APPENDIX E

HISTORY AND PROJECTION OF TRAFFIC, TOLL REVENUES AND EXPENSES

and

Review of Physical Conditions

Of the Facilities of

Triborough Bridge and Tunnel Authority

April 29, 2011

Prepared for the
Triborough Bridge and Tunnel Authority

A Constituent Agency of the Metropolitan Transportation Authority

By

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April 29, 2011

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, toll revenues and expenses for the toll bridge and tunnel facilities operated by the 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 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 toll revenue data, reflecting the 15 toll increases since 1972; (3) the impact of the *E-ZPass* electronic toll collection system; (4) the toll structure; (5) planned and possible future toll increases; (6) economic, population, employment and other demographic forecasts in the New York Metropolitan Area; (7) the traffic capacities of the bridges and tunnels and the existing roadway network that feeds the facilities in terms of the potential for future growth of peak versus non-peak period traffic; (8) current and programmed construction activities on TBTA's facilities and the arterial highway network serving the New York Metropolitan Area, including the toll-free East River bridges; and (9) mass transit network projects.

In 2010, actual total toll revenues for the TBTA facilities were $1,417.0 million, or 1.1 percent higher than the URS' previous forecast of $1,401.9 million and 6.4 percent higher than actual 2009 toll revenue. Total revenue traffic was 291.6 million vehicles, or 0.5 percent higher than that forecasted of 290.2 million vehicles and 0.1 percent higher than actual 2009 traffic.

TRANSPORTATION INFRASTRUCTURE

The New York Metropolitan Area's transportation infrastructure consists of an extensive network of highways, tunnels and bridges (both tolled and toll-free), regional bus and 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 2010, these facilities carried 294.9 million total vehicles, of which 291.6 million were toll paying, and generated $1,417.0 million in toll revenue. (Non-revenue transactions include police, emergency and TBTA vehicles.) The locations of the facilities are shown on the following map in the context of the regional highway network.

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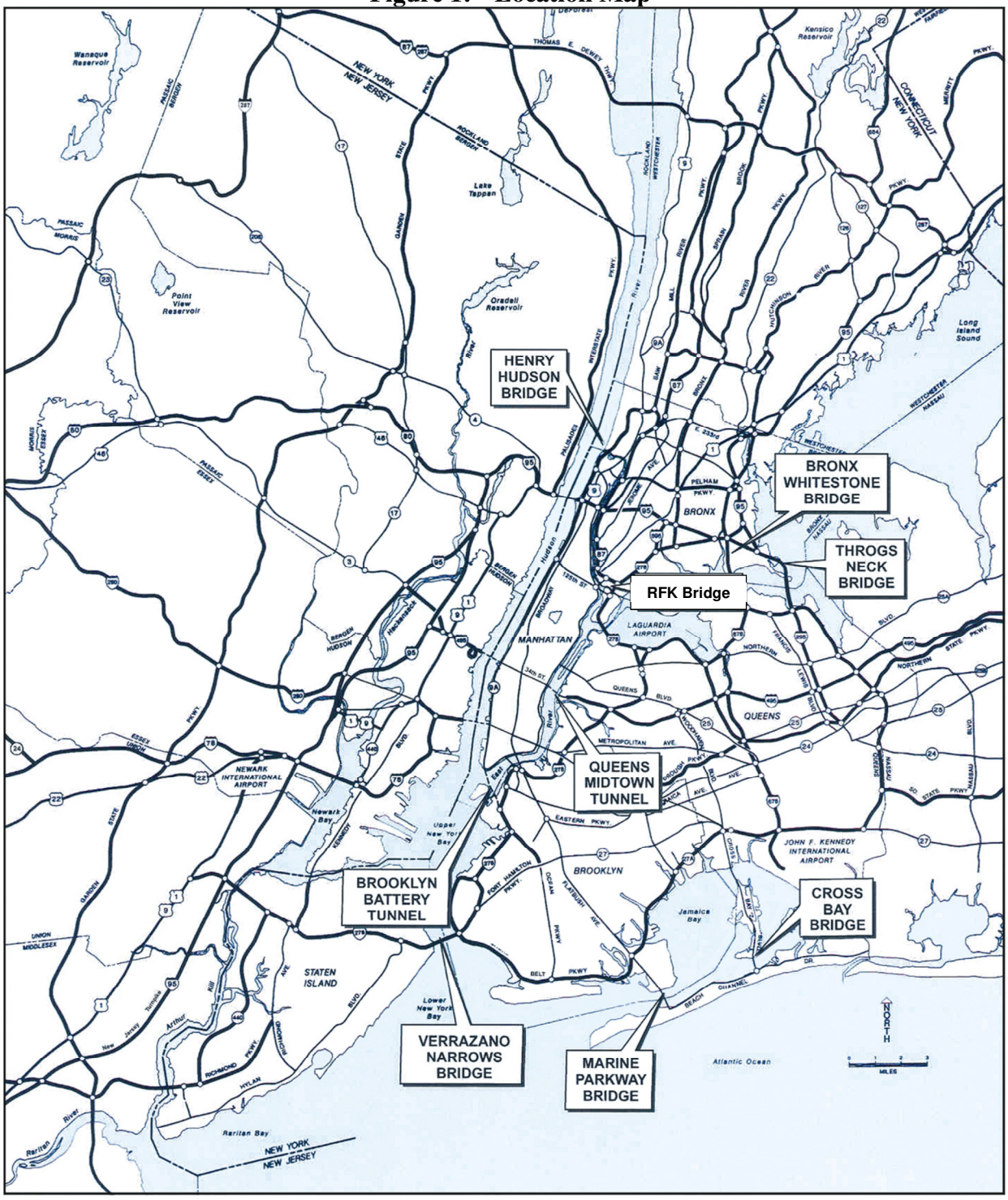
Figure 1: Location Map



The facilities are briefly described as follows:

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

Robert F. Kennedy (RFK) Bridge (formerly the *Triborough Bridge)* - a complex of three bridges connecting Manhattan, the Bronx and Queens, with a central connecting interchange on Randalls Island. Manhattan is reached via a six-lane vertical lift bridge over the Harlem River. The Bronx is accessed via an eight-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 and evening commuting hours, three lanes are operated in the peak traffic direction.

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

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

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

Metropolitan Area Arterial Network

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

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 RFK Bridge. The

Queens Midtown Tunnel carries I-495 (Long Island Expressway) into Manhattan. The RFK 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 RFK, Bronx-Whitestone and Throgs Neck bridges via the expressway system in the Bronx (plus the George Washington-RFK 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 twenty others beyond the New York Metropolitan Area, are linked through the *E-ZPass* Interagency Group (IAG) to better serve the regional traveler through a common electronic toll collection tag. *E-ZPass* and its impact on the TBTA facilities are discussed further, later 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 — RFK Bridge, Queens Midtown Tunnel and Brooklyn-Battery Tunnel — the motorist can, for the most part, choose to use transit as an alternative. 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 RFK Bridge, Bronx-Whitestone Bridge, Throgs Neck Bridge, Queens Midtown Tunnel and Brooklyn-Battery Tunnel. The minor crossings are the Henry Hudson Bridge, Marine Parkway-Gil Hodges Memorial Bridge and Cross Bay Veterans Memorial Bridge. The Verrazano-Narrows Bridge is the only facility on which tolls are collected in one direction only, while the cash tolls for passenger cars on the minor bridges are half the level of those on the major facilities, with the exception of the Henry Hudson Bridge.

Present and Proposed Toll Structures and Operation

The current toll structure, in place since December 30, 2010, is shown in Table 1. Tolls are determined using a basic rate as modified by variables specific to a number of factors. These factors include:

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

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Table 1 Current Toll Rates at TBTA Facilities, Effective December 30, 2010

Classification	Verrazano-Narrows Bridge [a]		RFK Bridge Bronx-Whitestone Bridge Throgs Neck Bridge Queens Midtown Tunnel Brooklyn-Battery Tunnel		Henry Hudson Bridge		Marine Parkway-Gil Hodges Memorial Bridge Cross Bay Veterans Memorial Bridge	
	Cash	*E-ZPass*[e]	Cash	*E-ZPass*[e]	Cash	*E-ZPass*[e]	Cash	*E-ZPass*[e]
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	$6.50	$4.80	$6.50	$4.80	$4.00	$2.20	$3.25	$1.80
Each additional axle costs	2.75	2.75	2.75	2.75	2.00	2.00	2.00	2.00
The following discounted prepaid charges are presently available for the two-axle vehicles referenced above:								
Prepaid charges through token roll purchases							2.17[b]	
Prepaid charges per crossing for registered Staten Island Residents using an eligible vehicle with three or more occupants	1.34							
Prepaid charges per crossing for registered Staten Island Residents using an eligible vehicle through token roll purchase	3.86[b]							
Registered Staten Island Residents using an eligible vehicle		2.88						
Prepaid charges per crossing for registered Rockaway Peninsula/Broad Channel Residents using an eligible vehicle							1.62[b]	1.19[c]
All two axle vehicles greater than 7,000 lbs. and buses (other than franchise buses and motor homes)	13.00	8.66	13.00	8.66	(d)	(d)	6.50	4.33
3 Axle	21.00	14.18	21.00	14.18			10.50	7.09
4 Axle	27.00	18.12	27.00	18.12			13.50	9.06
5 Axle	35.00	23.63	35.00	23.63			17.50	11.82
6 Axle	41.00	27.57	41.00	27.57			20.50	13.79
7 Axle	50.00	33.08	50.00	33.08			25.00	16.54
Each additional axle above 7	8.00	5.52	8.00	5.52			4.00	2.76
Two-axle franchise buses	5.25	3.47	5.25	3.47	(d)	(d)	2.60	1.73
Three-axle franchise buses	6.25	4.12	6.25	4.12	(d)	(d)	3.25	2.17
Motorcycles	2.75	2.09	2.75	2.09	2.75	1.49	2.75	1.49
Each additional axle costs	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25

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 after the first two trips taken during the same calendar day on the same *E-ZPass* transponder, reimbursed to TBTA by MTA. This program was instituted July 23, 2010.
(d) Passage prohibited.
(e) New York Customer Service Center transponders only; customers of other CSCs are charged the cash toll.

Passenger Car Tolls

TBTA crossings are separated into major and Verrazano-Narrows Bridge and minor and Henry Hudson Bridge categories for toll classification purposes. The passenger car cash toll is $6.50 for the major crossings and the Verrazano-Narrows Bridge. The minor crossing passenger car cash toll is $3.25 on the Marine Parkway-Gil Hodges Memorial and Cross Bay Bridges and $4.00 on the Henry Hudson Bridge. All tolls are collected in each direction except on the Verrazano-Narrows Bridge where the round-trip tolls are collected only in the westbound (Staten Island-bound) direction in order to comply with a provision of Federal law.

Tolls for passenger cars are discounted under the following programs: (1) *E-ZPass* and tokens; (2) place of residence/crossing used; (3) place of residence/vehicle occupancy; and (4) some combination of the foregoing. *E-ZPass* electronic toll collection is available on all TBTA toll facilities (see the following section for a more complete description of *E-ZPass* and its impact). Motorists open a pre-paid *E-ZPass* account and receive a transponder that they mount on their vehicles (typically 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 pre-paid account. Under the current toll schedule, passenger cars equipped with a New York Customer Service Center (NYCSC) *E-ZPass* receive a $1.70 discount per trip at all major facilities ($3.40 for Verrazano-Narrows Bridge westbound only), $1.80 on the Henry Hudson Bridge, and $1.45 at the Cross Bay Veterans Memorial and Marine Parkway-Gil Hodges Memorial bridges. Passenger cars equipped with a non-NYCSC transponder pay the same toll rate as cash customers. NYCSC transponders are available to non-New York residents.

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. This program was modified effective July 23, 2010. Under the modified program, Rockaway residents are charged the discounted toll of $1.19 for the first two trips taken over the bridge on a calendar day on a per *E-ZPass* transponder basis whereas before they were rebated for all trips. In 2010 the TBTA reimbursed the TBTA in the amount of approximately $2.6 million in toll rebates. The TBTA estimates that the reimbursements in 2011 will total approximately $0.6 million.

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, the present cash rate for these vehicles is $13.00 for two axles, increasing to $50.00 for a seven axle vehicle. These vehicles receive approximately a 33 percent discount with a NYCSC *E-ZPass.* Vehicles with more than seven axles pay a cash rate of $8.00 for each additional axle over seven and a NYCSC *E-ZPass* rate of $5.52 for each additional axle over seven (rates at the Verrazano-Narrows Bridge are doubled since the toll is collected in the westbound direction only). Vehicles with three to six axles pay varying rates, which increase with the number of axles, as shown in Table 1.

For the minor crossings, the two-axle cash rate for vehicles over 7,000 pounds is $6.50, increasing to $25.00 for a seven axle vehicle. These vehicles presently receive approximately a 33 percent discount with a NYCSC *E-ZPass*. Vehicles with more than seven axles pay a cash rate of $4.00 for each additional axle over seven and a NYCSC *E-ZPass* rate of $2.76 for each additional axle over seven. Vehicles with three to six axles pay varying rates, which increase with the number of axles, as shown in Table 1. 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 *E-ZPass*-only lanes. With the exception of the Henry Hudson Bridge, where gates were removed from the *E-ZPass*-only lanes on January 20, 2011, all *E-ZPass*-only lanes are gated. When a vehicle with an *E-ZPass* transponder enters an *E-ZPass*-only lane, an electronic reader identifies the tag code at the toll plaza and the toll is deducted from the customer's pre-paid account. TBTA has over 3.4 million *E-ZPass* tags in use. Currently, participation rates are at 76 percent of toll-paying traffic TBTA-wide. The total number of active Interagency Group (IAG) tags in use for all agencies in the extended region as of December 31, 2010 was over 20.8 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 (gated) *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. Recent reports from the TBTA indicate that travel time through the gateless lanes has decreased due to the elimination of *E-ZPass* interventions. According to the TBTA, the agency is continuing to move forward with an all-electronic tolling pilot project at the Henry Hudson Bridge. The first phase of the conversion was the removal of gates in the *E-ZPass*-only lanes, as noted above. The second phase, the elimination of cash toll collection, is scheduled to take place early in 2012, upon the evaluation of the gateless *E-ZPass* phase. As part of its evaluation, TBTA will be analyzing the violation rates and the enforcement strategies that are employed.

Table 2 lists the *E-ZPass* annual TBTA-wide participation rates starting in 2002, the sixth 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 2010.

Table 2 *E-ZPass* Participation Rates

	Annual Participation Rates for all Facilities								
Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
Percent Participation (All Facilities)	68.5%	69.8%	70.1%	71.5%	72.6%	73.5%	74.0%	73.9%	75.8%
	Participation Rate by Facility								
Facility	RFK	Bronx-Whitestone	Henry Hudson	Marine Parkway	Cross Bay	Queens Midtown	Brooklyn Battery	Throgs Neck	Verrazano-Narrows
Percent Participation (2010)	69.6%	69.2%	82.4%	81.2%	76.9%	80.8%	83.5%	75.1%	78.9%

Source: TBTA data.

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.

TBTA continues to undertake efforts to increase *E-ZPass* market share. The most recent toll increase widens the gap between *E-ZPass* and cash tolls, which may cause a shift toward *E-ZPass*. In addition, TBTA began *E-ZPass* On-the-Go in 2008. This is a program that enables customers to purchase a prepaid *E-ZPass* tag and account kit at participating retailers. The program has been quite successful and, in 2010, more than 32,000 On-the-Go accounts were opened, which is more than 20% of the total *E-ZPass* accounts for the year. Sixty-one retailers and 377 stores now sell the tag in the metropolitan area and future expansion is planned. In another initiative, TBTA will begin testing an *E-ZPass* replenishment card in 2011. This program will allow customers who wish to replenish their accounts with cash to receive an " *E-ZPass* Reload card" (it will look like a credit or debit card) that is directly linked to their *E-ZPass* accounts. Customers will be able to go to participating retailers and use the card to reload their *E-ZPass* accounts with cash through a self-service kiosk or through a sales clerk. An SMS text or e-mail message will be sent back to the customer acknowledging the transaction. Preparatory work began early in 2010 and TBTA hopes to implement this pilot project in mid-2011.

E-ZPass is fully integrated at facilities located in 14 states. The transportation network includes the six interstate crossings of the Port Authority of New York and New Jersey, the New Jersey Turnpike and Garden State Parkway operated by the New Jersey Turnpike Authority, 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, two toll bridges between New Jersey and Pennsylvania operated by

the Burlington County Bridge Commission, the toll roads maintained by the Illinois State Toll Highway Authority, the Chicago Skyway Bridge operated by the Skyway Concession Company, LLC, the Indiana Toll Road Concession Company, Chesapeake Bay Bridge and Tunnel District, Rhode Island Turnpike and Bridge Authority and the Ohio Turnpike Commission.

