Report to the New York City Traffic Congestion Mitigation Commission

New York State Department of Transportation
Astrid C. Glynn, Commissioner

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EXECUTIVE SUMMARY

Introduction

This report is intended to meet the requirement of Chapter 384 of the Laws of 2007, that the New York State Department of Transportation (NYSDOT) provide comments to the New York City Traffic Congestion Mitigation Commission (Commission) by October 1, 2007 on the traffic congestion mitigation plan submitted by the mayor of New York City (NYC). That law also requires that NYSDOT provide to the Commission:

1. a description of the additional capital needs required for implementation of such plan;
2. the proposed utilization of any potential revenues derived from such plan for implementation of such plan; and,
3. the impact of such revenue upon the agency’s capital and operating budgets.

In April 2007, Mayor Bloomberg outlined a proposal to implement congestion pricing in Manhattan as part of his PlaNYC initiative. In order to take advantage of federal funding available to implement congestion pricing, the State and City partnered on an application to the United States Department of Transportation (USDOT) under the Urban Partnership Program. In August, USDOT entered into an Urban Partnership with NYSDOT, the Metropolitan Transportation Authority (MTA), and NYC and outlined specific federal funding and other terms and conditions related to this agreement.

Implementation of the NYC Traffic Congestion Mitigation Plan (TCMP) will impact travel on the metropolitan area’s regional transportation system. The MTA will address the impacts on their facilities and operations in their report to the Commission. This report will address the anticipated impacts on the region’s transportation facilities other than those operated by the MTA, including impacts on the region’s highway system, transit needs for areas not served by MTA, and regional transportation technology, data collection, information, and monitoring needs.

This report is based on an analysis and interpretation derived from information made available by NYC from their TCMP. Currently, there is not the level of detailed information available to accurately predict changing traffic patterns on individual highway corridors or facilities and precise diversions to transit services. The impacts on specific interchanges or traffic bottlenecks, and the resulting capital improvements that may be needed to mitigate these impacts, cannot be predicted at this time given the available data. Additional modeling may not yield a major improvement in precision. Given the uniqueness of the TCMP, the best way to be certain of the impacts is to demonstrate the proposal and analyze what occurs. Before and after data collection on the operation and usage of the entire regional transportation system is recommended. The Commission may want to consider funding this activity from congestion pricing revenues.

NYSDOT suggests that as the Commission evaluates the allocation of congestion pricing revenues, the Commission consider retaining the ability to adjust the allocation in the future based on actual results of diversions and traffic changes. Actual results from implementation of congestion pricing may require changes to transit services different than those originally forecasted, or result in traffic flows that vary from those anticipated by the current models. Capital projects necessary to mitigate any problems caused by the implementation on congestion
pricing may need funding in the future. The transportation agencies could benefit from the ability to adjust to these changing conditions and revenues available to cover unanticipated costs.

**Comments on NYC Traffic Congestion Mitigation Plan**

Traffic congestion in the New York Metropolitan area is causing travel delay that increases the cost of doing business, increases pollution from motor vehicles, and reduces the quality of life. The expected increase of 1.5 million residents and nearly one million jobs in New York City by 2030 will exacerbate the growing traffic congestion problem. Mayor Bloomberg’s proposal to implement a cordon based congestion pricing program is a significant effort in finding a way to address this problem.

**Capital Needs**

Following are the capital needs related to NYSDOT programs to support implementation of the TCMP. Although not required to implement the City’s plan, these projects complement the TCMP and can mitigate traffic impacts, reduce congestion and improve the level of service on the region’s highway network.

**Technology and Information:**

$98.6M - Technology and traffic monitoring projects that support the implementation of TCMP.

$12.5M - Regional data collection and information sharing.

**Transit Services Other than the MTA:**

$30M - Purchase/lease of suburban commuter/express bus Park and Ride facilities, bus shelters, and amenities.

$25M - Improved traveler information, integrated fare media, and transit technology.

The Department will work with the MTA to support provision of adequate express bus service from those suburban areas not well served by the MTA Commuter Railroads.

