0	2.5	0.8	0.8	0.9	0.4
2000 to 2005	-1.0	0.9	0.2	0.4	1.1	-0.5	0.6	0.5	0.1
2005 to 2010	1.5	0.9	1.0	1.0	2.2	1.3	0.9	0.9	1.2
2010 to 2015	0.8	0.8	0.9	0.7	1.8	0.8	0.9	0.9	0.7
2015 to 2020	0.8	0.8	1.0	0.7	1.6	0.8	0.8	1.0	0.6

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

Source: New York Metropolitan Transportation Council, September 2004.

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

Population Trends and Projections

Between 1970 and 1980, population in New York City declined in the Bronx, Brooklyn, Manhattan and Queens, but increased on Staten Island. For the five boroughs, population totaled 7.9 million in 1970 and 7.1 million in 1980, as displayed in Table 14. The 1990 Census indicated that there was a turnaround and population grew at an average annual rate of approximately 0.3 percent. The Census results for the year 2000 show the population of New York City grew by approximately one percent annually and now exceeds 8,000,000. Nearby New York and New

Jersey counties also show increased growth. In Connecticut, population increases were in Fairfield County, the closest county to the TBTA facilities.

Table 14. Population Trends and Projections
(000s)

Year	New York City						New York Region ^(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	4,178	5,066	1,682
1980	1,428	1,169	2,231	1,891	352	7,072	4,314	4,915	1,725
1990	1,488	1,204	2,301	1,952	379	7,323	4,401	5,008	1,806
2000	1,537	1,333	2,465	2,229	444	8,008	4,681	5,431	1,889
2005 - Projected	1,583	1,367	2,515	2,273	471	8,209	4,882	5,614	1,958
2010 - Projected	1,626	1,391	2,566	2,334	495	8,412	5,060	5,726	2,016
2015 - Projected	1,651	1,432	2,622	2,445	524	8,674	5,196	5,850	2,078
2020 - Projected	1,676	1,485	2,688	2,611	554	9,014	5,349	5,993	2,292
Average Annual Percent Change									
1970 to 1980	-0.7%	-2.3%	-1.5%	-0.5%	1.7%	-1.1%	0.3%	-0.3%	0.3%
1980 to 1990	0.4	0.3	0.3	0.3	0.7	0.3	0.2	0.2	0.5
1990 to 2000	0.3	1.0	0.7	1.3	1.6	0.9	0.6	0.8	0.5
2000 to 2005	0.6	0.5	0.4	0.4	1.2	0.5	0.8	0.7	0.7
2005 to 2010	0.5	0.3	0.4	0.5	1.0	0.5	0.7	0.4	0.6
2010 to 2015	0.3	0.6	0.4	0.9	1.1	0.6	0.5	0.4	0.6
2015 to 2020	0.3	0.7	0.5	1.3	1.1	0.8	0.6	0.5	2.0

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

NYMTC’s latest population projections for the region for 2005 to 2020 were prepared in 2004. NYMTC projects steady population growth throughout the region ranging from 0.2 percent to 1.1 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 in 2020.

Motor Vehicle Registrations

One of the indicators of traffic stability and/or growth in an area is the trend in the number of motor vehicle registrations. As shown in the following table, motor vehicle registrations increased slightly for the period 2000 through 2006 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 2006 vehicle registrations grew by an average annual rate of growth of 1.2 percent in New Jersey. In Connecticut, registrations increased between

2005 and 2006, continuing an upward trend. From 2000 to 2006, registrations in Connecticut grew at an average rate of 1.6 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	5,951	2,735
2001	2,025	10,707	6,113	2,796
2002	1,946	10,445	6,275	2,893
2003	1,869	10,414	6,320	2,928
2004	1,849	10,450	6,361	2,989
2005	1,857	10,477	6,375	3,011
2006	1,833	10,551	6,406	3,016
Average Annual Growth				
2000-2006	-1.8%	-0.2%	1.2%	1.6%

Notes: (a) Including New York City.

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

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

Fuel Conditions

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

In 1974, while the economy slowed and fuel prices rose, there was a 4.9 percent decline in TBTA traffic and lowering of traffic growth rates from 3.8 percent prior to 1974 to 1.5 percent after 1974. Succeeding fuel shortages caused temporary traffic decreases that resulted in no permanent effects on traffic growth in subsequent years.

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 again reached \$3.04 in the first week of August 2006. Prices in the New York City area were over \$3.00 per gallon throughout the summer, reaching \$3.13 during the last week of July. As of May 21, 2007, the average price for a gallon of regular gasoline in the U.S. was \$3.22—up \$0.33 per gallon (11.4 percent) from a year ago. The price in the New York City area was \$3.10 per gallon, an increase of \$0.06 per gallon (2.0 percent) from the same time last year. The \$3.22 per gallon still falls short of the all time high, set in March 1981, when a gallon of regular gasoline cost \$3.29 in today's (May 2007) 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 2007. 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 phaseout 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;
- Gasoline quality requirements under the U.S. Environmental Protection Agency's (EPA) Tier 2 Vehicle and Gasoline Sulphur Program mandate further reduction in sulphur content. EPA estimates that the sulphur program will cost the refining industry about 2 cents per gallon to produce low-sulphur gasoline;
- Higher diesel fuel prices are also expected because of the additional cost of producing ultra-low-sulphur diesel fuel;
- Hurricanes and tropical storms with a potential to cause significant outages could add to the volatility of prices of motor fuel.

During 2006, transactions on TBTA facilities increased, after decreases in 2005 due to the increase in tolls in March, record rainfall in October and snow in December. While gasoline prices rose to over \$3.00 per gallon in September 2005, the effect the higher gas prices had on

transactions was slight and seemed only to appear on Labor Day weekend and the following weekend.