TBTA's Role in *E-ZPass*

TBTA was a founding member of the E-ZPass IAG, originally comprising toll authorities in Delaware, Pennsylvania, New Jersey and New York and now encompassing 24 toll agencies in 14 states and one international border crossing. Since the inception of the IAG more than 17 years ago, customers of the member IAG agencies have been able to use their tags on any E-ZPass-equipped facility operated by another IAG member.

The IAG is the only inter-state toll program in the country and processes well over three billion toll transactions annually. As the IAG has grown, the E-ZPass customer base has increased, which has helped 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 2010, TBTA transferred $507.4 million to, and received $312.0 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 40 years.

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

- Major crossings - RFK, Bronx-Whitestone and Throgs Neck bridges, and the Queens Midtown and Brooklyn-Battery tunnels;
- Minor crossings - Marine Parkway-Gil Hodges Memorial and Cross Bay Veterans Memorial bridges;
- Henry Hudson Bridge 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	RFK, Bronx-Whitestone and Throgs Neck Bridges and Queens Midtown Tunnel	Brooklyn-Battery Tunnel	Henry Hudson Bridge	Marine Parkway-Gil Hodges Memorial & Cross Bay Bridges
1971	$0.50	$0.25	$0.35	$0.10	$0.10
1972 – 1975	0.75	0.50	0.70	0.25	0.25
1975 – 1980	1.00	0.75	0.75	0.50	0.50
1980 – 1982	1.00	1.00	1.00	0.60	0.75
1982 – 1984	1.25	1.25	1.25	0.90	0.90
1984 – 1986	1.50	1.50	1.50	0.90	0.90
1986 – 1987	1.75[(a)]	1.75	1.75	1.00	1.00
1987 – 1989	2.00[(a)]	2.00	2.00	1.00	1.00
1989 – 1993	2.50[(a)]	2.50	2.50	1.25	1.25
1993 – 1996	3.00[(a)]	3.00	3.00	1.50	1.50
1996 – 2003	3.50[(a)]	3.50	3.50	1.75	1.75
2003 – 2005	4.00[(a)]	4.00	4.00	2.00	2.00
2005 – 2008	4.50[(a)]	4.50	4.50	2.25	2.25
2008[(b)]	5.00[(a)]	5.00	5.00	2.75	2.50
2009[(c)]	5.50[(a)]	5.50	5.50	3.00	2.75
2010[(d)]	6.50[(a)]	6.50	6.50	4.00	3.25

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) Effective March 16, 2008.
(c) Effective July 12, 2009.
(d) Effective December 30, 2010.

Over the years, various discount programs have been introduced. In March 1987, the Staten Island Carpool Program was initiated on the Verrazano-Narrows Bridge. 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 March 2008, the cost of 24 coupons increased to $55.92 and in July 2009 the cost of 24 coupons increased to $61.44. On December 30, 2010 the cost of 24 coupons increased to $64.32.

In general, tolls for vehicles over 7,000 pounds have also been adjusted upward whenever passenger car toll rates were increased. Notable exceptions occurred in 1987 and 1989 when these toll rates were not raised while there was a general increase for passenger cars. Historically, these vehicles received discounts on any TBTA facility when they used pre-paid accounts. This plan continues with *E-ZPass* with the exception of non-NYCSC customers.

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 present toll rate of $6.50 set in 2010, alongside the CPI.

Table 4 Cash Passenger Toll Rates Versus Consumer Price Index

Year	RFK, Bronx-Whitestone and Throgs Neck Bridges and Queens Midtown Tunnel	Consumer Price Index[(a)]	Tolls Adjusted to 1982-84 Dollars[(b)]
1971	$0.25	43.6	$0.57
1972	0.50	45.5	1.10
1975	0.75	57.6	1.30
1980	1.00	82.1	1.22
1982	1.25	95.3	1.31
1984	1.50	104.8	1.43
1986	1.75	112.3	1.56
1987	2.00	118.0	1.69
1989	2.50	130.6	1.91
1993	3.00	154.5	1.94
1996	3.50	166.9	2.10
2003	4.00	197.8	2.02
2005	4.50	212.7	2.12
2008	5.00	235.8	2.12
2009	5.50[(c)]	236.8	2.32
2010	6.50[(d)]	240.9	2.70
Ratio 2010/1971	26.0	5.5	4.7

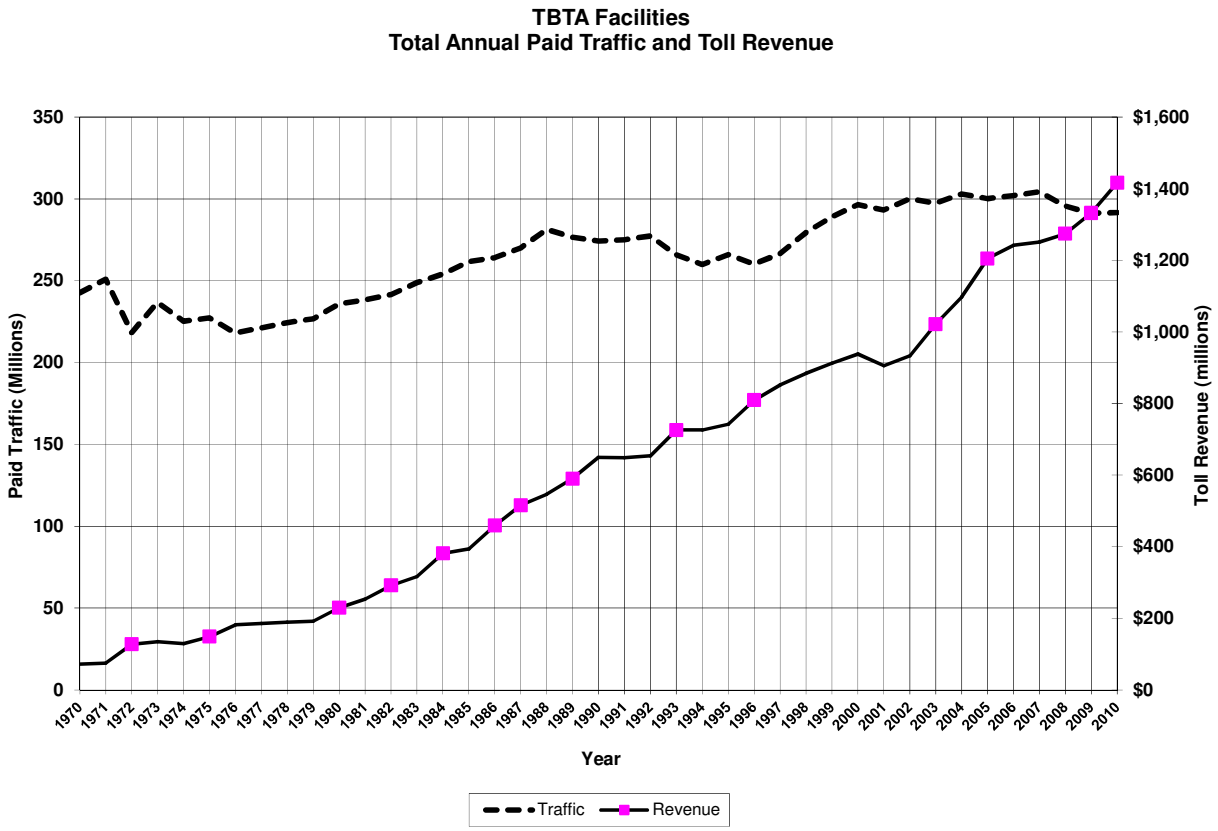
Notes: (a) New York Metropolitan Statistical Area: New York–Northern New Jersey-Long Island, NY-NJ-CT-PA, All Urban Consumers, All Items. Base period: 1982-1984 = 100.0. Not seasonally adjusted. Source: US Department of Labor, Bureau of Labor Statistics.
(b) The current toll divided by the CPI and expressed as a decimal.
(c) Effective July 12, 2009.
(d) Effective December 30, 2010.

As indicated in the table, TBTA tolls in current dollars have risen faster than the CPI during the 39-year period. As can be seen in Table 4, the $6.50 toll effective on December 30, 2010 in 2010 dollars is equivalent to a toll of $2.70 in 1982-1984 dollars. The actual 2010 cash toll for passenger cars is 26 times the actual toll in 1971. However, if adjusted for inflation, the toll in 2010 was only 4.7 times that in 1971 (in each case based on 1982-1984 dollars).

HISTORICAL TRAFFIC, REVENUES AND EXPENSES AND ESTIMATED/BUDGETED NUMBERS FOR 2011

Historical traffic, toll revenues and expenses were reviewed for the nine TBTA bridges and tunnels. Over the last 40 years, paid traffic volumes on the crossings have ranged from approximately 220 million in the 1970s to 304 million in 2007. As displayed in Figure 2, the growth of traffic reflects the region's moderate overall growth in population and employment, offset by the impact of 15 periodic toll increases (represented by the squares in the graph). By 2000, with tolls at 14 times the 1971 level and traffic levels 18 percent higher, toll revenues had increased more than 13-fold, from $72 million to $941 million in 2000. Revenues then declined to $915 million in 2001 primarily due to the closures and restrictions on TBTA facilities following the September 11 terrorist attack on the World Trade Center and the regional decline in employment. In 2007, with tolls having been increased again in 2003 and 2005, and traffic reaching an historic high of 304 million vehicles, revenue reached $1,251 million, $9 million greater than revenues in 2006. With the toll increase in March 2008, revenue in 2008 reached $1,274 million, $23 million higher than revenues in 2007. The toll increase in July 2009 resulted in revenues reaching $1,332 million, or $58 million greater than 2008. Toll revenue grew by $85 million in 2010, to $1,417 million, primarily due to a full year at the 2009 rates. Also note in Figure 2 that, despite the periodic toll increases, the traffic trend generally has been upward, with variations along the way when the tolls were increased.

Figure 2: Aggregated TBTA Facilities Paid Traffic and Toll Revenue, 1970 to 2010



Since 1970, annual operating expenses for the toll facilities have risen by a multiple of 15.4, from $25 million to $383 million in 2010, during which time the CPI for the New York Metropolitan Statistical Area increased by a multiple of 5.8. Among the significant increases over this period were additional expenses to maintain the facilities and increased security costs after the events of September 11, 2001.

Traffic and Toll Revenue, 2000 to 2010

Table 5 lists the traffic and toll revenue record for each of the nine crossings for the 2000-2010 period. Total TBTA traffic and toll revenue are shown in Table 6. The peak in toll-paying traffic during this period, 304 million crossings, occurred in 2007. In general, the pattern historically has been that when toll rates are increased, traffic declines moderately and then traffic begins to rise until the next rate increase. However, the toll rate increase in 2008 was also accompanied by rising fuel prices through mid-2008 and the deteriorating economy, resulting in a 2.9 percent drop in traffic. In contrast, with gasoline prices dropping in the latter portion of 2008, traffic decreased only 1.5 percent between 2008 and 2009, even with a toll increase occurring in July 2009. (The historical relationship between toll increases and traffic volume is described in the *Toll Impacts and Elasticity* section of this report.) The four most recent toll increases (prior to the 2010 toll increase) reflected in Tables 5 and 6, in 2003, 2005, 2008 and 2009, are evident in the jump in average tolls in those years.

In 2000, toll revenue was reported at $941 million 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 vehicular restrictions at the Brooklyn-Battery Tunnel, with negative impacts also occurring at the Queens Midtown Tunnel and at the RFK 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 Verrazano-Narrows Bridge traffic was brought about by the truck restrictions at the Holland Tunnel as well as New York City's single occupancy vehicle restrictions. Since November 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 exceeded $1 billion, largely as a result of the May 2003 toll increase. After the March 2005 toll increase, 2005 traffic volumes decreased 0.9 percent and revenue rose to $1,205 million for the year, and then revenues increased to $1,242 million in 2006 and increased further to $1,251 million, along with traffic, in 2007. In 2008 traffic volumes decreased 2.9 percent from 304 million in 2007 to 296 million, while toll revenues increased 1.9 percent to $1,274 million, as a result of the March 16, 2008 toll increase. The July 12, 2009 toll increase resulted in an overall increase in toll revenue from $1,274 million in 2008 to $1,332 million, an increase of 4.6 percent, while traffic decreased by 1.5 percent from 295.7 million to 291.4 million vehicles. Traffic grew by 0.1 percent in 2010 to 291.6 million vehicles and toll revenue grew 6.4 percent to $1,417 million. The revenue growth was primarily due to a full year's impact of the July 2009 toll increase.

Traffic on the Bronx-Whitestone and Throgs Neck bridges has been of similar magnitude over the years. 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, at times based on lane restrictions due to construction activity.

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Table 5 Annual Toll-Paying Traffic and Toll Revenue: 2000 to 2010
(000s)[a]

Year	Verrazano-Narrows Bridge				RFK Bridge				Bronx-Whitestone Bridge			
	Traffic		Revenue	Average Toll[c]	Traffic		Revenue	Average Toll	Traffic		Revenue	Average Toll
	Volume[b]	Change			Volume	Change			Volume	Change		
2000[d]	69,107	2.4%	$203,172	$2.94	63,677	2.8%	$222,612	$3.50	42,334	5.4%	$155,938	$3.68
2001	70,929	2.6	208,164	2.93	62,506	–1.8	215,241	3.44	42,090	–0.6	152,881	3.63
2002	73,361	3.4	216,312	2.95	60,747	–2.8	208,905	3.44	44,359	5.4	160,730	3.62
2003	71,108	–3.1	233,482	3.28	58,339	–4.0	222,224	3.81	44,413	0.1	175,393	3.95
2004	71,404	0.4	246,322	3.45	61,638	5.7	247,937	4.02	45,223	1.8	187,231	4.14
2005	69,980	–2.0	267,276	3.82	62,841	2.0	280,516	4.46	41,198	–8.9	188,808	4.58
2006	70,381	0.6	274,100	3.89	63,063	0.4	288,300	4.57	39,488	–4.2	186,384	4.72
2007	70,382	0.0	272,837	3.88	62,511	–0.9	285,847	4.57	42,397	7.4	200,076	4.72
2008	68,884	–2.1	278,906	4.05	59,741	–4.4	287,877	4.82	42,803	1.0	212,125	4.96
2009	68,600	–0.4	295,901	4.31	59,449	–0.5	304,794	5.13	42,675	–0.3	225,224	5.28
2010	68,086	–0.7	312,873	4.60	60,098	1.1	326,103	5.43	41,037	–3.8	229,428	5.59

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		
2000[d]	37,535	–1.4%	$152,453	$4.06	21,298	2.5%	$69,018	$3.24	26,573	2.3%	$89,451	$3.37
2001	37,802	0.7	150,764	3.99	16,452[e]	–22.8	52,188	3.17	26,177[e]	–1.5	87,067	3.33
2002	39,687	5.0	157,988	3.98	15,447[e]	–6.1	48,880	3.16	26,901[e]	2.8	88,865	3.30
2003	39,082	–1.5	172,603	4.42	17,806[e]	15.3	61,810	3.47	27,512[e]	2.3	99,994	3.63
2004	39,439	0.9	184,338	4.67	17,700	–0.6	64,366	3.64	28,181	2.4	107,067	3.80
2005	41,199	4.5	210,242	5.10	17,426	–1.5	70,294	4.03	28,751	2.0	121,666	4.23
2006	43,186	4.8	223,756	5.18	17,718	1.7	73,868	4.17	28,966	0.7	127,075	4.39
2007	41,931	–2.9	217,958	5.20	18,139	2.4	75,980	4.19	29,375	1.4	129,348	4.40
2008	40,492	–3.4	219,855	5.43	16,899	–6.8	73,590	4.35	28,620	–2.6	131,264	4.59
2009	39,050	–3.6	222,825	5.71	15,899	–5.9	73,248	4.61	27,702	–3.2	134,927	4.87
2010	39,362	0.8	240,343	6.11	16,093	1.2	79,225	4.92	28,443	2.7	146,934	5.17

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		
2000[d]	22,546	5.9%	$31,938	$1.42	7,207	–2.5%	$8,374	$1.16	6,356	5.7%	$7,651	$1.20
2001	23,290	3.3	32,242	1.38	7,263	0.8	8,344	1.15	6,712	5.6	7,965	1.19
2002	24,657	5.9	34,045	1.38	7,745	6.6	8,938	1.15	7,091	5.6	8,471	1.19
2003	24,582	–0.3	37,744	1.54	7,704	–0.5	9,694	1.26	6,919	–2.4	8,993	1.30
2004	24,703	0.5	40,149	1.63	7,719	0.2	10,102	1.31	6,989	1.0	9,477	1.36
2005	24,136	–2.3	43,920	1.82	7,673	–0.6	11,234	1.46	7,182	2.8	10,988	1.53
2006	24,159	0.1	44,901	1.86	7,737	0.8	11,536	1.49	7,361	2.5	11,630	1.58
2007	24,117	–0.2	44,779	1.86	7,833	1.2	11,635	1.49	7,679	4.3	12,090	1.57
2008	22,823	–5.4	46,126	2.02	7,829	–0.1	12,019	1.54	7,589	–1.2	12,212	1.61
2009	22,584	–1.0	49,581	2.20	7,876	0.6	12,921	1.64	7,548	–0.5	12,694	1.68
2010	23,054	2.1	54,452	2.36	7,837	–0.5	13,774	1.76	7,625	1.0	13,914	1.82

Traffic numbers are preliminary, subject to final audit.