The TCMP proposal depends on a well functioning regional highway system to accommodate vehicular traffic. Much of the region’s highway network is old, with increasing costs for maintenance and repair. Highway construction itself can contribute to traffic congestion when the full amount of highway capacity is not available for use during construction periods. Although not addressed in this report, there is a continued need to maintain and improve the state and local highway system to keep it fully operational to serve travel demands resulting from any congestion pricing proposal. Additional highway improvements may be identified in the future to mitigate any potential traffic impacts.

**Revenue Utilization**

Revenue from implementation of the City’s congestion pricing proposal is estimated by NYC to generate $390M annually after funding the costs to operate the system.
The Urban Partnership Agreement with USDOT provided $354M to assist in implementation of the TCMP. Much of this federal aid was for additional/improved bus transit services. Little was provided by USDOT for the startup infrastructure and operations needed to implement the congestion pricing system.

The cost to install and operate the infrastructure and technology necessary to implement congestion pricing was estimated at $224M in PlaNYC and is to be funded either through NYC funds or through revenue generated from congestion pricing. This startup cost may require greater use of congestion pricing resources in the early years, but should diminish over time to the annual cost to operate and maintain the congestion pricing system.

Additional transit services to accommodate vehicular commuters diverted to transit will also require a substantial up front capital cost to purchase vehicles and other infrastructure as well as operate new services. Over time, the need for new resources for transit service should diminish to annual operating and maintenance costs, but may fluctuate if diversion to transit increases and additional transit services are needed. MTA will be providing their own estimate of need for revenue to fund MTA transit capital and operating expenses beyond the resources provided by USDOT. There may also be a need to fund additional transit services for areas not served by MTA as described above.

On the regional highway network, the implementation of congestion pricing would be aided by additional capital and operating investments for technology, intelligent transportation systems, and data collection and monitoring. There were no federal funds provided in the Urban Partnership agreement with USDOT to cover these important projects. The Commission should give consideration to funding the capital and operating costs of the investments listed above that support the efficient operation of the regional transportation network.

**Impact on NYSDOT Capital and Operating Budgets**

The projects and activities identified above to support the TCMP are above and beyond the current NYSDOT capital program and were not funded in the Urban Partnership Agreement with USDOT. The capital and operating costs are not part of the current NYSDOT capital or operating budgets, or the current multiyear capital program. There are no plans to undertake the recommended projects and activities absent the identification of new funding resources.

The Congestion Pricing legislation includes the submission of new NYSDOT and MTA capital programs by March 31, 2008. Although the implementation of Congestion Pricing may have an impact on NYSDOT and MTA operations, the excess revenues generated from any Congestion Pricing program above those needed for implementation should be devoted to a balanced program of infrastructure investments in all modes.
INTRODUCTION

In July, New York State (NYS) adopted Chapter 384 of the Laws of 2007. That law established the New York City Traffic Congestion Mitigation Commission (the Commission) and required the development of a traffic congestion mitigation plan (TCMP) by the mayor of the city of New York, established criteria that must be met before any congestion pricing plan can be implemented, and changed the timing of the Metropolitan Transportation Authority (MTA), and New York State Department of Transportation (NYSDOT) five-year capital plans.

Chapter 384 was adopted in part because of the U.S. Department of Transportation’s (USDOT) National Strategy to Reduce Congestion on America’s Transportation Network and the potential for an Urban Partnership Agreement (UPA). Through the UPA, USDOT planned to partner with certain metropolitan areas or “Urban Partners” to demonstrate strategies with proven effectiveness in reducing traffic congestion.

In August 2007, USDOT formed a partnership with its New York City Urban Partner comprised of New York City (NYC), the MTA and NYSDOT through a Memorandum of Understanding “MOU”. All parts of the MOU agreement are contingent on the State Legislature approving the pilot congestion pricing plan, or an alternative pricing mechanism, within 90 days of the opening of the next legislative session, and making it effective no later than March 31, 2009.