From 1995 to 2000, TBTA traffic increased 2.3 percent per year when gasoline prices were relatively stable; whereas from 2000 to 2006 TBTA traffic increased 0.3 percent per year while New York gasoline prices increased 14 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 are now slightly over \$3.00 per gallon. If this level is exceeded for a prolonged period of time, it may have an 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 May 8, 2007:

Continuing problems for refineries in the United States and abroad, combined with strong global gasoline demand, have raised our projected average summer gasoline price by 14 cents per gallon from our last Outlook. Retail regular grade motor gasoline prices are now projected to average \$2.95 per gallon this summer compared with the \$2.84 per gallon average of last summer.

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

Some motorists are offsetting higher gasoline prices by purchasing more efficient vehicles.

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. The elasticity factors are shown in Table 16.

Table 16. Elasticity Factors

Location	Elasticity Factors
Bronx-Whitestone/Throgs Neck	-0.105
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	-0.126

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.

If the historical toll increase patterns continue, it can be expected that tolls will be increased again during the forecast period (through 2017). Accordingly, for the purposes of projecting traffic and toll revenue, URS has prepared two sets of forecasts: one at constant tolls (at the present level); and the other with toll increases assumed by URS in January 2009, 2012 and 2015. The foregoing does not reflect TBTA adopted policy.

For the toll-increase alternative, it was assumed that the toll levels (i.e., the cash toll for passenger cars) on the major and minor crossings would be increased to \$5.00 and \$2.50, respectively, in January 2009. Further, it was assumed that cash passenger car toll increases of \$0.50 on the major crossings and \$0.25 on the minor crossings (with commensurate increases for other vehicle classes) would be implemented in January 2012 and 2015. It was also assumed that the truck tolls would be increased proportionately, and that the relationship between cash and *E-ZPass* tolls for passenger cars would remain the same: \$0.50 lower than the respective cash tolls on the major crossings, \$1.00 on the Verrazano Narrows Bridge, \$0.50 on the Henry Hudson Bridge and \$0.75 on the Cross Bay Veterans Memorial and Marine Parkway-Gil Hodges

Memorial bridges. This is consistent with the experience of the March 2005 toll increase. The percent changes are shown in Table 17.

As for the impacts of the toll increases on traffic demand, the elasticity factors from Table 16 as described above were used to calculate traffic decreases as shown in Table 17. It was assumed the toll increases described previously would occur on January 1, 2009, 2012 and 2015. These traffic impacts represent the reduction in values from the corresponding annual traffic levels that would be expected if the tolls were not increased.

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

Facility	Elasticity Factor	2009		2012		2015	
		Toll	Traffic	Toll	Traffic	Toll	Traffic
Bronx-Whitestone/Throgs Neck Bridge	-0.105	11.9%	-1.3%	10.6%	-1.1%	9.6%	-1.0%
Brooklyn-Battery Tunnel	-0.358	12.1	-4.3	10.7	-3.8	9.7	-3.5
Cross Bay Bridge	-0.137	17.2	-2.3	14.3	-2.0	12.5	-1.7
Henry Hudson Bridge	-0.289	13.2	-3.8	11.6	-3.3	10.4	-3.0
Marine Parkway Bridge	-0.101	17.1	-1.7	14.2	-1.4	12.5	-1.3
Queens Midtown Tunnel	-0.192	12.0	-2.3	10.7	-2.1	9.7	-1.9
Triborough Bridge	-0.208	11.9	-2.5	10.6	-2.2	9.5	-2.0
Verrazano Narrows Bridge	-0.126	14.3	-1.8	12.3	-1.5	10.9	-1.4

The periodic toll increases indicated above were selected by URS to provide increases for cash passenger cars of \$0.50 on the major crossings and \$0.25 on the minor crossings, implemented periodically in line with corresponding increases in inflation. These increases have been assumed by URS for forecasting purposes only and are not adopted TBTA policy. 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 72.6 percent in 2006, 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 2007), matching the 2006 traffic volumes against the highest annual volumes recorded, by facility, going back to 1970. Note in Table 18 that the Throgs Neck Bridge and the Queens Midtown Tunnel carried their highest volumes in 2006.

Table 18. Comparison of 2006 Traffic with Highest Recorded Levels Since 1970

Facility	Highest Volume Since 1970		2006 Volume* (000s)	2006 Percent of Highest Volumes
	Year	Volume (000s)		
Throgs Neck Bridge	2006	43,186	43,186	100%
Bronx - Whitestone Bridge	2004	45,223	39,488	87
Triborough Bridge	1988	64,215	63,063	98
Queens Midtown Tunnel	2006	28,966	28,966	100
Brooklyn-Battery Tunnel	1971	22,920	17,718	77
Verrazano-Narrows Bridge	2002	73,361	70,381	96
Henry Hudson Bridge	2004	24,703	24,159	98
Marine-Parkway- Gil Hodges Bridge	1971	9,150	7,737	85
Cross Bay Veterans Memorial Bridge	1972	7,562	7,361	97

* 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 replacement of the upper level suspended deck is not likely to have major traffic impacts since a movable barrier will be used to allow maintenance of traffic in the peak flow direction, and because the lower deck will be unimpeded. The upper level deck replacement is expected to be included in the 2010-2014 Capital Program; there is no commitment to re-deck the lower level of the bridge.
- The **Cross Bay Veterans Memorial Bridge** superstructure/deck rehabilitation is scheduled to begin in 2007. The roadway is to be reduced to two lanes in each direction until May 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 nighttime closures for four weeks during 2007 as reconstruction is nearing completion.
- On the **Bronx-Whitestone Bridge**, the replacement of the deck on the suspended span with an orthotropic deck has been completed. Approach decks will be replaced in the Bronx in 2008, and in Queens are expected to be scheduled in the 2010-2014 Capital Program. 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 2015. With a contraflow lane, three lanes will be maintained in the peak direction. Cross Island Parkway ramp closures are scheduled to occur during 2008 (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 is programmed for 2008.
- **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** work on the Manhattan approach is nearing completion, with no traffic impacts expected.