Notes:
(a) Toll rate increases occurred on May 18, 2003, March 13, 2005, March 16, 2008, July 12, 2009 and December 30, 2010.
(b) Westbound toll traffic volume doubled (an approximation), since traffic is not registered in the eastbound direction.
(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.

Source: TBTA data.

Of the nine TBTA toll facilities, the RFK Bridge reported the highest toll revenue for 2010 at $326.0 million, while the Marine Parkway-Gil Hodges Memorial Bridge registered the lowest revenue at $13.8 million.

Total annual TBTA toll traffic volume and revenue are shown in Table 6 for the period 2000 through 2010.

Table 6 Summary of Annual Paid Traffic and Toll Revenue: 2000 to 2010

Year	Total Paying Traffic Volume (000s)	Total Toll Revenue (000s)	Average Toll
2000[a]	296,633	$940,607	$3.17
2001	293,220	914,856	3.12
2002	299,995	933,134	3.11
2003[b]	297,465	1,021,937	3.44
2004	302,995	1,096,989	3.62
2005[b]	300,385	1,204,944	4.01
2006	302,059	1,241,551	4.11
2007	304,364	1,250,549	4.11
2008[b]	295,680	1,273,974	4.31
2009	291,383	1,332,115	4.57
2010[b,c]	291,634	1,417,046	4.86

Notes:
(a) Includes $9.7 million relating to the write-off of unredeemed tokens and tickets.
(b) Toll rate increases occurred on May 18, 2003, March 13, 2005, March 16, 2008, July 12, 2009 and December 30, 2010.
(c) Traffic numbers are preliminary, subject to final audit.
Source: TBTA data.

Traffic by Facility and Vehicle Class, 2010

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 2010 traffic volumes by facility. Passenger cars totaled 270.9 million crossings and represented 93 percent of the total toll-paying vehicles (which has remained relatively constant over time). Of the TBTA facilities, the Verrazano-Narrows Bridge registered the highest two-way traffic volume of 68.1 million toll-paying vehicles. The lowest toll-paying volume, 7.6 million vehicles, was recorded at the Cross Bay Veterans Memorial Bridge.

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Table 7 Traffic by Facility and Vehicle Class, 2010

(000s)

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	35,333	49	44	1,570	1	1	315	303
Bronx-Whitestone Bridge	38,148	13	8	1,311	164	2	317	200
RFK Bridge	55,393	22	9	2,960	112	247	587	92
Queens Midtown Tunnel	26,140	6	4	1,670	68	229	231	28
Brooklyn-Battery Tunnel	14,699	2	1	646	1	553	109	14
Verrazano-Narrows Bridge[(a)]	63,683	28	24	1,910	158	381	398	217
Henry Hudson Bridge[(b)]	22,876	2	1	120	0	0	3	1
Marine Parkway Bridge	7,558	2	1	163	58	2	20	4
Cross Bay Bridge	7,106	3	1	290	116	24	38	5
Total	270,936	125	94	10,639	677	1,439	2,018	863
Percent of Paid Vehicles	92.9%	0.0%	0.0%	3.6%	0.2%	0.5%	0.7%	0.3%

Facility	8 Trucks 5 Axles	9 Motor-cycles	12 Trucks 6 Axles	13 Trucks 7 Axles	14 Other Vehicles	Total Toll-Paying Vehicles	10 Non-Rev Vehicles[(c)]	Total Vehicles
Throgs Neck Bridge	1,566	84	92	2	2	39,362	204	39,566
Bronx-Whitestone Bridge	784	78	11	0	1	41,037	184	41,221
RFK Bridge	538	122	15	0	1	60,098	1,055	61,153
Queens Midtown Tunnel	13	52	2	0	0	28,443	395	28,838
Brooklyn-Battery Tunnel	3	64	1	0	0	16,093	447	16,540
Verrazano-Narrows Bridge[(a)]	1,079	167	38	1	2	68,086	646	68,733
Henry Hudson Bridge[(b)]	1	52	0	0	0	23,054	79	23,133
Marine Parkway Bridge	12	16	1	0	0	7,837	79	7,916
Cross Bay Bridge	17	22	2	0	0	7,625	126	7,751
Total	4,013	657	161	5	7	291,634	3,216	294,850
Percent of Paid Vehicles	1.4%	0.2%	0.1%	0.0%	0.0%	100.0%		

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

Source: TBTA

Monthly Traffic, 2010

Monthly variations in traffic volumes on the nine crossings have historically been attributed to several factors, including severe winter weather, which may result in lower volumes; and, conversely, traffic reaching its highest levels during the summer months when recreational travel peaks. Traffic volumes also tend to decline in the aftermath of a toll increase. Furthermore, individual facilities can be affected by construction projects on the facility itself or its approaches, and on adjacent arterials or competing bridges. The limited number of crossings in the region, however, 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 2010 peaked in June. August was the second highest month in 2010. For the combined facilities, the monthly variations in 2010 ranged from 14 percent below the annual average in February (due to harsh weather) to 8 percent above in June. This is indicative of a stable traffic mix comprising a solid base of commuting, discretionary and commercial traffic.

Table 8 Monthly Traffic Variations, 2010

Month	Average Daily Toll-Paying Traffic										Ratio to AADT[(b)]
	Throgs Neck	Bronx-Whitestone	RFK	Queens Midtown	B'klyn Battery	Verrazano-Narrows[(a)]	Henry Hudson	Marine Pkwy	Cross Bay	Total	
January	97,237	103,957	145,013	68,592	39,327	172,906	56,444	18,263	18,613	720,352	0.90
February	91,303	99,197	139,686	67,306	38,573	160,440	52,862	16,835	17,631	683,832	0.86
March	103,706	113,391	162,494	78,641	44,219	184,871	61,778	20,187	20,692	789,979	0.99
April	105,215	121,552	169,026	79,050	45,052	190,808	66,404	20,787	21,119	819,013	1.03
May	105,707	127,609	173,729	79,934	44,922	193,975	66,759	22,724	22,733	838,093	1.05
June	108,607	127,644	178,163	83,372	47,116	201,611	67,715	25,518	24,824	864,569	1.08
July	116,071	119,757	171,168	78,627	42,878	195,505	62,359	27,030	24,725	838,120	1.05
August	120,826	116,500	173,808	81,015	44,858	196,678	63,662	25,334	22,553	845,234	1.06
September	115,977	108,551	172,154	80,820	45,140	189,884	65,115	22,012	20,937	820,590	1.03
October	115,950	104,307	171,714	82,746	47,838	190,922	67,688	20,654	19,815	821,634	1.03
November	111,478	106,389	165,378	79,579	45,988	185,351	66,497	19,867	19,136	799,662	1.00
December	100,724	99,484	151,920	74,760	42,855	173,666	60,090	18,067	17,668	739,235	0.93
AADT[(b)]	107,840	112,430	164,652	77,926	44,090	186,537	63,162	21,471	20,890	798,998	1.00

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

Changes in Monthly Traffic, 2009 to 2010

Table 9 lists the monthly average daily traffic changes that have occurred between 2009 and 2010.

Table 9 Changes in Monthly Average Daily Traffic – 2009 to 2010

Month	Percent Change Comparing 2010 Monthly Average Daily Traffic to 2009								
	Throgs Neck	Bronx-Whitestone	RFK	Queens Midtown	Brooklyn-Battery	Verrazano-Narrows	Henry Hudson	Marine Parkway	Cross Bay Bridge
January	2.1%	1.3%	2.3%	1.7%	–2.3%	0.9%	5.3%	0.2%	2.3%
February	–10.4	–9.1	–8.7	–7.8	–12.5	–10.9	–10.7	–11.0	–7.0
March	–0.3	2.1	3.2	5.0	–1.1	1.1	3.1	1.0	7.0
April	–5.4	1.7	1.4	1.2	–0.8	–0.5	2.3	1.2	3.7
May	–7.4	5.6	1.9	2.8	–0.3	0.4	2.6	1.8	6.9
June	–6.7	2.9	2.9	3.6	0.4	1.3	3.4	7.3	10.9
July	15.0	–9.2	–1.7	2.9	0.5	–0.6	2.0	1.9	3.5
August	8.1	–8.5	2.4	6.5	7.3	0.4	4.2	–1.9	–2.9
September	3.5	–8.9	2.3	3.4	5.5	–0.3	2.4	–2.0	–0.7
October	6.1	–8.9	4.2	4.1	7.3	1.7	4.0	0.7	–3.5
November	3.8	–6.6	2.8	6.0	8.3	0.5	4.1	–0.9	–2.3
December	1.0	–8.2	–1.3	1.3	1.8	–4.4	0.8	–7.7	–8.0
Annual	0.8	–3.8	1.1	2.7	1.2	–0.7	2.1	–0.5	1.0

Reasons for monthly traffic changes include:

- In 2010, harsher weather in February and December compared to 2009;
- The July 12, 2009 toll increase;
- Continued uncertainties in the economy;
- The fluctuations in motor fuel prices;
- The construction fire on the Throgs Neck Bridge in July 2009, resulting in diversions to the Bronx-Whitestone and RFK bridges and a subsequent return of traffic to the Throgs Neck Bridge in 2010; and
- Construction on the Brooklyn Bridge beginning in August 2010 resulting in diversions to the Brooklyn Battery Tunnel.

Estimated Traffic and Toll Revenue, 2011

URS' development of the traffic and toll revenue estimates for 2011 took into account the economic condition of the region, as well as the impact of the last two toll increases (July 12, 2009 and December 30, 2010). The impacts in the long term, regarding the national and regional economies, projected employment in the Manhattan financial district and the traffic and toll revenue forecasts beyond 2011, are covered in the following sections of the report. In developing the traffic and toll revenue estimates for 2011, anticipated traffic volumes based upon historical understanding of traffic growth trends and price elasticity of demand were compared to actual (post-toll increase) traffic volumes from August 2009 through November 2010. February

and December 2010 data were not used due to the severe snow storms that occurred in those months, along with the toll increase at the end of December 2010). In addition, data in early 2011 were examined for any impacts resulting from the December 2010 toll increase; however, January 2011 data were affected by winter weather thus resulting in lower traffic volumes than may have been expected. The estimates for the remainder of 2011 reflect a combination of the pre- and post-December 2010 toll increase impacts for each of the nine facilities. The forecast percent changes are shown in Table 10.

Table 10 Estimated Changes in Annual Traffic – 2010 to 2011

Facility	Percent Change excluding February and December data	Percent Change February 2010 vs. February 2011	Percent Change December 2010 vs. December 2011	Percent Change including February and December data
Throgs Neck Bridge	–0.1%	8.6%	4.7%	0.5%
Bronx-Whitestone Bridge	–1.1	–3.3	–0.1	–1.1
RFK Bridge	–0.5	4.1	4.6	0.2
Queens Midtown Tunnel	–0.3	8.8	3.6	0.6
Brooklyn-Battery Tunnel	–1.5	12.1	4.0	–0.1
Verrazano-Narrows Bridge	–1.1	6.4	4.9	–0.1
Henry Hudson Bridge	–1.4	8.7	2.6	–0.4
Marine Parkway-Gil Hodges Mem. Bridge	–1.5	3.6	6.4	–0.7
Cross Bay Veterans Memorial Bridge	–2.3	–1.0	4.7	–1.7
All	–0.8	5.3	3.7	–0.1

A small decline is traffic is forecasted from 2010 to 2011 due to the severe winter weather in early 2011, the December 2010 toll increase and the continuing economic slowdown.

As shown in Table 10, the effects of the severe winter weather in the New York region during the month of February and in late December had a significant impact on the estimated percent change in annual traffic from 2010 to 2011 as shown by the increases from 2010 to 2011 for those two months.

Note that, with the exception of the Throgs Neck and RFK Bridges and the Queens Midtown Tunnel, traffic levels in 2011 are expected to decrease from those in 2010, due to the toll increase implemented on December 30, 2010. The decreases in 2011 are not as severe as may be expected due to the recovery from the severe winter weather that occurred during February 2010 and December 2010.

The resulting traffic and toll revenue estimates for 2011 are presented in Table 11.

Table 11 Estimated 2011 Toll-Paying Traffic and Toll Revenue

Facility	Traffic (000s)	Average Toll	Revenue (000s)
Throgs Neck Bridge	39,574	$6.62	$261,962
Bronx Whitestone Bridge	40,567	6.12	248,249
RFK Bridge	60,233	5.95	358,116
Queens Midtown Tunnel	28,612	5.59	159,825
Brooklyn Battery Tunnel	16,072	5.40	86,824
Verrazano-Narrows Bridge	67,998	5.14	349,317
Henry Hudson Bridge	22,964	2.66	61,083
Marine Parkway Bridge	7,785	1.94	15,139
Cross Bay Bridge	7,494	2.08	15,605
Total	291,300	$5.34	$1,556,119

Summarizing, our estimates show a 0.1 percent decrease in traffic and a 9.9 percent increase in system-wide revenue over 2010, which reflects actual performance through February 2011, the full year benefit of the toll increase of December 30, 2010, and anticipated changes in traffic volumes for the remainder of the year.

Table 11 provides the transition between the historical traffic and revenue data presented on the preceding pages and the 10-year forecasts in Tables 19 and 20. The methodology used to develop the estimated growth rates beyond 2011 is discussed under the "Projected Traffic, Revenue and Expenses" section of this report.

Operating Expenses 2000 to 2010

Table 12 displays the historical operating expenses for the TBTA facilities from 2000 through 2010. TBTA divides operating expenses into two major categories: labor and non-labor. Labor includes salaries, overtime and fringe benefits, net of capital reimbursements. Major maintenance, bridge painting, outside services, insurance, 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 $112.3 million in 2000 to $209.5 million in 2010. 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 $129.0 million in 2000 to $174.0 million in 2010. The primary driving factors in TBTA's non-labor expense growth were inflation, an increase in major maintenance and bridge painting activities.

Table 12 Historical Operating Expenses: 2000 to 2010

Year	Operating Expenses (000s)			Percent Change[(c)]
	Labor [(a)]	Non-Labor [(b)]	Total	
2000	$112,256	$129,002	$241,258	5.8%
2001	123,316	133,198	256,514	6.3
2002	140,967	159,229	300,196	17.0
2003	159,976	169,039	329,015	9.6
2004	158,403	160,811	319,214	–3.0
2005	173,549	170,123	343,672	7.7
2006	183,268	169,642	352,910	2.7
2007	196,755	172,270	369,025	4.6
2008	207,305	200,686	407,991	10.6
2009	220,458	177,367	397,825	–2.5
2010	209,499	173,950	383,449	–3.6

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

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

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

The 2003 increase in labor costs was primarily 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* NYCSC costs and other business expenses.

In 2004, non-labor expenses were 4.9 percent lower than 2003 due to a decrease in the number of *E-ZPass* tag purchases. In 2005, expenses reflected a continuation of the security measures noted above, *E-ZPass* tag replacement, and increases in major maintenance and bridge painting, offset by a reduction in 2 Broadway lease charges. Labor costs increased in 2006 primarily due to rising payroll, pension and health and welfare expenses. Regarding non-labor expenses, increased funding for additional bridge painting needs in 2006 was offset by a decrease in *E-ZPass* tag purchases and lower insurance costs. In 2007, labor costs increased 7.4 percent primarily due to higher payroll expenses associated with collective bargaining agreements, inflation, higher pension expenses and a revised actual cost adjustment for worker's compensation, while non-labor expenses increased less than two percent primarily due to lower bridge painting program costs than in 2006. In 2008, labor costs increased 5.4 percent from 2007 primarily due to higher payroll and associated fringe costs, and non-labor expenses increased 16.5 percent primarily due to higher major maintenance needs in 2008.

The operating expenses for 2009 saw a net decrease in expenditures from 2008 of 2.5 percent. Labor expenses increased by 6.3 percent, offset by a decrease in non-labor expenses of 11.6 percent. The reasons for the increases in labor were primarily due to contractual adjustments and an actuarial adjustment for worker's compensation. The decreases in non-labor expenses were primarily the result of lower bridge painting costs.