This report is intended to meet the requirements of required by Chapter 384 of the Laws of 2007. By October 1, 2007, NYSDOT is required to provide the Commission comments on the TCMP submitted to the Commission by the mayor of NYC. NYSDOT is required to provide a description of the additional capital needs required for implementation of such plan; the proposed utilization of any potential revenues derived from such plan for implementation of such plan; and the impact of such revenue upon the agency’s capital and operating budgets. Mayor Bloomberg’s plan is laid out in PlaNYC, the Urban Partnership application, the Urban Partnership Agreement USDOT follow-up questions and Urban Partner answers, and the mobility section of the technical report of the PlaNYC New York City Mobility Needs Assessment 2007-2030 (pages 9-22).

Congestion Pricing Modeling Issues

Issues

The New York Metropolitan Transportation Council (NYMTC) Best Practice Model (NYBPM) is an advanced activity-based travel demand model that is being used in the region as a travel demand forecasting tool for air quality transportation conformity analysis, and to analyze transportation projects by NYMTC and its member agencies. The NYBPM has been adapted by New York City to estimate the effects the TCMP on highway and transit trip demand in the region.

The NYBPM study area covers 28 counties in New York, New Jersey, and Connecticut (Figure 1). It is comprised of 3,500 transportation analysis zones and includes most types of road facilities, from minor arterials and above, and all forms of public transportation.
Since the NYBPM is a regional model designed to develop county-to-county and corridor-level travel flow changes, it is reasonable to use the model to test the regional impacts of congestion pricing. While NYBPM was not designed to develop trip volume changes on individual streets and transit stations, the PlaNYC version of the NYBPM allows reasonable ‘order of magnitude’ changes in traffic volumes and speeds from TCMP to be assessed at the corridor level. In order to more accurately predict the impact of congestion pricing at a more localized level, a more rigorous study would be needed using additional modeling tools to include micro-simulation models that can analyze TCMP impacts at specific interchanges and key local street links.

Because of the lack of specific sub-corridor local level impacts from the currently available analysis tools, it is important to collect necessary traffic and travel data before, during and after the congestion pricing demonstration to quantify the specific impacts on the regional transportation system. This information will allow any necessary adjustments to the congestion pricing program to be made based on actual experience.
NYBPM Analysis

According to the analysis of NYBPM 2007 baseline output, nearly 70% of vehicular journeys to the NYC Central Business District (CBD) come from NYC, including 22% from within the CBD, 13% from the rest of Manhattan, and 33% from the other four boroughs. The remaining 30% originate from New Jersey (19%), Long Island (6%), and north of NYC (6%).

The results of the NYBPM model outputs show the TCMP will include both mode and destination shifts of travelers.

The primary impacts on surrounding areas would be due to modal shift. This will result in a need for increased transit services in these areas to meet new demand, an increase in Park and Ride and transit parking capacity, an improved ridesharing brokerage and public information, as well as transfer arrangements and fare coordination with MTA.

Secondary impacts would include shifting traffic patterns, temporal shifts, shifts in facility usage, shifts in goods movement (temporally and spatially), and newly emerging congestion at different times and locations (with the potential for causing new traffic bottlenecks).

Potential Areas for Future Analysis

A better prediction and understanding of the impacts of the TCMP would require more rigorous study. Additional data such as: data for specific roadway segments; commercial vehicle classification counts; and, additional locations outside the CPZ could be explored to better understand the impacts resulting from the TCMP. Additional evaluation of how TCMP might influence transit levels of service would help in developing transit actions.

Some of the above actions are already being implemented by NYCDOT to serve the needs of the Commission. Additional enhancement of NYBPM may be beneficial in addition to NYCDOT’s current modifications.

Impacts of Congestion Pricing: State Arterials and Other Major Roadways

Introduction

The following is a preliminary discussion on the impacts of the TCMP on the State Arterial System (SAS) in New York City. The SAS within NYC consists of approximately 200 centerline miles of primarily limited access parkways and expressways. The discussion below utilizes information developed by the PlaNYC version of the NYBPM to assess impacts. The approach to be taken in this analysis consists of the following:

- A generalized (macroscopic) analysis of overall system impacts utilizing information developed by the NYBPM for seven ‘mega-corridors’ in NYC. The analysis compares travel per day in each corridor computed both for current (base line) conditions, and after TCMP is implemented. The comparisons use traffic volume, travel time, and travel speed.
• A discussion of localized impacts due to introduction of TCMP at specific locations where professional and technical judgment suggest there may be significant changes in travel patterns.
• A brief discussion of mitigating measures and suggested next steps.