Operational Changes Resulting from September 11, 2001

- The ban on eastbound commercial vehicles remains in effect at the Holland Tunnel. Commercial vehicles may now use the westbound Holland Tunnel to exit New York City.

Competing Ferry Service

- **New York Water Taxi** operates East River ferry service between Manhattan, Brooklyn and Queens on the following routes: Pier 11/Wall Street – Fulton Ferry Landing and Brooklyn Army Terminal; and East 34th Street – Hunters Point and Schaefer Landing. 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 1989, numerous rehabilitation projects have involved the upper or lower levels, or ramp approaches to the bridge. Miscellaneous items at various locations throughout the bridge, approaches and ramps that were not addressed or were deleted from previous contracts began in November of 2003. During 2006, the surface of both roadways of the upper level of Queensboro Bridge was removed and replaced. Cleaning and repainting structural steel of the main spans and approach roadways is scheduled to be completed in January 2009. Throughout the painting contract, the North Lower Outer Roadway may be partially closed while providing a five-foot access for bicyclists and pedestrians. Seismic retrofitting of the Queensboro Bridge is programmed to commence in 2012.
- **Williamsburg Bridge** – Miscellaneous rehabilitation of the main span began in March 2003 and is expected to be completed in June 2007. 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). The contractor is allowed to close two lanes for construction purposes, but always maintain four lanes in the peak travel direction. From October 2006 to October 2007, two lanes are made available (except for trucks and buses) by reversing the south inner roadway from 6 AM

to 10 AM weekdays, to help minimize the impact of closing the lower roadway of the Manhattan Bridge. Seismic retrofitting of the Williamsburg Bridge is programmed to commence in 2011.

- **Manhattan Bridge** - Replacement of the lower roadway 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. Closure of the lower roadway until October 2007 may be inducing some traffic to divert to the Brooklyn-Battery Tunnel and Williamsburg Bridge. Replacement of the Manhattan Bridge suspender ropes and rewinding all cables is to begin in 2008, and seismic retrofitting is scheduled to begin in 2011.
- **Brooklyn Bridge** – Maintenance and inspection of the maintenance travelers on the main span of the Brooklyn Bridge is expected to be completed in 2008. 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. Seismic retrofitting of the Brooklyn Bridge is programmed to commence in 2012.

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 March 2007 and is scheduled to be completed by March 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 includes 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 is expected to be fully completed by mid 2007. 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. Construction between the Brooklyn-Battery Tunnel and Sixth Avenue was scheduled for April 2007, but has not been completed. Brooklyn-Battery Tunnel approaches and Prospect Expressway 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 Kosciuszko Bridge** — New York State Department of Transportation completed the Draft Environmental Impact Statement for the Kosciuszko Bridge Project, with formal public hearings scheduled during April 2007. Alternatives provide for maintaining all lanes on the Brooklyn Queens Expressway and local connections, while constructing a replacement bridge. Construction is programmed to begin in 2012.
- 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 in the fall 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. 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 – Replacement of the northbound Whitestone Expressway bascule bridge is scheduled for completion in 2008, as well as a new exit ramp from Astoria Boulevard to Linden Place. One of three lanes is closed during off peak hours. 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 2008. 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 — Preliminary engineering and Final Environmental Impact Statement are scheduled for completion in November 2007 and design in 2008-2009. 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 interchange is scheduled to begin in 2010.

- **Van Wyck Expressway (I-678)** – Rehabilitation of Roosevelt Avenue bridge is under-way through 2012.
- **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 two waterways (Mill Basin, Gerritsen Inlet) and two overpasses (Nostrand Avenue, Rockaway Parkway) 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 design of 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. 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 – \$8 for autos and \$21 for trucks. East River bridges would remain toll-free, as well as the FDR Drive and Route 9A. *E-ZPass* users paying bridge and tunnel tolls to enter the zone would be credited the amount of their round-trip tolls. Until the plan is more advanced in the legislative process, it is too early to estimate the traffic shifts, consolidations and diversions to transit that could occur; however, since there would be no change in tolls paid by motorists using the TBTA crossings, and East River bridges patrons would be charged, it is not anticipated that there will be a negative impact on traffic on TBTA crossings, and it could be positive.

- **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 implemented throughout the forecast period. Future capital programs sufficient to maintain the structural integrity of bridges and tunnels will be adopted and implemented throughout the forecast period.
- For the scenario with periodic toll increases, toll rate increases will be implemented in accordance with the schedule contained in this report.
- Elasticity factors, prepared by URS based on historical toll increases prior to and including 2006, are valid in their application to future toll rate increases to estimate future traffic and toll revenue.
- Electronic toll payment by *E-ZPass* will continue to be available on all TBTA crossings, and the payment of revenue in full to TBTA will continue to be in accordance with current interagency agreements.
- Capacity constraints in the arterial highway network will continue to limit traffic growth on the nine TBTA crossings.
- Highway/crossing improvements, in general, for the competing bridges and roadway network will be made in accordance with the plans and schedules described herein.
- Major TBTA roadway and structural improvements will continue to be performed during nighttime and non-peak hours, and/or in the off-peak direction, and approaches to the nine TBTA crossings will not be significantly impaired by construction work beyond the items discussed in this report.