Total operating expenses in 2010 declined 3.6 percent from 2009. TBTA undertook a major organizational assessment in 2010 which reduced organizational layers and eliminated non-value added and duplicative functions. This effort resulted in the elimination of 117 full-time positions and a subsequent drop in labor costs of 4.9 percent. Non-labor expenditures declined 1.9 percent primarily due to the capitalization of much of the bridge painting program.

Finally, we noted that the total 2010 operating expenses of $383.4 million were under the $444.7 million 2010 operating expense budget (prepared by TBTA in 2009) by $61.3 million, a savings of 13.8 percent.

2011 Budget

Operating expenses have been budgeted by TBTA for 2011 at $398.7 million, an increase of 4.0 percent over the 2010 operating expenses of $383.4 million. These expenses are split into the following categories: labor expenses of $219.0 million (an increase of 4.6 percent over 2010) and non-labor expenses of $179.7 million (an increase of 3.3 percent over 2010). The primary reasons for the increases in labor expenses are contractual payroll adjustments and higher expenses for pension, health and welfare benefits. The primary reason for the increase in non-labor expenses is due to higher expenses for *E-ZPass* credit card fees associated with the toll increase that was implemented on December 30, 2010 and higher *E-ZPass* NYCSC expenses.

FACTORS AFFECTING TRAFFIC GROWTH

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

Employment, Population and Motor Vehicle Registrations

Regional demographic data providing information on long-term trends are maintained by the New York Metropolitan Transportation Council (NYMTC). Information from NYMTC regarding employment and population history and projections from 1970 to 2035 is included in the following tables. In general, traffic volumes in the region are affected by changes in employment and population. Normally the demand on the TBTA facilities tends to be less influenced by regional demographic trends because water crossings are limited. Another indicator of trends in traffic volumes is motor vehicle registrations, which had been on an upward trend since 1970 in the tri-state region but have now leveled off or decreased. To better understand how these indicators may influence traffic volumes on the TBTA crossings in the long term, URS first reviewed historical trends and forecasts by NYMTC and others, and adjusted the traffic forecasts in the short term to account for the present economic climate.

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, as has been the case during the recent economic slowdown, traffic volumes generally decline. (The rate of change declines depending on the severity of the job losses.)

The long-term trend in employment in the region is shown in Table 13. A downward trend in employment occurred between 1970 and 1980 in New York City. Jobs declined by 1.2 percent per year, from 4,066,500 in 1970 to 3,614,000 in 1980. Staten Island, where employment increased by 3.5 percent per year, was the exception. The most recent employment forecasts were released by NYMTC in March 2008. Despite the worsening of the economic situation since then, NYMTC has not updated its long-term forecasts and thus its projections continue to show a steady growth through 2035. NYMTC has stated that they are in the process of updating their forecasts to a base year of 2010, but the new forecasts will not be available until October of this year at the earliest.

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

URS

Table 13 Employment Trends and Projections

(000s)

Year	New York City						New York Region [b]	New Jersey Region [c]	Connecticut Region [d]
	Manhattan	Bronx	Brooklyn	Queens	Staten Island	Total [a]			
1970	2,550.3	251.3	631.9	586.0	47.1	4,066.5	1,554.6	2,447.6	727.4
1980	2,277.5	216.9	516.4	536.7	66.4	3,614.0	1,918.6	2,828.2	869.3
1990	2,565.1	237.8	504.5	567.3	91.6	3,966.1	2,339.0	3,403.9	1,008.9
2000	2,682.2	269.4	584.6	624.1	116.9	4,277.3	2,537.5	3,676.3	1,065.5
2005	2,680.7	306.1	605.4	646.1	122.6	4,360.9	2,715.9	3,894.6	1,099.6
2010	2,688.2	338.6	700.7	705.9	146.1	4,579.5	2,724.7	3,865.3	1,110.6
2015 - Projected	2,885.1	367.6	760.3	751.2	164.5	4,928.8	3,017.7	4,352.9	1,229.7
2020 - Projected	2,948.0	388.9	809.3	776.7	177.8	5,100.7	3,129.1	4,521.5	1,277.0
2025 - Projected	3,069.7	408.8	855.2	806.6	192.0	5,332.4	3,250.5	4,717.2	1,324.9
2030 - Projected	3,171.5	425.8	896.1	831.5	205.1	5,530.0	3,367.0	4,905.4	1,378.8
2035 - Projected	3,288.7	442.3	936.7	858.2	218.4	5,744.3	3,491.8	5,078.7	1,440.9
Average Annual Percent Change									
1970 to 1980	–1.1%	–1.5%	–2.0%	–0.9%	3.5%	–1.2%	2.1%	1.5%	1.8%
1980 to 1990	1.2	0.9	–0.2	0.6	3.3	0.9	2.0	1.9	1.5
1990 to 2000	0.4	1.3	1.5	1.0	2.5	0.8	0.8	0.8	0.5
2000 to 2005	0.0	2.6	0.7	0.7	1.0	0.4	1.4	1.2	0.6
2005 to 2010	0.1	2.0	3.0	1.8	3.6	1.0	0.1	-0.2	0.2
2010 to 2015	1.4	1.7	1.6	1.3	2.4	1.5	2.1	2.4	2.1
2015 to 2020	0.4	1.1	1.3	0.7	1.6	0.7	0.7	0.8	0.8
2020 to 2025	0.8	1.0	1.1	0.8	1.5	0.9	0.8	0.9	0.7
2025 to 2030	0.7	0.8	0.9	0.6	1.3	0.7	0.7	0.8	0.8
2030 to 2035	0.7	0.8	0.9	0.6	1.3	0.8	0.7	0.7	0.9

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

Source: New York Metropolitan Transportation Council.

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, 2005, 2008 and 2009, fluctuations occurred in response to toll increases (although difficult to isolate in 2008 and 2009 due to fluctuating fuel prices and economic conditions), when traffic declined while toll revenues increased.

Looking to the short-term impacts of the current recession in the New York Metropolitan Statistical Area (MSA), the unemployment rate (as calculated from the monthly data) for 2010 was 8.9 percent, up from the 8.8 percent in 2009 as reported by the Bureau of Labor Statistics. The MSA's highest monthly unemployment rate in the past ten years occurred in February 2010 to be at 9.6 percent. Previous to the economic downturn that began in April 2008, the MSA's unemployment had been generally decreasing since hitting a high of 7.2 percent in January 2003. According to New York City's Office of Management and Budget (OMB) Monthly Report on

Economic Conditions, released January 19, 2011, "New York City's labor market performed well in 2010 compared to the rest of New York State and the nation." During 2010, private employment in the City grew 1.6 percent, while nationally it has grown at a rate of 1.1 percent, with all sectors either growing or remaining flat in comparison to 2009 levels. While total employment in the City has shown growth during 2010, it still remains 99,000 jobs or 3 percent below peak levels reached during April 2008. According to the FY 2011-to-2015 Financial Plan released by the OMB in February 2011, the New York City labor market (non-agricultural) is expected to grow by 0.9 percent in 2011 over 2010, with a 1.2 percent growth in private labor. Vacancy rates had been at their peak in mid-2003 and then experienced steady decline. In 2007, the vacancy rate stood at 5.3 percent, and asking rents jumped 33 percent over the prior year. In 2008 the vacancy rate increased to 7.3 percent and the associated average square foot asking rent dropped 15.3 percent. Even with the leveling off of job losses, Class A commercial real estate vacancy rates continued to increase for the third consecutive year, reaching double digit levels in 2009. According to Cushman & Wakefield year-end statistics, vacancy rates decreased to 10.5 percent in December 2010, with asking rents increasing for the first time since the third quarter of 2008.

As noted in New York City's February 2011 Financial Plan (Fiscal Years 2011 – 2015) the real estate industry anticipates that vacancy rates over the next five years would decrease overall to 9.4 percent, despite reaching a local peak of 10.2 percent in 2014. Conversely, non-agricultural employment is expected to grow at a steady rate between 0.9 and 1.1 percent over the next five years, rising to nearly 3.9 million jobs in 2015. This estimate is more pessimistic than the NYMTC data shown in Table 13 due to the availability of more recent input data contained in the Financial Plan.

The latest (preliminary) Bureau of Labor Statistics data (March 2011) show that total nonfarm employment (not seasonally adjusted) in the New York MSA increased 0.6 percent over one year ago with a gain of 1.8 percent occurring in the professional and business services sector and a gain of 1.5 percent occurring in the financial activities sector. The construction sector declined 3.1 percent while the government sector declined 2.6 percent. Growth did occur in the health and education and leisure and hospitality sectors, with rates of 1.6 and 3.0 percent, respectively.

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 million. Nearby New York, New Jersey and Connecticut counties also show increased growth. The census results for 2010 indicate that the population of New York City still exceeds 8 million and it grew since the 2000 census, while regional population continued to grow also, albeit slowly.

Table 14 Population Trends and Projections

(000s)

Year	New York City						New York Region [b]	New Jersey Region [c]	Connecticut Region [d]
	Manhattan	Bronx	Brooklyn	Queens	Staten Island	Total [a]			
1970	1,539	1,472	2,602	1,987	296	7,895	4,372	5,800	1,682
1980	1,428	1,169	2,231	1,891	352	7,072	4,537	5,857	1,725
1990	1,488	1,204	2,301	1,952	379	7,323	4,635	6,097	1,806
2000	1,537	1,333	2,465	2,229	444	8,008	4,933	6,662	1,889
2005	1,606	1,365	2,511	2,257	475	8,214	5,072	6,874	1,935
2010	1,586	1,385	2,505	2,231	469	8,175	5,124	6,946	1,969
2015 – Projected	1,691	1,382	2,534	2,297	487	8,391	5,314	7,184	2,018
2020 - Projected	1,743	1,415	2,609	2,370	509	8,646	5,467	7,422	2,079
2025 - Projected	1,778	1,450	2,694	2,462	528	8,911	5,664	7,656	2,151
2030 - Projected	1,820	1,489	2,778	2,585	546	9,218	5,898	7,940	2,249
2035 - Projected	1,885	1,528	2,860	2,752	561	9,586	6,123	8,230	2,368
Average Annual Percent Change									
1970 to 1980	–0.7%	–2.3%	–1.5%	–0.5%	1.8%	–1.1%	0.4%	0.1%	0.3%
1980 to 1990	0.4	0.3	0.3	0.3	0.7	0.3	0.2	0.4	0.5
1990 to 2000	0.3	1.0	0.7	1.3	1.6	0.9	0.6	0.9	0.4
2000 to 2005	0.9	0.5	0.4	0.2	1.4	0.5	0.6	0.6	0.5
2005 to 2010	0.3	0.3	–0.1	–0.2	–0.3	–0.1	0.2	0.2	0.4
2010 to 2015	1.3	0.0	0.2	0.6	0.8	0.5	0.7	0.7	0.5
2015 to 2020	0.6	0.5	0.6	0.6	0.9	0.6	0.6	0.7	0.6
2020 to 2025	0.4	0.5	0.6	0.8	0.7	0.6	0.7	0.6	0.7
2025 to 2030	0.5	0.5	0.6	1.0	0.7	0.7	0.8	0.7	0.9
2030 to 2035	0.7	0.5	0.6	1.3	0.5	0.8	0.7	0.7	1.0

Notes:

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

Sources: US Census Bureau and New York Metropolitan Transportation Council.

NYMTC's latest population projections for the tri-state region as a whole (including New York City) for 2010 to 2035 were released in March 2008. NYMTC projects steady population growth throughout the entire region as a whole ranging from 0.3 percent to 0.8 percent. As noted earlier, NYMTC has stated that they are in the process of updating their forecasts to a base year of 2010, but the new forecasts will not be available until October of this year at the earliest.

Population growth should continue to have a positive effect on traffic demand on the TBTA crossings in the long-term. NYMTC's last set of projections were for a population of over 9 million for New York City by 2030.

In summary, generally, employment indicators overall appear to have had a more noticeable effect on traffic volumes on the TBTA facilities than population growth. However, TBTA traffic

variations do not always correlate year by year with the regional demographic trends. As discussed throughout this report, demand for the TBTA facilities has been strong overall, and NYMTC's long-term regional population projections indicate an increasing trend throughout the forecast period. With regard to employment, there may be some years that will show declines, but there will be other years that will be characterized by significant growth. Overall modest growth is expected in the long-term through the end of NYMTC's forecast period in 2035.

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 decreased for the period 2001 through 2010 in New Jersey, increased in Connecticut, decreased in New York City and remained relatively constant throughout New York State. 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
2001	2,025	10,707	7,086	2,796
2002	1,946	10,445	7,325	2,893
2003	1,869	10,414	7,420	2,928
2004	1,849	10,450	7,475	2,989
2005	1,857	10,477	7,545	3,011
2006	1,833	10,551	7,621	3,016
2007	1,926	10,665	7,728	3,035
2008	1,945	10,698	7,744	3,036
2009	1,951	10,699	7,587	3,025
2010	1,962	10,750	6,583	3,023
Average Annual Growth				
2001-2010	–0.4%	0.0%	–0.8%	0.9%

Notes: (a) Including New York City.
Sources: New York State Department of Motor Vehicles, Connecticut Department of Motor Vehicles and New Jersey Department of Motor Vehicles.

Fuel Conditions

The availability and pricing of motor fuel has historically affected the use of TBTA facilities. During the previous 38 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 again during the Iraq war and in the aftermath of Hurricane Katrina, and now as a result of the turmoil in North Africa, notably Libya.

More recent history has shown that U.S. motor fuel prices, as reported by the Energy Information Agency of the Department of Energy, peaked in July 2008 for the U.S and New York City, reaching $4.06 and $4.14 per gallon, respectively. The $4.06 per gallon represents an all-time high, surpassing the previous high set in March 1981 when a gallon of regular gasoline cost $3.54 in today's (February 2011) dollars. The price then dropped precipitously in the second half of the 2008 calendar year as the economy contracted, hovering around $2.00 per gallon in New York and dropping to $1.61 per gallon nationally. After bottoming out in January 2009, prices rose at a slow pace, remaining significantly lower than 2008 record levels. Monthly average regular-grade gasoline prices averaged $2.35 per gallon in 2009, increasing from $1.79 per gallon in January 2009 to $2.61 per gallon in December. From January 2010 through August 2010 gasoline prices remained relatively constant in New York City, averaging near $2.77. From September to December, prices slowly rose ending the year at $3.15. Prices exhibited similar trends nationally. In general, fuel costs were consistent with seasonal increases in demand. As of April 25, 2011, the current price in the New York City area is $3.95 per gallon for regular gasoline.

Other factors currently affecting the prices of fuel, both upwards and downwards, are:

- Higher prices for crude oil and petroleum products due to a slowly rebounding global economy and depletion of petroleum inventories;
- Gasoline consumption which has increased over the past year, is expected to continue to grow, albeit at modest rates;
- Increased demand for gasoline and petroleum products from developing countries; and
- Volatility and political unrest continues in oil producing countries, particularly in North Africa, the Middle East, and to some extent in Venezuela and Nigeria.

During 2008, transactions on the TBTA facilities decreased from their 2007 levels as gasoline prices fluctuated, first up and then down, and the economy continued to worsen. Also affecting traffic were the March 2008 and July 2009 toll increases.

With gasoline prices in New York City currently (as of April 25) at $3.95 per gallon for regular, adverse travel impacts of this fuel price have been combined with the impact of the recession.

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. 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.

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 RFK 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.

For purposes of this report and URS' projections, we have assumed, in consultation with TBTA, future toll increases of 7.5 percent in 2013 and then 5 percent every two years in the future, beyond the toll increase of December 30, 2010. For the forecast period of this report, this would be toll increases in 2013, 2015, 2017 and 2019 and 2021. The 5 percent biennial increases beginning in 2015 (2.47 percent per year, compounded) would be at approximately the same level as recent general cost increases due to inflation. This relatively small increase coupled with the high usage of Electronic Toll Collection (ETC) on TBTA facilities would tend to reduce the elasticity factors seen in past toll increases. Also, the elasticities resulting from the 2003 and 2005 toll increases (the first two toll increases of the ETC era) were lower than the historical elasticities. Such results for TBTA – that show that ETC users are not as affected by toll increases as those who pay cash tolls – are consistent with results of other toll agencies with substantial ETC usage. Generally, elasticities in the ETC era have been 60 percent of the historical elasticities.

Due to the impacts of fluctuating fuel prices and the condition of the economy, it was not possible to isolate and evaluate the specific effects of the 2008 and 2009 toll increases to determine if the elasticity factors have changed significantly. In addition, there are insufficient data to evaluate the effects of the recent December 2010 toll increase. In the absence of new empirical data, it was considered prudent to use the established ETC-era elasticity factors in projecting toll facility volumes for 2011 through 2021. These, shown in Table 16, have tended to result in reasonably accurate results in terms of comparisons of actual versus forecast traffic and toll revenue.