**Corridor Descriptions**

NYBPM was used to evaluate trip changes for seven corridors (see Figure 2) which directly impact and are impacted by the TCMP. These corridors consist of the following:

1. **East Side Corridor**
   a. FDR Drive
   b. Harlem River Drive (HRD)
   c. Major Deegan Expressway (I-87/to the Westchester border)

2. **West Side Access**
   a. Route 9A
   b. Henry Hudson Parkway (HHP) (to the Westchester border)

3. **Staten Island/Brooklyn/Queens (I-278)**
   a. Staten Island Expressway (SIE)
   b. Gowanus Expressway
   c. Brooklyn-Queens Expressway (BQE) (to the Triborough Bridge)

4. **Queens/East-West**
   a. Long Island Expressway (LIE)
   b. Grand Central Parkway (GCP)

5. **Bronx/East-West**
   a. Cross Bronx Expressway
   b. Interstate Connectors

6. **Bronx/North-South**
   a. Bruckner Expressway
   b. New England Thruway

7. **Brooklyn/Queens/North-South**
   a. Shore Parkway (Belt System)
   b. Southern Parkway (Belt System)
**Corridor Level Analysis**

The tables in Figure 3 show the results of an analysis of all seven corridors. The data was developed from NYC’s output from the NYBPM. For each corridor, the model predicts the level of travel (in vehicle-miles of travel) for the ‘before TCMP’ or Baseline condition, and the post implementation condition after the TCMP is in place. The model also predicts changes in vehicle-hours of travel and travel speed. The data in Figure 3 were computed independently for each highway direction, thus the figure shows separate East-West and North-South directional splits for changes in travel. The one exception is the West Side Corridor for which only total combined North-South data was available for analysis.
### Vehicle Miles of Travel (VMT)

<table>
<thead>
<tr>
<th>Corridor name</th>
<th>2007 ‘Baseline’ values</th>
<th>After Implementation of TCMP</th>
<th>% Change</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>N/E</td>
<td>S/W</td>
<td>N/E</td>
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<td>EAST SIDE</td>
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<tr>
<td>SI/BK/QNS EXP</td>
<td>1278275</td>
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<td>QUEENS-CPZ</td>
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<td>BRONX E-W</td>
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### Vehicle Time Travel (VHT)

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<th>2007 ‘Baseline’ values</th>
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<th>% Change</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td>S/W</td>
<td>N/E</td>
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<td>WEST SIDE</td>
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<tr>
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### SPEED

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<th>After Implementation of TCMP</th>
<th>% Change</th>
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<td></td>
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<td>BK/QNS N-S</td>
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</table>

In all cases, travel overall improves in the corridor. Total vehicle mileage drops slightly, travel hours are reduced slightly and overall travel speed goes up slightly. Thus, using the model output, it will be reasonable to expect that overall impact on the arterial system, in terms of
mobility, will be positive. This is intuitively what would be expected since the higher fees to enter the CPZ would encourage travelers to do the following:

- Change to public transportation,
- Cancel or defer their trips (not generally an option for work or school trips but possibly an option for discretionary trips),
- Change destination away from the CPZ (generally only for discretionary trips), and
- Shift time of travel to avoid the congestion pricing fee (this decision would not impact vehicle miles of travel but might reduce vehicle-hours of travel and increase average travel speed by shifting travel out of the most congested time periods of the day).

**Potential Localized Impacts**

While the corridor level analysis is useful, it does not tell the entire story, since implementation of the TCMP could cause changes in both mode and route selection. Discussions have begun with other agencies including the Port Authority of New York and New Jersey (PANYNJ) to better understand these potential changes. Localized impacts could result in changes in traffic patterns and can best be assessed based on actual field data collected as part of the Congestion Pricing demonstration.