- The forecasts are based on the assumption that *E-ZPass* usage will grow at the rate of 0.5 percent annually during the period included in these forecasts. While usage at a higher level would improve toll plaza operating conditions, it would also result in lower average tolls and, therefore, could reduce the level of increase in gross toll revenues. Growth in traffic volumes would be limited without *E-ZPass* at toll plazas.
- Competing East River crossings will continue to operate toll-free and to be maintained in efficient operating condition. (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 \$0.50 discount for *E-ZPass* auto customers and the Staten Island residents' discount program for the Verrazano-Narrows Bridge.
- The effects of the toll-rebate program, implemented in January 1998, for the benefit of *E-ZPass* customers who are residents of Broad Channel and Rockaway peninsula traveling on the Cross Bay Bridge, are fully reflected in the results since 1998 and, therefore, no further impact will occur.
- No other toll discount programs will be introduced that would adversely affect the TBTA toll facilities' revenue stream.
- No material natural disaster, or local, state or national emergency will occur that would alter travel patterns and divert traffic from the TBTA facilities.

While the projections are made and presented year-by-year by URS, they are intended to show trends on the basis of its analysis of historical data and the assumptions and conditions set forth

above. Variations in the year-to-year forecasted results may occur and such variations may be significant.

PROJECTED TRAFFIC, REVENUES AND EXPENSES

Future traffic and toll revenues are estimated for the 10-year (2007-2017) 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 2007 through 2010 budget, 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 16 and adjusted the average tolls to develop the forecast with periodic toll increases.

Traffic and Toll Revenue at Current Tolls

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

All indicators point to the potential for traffic increases in the future at modest rates of growth. URS estimates that traffic on the Throgs Neck, Triborough, Bronx-Whitestone, Henry Hudson and Verrazano-Narrows bridges and Queens Midtown Tunnel will increase primarily during the off-peak period, once these facilities exceed their capacity levels with respect to the highest recorded levels achieved since 1970 (from Table 18). (The Cross Bay Veterans Memorial Bridge is anticipated to reach its previous highest annual volume during the forecast period; however, there is available capacity for growth on that facility so the growth rate was not reduced.) 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 Verrazano-Narrows Bridge will reach the previous highest annual traffic volume in 2010. After that, an application of the 50 percent growth factor was used for the remainder of the forecast period.

On this basis, starting with the 2007 estimated traffic by facility from Table 11, URS projected the traffic by facility as shown in Table 19, and calculated the corresponding toll revenue based on the 2006 average tolls (also from Table 11).

General traffic growth in the range of 0.68 to 0.92 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. An exception is the Brooklyn-Battery Tunnel, which has shown an overall negative trend since 2001 due to decreased activity in lower Manhattan. We have assumed that this negative trend will not continue and have projected future traffic to increase at 0.5 percent per year. Also, 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 19), to which the elasticity impacts (from Table 17) were applied. URS then applied the appropriate increased average tolls (the 2006 averages from Table 11 increased by the percentages in Table 17) in the years 2009, 2012 and 2015 (effective January 1) to calculate the corresponding toll revenues in the respective years. The traffic and revenue forecasts with periodic toll increases are listed in Table 20.

Table 19. Traffic and Toll Revenue Forecast, Constant Tolls

Year	Throgs Neck ^(b)	Bronx-White-stone ^(b)	Tri-borough ^{(b)(c)}	Queens Midtown ^(b)	Brooklyn Battery ^(b)	Verrazano-Narrows	Henry Hudson	Marine Parkway-Gil Hodges Memorial Bridge	Cross Bay Veterans Memorial Bridge	Total
Annual Traffic (000s)										
2007 ^(a)	43,129	40,197	63,281	29,351	18,265	71,093	24,276	7,823	7,568	304,982
2008	43,584	40,621	63,236	29,673	18,356	71,986	24,656	7,856	7,813	307,781
2009	44,044	41,050	62,890	29,999	18,448	72,890	24,849	7,889	8,066	310,125
2010	44,509	41,483	63,185	30,328	18,540	73,348	25,044	7,923	8,327	312,687
2011	44,744	41,702	63,481	30,661	18,633	73,808	25,240	7,956	8,597	314,822
2012	44,980	41,922	64,429	30,998	18,726	74,272	25,437	7,990	8,875	317,630
2013	45,218	42,143	64,731	31,338	18,820	74,738	25,636	8,024	9,163	319,811
2014	45,456	42,366	65,692	31,682	18,914	75,208	25,837	8,058	9,460	322,671
2015	45,696	42,589	65,999	32,029	19,008	75,680	26,039	8,092	9,766	324,900
2016	45,938	42,814	66,309	32,381	19,103	76,155	26,243	8,126	10,082	327,152
2017	46,180	43,040	66,620	32,736	19,199	76,634	26,448	8,161	10,409	329,427
Traffic Growth										
2007-2008	1.06%	1.06%	-0.07%	1.10%	0.50%	1.26%	1.57%	0.42%	3.24%	0.92%
2008-2009	1.06	1.06	-0.55	1.10	0.50	1.26	0.78	0.42	3.24	0.76
2009-2010	1.06	1.06	0.47	1.10	0.50	0.63	0.78	0.42	3.24	0.83
2010-2011	0.53	0.53	0.47	1.10	0.50	0.63	0.78	0.42	3.24	0.68
2011-2012	0.53	0.53	1.49	1.10	0.50	0.63	0.78	0.42	3.24	0.89
2012-2013	0.53	0.53	0.47	1.10	0.50	0.63	0.78	0.42	3.24	0.69
2013-2014	0.53	0.53	1.48	1.10	0.50	0.63	0.78	0.42	3.24	0.89
2014-2015	0.53	0.53	0.47	1.10	0.50	0.63	0.78	0.42	3.24	0.69
2015-2016	0.53	0.53	0.47	1.10	0.50	0.63	0.78	0.42	3.24	0.69
2016-2017	0.53	0.53	0.47	1.10	0.50	0.63	0.78	0.42	3.24	0.70
Average Toll										
2007	\$5.181	\$4.720	\$4.572	\$4.387	\$4.169	\$3.895	\$1.859	\$1.491	\$1.580	\$4.108
2008 ^(d)	5.181	4.719	4.571	4.386	4.169	3.894	1.858	1.491	1.580	4.108
Toll Revenues (000s)										
2007	\$223,459	\$189,728	\$289,296	\$128,765	\$76,149	\$276,874	\$45,119	\$11,664	\$11,956	\$1,253,012
2008	225,790	191,707	289,051	130,162	76,521	280,317	45,820	11,712	12,342	1,263,422
2009	228,145	193,707	287,437	131,574	76,894	283,802	46,173	11,760	12,740	1,272,232
2010	230,524	195,727	288,748	133,001	77,268	285,549	46,528	11,809	13,151	1,282,306
2011	231,712	196,736	290,065	134,444	77,645	287,306	46,887	11,857	13,576	1,290,228
2012	232,906	197,749	294,361	135,903	78,024	289,075	47,248	11,906	14,014	1,301,185
2013	234,106	198,768	295,703	137,377	78,404	290,854	47,612	11,955	14,466	1,309,245
2014	235,312	199,792	300,052	138,868	78,786	292,644	47,978	12,004	14,932	1,320,370
2015	236,525	200,822	301,421	140,374	79,170	294,445	48,348	12,054	15,414	1,328,572
2016	237,743	201,857	302,796	141,897	79,556	296,257	48,720	12,103	15,912	1,336,841
2017	238,968	202,897	304,176	143,436	79,944	298,080	49,096	12,153	16,425	1,345,176