Table 16 Elasticity Factors for 2011-2021

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

Note: For each 1% increase in toll the volume is expected to decrease by the elasticity factor; e.g. for each 1% increase in the toll at the Queens-Midtown Tunnel, volume would decrease by .115%.

Two sets of forecasts have been prepared: one at constant tolls (at the December 30, 2010 level); and the other with toll increases assumed by URS to occur in January 2013, 2015, 2017, 2019 and 2021.

For the periodic toll-increase scenario, it was assumed that the toll levels (i.e., the cash toll for passenger cars) on the major and minor crossings would be increased by 7.5 percent in 2013 and 5 percent every two years thereafter from 2015 to 2021. It was also assumed that the truck tolls would be increased proportionately, and that the relationships between cash and *E-ZPass* tolls for passenger cars would remain the same as those implemented for the toll increase on December 30, 2010.

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. These traffic impacts represent the reduction in volume 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	2013		2015		2017		2019		2021	
		Toll	Traffic	Toll	Traffic	Toll	Traffic	Toll	Traffic	Toll	Traffic
Throgs Neck	–0.063	7.5%	–0.5%	5.0%	–0.3%	5.0%	–0.3%	5.0%	–0.3%	5.0%	–0.3%
Bronx-Whitestone	–0.063	7.5	–0.5	5.0	–0.3	5.0	–0.3	5.0	–0.3	5.0	–0.3
RFK	–0.125	7.5	–0.9	5.0	–0.6	5.0	–0.6	5.0	–0.6	5.0	–0.6
Queens-Midtown	–0.115	7.5	–0.9	5.0	–0.6	5.0	–0.6	5.0	–0.6	5.0	–0.6
Brooklyn-Battery	–0.215	7.5	–1.6	5.0	–1.1	5.0	–1.1	5.0	–1.1	5.0	–1.1
Verrazano Narrows	–0.076	7.5	–0.6	5.0	–0.4	5.0	–0.4	5.0	–0.4	5.0	–0.4
Henry Hudson	–0.174	7.5	–1.3	5.0	–0.9	5.0	–0.9	5.0	–0.9	5.0	–0.9
Marine Parkway	–0.061	7.5	–0.5	5.0	–0.3	5.0	–0.3	5.0	–0.3	5.0	–0.3
Cross Bay	–0.082	7.5	–-0.6	5.0	–0.4	5.0	–0.4	5.0	–0.4	5.0	–0.4

Again, periodic toll increases indicated above were selected by URS, in consultation with TBTA, to provide increases for cash passenger cars of 7.5 percent in 2013 and 5 percent thereafter, and corresponding increases for the other vehicle classifications, every two years on all facilities. These increases have been assumed by URS for forecasting purposes only. Any such toll increases or adjustments are subject to future action by the TBTA Board.

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. This could have an impact on TBTA facility operations during various travel periods.

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 76 percent in 2010 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 2011), matching the 2010 traffic volumes against the highest annual volumes recorded, by facility, going back to 1970. Note in Table 18 that none of the facilities carried their historically highest volumes in 2010.

Table 18 Comparison of 2010 Traffic with Highest Recorded Levels Since 1970

Facility	Highest Volume Since 1970		2010 Volume(*) (000s)	2010 Percent of Highest Volumes
	Year	Volume (000s)		
Throgs Neck Bridge	2006	43,186	39,362	91.1%
Bronx - Whitestone Bridge	2004	45,223	41,037	90.7
RFK Bridge	1988	64,215	60,098	93.6
Queens Midtown Tunnel	2007	29,366	28,443	96.9
Brooklyn-Battery Tunnel	1971	22,920	16,093	70.2
Verrazano-Narrows Bridge	2002	73,361	68,086	92.8
Henry Hudson Bridge	2004	24,703	23,054	93.3
Marine-Parkway- Gil Hodges Bridge	1971	9,150	7,837	85.6
Cross Bay Veterans Memorial Bridge	2007	7,676	7,625	99.3

(*) 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 crossings 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; and when the construction fire on the Throgs Neck Bridge's Queens approach in July 2009 resulted in traffic restrictions, some traffic diverted to the Bronx-Whitestone 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**, Construction of the upper level re-decking in 2012 will use a movable median barrier to maintain traffic in the peak direction.

- The **Cross Bay Veterans Memorial Bridge** superstructure/deck rehabilitation was completed last year. The roadway will have daily one lane closures in each direction intermittently through 2012 for access to substructure during reconstruction. Due to low traffic volumes, this should not have a detrimental effect on traffic flows.

- The **Marine Parkway-Gil Hodges Memorial Bridge** deck rehabilitation on the Rockaway Point Boulevard Bridge, construction of which will occur in the 2010-2014 Capital Program, will be staged to avoid traffic impacts. There will be intermittent daily lane closures for median barrier repairs for about two months during the summer. Due to low traffic volumes, this should not have a detrimental effect on traffic flows.

- On the **Bronx-Whitestone Bridge**, the replacement of the Bronx approach decks began in 2008 and is scheduled to be completed in late 2012, with normal traffic patterns restored by November, 2011. Queens approach rehabilitation work is expected to start in 2011, with no impact to the roadway until 2012, once the Bronx approach is completed. Three lanes will be maintained in the peak direction, with two lanes in the reverse direction during staged construction.

- The **Throgs Neck Bridge** has multiple rehabilitation projects scheduled, including the ongoing replacement of the Queens approach concrete deck, which is nearing completion. The first phase of installation of a replacement deck on the suspended span is expected to begin in 2013 and be completed by 2016. With a contraflow lane, three lanes will be maintained in the peak direction.

- Redecking of the lower level of the **Henry Hudson Bridge** was completed in 2010. Replacement of the upper level deck in the vicinity of the toll plaza will begin in 2013 at the latest. Construction to replace upper level curb stringers and remove sidewalks will necessitate closing one lane to traffic beginning in May and is projected to last 33 months. Due to low traffic volumes, this should not have a detrimental effect on traffic flows.

  A pilot program to evaluate all electronic (cashless) tolling is currently in the gateless phase with the cashless phase to be implemented in early 2012.

- **RFK Bridge** full-depth deck repairs at the Bronx and Manhattan toll plaza areas and ramps are being implemented with various off-peak lanes closures, and or short duration hard lane closures (24 hours-per-day/seven days-per-week) with generally minor to moderate impact to traffic. The southbound Harlem River Drive ramp will soon be shut down for four to five months to replace the deck and superstructure.

- **Queens Midtown Tunnel** electrical rehabilitation will be performed in 2012 during off-peak, weekend or night closures.

- **Brooklyn-Battery Tunnel** ceiling and wall repairs, and electrical rehabilitation work, which is planned in the current capital program, will be performed during off-peak weekend or night closures.

Operational Changes Resulting from September 11, 2001

- The ban on eastbound 2- and 3-axle single unit commercial vehicles in effect at the Holland Tunnel since 2004 was lifted on January 3, 2010. These commercial vehicles (classes 1, 2 and 3 trucks) are now permitted in both directions. Vehicle classes 4, 5 and 6 (larger trucks) remain banned in both directions. In addition, no trailers or towed vehicles are allowed in both directions. There is also a ban on trucks on the lower level of both the Verrazano-Narrows and George Washington bridges.

Competing Ferry Service

- **New York Water Taxi** operates East River ferry service between Manhattan, Brooklyn and Queens. As part of the NYCDOT's proposed expansion of East River ferry service, there is a plan to further expand service by adding new stops at North Williamsburg and Greenpoint in Brooklyn. This phase of the plan will also include the construction of a new landing at Roosevelt Island that will be used by a private operator.

- The City is working with State agencies and the Port Authority of New York and New Jersey to expand opportunities for private ferry operators to provide services to meet current and future demand in new markets. The city will upgrade and construct physical facilities (e.g. docks, terminals) to accommodate these new services which may include new trans-Hudson crossings, as well as link the city to baseball stadiums, airports, New York City neighborhoods and outlying areas such as Connecticut, Westchester, Rockland, and Long Island. New facilities are planned for the Brooklyn and Queens East River waterfronts.

- NYC Department of Transportation operates the **Staten Island Ferry** between the Battery and St. George. Ferries carry passengers on frequent schedules around the clock. Ferries no longer carry vehicles.

In summary, ferry services do not significantly affect TBTA facilities.

Competing East River Crossings Construction

- **Queensboro Bridge** – Continuing numerous rehabilitation projects have involved the upper or lower levels, or ramp approaches to the bridge, including miscellaneous items at various locations throughout the bridge, approaches and ramps that were not addressed or were deleted from previous contracts. The rehabilitation of the north and south lower outer roadways was recently completed. Trucks are prohibited from the upper and outer roadways and are allowed on the lower inner roadways only. The north upper roadway is Manhattan-bound at all times. The south upper roadway is Queens-bound except from

5:30 AM to 11:00 AM weekdays when the roadway is reversed and accommodates the Manhattan-bound HOV2+ lane from 6:00 AM to 10:00 AM, Monday to Friday. The north outer roadway may be closed from 10:00 PM to 5:00 AM. During these times a bus shuttle will be provided for pedestrian and bicycles. The south outer roadway of the lower level is open Queens-bound to passenger cars only. A total of one lane in each direction may be closed on the lower level from 10:00 PM to 5:30 AM Monday to Friday, Saturday 12:01 AM to 7:00 AM, and Sunday from 1:00 AM to 11:00 AM. Additionally one of two lanes on the north upper roadway to Manhattan may be closed for NYCDOT Bridges repairs and maintenance from 10:00 PM to 5:00 AM Sunday nights to Friday mornings. These lane closures are necessary to facilitate NYCDOT bridge maintenance, repairs and/or painting. Seismic retrofitting of the Queensboro Bridge is programmed to be completed in 2013. This may result in traffic diverting to the Queens Midtown Tunnel and the RFK Bridge.

- **Williamsburg Bridge** – There are four lanes westbound (Manhattan-bound) and two lanes eastbound (Brooklyn-bound) with two lanes closed for construction in the off-peak direction weekdays from 5:00 AM to 10:00 AM. Weekdays from 10:00 AM to 3:00 PM there are three lanes maintained westbound, and two lanes maintained for traffic eastbound, with three lanes closed for construction activity. From 3:00 PM to 10:00 PM on weekdays there are four lanes maintained in both the eastbound and westbound directions. On weeknights from 10:00 PM to 5:00 AM there are two lanes maintained in both directions. Truck traffic is allowed on the bridge in both directions on the outer roadways only. Pedestrian and bicycle access maintained at all times.

- **Manhattan Bridge** – There are five lanes from 6:00 AM to 10:00 AM Monday to Friday westbound (Manhattan-bound) of which two are on the north upper roadway (the left lane HOV2+) and three on the lower roadway; two lanes are maintained on the south upper roadway eastbound (Brooklyn bound). There are three lanes westbound and two eastbound 10:00 AM to 3:00 PM Monday to Friday. No trucks are permitted on the north upper westbound roadway from 5:00 AM to 3:00 PM Monday to Friday. Overnight Monday to Friday from 3:00 PM to 5:00 AM the next day, there are five lanes eastbound and two lanes westbound. There are five lanes westbound to Manhattan and two lanes eastbound to Brooklyn over the weekend from 9:00 PM Friday to 10:00 AM Monday. Lane closures may occur on weekends and overnight for maintenance and construction activity on an as needed basis through June 2013. Replacement of the Manhattan Bridge suspender ropes and rewrapping all cables is expected to be complete in 2012. Seismic retrofitting is scheduled to be completed in 2014. This may result in traffic diverting to the Brooklyn-Battery Tunnel.

- **Brooklyn Bridge** – The reconstruction program that began in 1980 is expected to be complete in 2014. Maintenance and inspection of the maintenance travelers on the main span of the Brooklyn Bridge was expected to have been completed in June 2009 (no further information is available). Rehabilitation of the approaches and ramps and the painting of the bridge began in 2010 and will extend through 2014. One of three lanes may be closed in the eastbound direction to Brooklyn as needed 10:00 AM to 3:00 PM weekdays, 11:00 PM to 6:00 AM Monday to Friday, and Saturday and/or Sunday 2:00

AM to 2:00 PM to facilitate NYCDOT bridge maintenance scheduled through April 2010. Having begun in June 2010, all Manhattan-bound lanes will be closed for 24 summer weekends to be spread out from 2010 through 2013. All construction projects, including seismic retrofitting of the Brooklyn Bridge, are programmed to be complete in 2014. This may result in traffic diverting to the Brooklyn-Battery Tunnel.

It is unlikely any of the TBTA facilities will gain materially from these construction projects, but it is possible that the TBTA facilities noted at the end of the paragraphs above 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 current Transportation Improvement Program (TIP) for Federal Fiscal Years 2008-2012, will potentially have traffic implications for the TBTA facilities. The TIP includes the planned year of construction; however, adherence to this schedule is not mandated. Some of these projects do not yet have lane closure plans, which will be developed in coordination with NYCDOT and local community boards. As a matter of policy, NYCDOT seeks to restrict lane closures to off-peak and nighttime hours.

Other bridges, roads and overpasses programmed for construction include:

- **Willis Avenue Bridge** – Connects the FDR Drive, Major Deegan Expressway and Bruckner Expressway. Construction of a new Willis Avenue Bridge started in 2007 and, according to NYCDOT traffic advisories, is scheduled to be completed by the end of 2011. The new swing span was floated into position in mid-2010 and traffic diverted on to it in early October. At this stage, only the approaches are left to be completed. Any restrictions on the Willis Avenue Bridge approach ramps may induce some diversions to the RFK Bridge.

- **Madison Avenue Bridge —** Rehabilitation of the Madison Avenue Bridge over the Harlem River is scheduled to begin in 2011. This may result in diversions to the RFK Bridge.

- **Broadway Bridge —** Rehabilitation of the Broadway Bridge over the Harlem River was scheduled to begin in 2010 and finish in 2013, which may divert some traffic to the Henry Hudson Bridge. No further information is available.

- **I-87/Major Deegan Expressway** – Rehabilitation of various overpasses along the Major Deegan Expressway between the RFK Bridge and Mosholu Parkway is scheduled for design and construction thorough 2021. The anticipated schedule for construction is:

    - RFK Bridge to 138th Street – spring 2016 – spring 2018
    - 160th Street to 232nd Street – spring 2017 – spring 2019
    - 232nd Street to City Line – summer 2019 – summer 2021
    - Over Mosholu Parkway – summer 2013 – spring 2014

  Safety and operational improvements northbound from Burnside Avenue to Van Cortlandt Park, including West 230th Street, are scheduled from summer 2021to spring 2023. Traffic impacts at the RFK Bridge should not be significant.

- **Grand Central Parkway/94th Street interchange** – This project involves implementing safety and operational improvements at the intersection of 94th Street and Ditmars Boulevard, plus bridge rehabilitation of the 94th Street bridge and the 62nd Drive pedestrian bridge over Grand Central Parkway and bridge painting and maintenance of approximately 30-40 bridges. The project was expected to begin in 2010 and be completed in early 2013. The Region will also be letting an Intelligent Transportation Systems (ITS) project along the Grand Central Parkway. It is expected that there will be no significant impact to traffic on the RFK Bridge.

- **I-95/Alexander Hamilton Bridge** and Highbridge interchange ramps rehabilitation – This project will rehabilitate the I-95 corridor between Amsterdam Avenue in Manhattan and Undercliff Avenue in the Bronx. Major construction commenced in spring of 2009 and is expected to be completed by the fall of 2013. The project will be completed in five stages over the course of the construction period, with each stage corresponding to a different alignment of traffic across the bridge. As part of Stage 1, the existing median will be converted into a travel lane, allowing the project to maintain four lanes of traffic in each direction during subsequent stages. Few detours will be required as part of this project. Since no daytime closures are allowed on I-95, any closure on the I-95 mainline will take place at night, between the hours of 11:00 PM and 5:30 AM. Closures on the Alexander Hamilton Bridge mainline therefore are anticipated to be rare and not require detours. Most of the ramps undergoing reconstruction also will not require detours, since temporary ramps will be constructed. These temporary ramps will be located adjacent to the existing ramps while those ramps are being repaired or reconstructed. Traffic will move back onto the existing ramps once they are reconstructed and the temporary ramps will be removed. This complex process was designed by NYSDOT to minimize traffic impacts of construction. However, as a result of this construction, traffic may divert away from the Bronx-Whitestone and Throgs Neck bridges.