**Transit Impacts on the Arterial System**

The MTA and NYSDOT transit staff have analyzed the additional transit needs to absorb modal shifts from automobiles under TCMP. Many of these buses must be accommodated in whole or in part on the arterial system and may place a burden on the Bus/HOV lanes already in operation. Considering that TCMP will result most likely in an increase in ridesharing (with attendant increases in HOV’s) the additional burden on the existing (and proposed) Bus-HOV lanes could be significant and require mitigations to allow these lanes to operate effectively.

**Intelligent Transportation Systems (ITS) Enhancements**

Intelligent Transportation Systems represent the application of modern technology and information and management systems to address multi-modal transportation needs, in particular to enable the more efficient operation and management of the transportation system. ITS improves transportation safety and mobility and enhances productivity through the use of advanced communications technologies. Although not required to implement the City’s plan, these projects complement the TCMP and can mitigate traffic impacts, reduce congestion and improve the level of service on the region’s highway network.

Enhancements to ITS would help improve system efficiency and facilitates the level and types of operations anticipated with TCMP, which is predicted to generate major changes to travel patterns in and around NYC. It will become increasingly important to be proactive in managing the transportation system. These ITS projects will help mitigate the traffic impacts resulting from implementation of TCMP. They will also provide enhanced mobility in the NYC metro area on routes surrounding, to, and through the CPZ.
Improving Travel Information Services - $12.5 million

One means for reducing congestion is to provide travelers with information about the transportation system. Several projects that enable transportation system users to make informed decisions about their journeys including mode and route choices are presented below. Improved traveler information systems will provide useful, high quality, comprehensive, readily available travel information for multiple modes of transportation in a timely manner. The intent is to increase choices and satisfaction while reducing congestion and mitigating the impacts of congestion pricing on the State Arterial System. These Travel Information projects include:

- The 511 Traveler Information Program which will allow interested travelers to access information by either telephone or the Internet, Cost: $7M annually (recurring),
- Parking Lot Management Pilot to provide real time availability information, Cost: $1M,
- Update of TRIPS 123, which would feed into the 511 system, Cost: $0.2M,
- Transit ITS, an integration pilot that would not only gather transit information but make that information available via Variable Message Signs, Highway Advisory Radio, and kiosks in stations and parking lots, Cost: $4M, and
- Traveler Information Specialists who would ensure the delivery of high quality information through the 511 system, Cost: $0.3M annually (recurring).

Enhance Data Collection and Analysis - $28.2 million

In addition to sharing information with travelers, it is increasingly important to manage normal traffic flow in addition to managing non-recurring incidents. Suggesting alternative routes is also beneficial to reducing congestion. The following projects will help meet the goal of better managing the transportation system and its users as a means to reduce congestion:

- Analysis of data and evaluation of performance in the context of the demands placed upon the transportation system because of TCMP, Cost: $1.2M,
- Instrumentation of arterial highways to monitor and manage the changes in travel patterns caused by TCMP, Cost: $2M, and
- Congestion Mitigation/Mobility Enhancing Predictive modeling which would, based on real time information and previous behaviors, predict traffic flows, enabling proactive management of resources, Cost: $25M.

Deploy Additional ITS Infrastructure - $15 million

To supply the best information possible to travelers, existing infrastructure for gathering and sharing information will need to be enhanced. Having better information upon which to base decisions will enable travelers to avoid congested locations and reduce any secondary congestion that may be caused by TCMP. NYSDOT has identified two projects to improve traffic monitoring through additional infrastructure.

- Expansion of Transmit/Travel Time Network would expand the installation of E-Z Pass readers to cover all segments of limited access facilities in New York City, Cost: $10M,
- Expansion of Closed Circuit Television Coverage to all limited access highways complements several other efforts and supports better management of the arterial system, Cost: $5M.
The integration of the three Transportation Management Centers (TMCs) in the metropolitan New York City region will provide seamless traffic management throughout the downstate area. Information on traffic conditions can be readily available to managers in the adjacent regions to obtain information beyond their regional boundaries for managing traffic. Area-wide information that is consistent and standardized can be disseminated to travelers from any of the centers. This integration will provide better information to travelers, and increase the ability of the entire region to react quickly to changes anywhere on the transportation system including localized congestion and traffic volume changes. Identified improvements to the TMCs consist of nine separate projects, of which $10 million are recurring:

- Improved communication through the deployment of a high bandwidth, secure communication system, Cost: $6M,
- TMC Integration which involves among other things, creating a seamless concept of operations, standardized operational policies and protocols, Cost: $2M,
- HELP Program expansion to cover all critical facilities, Cost: $5M annually (recurring),
- Vehicle Infrastructure Integration Test Bed to create an environment in which vehicle-to-vehicle and vehicle-to-roadside communications can enhance transportation management and security functions, and improve safety, Cost: $5M,
- Expanding operations and maintenance to support the other actions being taken to improve TMC operations, Cost: $5M annually (recurring),
- Protocols to guide the expansion of the region’s Integrated Incident Management System (IIMS), Cost: $0.5M,
- Expanded Mobile IIMS Field Utilization by increasing the number and type of field units, Cost: $1.4M,
- HAZMAT/Origin & Destination tracking pilot, Cost: $3M and,
- Optimized Signal Timing through a review of all traffic signals along critical corridors and connect appropriate signals to TMCs to allow remote monitoring, access, and control, Cost: $15M.

Regional Transportation Impact

Implementation of the TCMP will have an impact that reaches beyond NYC boundaries. Earlier sections of this report discussed changes to the transportation system largely within NYS based on best assumptions of how the TCMP will alter individual travel choices. This section looks at the impact on the regional transportation system.

Congestion pricing will have an affect on PANYNJ Hudson River Crossings, which currently employ pricing strategies to influence driver behavior. An example of this is the $1.00 off peak discount available to automobiles with E-Z Pass tag holders using the George Washington Bridge, Lincoln Tunnel, Holland Tunnel, Bayonne Bridge, Goethals Bridge, or Outerbridge Crossing Bridge eastbound into NYC. The TCMP will credit automobile drivers the amount of any tolls paid toward their daily $8.00 fee, making the off-peak discount irrelevant. These types of issues should be researched and understood.
NYC’s TCMP will have a considerable impact on the tri-state region’s transportation infrastructure and operations. In particular, enhancements to the region’s transit services to the Manhattan CBD.

Another consideration is the treatment of private commuter, intercity and charter bus services entering the CPZ. Because public transit services contribute to reducing vehicular traffic, there are reasons to treat them all the same and exempt them from the congestion pricing fee.

The following map (Figure 4) shows anticipated changes in vehicular and transit travel patterns as modeled by the NYBPM.

**Figure 4**

![Map showing impact of congestion pricing on vehicle and transit journeys to NYC CBD](attachment:image)
Impacts on Public Transportation Service Provided by Systems other than the MTA

Operational Issues

Reducing vehicle travel into the CBD is partially dependent upon the availability of safe, convenient, and affordable public transportation alternatives from the outer-borough and suburban commuter markets. The capacity of the diverse, multi-agency public transportation network to attract and absorb additional travel demand is also a critical factor in the success or failure of the TCMP.

Developing and supporting the capacity of the regional public transportation network to address demand will require additional capital and operating investments, supportive policies, and strong interagency coordination and cooperation. The predominant share of trip diversions from automobiles to public transportation will be accommodated by the MTA subsidiaries, particularly via commuter rail, subway, and planned Bus Rapid Transit (BRT) investments. Notwithstanding, given existing station parking constraints on Long Island and the Hudson Valley, an increase in diversions to commuter and express bus services are anticipated.

Beyond those needs identified by the MTA, the following regional public transportation impacts of congestion pricing were identified for consideration to fully equip the region’s public transportation network to attain the goals of the Urban Partnership:

- **Parking Capacity** - Parking capacity is a significant constraint on the potential growth of ridership for commuter rail and bus. MTA’s Long Island Rail Road (LIRR) and Metro-North Railroad (MNR) station parking facilities are at or over capacity. Limited land availability and development pressures significantly constrain the opportunities for extensive surface lot expansion. Structured parking is being developed in some cases but is limited by cost and community factors. Opportunities to expand Park and Ride facilities for commuter bus operations sponsored by suburban municipalities are similarly limited.