(a) From Table 11.

(b) Growth rates reduced by 50 percent because volume reaches previous highest traffic level.

(c) Reflects impact of construction of Second Avenue Subway between 2008 and 2013.

(d) Average toll adjusted in 2008 and each year thereafter to reflect increase in *E-ZPass* usage of 0.5 percent per year.

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

Year	Throgs Neck ^(b)	Bronx-Whitstone ^(b)	Tri-borough ^{(b)(c)}	Queens Midtown ^(b)	Brooklyn Battery ^(b)	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										
2009	-1.25%	-1.25%	-2.47%	-2.31%	-4.33%	-1.80%	-3.83%	-1.72%	-2.35%	
2012	-1.11	-1.11	-2.19	-2.06	-3.84	-1.55	-3.35	-1.44	-1.95	
2015	-1.01	-1.01	-1.99	-1.86	-3.47	-1.38	-3.00	-1.26	-1.71	
Annual Traffic (000s)										
2007 ^(a)	43,129	40,197	63,281	29,351	18,265	71,093	24,276	7,823	7,568	304,982
2008	43,584	40,621	63,236	29,673	18,356	71,986	24,656	7,856	7,813	307,781
2009	43,494	40,536	61,338	29,305	17,650	71,581	23,898	7,753	7,877	303,431
2010	43,953	40,964	61,626	29,626	17,738	72,030	24,085	7,786	8,132	305,940
2011	44,185	41,181	61,915	29,952	17,827	72,483	24,273	7,819	8,395	308,029
2012	43,924	40,938	61,460	29,658	17,227	71,808	23,645	7,740	8,498	304,898
2013	44,156	41,154	61,749	29,984	17,314	72,259	23,830	7,772	8,773	306,990
2014	44,389	41,371	62,665	30,313	17,400	72,713	24,016	7,805	9,057	309,729
2015	44,175	41,171	61,708	30,076	16,881	72,161	23,478	7,740	9,191	306,581
2016	44,408	41,389	61,998	30,406	16,965	72,614	23,662	7,773	9,489	308,702
2017	44,642	41,607	62,288	30,740	17,050	73,070	23,847	7,806	9,796	310,846
Average Toll ^(d)										
2007–2008	\$5.181	\$4.720	\$4.572	\$4.387	\$4.169	\$3.895	\$1.859	\$1.491	\$1.580	\$4.108
2009–2011	5.801	5.279	5.114	4.915	4.673	4.450	2.104	1.745	1.851	4.625
2012–2014	6.418	5.836	5.654	5.440	5.174	4.997	2.348	1.994	2.116	5.138
2015–2017	7.035	6.392	6.193	5.965	5.676	5.544	2.591	2.243	2.381	5.648
Toll Revenue (000s)										
2007	\$223,459	\$189,728	\$289,296	\$128,765	\$76,149	\$276,874	\$45,119	\$11,664	\$11,956	\$1,253,012
2008	225,790	191,707	289,051	130,162	76,521	280,317	45,820	11,712	12,342	1,263,422
2009	252,320	214,002	313,680	144,031	82,478	318,513	50,291	13,533	14,582	1,403,431
2010	254,952	216,235	315,111	145,594	82,880	320,474	50,678	13,589	15,052	1,414,563
2011	256,266	217,349	316,548	147,173	83,284	322,446	51,068	13,645	15,538	1,423,316
2012	281,919	238,900	347,467	161,345	89,142	358,803	55,511	15,434	17,980	1,566,501
2013	283,372	240,131	349,052	163,095	89,576	361,011	55,938	15,498	18,561	1,576,233
2014	284,832	241,368	354,186	164,864	90,013	363,233	56,369	15,561	19,159	1,589,586
2015	310,784	263,172	382,166	179,417	95,809	400,032	60,832	17,359	21,879	1,731,451
2016	312,385	264,528	383,909	181,363	96,276	402,494	61,301	17,431	22,585	1,742,272
2017	313,995	265,891	385,660	183,331	96,746	404,971	61,773	17,503	23,314	1,753,182