- **I-95/Cross Bronx Expressway –** Several rehabilitation projects are in development for the Cross Bronx Expressway. Rehabilitation of 14 bridges through replacement of deck and superstructure from Boston Road to Bronx River Parkway is expected to begin in spring 2019 and extend through spring 2021. Planned rehabilitation of the bridge deck at Grant Avenue is also under development and construction is expected to extend through

summer 2013, and general rehabilitation work from Rosedale Avenue to Havemeyer Avenue will end in spring 2014. Resurfacing is scheduled between Undercliff Avenue and Prospect Avenue starting in fall 2018 and ending in fall 2019. There may be traffic diversions from the Throgs Neck and Bronx-Whitestone bridges to the RFK Bridge.

- **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. The New York State Department of Transportation (NYSDOT) is currently preparing a Draft Environmental Impact Statement (DEIS) in support of permanent improvements to the Expressway. The DEIS, which is examining both roadway and tunnel alternatives, was completed in 2010, with an earliest anticipated construction start date of 2013. Until a permanent replacement option is built, an interim solution is needed to maintain the viability and safety of the structure. One construction contract between the Brooklyn-Battery Tunnel and Sixth Avenue was completed in 2007. Construction on the eastbound Brooklyn-Queens Expressway connector ramp, from the Brooklyn-Battery Tunnel to the Prospect Expressway, the Prospect Expressway to the Belt Parkway and the southern section of the Gowanus Expressway is currently underway. Brooklyn-Battery Tunnel approaches and Prospect Expressway interchange construction are scheduled through the winter of 2011. Future work on the Brooklyn-Battery Tunnel approach is also in design, with construction anticipated to begin in spring 2014. The Belt (Shore) Parkway interchange began construction in 2010 and is expected to be complete in 2014. The project is being designed to minimize lane closures and traffic disruption. The eastbound Bus/HOV lane is being maintained from the Verrazano-Narrows Bridge to the Brooklyn-Battery Tunnel during the AM peak period.

  Emergency repair work involving general bridge rehabilitation began in the summer of 2009 and is expected to continue through the fall of 2012.
  There may be minimal diversions from the Verrazano-Narrows Bridge and the Brooklyn-Battery Tunnel due to the lack of viable alternative routes.

- **I-278/Brooklyn-Queens Expressway —** Park Avenue viaduct. NYSDOT began reconstruction of the Brooklyn-Queens Expressway between Flushing Avenue and Sands Street in 2005. This project was completed in the spring of 2010.

  In addition to the above, NYSDOT is scoping future safety and operational improvements. The project is expected to go to construction in 2017 and last one year.

  Reconstruction of the cantilever section between Atlantic Avenue and Sands Street is programmed for design in 2010-2012 and is currently scheduled to begin construction in 2017.

  Rehabilitation of the Grand Central Parkway interchange complex from 71st Street to 82nd Street and 25th Avenue on the Brooklyn-Queens Expressway to the Grand Central Parkway ramp is scheduled to begin in 2020, preceded by the section of Grand Central Parkway from Astoria Boulevard to 44th Street in 2019. The projects involve reconstruction of the highway interchange and both stages are currently in development.

NYSDOT completed the Final Environmental Impact Statement (FEIS) for the I-278/BQE Kosciuszko Bridge project. The FEIS recommended a replacement of the existing bridge by building a new permanent, parallel structure on the east side of the existing bridge. The recommended alternative provides for maintaining all lanes on the Brooklyn-Queens Expressway and local connections, while constructing a replacement bridge. The project is entering the final design phase and construction is scheduled between fall 2017 and summer 2021.

None of these projects are expected to have a significant impact on the TBTA facilities.

- **I-678/Whitestone Expressway** bridge over the Flushing River – The project was completed in 2010.

- **I-678/Van Wyck Expressway –** Rehabilitation of Roosevelt Avenue bridge is scheduled to begin in 2011.

  Kew Gardens Interchange infrastructural and operational improvements. The project involves replacing bridges due to structural problems. Construction is scheduled for spring 2010 through winter 2011/2012.

  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 ongoing. Upon completion, this may 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.

- **I-495/Long Island Expressway** – Van Wyck Expressway to Grand Central Parkway **—** Various projects are underway to improve infrastructure, traffic operations and safety conditions on the Long Island Expressway (LIE), the Grand Central Parkway (GCP), the connecting cloverleaf interchange ramps, the service roads and the collector distributor roads in the project area. Interim rehabilitation of three bridges at the Long Island Expressway/Grand Central Parkway interchange, involving the replacement of the bridge superstructure, will begin summer 2014 and extend through summer 2015. There should be minimal effect on Queens Midtown Tunnel and RFK Bridge traffic.

- **I-295/Clearview Expressway —** Rehabilitation of the Grand Central Parkway inter-change is scheduled to begin in 2014 and is expected to be completed in 2017. There should be minimal effect on Throgs Neck Bridge traffic.

- **Belt Parkway** – Provides access to the Verrazano-Narrows Bridge from southern Brooklyn, JFK Airport, Queens and the Long Island parkway system. Rehabilitation of bridges over four waterways and three overpasses are underway or scheduled through

2014. Traffic impacts should be limited to detours or alternative access routes during off-peak periods, when construction severely limits capacity. Installation of Advanced Traffic Management System equipment from the Gowanus Expressway to Cross Bay Boulevard is scheduled to begin in summer 2020 and end in spring 2022. Traffic to/from the Verrazano-Narrows Bridge and the Cross Bay Bridge may be affected.

- **FDR Drive –** The design of reconstruction of the FDR Drive viaduct from East 24th to East 42nd Street will improve safety. Construction is scheduled to begin spring 2021 and conclude in winter 2023/2024. It is anticipated that the construction schedule (indefinite) will resemble the current project on the FDR Drive extending from East 53rd to East 64th Streets. There may be an effect on Queens Midtown Tunnel traffic.

  Harlem River/FDR Drive — Reconstruction between East 125th and East 132nd Streets, Streets, including a new entrance ramp from the Third Avenue bridge onto southbound Harlem River Drive, is scheduled to begin in 2011.

  Design of safety alignment improvements southbound between East 125th and East 116th Streets is scheduled to begin in 2016.

  Replacement of the deck on the I-95 ramp will begin in fall 2020 and finish in winter 2022/2023.

  There may be an effect on RFK Bridge traffic.

- **Bruckner/Sheridan Expressway Interchange -** Preliminary engineering and Draft Environmental Impact Statement are currently underway on reconstructing the inter-change 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 altogether or replacing it with a lower-speed boulevard. It is anticipated that construction will be initiated by 2014/2015. Phase II rehabilitation is in future development for spring 2020 and includes rehabilitation of the interchange between the Bruckner Expressway and the Bronx River Parkway. Traffic patterns to/from the RFK Bridge could be altered somewhat, depending on the alternative selected.

  I-95/Bruckner Expressway – Addition of fourth lane northbound between Pelham Parkway and East Gun Hill Road and between Wilkinson Avenue and Hutchinson River Parkway. Construction for the former is slated for spring 2016 to spring 2017 and the latter is slated for summer 2016 to summer 2018. Construction of access improvements between Brush Avenue and Pelham Parkway, which would involve the construction of new bridges, is scheduled from summer 2019 to summer 2020. Some traffic may divert from the Throgs Neck Bridge to the Bronx-Whitestone Bridge.

- **I-278/Goethals Bridge Replacement –** The environmental review process for The Port Authority of New York and New Jersey's Goethals Bridge Replacement Project was concluded with the US Coast Guard's issuance of the Final Environmental Impact Statement in August 2010 and the Record of Decision in January 2011. In addition, according to the Infrastructure Investor website:

  > The Port Authority of New York and New Jersey is seeking investors for a bridge replacement project that could cost up to $1 billion. The agency said that it is looking to find a private partner who will design, build, finance and maintain a replacement to the Goethals Bridge connecting New Jersey with New York City's Staten Island. The Port Authority will also look for the selected bidder to demolish and dispose of the 82 year-old Goethals Bridge upon completion of the new structure.

- **I-278/Staten Island Expressway** – 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 winter 2011 and is scheduled for completion in the fall of 2013. One of the feasible scenarios would allow off-peak and weekend use of the lanes by all traffic, which could make the Verrazano-Narrows Bridge more attractive to motorists at those times.

  Access improvement between the Verrazano-Narrows Bridge toll plaza and Renwick Avenue is programmed for construction beginning in fall 2011 and to be completed in fall 2013. The project will include the construction of five new ramps, and relocating/reconfiguring three ramps. The project will include the construction of continuous auxiliary lanes in both directions between Renwick Avenue and Lily Pond Avenue. Additional improvements will include the removal of the abandoned interchange over the expressway between Slosson and Renwick Avenues, as well as minor shifts to the alignment of the expressway. The improvements will address bottlenecks caused by delays due to weaving traffic entering and exiting the highway at the Bradley Avenue, Slosson Avenue and Clove Road access points. The addition of the auxiliary lane is also expected to reduce the number of accidents along this segment of the interstate highway. These improvements could improve traffic flows between the Staten Island Expressway and Verrazano-Narrows Bridge**,** as well as reduce accidents**.**

  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 could positively affect traffic volumes on the Verrazano-Narrows Bridge.

Ramp improvements in the eastbound direction from South Avenue to the MLK Expressway interchange are scheduled to begin in summer 2014 and end in summer 2015. Replacement of decks for the Hyland Avenue bridges over the Staten Island Expressway is scheduled to begin in summer 2013 and end in summer 2015. Both of these projects may have an impact on Verrazano-Narrows Bridge traffic.

- **Bridge Preventive Maintenance** – Preventive maintenance of various bridges in Manhattan, the Bronx and Staten Island to ensure structural integrity/motorist safety. The subject project includes highway corridors on the Harlem River Drive, West Shore Expressway, Martin Luther King Expressway, Korean War Veterans Expressway, Staten Island Expressway, Throgs Neck Expressway, Bruckner Expressway, and Bronx River Parkway. Deteriorated bridge deck joints will be resealed or replaced, concrete overlay will be removed and replaced, and deck will be repaired on select bridges.

- **State Of Good Repair (SOGR) Interstate/Parkway Resurfacing Various Counties** – This economic stimulus project will repair and resurface approximately 69.7 miles of pavement on highways in the Bronx, Manhattan and Queens. In the Bronx, work will be done on the Major Deegan Expressway southbound lanes from the Mosholu Parkway to Fordham Road and on the Bruckner Expressway northbound lanes from the Cross Bronx Expressway to the Throgs Neck Expressway. In Manhattan, work will be performed on the Henry Hudson Parkway northbound lanes from West 181st Street to Dyckman Street and on the Harlem River Drive in both directions from the Macombs Dam Bridge to I-95. In Queens, resurfacing will be done on the Long Island Expressway in both directions from the Grand Central Parkway to the Clearview Expressway. Project construction started in September 2009 with anticipated completion in summer 2011.

- **Intelligent Transportation Systems** – Installation began in 2008 in Brooklyn, including on the Gowanus Expressway (I-278), on State routes in Queens including the Long Island Expressway, on the New England Thruway (I-95), Bronx River Parkway, and Hutchinson River Parkway in the Bronx, and in Manhattan on the Henry Hudson Parkway and FDR Drive. 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 could result in smoother flow on the highway system including TBTA facilities, and increase reliability and motorists' satisfaction.

Transit Improvements

Significant transit improvements, when completed, are expected to affect TBTA traffic levels during the forecast period through the year 2020.

- **MTA Second Avenue Subway** – Construction of Phase 1 started in April 2007 and is scheduled for completion in 2016. Service from new stations at East 96th, East 86th and East 72nd Streets along Second Avenue will connect to the 63rd Street line. Phases 2, 3 and 4 will extend service to East 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 East 96th Street north to East 125th Street is not yet funded and is not included in the current MTA Financial 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 RFK Bridge, the ramps between the RFK Bridge and East 125th Street may experience a loss of capacity. The high-volume ramps between the FDR Drive and the RFK 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 2016. 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, toll revenues and expenses have been projected by URS on the basis of the historical record of traffic, toll 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 2010 – 2014 Capital Program that was approved by the MTA Board on April 28, 2010 will be carried out throughout the forecast period. Future capital programs sufficient to maintain the structural integrity of bridges and tunnels will be adopted and implemented throughout the forecast period.

- Electronic toll payment by *E-ZPass* will continue to be available on all TBTA crossings, and the payment of revenue in full to TBTA will continue to be in accordance with current inter-agency agreements. Almost three-quarters of all tolls paid on TBTA facilities are *E-ZPass* transactions.

- It is assumed that congestion pricing in Manhattan will not be implemented in the near future.

- Competing East River crossings will continue to operate toll-free and to be maintained in efficient operating condition.

- For the scenario with periodic toll increases, following the toll increase on December 30, 2010, tolls on TBTA facilities will be increased by approximately 7.5 percent in 2013 and five percent every other year thereafter beginning in 2015 and continuing through 2021.

- Capacity constraints which may be somewhat mitigated by stagnant or no traffic growth in the near term on the local and arterial highway networks will, however, continue to limit traffic growth on the nine TBTA crossings. This is reflected in conservative growth rates used to forecast TBTA traffic.

- Although city and state budget difficulties continue, 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 rate of increase in gross toll revenues relative to traffic growth. However, growth in traffic volumes would be limited without *E-ZPass* at the toll plazas.

- Short-term growth assumptions, based on the projections in the New York City February 2011 Financial Plan, and long-term trends in regional employment and population, forecast by NYMTC and presented in this report, will be realized in the Tri-State area and in New York City.

- If gasoline prices in the New York metropolitan area were to increase again to and above the $4.00 per gallon level as they did in the summer of 2008, 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 if prices do not increase substantially above the $4.00 per gallon level.

- LIRR East Side Access may shift some Long Island auto commuters to rail, after its planned completion in 2015.

- Current toll discount programs remain in effect at current projected levels, including the discount for NYCSC *E-ZPass* customers and the Staten Island residents' discount program for the Verrazano-Narrows Bridge.

- The toll-rebate program, implemented in January 1998 and modified in July 2010, for the benefit of *E-ZPass* customers who are residents of Broad Channel and Rockaway peninsula traveling on the Cross Bay Bridge, will be continued as modified.

- A pilot program to evaluate cashless tolling on the Henry Hudson Bridge is planned for 2012. The bridge is presently in the gateless operation phase in the *E-ZPass* only lanes. It is assumed for purposes of these forecasts that there will be no significant impact on revenues.

- No other toll discount programs will be introduced that would adversely affect the TBTA toll facilities' revenue stream.

- Economic conditions, nationally and in the New York Metropolitan Area, will have started to improve during 2011 and should continue in 2012.

- No material natural disaster or local, state or national emergency will occur that would materially 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

Current and future traffic and toll revenues are estimated for the 10-year (2011-2021) forecast period for each TBTA facility based on historical trends in traffic and toll 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 2011 budget and 2012 through 2014 financial plans, and growth estimates based on the Consumer Price Index and historical trends, are input to the future operating expense forecast. Future operating expense estimates are used to develop net toll revenue projections over the forecast period.

Traffic and toll revenues were first projected on the basis that the tolls that were placed into effect on December 30, 2010 will be continued throughout the forecast period. Then, using these estimates as a base, URS applied the elasticity impact factors listed in Table 17 and adjusted the traffic volumes and average tolls to develop the toll revenue 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 zero to minimal traffic growth in the short-term. These indicators include: the effects of the December 30, 2010 toll increase, the gradually increasing costs of motor fuel, uncertain economic conditions, capacity constraints in the highway network, and the various factors affecting traffic growth.

The technique used in the forecast was to reduce the potential growth rates to reflect lower overall growth due to the expected slow emergence from the recession and approaching of (but not exceeding) facility capacity. This approach produces conservative forecasts even though *E-ZPass* has provided some additional capacity at the toll plazas.

On this basis, starting with the 2011 estimated traffic and revenue from Table 11, URS projected the traffic and toll revenue for the forecast period through 2021 (at constant tolls after 2011 at the current rates established on December 30, 2010), as shown in Table 19.

Changes in traffic volumes in the range of –1.7 to +2.1 percent annually, depending on the facility, are estimated in the forecast period. This growth is based on the historical growth in traffic on each facility through February 2011 (for which data are available), after the impact of toll increases were taken into account, and an assessment of the state of the economy in the

region and the recent rise in motor fuel prices. With respect to employment forecasts, our growth assumptions are based on the OMB employment projections in the short-term and NYMTC's employment projections in the long-term.

Traffic and Toll Revenue with Periodic Toll Increases

As mentioned previously, the traffic forecast with periodic toll increases was built upon the base forecast (from Table 19), to which the elasticity impacts (from Table 17) were applied. URS then applied the appropriate increased average tolls increased by the percentages, also shown in Table 17, in the years 2011 (as a result of the toll increase on December 30, 2010), 2013 (7.5 percent) and 5 percent in each of the following years, 2015, 2017, 2019 and 2021 (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.

Finally, with respect to both forecasts based on current tolls and for periodic toll increases, in reviewing the traffic results for 2009, 2010 and 2011 through February, we noted previously that the severe winter weather in February and December 2010 and January 2011 abnormally constrained traffic on the TBTA facilities, below that which had been experienced through November 2010. By estimating traffic through the remainder of 2011, the January 2011 constraint was included in the resulting estimates for the year. This constraint, however, was not extrapolated beyond 2011 precisely because of its abnormality. Accordingly, it was assumed that the traffic that would have crossed the TBTA facilities in February and December 2010 (but did not, due to the severe weather) would return in 2011 and thereafter brought about by more normal weather conditions. This is somewhat reflected in the slightly elevated growth rates (in Table 19) from 2011 to 2012 that account for the traffic that did not materialize in February and December 2010 and January 2011. Then, using the adjusted (pro forma) 2011 estimates as a foundation, the growth rates listed in Table 19 provided the basis for the forecast through 2021.

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Table 19 Traffic and Toll Revenue Forecast, Constant Tolls

Year	Throgs Neck	Bronx-Whitestone	RFK	Queens Midtown	Brooklyn Battery	Verrazano-Narrows	Henry Hudson	Marine Parkway-Gil Hodges Memorial Bridge	Cross Bay Veterans Memorial Bridge	Total
Traffic Change										
2010-2011	0.5%	-1.1%	0.2%	0.6%	-0.1%	-0.1%	-0.4%	-0.7%	-1.7%	-0.1%
2011-2012	1.2	1.7	1.7	0.9	0.9	1.4	2.1	1.3	1.5	1.4
2012-2013	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2013-2014	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2014-2015	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2015-2016	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2016-2017	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2017-2018	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2018-2019	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2019-2020	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2020-2021	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Annual Traffic (000s)										
2010	39,362	41,037	60,098	28,443	16,093	68,086	23,054	7,837	7,625	291,634
2011	39,574	40,567	60,233	28,612	16,072	67,998	22,964	7,785	7,494	291,300
2012	40,036	41,249	61,284	28,868	16,216	68,928	23,445	7,885	7,606	295,516
2013	40,236	41,455	61,590	29,012	16,297	69,273	23,562	7,924	7,644	296,994
2014	40,437	41,662	61,898	29,157	16,378	69,619	23,680	7,964	7,683	298,479
2015	40,639	41,870	62,208	29,303	16,460	69,967	23,798	8,004	7,721	299,971
2016	40,842	42,080	62,519	29,450	16,543	70,317	23,917	8,044	7,760	301,471
2017	41,047	42,290	62,832	29,597	16,625	70,669	24,037	8,084	7,798	302,978
2018	41,252	42,502	63,146	29,745	16,708	71,022	24,157	8,124	7,837	304,493
2019	41,458	42,714	63,461	29,894	16,792	71,377	24,278	8,165	7,877	306,016
2020	41,665	42,928	63,779	30,043	16,876	71,734	24,399	8,206	7,916	307,546
2021	41,874	43,142	64,098	30,193	16,960	72,093	24,521	8,247	7,956	309,084
Average Toll										
2010	$6.11	$5.59	$5.43	$5.17	$4.92	$4.60	$2.36	$1.76	$1.82	$4.86
2011	6.62	6.12	5.95	5.59	5.40	5.14	2.66	1.94	2.08	5.34
2012	6.61	6.11	5.94	5.58	5.39	5.13	2.66	1.94	2.08	5.33
2013	6.60	6.10	5.93	5.57	5.38	5.12	2.65	1.94	2.08	5.32
2014	6.59	6.09	5.92	5.56	5.37	5.11	2.65	1.93	2.07	5.31
2015	6.58	6.08	5.91	5.55	5.36	5.10	2.64	1.93	2.07	5.31
2016	6.57	6.07	5.90	5.54	5.35	5.09	2.64	1.93	2.07	5.30
2017	6.56	6.06	5.89	5.53	5.34	5.08	2.63	1.92	2.06	5.29
2018	6.55	6.05	5.88	5.52	5.33	5.07	2.63	1.92	2.06	5.28
2019	6.54	6.04	5.87	5.51	5.32	5.06	2.62	1.92	2.06	5.27
2020	6.53	6.03	5.86	5.50	5.31	5.05	2.62	1.91	2.05	5.26
2021	6.52	6.02	5.85	5.49	5.30	5.04	2.61	1.91	2.05	5.25
Toll Revenue (000s)										
2010	$240,343	$229,428	$326,103	$146,934	$79,225	$312,873	$54,452	$13,774	$13,914	$1,417,046
2011	261,962	248,249	358,116	159,825	86,824	349,317	61,083	15,139	15,605	1,556,119
2012	264,654	252,047	364,003	160,949	87,373	353,326	62,291	15,285	15,805	1,575,733
2013	265,493	252,845	365,156	161,459	87,650	354,446	62,489	15,334	15,931	1,580,803
2014	266,334	253,647	366,313	161,971	87,928	355,569	62,687	15,382	15,905	1,585,735
2015	267,584	254,450	367,474	162,777	88,207	356,695	62,885	15,431	15,955	1,591,459
2016	268,432	255,257	368,638	163,293	88,486	357,826	63,085	15,560	16,083	1,596,661
2017	269,283	256,488	369,807	163,810	88,767	358,960	63,284	15,529	16,056	1,601,984
2018	270,136	257,301	371,610	164,329	89,048	360,097	63,485	15,578	16,107	1,607,692
2019	270,992	258,117	372,787	164,850	89,330	361,238	63,686	15,709	16,237	1,612,947
2020	272,268	258,935	373,969	165,372	89,613	362,383	63,888	15,677	16,209	1,618,314
2021	273,130	259,755	375,154	165,896	89,897	363,531	64,090	15,727	16,340	1,623,522

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Table 20 Traffic and Toll Revenue Forecast, Periodic Toll Increases

Year	Throgs Neck	Bronx-Whitestone	RFK	Queens Midtown	Brooklyn Battery	Verrazano-Narrows	Henry Hudson	Marine Parkway-Gil Hodges Memorial Bridge	Cross Bay Veterans Memorial Bridge	Total
Traffic Change										
2010-2011	0.5%	-1.1%	0.2%	0.6%	-0.1%	-0.1%	-0.4%	-0.7%	-1.7%	-0.1%
2011-2012	1.2	1.7	1.7	0.9	0.9	1.4	2.1	1.3	1.5	1.4
2012-2013	0.0	0.0	-0.4	-0.4	-1.1	-0.1	-0.8	0.0	-0.1	-0.3
2013-2014	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2014-2015	0.2	0.2	-0.1	-0.1	-0.6	0.1	-0.4	0.2	0.1	0.0
2015-2016	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2016-2017	0.2	0.2	-0.1	-0.1	-0.6	0.1	-0.4	0.2	0.1	0.0
2017-2018	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2018-2019	0.2	0.2	-0.1	-0.1	-0.6	0.1	-0.4	0.2	0.1	0.0
2019-2020	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2020-2021	0.2	0.2	-0.1	-0.1	-0.6	0.1	-0.4	0.2	0.1	0.0
Annual Traffic (000s)										
2010	39,362	41,037	60,098	28,443	16,093	68,086	23,054	7,837	7,625	291,634
2011	39,574	40,567	60,233	28,612	16,072	67,998	22,964	7,785	7,494	291,300
2012	40,036	41,249	61,284	28,868	16,216	68,928	23,445	7,885	7,606	295,516
2013	40,045	41,258	61,014	28,761	16,034	68,878	23,255	7,888	7,597	294,731
2014	40,245	41,464	61,319	28,905	16,115	69,223	23,372	7,928	7,635	296,205
2015	40,318	41,539	61,241	28,882	16,021	69,305	23,284	7,943	7,642	296,176
2016	40,519	41,747	61,547	29,026	16,101	69,651	23,401	7,983	7,680	297,657
2017	40,593	41,823	61,469	29,003	16,008	69,734	23,314	7,999	7,687	297,629
2018	40,796	42,032	61,776	29,148	16,088	70,083	23,430	8,038	7,726	299,117
2019	40,870	42,108	61,698	29,125	15,995	70,166	23,343	8,054	7,732	299,091
2020	41,074	42,319	62,006	29,271	16,075	70,517	23,460	8,095	7,771	300,586
2021	41,149	42,396	61,928	29,247	15,982	70,600	23,372	8,110	7,778	300,561
Average Toll										
2010	$6.11	$5.59	$5.43	$5.17	$4.92	$4.60	$2.36	$1.76	$1.82	$4.86
2011	6.62	6.12	5.95	5.59	5.40	5.14	2.66	1.94	2.08	5.34
2012	6.61	6.11	5.94	5.58	5.39	5.13	2.66	1.94	2.08	5.33
2013	7.09	6.56	6.37	5.98	5.78	5.50	2.85	2.08	2.23	5.72
2014	7.08	6.55	6.36	5.97	5.77	5.49	2.85	2.08	2.23	5.71
2015	7.42	6.87	6.67	6.26	6.05	5.75	2.98	2.18	2.33	5.99
2016	7.41	6.86	6.66	6.25	6.04	5.74	2.98	2.18	2.33	5.98
2017	7.76	7.19	6.98	6.55	6.33	6.02	3.12	2.29	2.44	6.27
2018	7.75	7.18	6.97	6.54	6.32	6.01	3.12	2.29	2.44	6.26
2019	8.12	7.53	7.31	6.85	6.62	6.30	3.27	2.40	2.55	6.56
2020	8.11	7.52	7.30	6.84	6.61	6.29	3.27	2.40	2.55	6.55
2021	8.50	7.88	7.66	7.17	6.93	6.59	3.43	2.51	2.67	6.87
Toll Revenue (000s)										
2010	$240,343	$229,428	$326,103	$146,934	$79,225	$312,873	$54,452	$13,774	$13,914	$1,417,046
2011	261,962	248,249	358,116	159,825	86,824	349,317	61,083	15,139	15,605	1,556,119
2012	264,654	252,047	364,003	160,949	87,373	353,326	62,291	15,285	15,805	1,575,733
2013	284,048	270,517	388,868	172,066	92,706	378,860	66,300	16,409	16,939	1,686,713
2014	284,948	271,788	390,101	172,612	93,000	380,060	66,510	16,461	16,993	1,692,473
2015	299,192	285,375	408,340	180,768	96,907	398,809	69,449	17,286	17,826	1,773,951
2016	300,140	286,279	409,634	181,340	97,214	400,073	69,669	17,421	17,882	1,779,652
2017	315,144	300,590	428,786	189,909	101,298	419,808	72,747	18,295	18,759	1,865,335
2018	316,143	301,963	430,763	190,511	101,619	421,138	73,212	18,433	18,818	1,872,598
2019	331,946	317,058	450,903	199,512	105,889	441,913	76,446	19,357	19,740	1,962,764
2020	332,998	318,062	452,952	200,144	106,224	443,313	76,688	19,418	19,803	1,969,603
2021	349,644	333,962	474,129	209,601	110,687	465,182	80,076	20,392	20,773	2,064,447

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. While not likely, 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 toll-free 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 Tables 19 and 20 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 is between 96th Street and 63rd Street. With four lanes being maintained on Second Avenue, there have been no discernible impacts on RFK Bridge traffic levels.

For the RFK Bridge, 28 percent of the traffic exits onto Second Avenue at 125th Street, 56 percent exits onto the FDR Drive, and 17 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.

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 $398.7 million in 2011 to $613.2 million in 2021. 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 budgeted by TBTA for 2011 and as projected by TBTA through 2014, are shown in Table 21.

An ongoing *E-ZPass* Tag Replacement Program commenced in 2010. Based on the 2011-2014 Adopted Financial Plan, the program will cost approximately $13 million in 2011 and approximately $9 million on average each year thereafter through 2014.

URS projected that labor expenses would increase at a rate of 4.0 percent annually while non-labor expenses would increase at a rate of 5.0 percent per year.

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]
2011[d]	$219,047	$179,692	$398,739
2012[e]	228,755	184,129	412,884
2013[e]	236,706	194,453	431,159
2014[e]	245,975	205,775	451,750
2015	255,814	216,064	471,878
2016	266,046	226,867	492,913
2017	276,688	238,210	514,899
2018	287,756	250,121	537,877
2019	299,266	262,627	561,893
2020	311,237	275,758	586,995
2021	323,686	289,546	613,232

(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) Adopted budget.
(e) From TBTA estimates.

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 toll revenues (before debt service on outstanding TBTA obligations), one at constant tolls and the other with periodic toll increases, as shown in Table 22. For 2011, net toll revenue under either scenario is estimated at $1.2 billion. By 2021, net toll revenue at constant tolls is estimated to be $1.0 billion, and with periodic toll increases, net toll revenue is estimated to be on the order of $1.5 billion.

Table 22 Net Toll Revenue Forecast
(000s)

Year	Gross Toll Revenues		Operating Expenses	Net Toll Revenues	
	Constant Tolls	Periodic Toll Increases		Constant Tolls	Periodic Toll Increases
2011	$1,556,119	$1,556,119	$398,739	$1,157,381	$1,157,381
2012	1,575,733	1,575,733	412,884	1,162,849	1,162,849
2013	1,580,803	1,686,713	431,159	1,149,644	1,255,555
2014	1,585,735	1,692,473	451,750	1,133,985	1,240,723
2015	1,591,459	1,773,951	471,878	1,119,582	1,302,073
2016	1,596,661	1,779,652	492,913	1,103,747	1,286,738
2017	1,601,984	1,865,335	514,899	1,087,086	1,350,436
2018	1,607,692	1,872,598	537,877	1,069,816	1,334,722
2019	1,612,947	1,962,764	561,893	1,051,054	1,400,871
2020	1,618,314	1,969,603	586,995	1,031,319	1,382,608
2021	1,623,522	2,064,447	613,232	1,010,289	1,451,215

REVIEW OF PHYSICAL CONDITIONS

The facilities under TBTA's jurisdiction include two tunnels and seven bridges listed in Table 23, together with Randalls 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 RFK, 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 investments for each facility from 1992 through 2010.

Table 23 Opening Dates of TBTA Facilities

Facility	Open to Traffic	Years in Use
RFK Bridge	1936	75
Bronx-Whitestone Bridge	1939	72
Throgs Neck Bridge	1961	50
Henry Hudson Bridge	1936[(a)]	75
Queens Midtown Tunnel	1940	71
Brooklyn-Battery Tunnel	1950	61
Verrazano-Narrows Bridge	1964[(b)]	47
Cross Bay Veterans Memorial Bridge	1970[(c)]	41
Marine Parkway-Gil Hodges Memorial Bridge	1937	74

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 Investments by Facility, 1992 to 2010
(Millions of dollars)

Facility	Total by Facility 1992 through 2010[a, b]
Agency Wide[c]	$343.6
Brooklyn-Battery Tunnel	373.2
Bronx-Whitestone Bridge	558.5
Cross Bay Bridge	100.5
Henry Hudson Bridge	224.5
Marine Parkway Bridge	151.2
Queens Midtown Tunnel	233.0
RFK Bridge	929.9
Throgs Neck Bridge	300.8
Verrazano-Narrows Bridge	316.0
Total	$3,531.2

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

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

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

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

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

Review of Inspection Reports

TBTA's seven bridges and two tunnel facilities undergo periodic condition inspections. Bridges are inspected biennially per federal and state mandate, with interim yearly inspections of any components that require monitoring. The purpose of the biennial inspection program is to maintain the safety and structural integrity of bridges. TBTA's Bridge Inspection Program was assessed from 2006 to 2007 by an independent engineering firm well known in the field of structural inspection and appraisal, which noted that "the program is meeting the minimum state and federal standards" and "In several respects the program exceeds the minimum standards" and "with respect to the accuracy, clarity, and thoroughness of the reports generated, we find them to be of the highest quality".

While there is no federal or state mandate, TBTA performs regular tunnel inspections of selected tunnels elements as needed, with more comprehensive inspections performed approximately every ten years. The FHA/FTA Tunnel Inspection Manual recommends an interval of 2-5 years between inspections, thus TBTA is in conformance with this guideline. The regular inspection of the Queens Midtown Tunnel was awarded in 2007 and completed in 2008. The contract for the regular inspection of the Brooklyn-Battery Tunnel is expected to be awarded in 2011 and a recent inspection of the tunnel was performed in 2009/2010 by the same firm for the purpose of developing the scope for the tunnel rehabilitation contract included in the 2010 - 2014 Capital Program.