- (a) From Table 11.
- (b) Growth rates reduced by 50 percent because volume is at or near previous highest traffic level.
- (c) Reflects impact of construction of Second Avenue Subway between 2008 and 2013.
- (d) Passenger car cash toll increase of \$0.50 at major crossings and \$0.25 at minor crossings, with commensurate increases for other vehicle classes assumed by URS in 2009, 2012 and 2015. These increase are for forecasting purposes only and have not been adopted as TBTA policy. Average toll adjusted in 2008 and each year thereafter to reflect increase in *E-ZPass* usage of 0.5 percent per year.



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 21. Total operating expenses, consisting of labor and non-labor, are estimated to increase from \$407.8 million in 2007 to \$555.5 million in 2017. 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 2007 through 2010 as shown in Table 21. Nonrecurring costs include costs associated with the transition to a new contract for the *E-Zpass* Customer Service Center in 2007, 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 2007 to 2008 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 estimated cost of \$26.1 million in 2010 and 2011 and 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 2017.

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

Table 21. Projected Operating Expenses
(000s)

Year	Labor ^(a)	Non-Labor ^(b)	Total ^(c)
2007 ^(d)	\$192,765	\$215,040	\$407,805
2008 ^(d)	204,269	200,334	404,602
2009 ^(d)	214,512	212,042	426,554
2010 ^(d)	225,449	239,465	464,914
2011 ^(e)	235,594	249,066	484,661
2012 ^(e)	245,018	244,935	489,953
2013 ^(e)	253,594	253,051	506,645
2014 ^(e)	261,201	260,251	521,453
2015 ^(e)	269,037	254,617	523,655
2016 ^(e)	277,109	262,256	539,364
2017 ^(e)	285,422	270,123	555,545

- (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 22. For 2007, net toll revenue under either scenario is estimated at \$845.2 million. In year 2017, net toll revenue at constant tolls is estimated to be \$789.6 million and, with periodic toll increases, net toll revenue is estimated to be \$1,197.6 million.

Table 22. Net Toll Revenue Forecast
(000s)

Year	Gross Toll Revenues		Operating Expenses	Net Toll Revenues	
	Constant Toll	Periodic Toll Increases		Constant Toll	Periodic Toll Increases
2007	\$1,253,012	\$1,253,012	\$407,805	\$845,207	\$ 845,207
2008	1,263,422	1,263,422	404,602	858,820	858,820
2009	1,272,232	1,403,431	426,554	845,678	976,877
2010	1,282,306	1,414,563	464,914	817,392	949,649
2011	1,290,228	1,423,316	484,661	805,567	938,655
2012	1,301,185	1,566,501	489,953	811,232	1,076,548
2013	1,309,245	1,576,233	506,645	802,600	1,069,589
2014	1,320,370	1,589,586	521,453	798,917	1,068,133
2015	1,328,572	1,731,451	523,655	804,918	1,207,796
2016	1,336,841	1,742,272	539,364	797,477	1,202,908
2017	1,345,176	1,753,182	555,545	789,630	1,197,637

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

1. This report presents the results of our consideration of the information available to us as of the date hereof and the application of our experience and professional judgment to that information. It is not a guarantee of any future events or trends.
2. The traffic, revenue and expense forecasts will be subject to future economic and social conditions, demographic developments and metropolitan area transportation construction activities that cannot be predicted with certainty.
3. The projections contained in this report, while presented with numerical specificity, are based on a number of estimates and assumptions that, though considered reasonable to us, are inherently subject to significant economic and competitive uncertainties and contingencies, many of which will be beyond the control of TBTA and cannot be predicted with certainty. In many instances, a broad range of alternative assumptions could be considered reasonable. Changes in the assumptions used could result in material



differences in projected outcomes.

4. URS' net toll revenue projections only represent its best judgment and URS does not warrant or represent that actual net toll revenues will not vary from its projections, estimates and forecasts. The projection of revenues with periodic toll increases is for forecasting purposes only and does not represent adopted TBTA policy.
5. If, for any reason, any of these conditions should change due to changes in the economy or competitive environment, or other factors, URS' opinions or estimates may be affected.

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

REVIEW OF PHYSICAL CONDITION

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

Table 23. Opening Dates of TBTA Facilities

Facility	Open to Traffic	Years in Use
Triborough Bridge	1936	71
Bronx-Whitestone Bridge	1939	68
Throgs Neck Bridge	1961	46
Henry Hudson Bridge	1936 ^(a)	71
Queens Midtown Tunnel	1940	67
Brooklyn-Battery Tunnel	1950	57
Verrazano-Narrows Bridge	1964 ^(b)	43
Cross Bay Veterans Memorial Bridge	1970 ^(c)	37
Marine Parkway-Gil Hodges Memorial Bridge	1937	70

Notes: (a) Upper deck was added and opened in 1938.

(b) Lower level opened in 1969.

(c) The present structure replaced the previous structure that had been in service since 1939.

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

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

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

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

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

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

- Comparison of Conclusions and Recommendations sections of the current inspection reports with the previous inspection reports to note significant changes in observed deterioration, if any;
- Review of the current Capital Program to verify that the repairs recommended by the latest inspection reports are being addressed; and
- Review of TBTA’s Routine Maintenance Program 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, comprehensive condition inspections. Bridges are inspected biennially per federal and state mandate, with interim yearly inspections of any components that require monitoring. 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 regular biennial inspection of the Queens Midtown Tunnel has been let 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 2005/2006 by various consultants, under the New York State Biennial Bridge Inspection Program. New cycles of NYSDOT Biennial Bridge Inspection are currently underway. In addition, separate underwater and substructure inspections were performed in accordance with the five-year cycles of NYSDOT to obtain riverbed contours and to assess potential scour conditions at the substructure. These ongoing inspections, performed by the inspection consultants, consisted of visual examination, sounding and chipping concrete, scraping and cleaning steel, and taking appropriate measurements to determine the physical conditions of the bridges and tunnels.

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

The consulting engineering firms who performed the 2005 and 2006 biennial inspections and those who performed the 2001 and 2005 tunnel inspections for each facility were/are:

<i>Facility</i>	<i>Consulting Firm</i>
Triborough Bridge	Charles H. Sells, Inc. (2006)
Throgs Neck Bridge	Parsons Brinckerhoff (2005)
Bronx-Whitestone Bridge	Charles H. Sells (2005)
Henry Hudson Bridge	Lichtenstein Engineering Associates (2005)
Queens Midtown Tunnel	Parsons Brinckerhoff (2004-2005); facility approach bridges: Lichtenstein Engineering Associates (2005)
Brooklyn-Battery Tunnel	Parsons Brinckerhoff (2001)
Verrazano-Narrows Bridge	Lichtenstein Engineering Associates (2006)
Marine Parkway/Gil Hodges Mem. Br.	Hardesty and Hanover (2005)
Cross Bay Bridge	Hardesty and Hanover (2005)

These firms are well known in the field of structural inspection and appraisal. Copies of pertinent sections of the final inspection reports for the various facilities were requested and made available by TBTA. Bridges that are part of the odd-year inspection cycle listed above will be

undergoing inspections this summer, but the results of these inspections are not available at this time. These results of these inspections, also done by experts in the field, will generally be available at the end of the year.

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

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

Triborough Bridge - The design phase of the contract for the deck replacement for the Bronx toll plaza and ramps is underway with construction anticipated for 2011, 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. No significant priority maintenance steel repairs of components noted in the most recent inspection are necessary at this time. Maintenance painting of Ward's Island Viaduct and the superstructure of the suspended spans are ongoing. 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 replacement of the suspender ropes at the East River suspended span, main cable rewinding 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 is scheduled to be awarded by late summer in 2007 and will continue until 2009. Design of interior and exterior anchorage rehabilitation is ongoing and construction is scheduled to begin in 2008. 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, is substantially complete. The feasibility study for complete replacement of the main cables, should that become necessary in the future, is complete, and it has been concluded that replacement is feasible if it becomes necessary. There is no need to replace the cable in the near future, thus monitoring and maintenance of the main

cables is ongoing. The conceptual designs of the replacement of the Bronx/Queens approach spans and all on-grade approaches were completed with construction anticipated to be phased. The construction of the Bronx Approach span is anticipated to begin in 2008. The Queens replacement design will begin in 2007 with construction in the next capital program. 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, addition of three new tollbooths, the installation of acoustic sensors for cable monitoring at the main cables, and the rehabilitation of the Bronx/Queens approach ramps.

Throgs Neck Bridge - The orthotropic deck prototype construction and the testing associated with it is complete. The prototype was monitored, and a full-scale design of how to best implement deck replacement is being let now, with construction expected by 2015. The design of the investigation of the suspension system is complete. Construction was let in 2006 as part of a major rehabilitation contract to also include painting and steel repair of the suspended span superstructure, towers, main cables and suspender ropes and catwalk replacement. The construction project including structural steel rehabilitation, drainage system improvements and roadway barrier painting is complete. The monitoring of the prototype light pole and luminaire replacement project is ongoing, with full-scale lighting replacement on the structure scheduled to begin in 2008, phased with the deck replacements. Design of deck rehabilitation and replacement on the Queens approach is scheduled for completion in 2007 with construction expected to start in 2008. Design of rehabilitation of the fenders at the towers and anchorages began in April of 2006 with construction anticipated for January of 2009. Replacement of the slab on grade in the toll plazas, which was awarded in June 2006, is nearly complete. Installation of variable speed limit signs is ongoing. 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.

Henry Hudson Bridge - The conceptual study for the southbound lower level toll plaza expansion, replacement of the garage and the south approach replacement is complete with scoping planned by 2009, and design is anticipated to start thereafter. The garage and south approach is expected to be replaced in 2010-2014. The lower level toll plaza expansion is expected to take place in 2015-2019. The design of the replacement of the upper level deck in the vicinity of the toll plaza is ongoing with construction anticipated in 2008. Design of the lower level deck replacement is complete; construction was awarded in September 2006. The design of the removal of the sidewalk and the curb stringers, and the widening of the bridge is ongoing with construction anticipated for the next capital program. The cross drainage of the approaches between Dyckman Street and the main span is undergoing rehabilitation/replacement design with construction anticipated in 2008. Ongoing major maintenance includes limited rehabilitation of the lower level garage consisting of concrete repairs, and repaving and waterproofing the roadway above the garage. A major maintenance project was completed this year for the jacking and repairing of bearings and installation of safety ladders and platforms to the Dyckman Street electrical rooms. On the bridge, steel stringer pedestal defects identified in the biennial inspections were repaired. 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.