The TBTA bridges were last inspected and their physical condition appraised in 2008/2009 by various consultants, under the New York State Biennial Bridge Inspection Program. New cycles of NYSDOT Biennial Bridge Inspection are currently underway. In addition, separate under-water and substructure inspections were performed in accordance with the five-year cycles of NYSDOT to obtain riverbed contours and to assess potential scour conditions at the substructure. These ongoing inspections, performed by the inspection consultants, consisted of close visual examination, 100% hands on inspection of designated critical elements, sounding and chipping concrete, scraping and cleaning steel, and taking appropriate measurements to determine the physical conditions of the bridges and tunnels. The biennial bridge inspection is performed per the guidelines of the New York State Bridge Inspection Manual and the Federal Guidelines. Under these guidelines, each bridge component is inspected and assigned a rating. Any priority conditions are reported immediately to the TBTA for prompt attention. The ratings are reviewed by TBTA personnel to assess what components of the bridge require more comprehensive inspection and rehabilitation, which is then awarded as contracts under the Capital and Maintenance Programs. Bridge components which warrant more frequent monitoring to ensure public safety are monitored annually with a special inspection.

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

TBTA has an ongoing seismic retrofit program to identify and implement necessary seismic retrofits in order to bring critical facilities to current seismic code standards. This program has made substantial progress in identifying necessary seismic upgrades and incorporating them into various Capital facility rehabilitation design and construction projects when applicable. This effort will continue in the current 2010-2014 and the 2015-2019 Capital Programs.

The consulting engineering firms who performed the 2009 and 2010 biennial inspections and those who performed or are performing the 2010/2011 and 2008 tunnel inspections for each facility are shown in Table 25:

Table 25 Facility Inspection Firms

Facility	Consulting Firm
RFK Bridge	WSP Sells/ TranSystems (2010)
Throgs Neck Bridge	HNTB, Inc. (2009)
Bronx-Whitestone Bridge	WSP_Sells (2009)
Henry Hudson Bridge	TranSystems (2009)
Queens Midtown Tunnel	Jenny Engineering (2008)
Facility approach bridges	TranSystems (2009)
Brooklyn-Battery Tunnel	Parsons Brinckerhoff (2010/2011)(*)
Verrazano-Narrows Bridge	HNTB/ B&H (2010)
Marine Parkway/Gil Hodges Memorial Br.	HAKS (2009)
Cross Bay Bridge	HAKS (2009)

(*) 2010 inspection of components for rehabilitation, 2011 comprehensive inspection.

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, and therefore the results of these inspections are not available at this time. The results of these inspections, also done by experts in the field, will generally be available at the end of the year.

Funds proposed for TBTA's 2010-2014 Capital Program total approximately $2.452 billion. The plan breaks this amount into specific projects by facility as well as agency-wide projects. Comparisons between the Capital Program planned projects and total repair item lists for each facility, as prepared by inspection consultants in the biennial reports, confirm that the Capital Program gives high priority to key rehabilitation projects. 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 and the maintenance and programmatic needs of the facilities include:

RFK Bridge – Construction of utility relocation for future toll plaza reconstruction will be awarded shortly and will continue for 18 months. The design phase of the contract for the deck replacement for the Bronx toll plaza and ramps, repairs and painting of the steel is planned to start in fall of 2011, with construction in 2014. The Manhattan toll plaza interim repairs will begin design in fall of 2011 and are planned for 2014 construction. Rehabilitation and replacement of the Manhattan approach is planned. The southbound Harlem River Drive ramp to the RFK Bridge will see construction beginning shortly to replace the deck and superstructure. A construction contract to replace the wearing surface on all steel decks including the Harlem River lift span, Bronx Truss and Queens suspension span, has been awarded. Rehabilitation of the 124th/125th Street on and off ramps is expected to be completed in the 2010-2014 capital program as well as interim repair of the FDR ramp. High priority structural repairs to address flag conditions from the most recent biennial inspection are ongoing. Construction of a new Bronx-to-Randall's Island ramp is complete. Projects completed within recent years include numerous repair projects such as repair of the bridge deck joints, drains, cracked decks, piers, superstructure, substructure and maintenance painting of the Ward's Island viaduct and suspended span.

Bronx-Whitestone Bridge – Interior and exterior concrete Queens anchorage repair construction is ongoing. The bridge has an ongoing program to inspect and monitor the condition of the main cables. 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. Complete replacement of the main cables and suspender ropes is planned to be studied in the next 20 years, including widening of the suspended spans. There is no need to replace the cable in the near future, thus monitoring and maintenance of the main cables is ongoing. Design and construction for replacement of the necklace lighting and the acoustic monitoring system for the main cables is planned for the 2010 - 2014 Capital Program. Construction of the replacement of the Bronx approach span with upgrade to modern standards in shoulder and lane widths is ongoing and should be complete in late 2012. Construction of interior and exterior concrete repairs to the Bronx anchorage is planned to begin after the Bronx approach construction is completed. The Queens approach span replacement design, also to current standards, is complete, with construction to be let in 2011 to include replacement of fire standpipe system, new roadway lighting, and replacement of power and communication systems. Flag repairs in the approaches will continue until the approaches are replaced. Preliminary design of toll plaza reconstruction in order to improve traffic flow is being reevaluated to implement possible alternative toll collection methods and will tentatively be carried out in the next capital program. Projects completed within recent years include: painting of the main cables, suspender ropes and towers, painting and replacement of the collars of the suspender ropes and installation of orthotropic bridge deck in the suspended span.

Throgs Neck Bridge – Design will begin in the end of 2011 and the first phase of full scale replacement of the suspended span deck is planned for construction in 2013 to 2016, permitting the future addition of a seventh contra-flow lane with a movable median barrier. Deck replacement work will also include utility relocations, underdeck traveler installation to address future access to the bridge structure and roadway lighting replacement. Two major rehabilitation construction contracts will be awarded this summer to include rehabilitation of the suspended

span, Queens approach and Bronx approach structural steel to address all known deficiencies such as deteriorated floor beams, stringers, gusset plates, lateral bracings, stiffening and floor truss elements. Painting of the Bronx approach will also be included in the contract. Structural repairs to address flag conditions from the biennial inspections have been completed at many locations, and are ongoing with numerous locations incorporated into the capital programs mentioned above. Design of an anchorage dehumidification system is scheduled for 2012-2013. Construction will be in the future capital programs. Full-scale lighting replacement and catwalk replacement on the structure continues, phased with the deck replacements. Construction for the rehabilitation of the fenders at the towers and anchorages is ongoing. Projects completed within recent years include: deck replacement and rehabilitation on the Queens approach, tower and structural steel painting, steel repairs of the suspended span superstructure, main cables and suspender ropes investigation, structural steel rehabilitation, and drainage system improvements.

Henry Hudson Bridge – The design for the northbound upper level toll plaza rehabilitation and the replacement of the upper level deck in the vicinity of the toll plaza, which will include toll booth, canopy, collection equipment and roadway lighting replacement is in the 2010-2014 Capital Program and construction is planned to begin by mid-2013. The design for the south approach replacement is planned for 2012 with construction in the future capital programs. A pilot program to evaluate all electronic tolling is currently in the gateless phase, with the cashless phase planned to be implemented in early 2012. The construction for the removal of the side-walk and the curb stringers on the upper level and the widening of the bridge will begin this spring and continue for 33 months. A project to design miscellaneous steel repairs at priority locations is anticipated to be let for construction this fall. Miscellaneous rehabilitation of the Staff Street and Dyckman Street bridges and the northbound parkway were suspended over the winter, and work will continue starting this spring. Replacement of the overlay and miscellaneous painting on the Staff Street bridge will be constructed in 2011. Upgrading of the northbound and southbound barrier on the parkway to current codes is also planned for 2011. Construction of rehabilitation of the begin abutment wingwall is planned for 2011 to pour a new façade with grouted tiebacks. Projects completed within recent years include: construction of the lower level deck replacement which replaces the lower level deck and sidewalk, northern approach structure, drainage system and roadway lighting, rehabilitation of cross drainage of the approaches between Dyckman Street and the main span, rehabilitation of the lower level garage consisting of concrete repairs, and repaving and waterproofing the roadway above the garage, and major maintenance projects including spall repairs at the towers, resealing the upper level deck, and light pole rehabilitation on the parkway approaches, and stone wall guide rail repairs.

Queens Midtown Tunnel – Construction is planned for 2012 to replace the electrical switchgear and fan motor control equipment for the tunnel vent fans including automatic transfer switches and external connections to portable diesel generators. A design project is planned for 2012 to upgrade the controls and communication system room, including expansion of the existing supervisory controls systems in the facility control center to incorporate vent and power system control and monitoring with connection to traffic control and signaling, VMS, traffic speed sensors, over-height detection and CCTV. Construction will occur in future capital programs. The design and construction of the rehabilitation of the facility operations and maintenance building is also scheduled for this capital program. Design and construction of the tunnel leak repairs, walls and ceiling rehabilitation is planned for the 2010-2014 Capital Program, with

design beginning in 2012. Another capital project is planned for a design start in 2011 which includes the design and construction of the first phase of rehabilitation of the three tunnel plazas, including repaving and repair of plaza sidewalks and gutters as well as scoping of the rehabilitation of the other two plazas. Projects completed within recent years include the following: replacement of all the tunnel ventilation exhaust fans and minor repairs to the supply fans, the rehabilitation of two overpasses including deck repair and beam encasement repair in the Manhattan approach area, replacement of drainage pumps inside the ventilation building and at the plazas, and reconfiguration of the traffic island in the Manhattan entrance plaza to provide better traffic flow.

Brooklyn-Battery Tunnel – Design will begin in 2012 to rehabilitate the tunnel ceilings and walls, including repairs to tunnel ceiling concrete panels, concrete liners, miscellaneous leaking areas, replacement of tunnel ceiling veneer panels and rehabilitation of the fire suppression system with construction planned for 2014. Construction of the upgrade of the electrical system, switchgear replacement, and automatic transfer connection to emergency generators was awarded in 2010.. Design will begin in 2012 for rehabilitation of the Brooklyn Plaza and repair/rehabilitation of miscellaneous leaks with construction planned for the fall of 2013. Design in 2012 and construction to begin in 2013 of the service building rehabilitation is also included in the Capital Program. Current maintenance work includes replacement of the concrete slab in the toll booth area, which is ongoing and will finish by the end of the summer, and repointing of the plaza walls in Manhattan, which is substantially completed. The Brooklyn toll plaza light repairs are substantially complete, and replacement of the associated light feeders are planned for construction this year. Projects completed within recent years include: construction of structural and architectural repairs for vent structures, the rehabilitation of the Brooklyn plaza pipe chase, modernization and upgrade of the control room, construction of a new pump system to get water runoff into the sanitary system on Governor's Island, construction of tunnel roadway and drainage system rehabilitation, tunnel leakage repairs and wall tile replacement, installation of a new ethanol fuel tank, and installation of new electrical generators. Design will begin in 2011 for the replacement of the elevators in the nearby Battery Parking Garage and construction to follow in 2012.

Verrazano-Narrows Bridge – The eastbound toll plaza, eastbound and westbound ramps and eastbound mainline design is complete and construction of the rehabilitation will occur in the 2010 – 2014 Capital Program, including upgrade to current standards, new ramps to the SIE for buses and interchange work. Relocation of the HVAC on the canopy toll plaza roof is ongoing. A construction contract for the utility relocation necessary for re-decking of the upper level suspended span is complete. The current capital program will begin construction of the second phase of redecking in 2012 with replacement of the upper level suspended span deck including associated concrete barriers, with a movable median barrier, drainage system and sign structures, which is currently in design. Replacement of the upper and lower level lighting system, tower floodlights, and the bridge communication system is also included in this contract. Construction for tower/suspended spans seismic retrofit is planned for this capital program. Painting and repair of the towers below the roadway, as well as traveler rails and struts began in the end of 2010 and is scheduled for 2012 completion. Steel repairs and concrete rehabilitation of the Belt Parkway ramp structures to address priority conditions including repairs to floor and truss members, rivet replacement, bearing, parapet, sidewalk, substructure repairs and drainage

rehabilitation is planned for construction in 2013. Design for rehabilitation and expansion of the service building is planned for future capital programs. General maintenance paving is ongoing. Rehabilitation of the traveler is complete this year. The rehabilitation of the electrical substation design is planned for 2012 and construction is planned for the 2010 - 2014 Capital Program. Projects completed within recent years include: deck replacement on the lower level Brooklyn and Staten Island approaches and Lily Pond Avenue bridge, maintenance bridge painting of the entire suspended spans, rehabilitation of the service building roof, construction of the salt storage facility, and maintenance painting of the Brooklyn approaches and tower painting, the installation of sensors with the provision of real time under bridge clearance, repair of flagged conditions on the structural steel superstructure from anchorage to anchorage, and removal of eight eastbound toll booths.

Marine Parkway-Gil Hodges Memorial Bridge – A design project to provide complete inspection of piers, and construction of repairs including institution of a scour restoration program is planned for the 2010 - 2014 Capital Program. A project to design and construct the rehabilitation of the mechanical and electrical components, including the programmable logic controller of the lift span is also planned for the 2010 - 2014 Capital Program, including attachment to the emergency generator, fire standpipe installation and motor rehabilitation. Design of repairs to the deck truss, main truss, lacing and gussets and interior floor beams are planned for the 2010-2014 Capital Program as well, with construction in the next Capital Program. The design of deck rehabilitation on the Rockaway Point Boulevard Bridge and Jacob Riis Pedestrian Bridge is planned to begin in late 2011; construction will be carried out in this capital program. Current maintenance work includes repair of the median barrier, which will occur this summer. Replacement of the span locks, painting of the deck trusses and repairs to the steel roadway and grating, were completed. Toll plaza drainage improvement construction has been completed. A construction project for cleaning of marine growth on the piers was completed. Projects completed within recent years include: the installation of a pre-engineered service building, 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 and secondary steel repairs, refurbishing of the toll booths and main motor shaft west and replacement of the elevators in the towers.

Cross Bay Veterans Memorial Bridge – A contract to rehabilitate the deck and superstructure was completed in May 2010. A construction contract to rehabilitate the substructure of the bridge, including repairs of the concrete piers, piles and pile caps was let in 2010 and is projected to continue into 2013. Fender repair and bike path rehabilitation are planned for the future capital programs. Projects completed within recent years include: installation of a facility engineer's trailer, a salt dome, rehabilitation of the air conditioning system in the service building, 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, refurbishing of the interior of the toll booths, and the complete concrete and drainage rehabilitation of the promenade and seawall at the Rockaway approach.

Other System-wide Improvements

Agency-Wide – Since the September 11th 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. Video surveillance software and hardware upgrades have been installed at many facilities. TBTA has also maintained a security department and incorporates mitigation measures into their operations, capital and maintenance programs.

This 2010 – 2014 Capital Program will continue with Intelligent Transportation System project initiatives including:

- Installation and Upgrade of RWIS (Roadway Weather Information Systems) at most facilities.
- TRANSMIT (an *E-ZPass*-based system) is operational at all facilities. Travel times (between TRANSMIT locations) are being measured, stored, and displayed on the internal website.
- The Variable Message Sign (VMS) program is proceeding well. Twenty older VMS have been replaced at seven crossings. The 2010 – 2014 Capital Program will replace 25 more and add 8 new signs. New VMS signs were recently installed at the Bronx-Whitestone, RFK and Henry Hudson bridges and certain signs at the Verrazano-Narrows have been replaced, and many others are in various stages of design and construction.
- The program to install variable speed limit signs continues. They have been installed at the Throgs Neck Bridge, and are in the process of being installed at several other facilities.
- With respect to the now almost 15 year old E-*ZPass* toll collection system, a number of major improvements are now complete, and others are planned. All lane controllers and plaza host computers have been replaced. TBTA is in the process of replacing or upgrading the original power and communication cables system wide to increase data capacity to allow additional ITS features in the future.

Other projects completed within recent years include: the installation of the traffic, safety improvements, tank testing and installation of alternative fuel tanks, installation of weather recording system and inspection platform, Randall's Island garage roof replacement and facility improvements to comply with Americans with Disabilities Act (ADA) requirements. Restoration of the Robert Moses building façade 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 with the most recent dated August 2009. 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 interview 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 contra-flow 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 2021 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 2041, assuming maintenance consistent with past practice.

The report contains forward-looking statements, revenue and expense projections, and statements of opinion based upon certain information. These forward-looking and opinion statements and projections include statements relating to preexisting conditions not caused or created by URS and external conditions beyond our control. We believe that our projections are reasonable and are based on reasonable assumptions. However, such forward-looking statements, projections and opinions, by their nature involve risks and uncertainties beyond our control. We caution that a variety of factors could cause the actual revenue associated with the TBTA facilities to differ from that expressed or implied in this document. We assume no obligation with respect to the differences between this document and the actual performance of the bridges or tunnels. This document was prepared solely for the use of the TBTA that commissioned it. It may only be relied upon by third parties at their own risk. Under no circumstance will URS be liable to third parties for claims or damage arising out of this document unless expressly agreed between the third party and URS. Any unauthorized use of this document is at the user's sole risk.

Respectfully,

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