Queens Midtown Tunnel - A contract for a study and the development of a master plan for a tunnel ventilation system and electrical controls project has been completed. As a result, a construction contract to replace the exhaust fans and to perform minor repair to the supply fans is ongoing and scheduled for completion in 2008. Design of electrical rehabilitation on the vent building is in procurement, with construction in the next capital program. The rehabilitation of two overpasses including deck rehabilitation and beam encasement repair in the Manhattan approach area is ongoing, with completion scheduled for 2007. 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 completion of a new air conditioning system at the Queens Emergency building. Paving in portions of the tunnel and around tollbooths is complete and will continue periodically as necessary. Projects completed within recent years include the following: the rehabilitation of the pipe gallery connection between the Service Building 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 building.

Brooklyn-Battery Tunnel - Construction of a second story addition with recladding, window replacement and masonry and roof repairs to the existing service building is complete. Construction of tunnel roadway and drainage system rehabilitation, tunnel leakage repairs and wall tile replacement, and fire standpipe and waterline valve replacement is complete. The rehabilitation of the Brooklyn plaza pipe chase is ongoing and construction is expected to be finished in fall 2007. Installation of a new ethanol fuel tank was completed. The design of structural and architectural repairs for vent structures is complete and construction is expected to be let as three separate contracts in 2007. Modernization and upgrade of the control room design is complete and construction was awarded and is scheduled for completion in 2008. New electrical generators were recently installed. 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 of repair of the supply fans and control system upgrade in the ventilation structure is ongoing with construction planned for the next capital program. Electrical design to replace the tunnel feeders is ongoing with construction planned for 2009. Projects completed within recent years include: replacement of the exhaust fans in the ventilation structure, pump replacement, traffic control and signal system replacement, repaving of the Brooklyn plaza and rehabilitation of the Manhattan plaza, the construction of the elevator upgrades in the ventilation structures, egress improvements and the replacement of the facade in the Governor's Island building, and fresh air duct repairs.

Verrazano-Narrows Bridge - Rehabilitation of the Staten Island and Brooklyn Approach viaducts (lower level) and the Lily Pond Avenue Bridge began in December 2006. Detailed

design to replace the upper level suspended span deck is ongoing, with utility relocation construction planned for 2009/2010. Re-decking is expected to be included in the 2010-2014 Capital Program. Repairs of priority conditions noted in the most recent biennial inspection reports are being designed, and will be addressed in ongoing maintenance and capital programs. Rehabilitation of the service building roof is substantially complete. Maintenance painting of the Brooklyn approaches is complete and tower painting including drainage rehabilitation of the lower level and top lower strut of the Brooklyn approaches is expected to be completed by the end of 2007. General maintenance paving is ongoing. Rehabilitation of the traveler is ongoing. The rehabilitation of the electrical substation design is expected to be completed by 2008 and should be let in the future, possibly the next capital program. The design of the Salt Storage Facility in Staten Island is complete, and should begin construction by the end of 2007. The installation of sensors for the provision of real time under bridge clearance is under development. Projects completed within recent years include: rehabilitation and upgrade of the electrical system in the suspended spans, miscellaneous concrete repairs at the service building and steel repairs near the towers, bridge painting of the entire suspended spans (except the towers and the side and center parapets of the upper roadways), Brooklyn approach pavement rehabilitation, feasibility study to investigate widening of the Belt Parkway ramps, a feasibility study for the rehabilitation of the tollbooths, plaza, pavement, utility and lighting systems and signage and traffic interchange in the vicinity of the toll plaza, and rehabilitation, sealing and dehumidifying of the Brooklyn and Staten Island anchorages.

Marine Parkway-Gil Hodges Memorial Bridge - A contract to replace the elevators in the towers is complete. The design-build contract for a pre-engineered service building is underway. Repairs of secondary members and at lower priority locations are in construction are expected to be completed in March of 2009. Bike path construction was completed in 2006. Major Maintenance work scheduled for 2008 includes replacement of the span locks, painting of the deck trusses and repairs to the steel roadway and grating. 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.

Cross Bay Veterans Memorial Bridge - A contract to rehabilitate the deck and superstructure is ongoing with construction scheduled to be completed in 2010. A construction contract to include substructure rehabilitation including piles and pile caps is planned for 2010. An office engineer's trailer is expected to be installed in 2007. Painting and refurbishing of the exteriors of the tollbooths is planned for 2008. 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 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 created a security department and incorporates mitigation measures into their operations, capital and maintenance programs.

The agreement that allowed six-axle dump trucks to increase their allowable load from 80,000 lbs. to 105,000 lbs is still in effect. According to the TBTA, this increase in allowable load was 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 all bridges will allow for heavier vehicles, while more stringent enforcement is also in place. TBTA is currently in the process of instituting a Weigh-In-Motion (WIM) prototype project, which will test the feasibility of WIM technology to identify and restrict the passage of overweight vehicles on their facilities.

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. 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.
- The Variable Message Sign (VMS) program is proceeding well. Five new VMS have been installed and approximately 23 more are in various stages of design and procurement.
- Variable Speed Limit Signs have been procured and will be installed at various facilities. A total of 73 signs are planned.



- Key elements of the toll registry system are being modernized in order to improve efficiency and maintainability.

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 2017 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 2037, assuming maintenance consistent with past practice.

Respectfully,

URS CORPORATION – NEW YORK

Kathleen Massarelli, AICP
Vice President

Arthur H. Goldberg, P.E.
Vice President

/lah

H:\10311248\10311249\Reports\Drafts\FinalReport050407LAH.doc