- **Feeder Bus Access to Key Rail Stations** - Feeder bus access to key rail stations, often provided by public transportation systems other than the MTA on Long Island and in the Lower Hudson Valley, have developed and grown over the past decade in response to station parking constraints. With the implementation of congestion pricing, increased demand, coupled with constrained parking, may place greater demands on local carriers to introduce and increase frequencies on rail feeder services.

- **Ferryboat Service to Commuter Rail** - The Haverstraw-to-Ossining and Newburgh-to-Beacon ferry services are operating currently with the objective of relieving station parking constraints. Congestion pricing may induce public interest in increased service and new service elsewhere along the MNR Hudson Line. There are seasonal variation, cost and emissions issues with ferry operations that should be closely evaluated when considering an appropriate role for ferryboats in addressing commuter rail parking capacity constraints.
• **Parking Capacity and Transit Oriented Development (TOD)** - Parking constraints limit the ability of additional riders to access commuter rail or bus services to the Manhattan CBD. State policies and investments that create incentives for integrated TOD in the vicinity of key suburban and outer borough transit hubs may be an effective way of increasing the non-auto accessibility of these facilities and services. Shared parking strategies and improved land use and pedestrian connectivity to these facilities may be effective strategies for building support for increasing access capacity.

**Commuter and Intercity Bus Capacity serving the CBD**

In the high growth West of Hudson areas of the lower Hudson Valley, commuter bus ridership exceeds MNR ridership to Manhattan. Express bus has also grown on Staten Island, fed by Park and Ride locations along the SIE. Potential ridership increases for these commuter bus services, resulting from the TCMP, may be constrained by the following capacity and policy issues:

• **Bus Capacity** – The estimate of additional bus capacity requirements assume that trip diversions on Long Island and in New York City can be accommodated through commuter rail and subway services and the addition of 58 commuter/express buses provided pursuant to the UPA. Generally, municipally sponsored commuter carriers such as Hudson Transit, Rockland Coaches, and Adirondack Trailways and intercity bus carriers such as Greyhound are running at or close to vehicle capacity during peak commuter periods. The Department would anticipate working with the MTA to support provision of adequate express bus service from those suburban areas not well served by the MTA Commuter Railroads.

  o **Suburban Park and Ride** - NYSDOT, working with local communities and public transportation carriers, has funded the development of a network of Park and Ride facilities for public transportation and rideshare. These sites now exist in the Hudson Valley as well as Long Island and Staten Island. Those facilities that are served by commuter bus, particularly West of Hudson in the Lower Hudson Valley and on Staten Island are at or approaching capacity. NYSDOT is actively pursuing additional parking capacity in these areas in response to trend growth in usage. The TCMP impacts on ridership demand will likely require an expansion of these investments. As noted above, additional capacity for commuter bus Park and Ride facilities is limited based on premium rental/purchase rates for real estate and community concerns.

  o **PANYNJ Midtown Terminal Capacity** - Within the CPZ a constraint on additional commuter bus service from suburban areas, including New Jersey, is the limited capacity of the PANYNJ Midtown Bus Terminal to handle additional buses in the peak periods. The primary structural constraint is ramp capacity entering and exiting the facility. The number of gates/bays and the terminal floor space are generally sufficient to handle additional buses. However the terminal ramps do not permit capacity for significant additional vehicle capacity. There is capacity that can be utilized at the George Washington Bridge Bus Terminal but this may have limited impact given the need to change modes well outside of the CPZ.
On-Street Stop Restrictions - MTA bus stops are owned and managed by NYCDOT and are available only to MTA vehicles. Buses operated by systems other than the MTA may be ticketed/fined for unauthorized use if they pick up or drop off passengers at these stops. In response to the TCMP, a more permissive policy with regard to use of specific on-street stops at key locations within Manhattan might be considered to mitigate the need for major capital investments in expanding ramp capacity at the Midtown Bus Terminal.

Bus Staging in Manhattan - Another constraint on the region’s capacity to increase commuter services into CPZ is the shortage of space at existing bus staging areas. With real-estate in Manhattan at a premium, surface parking for bus staging in between scheduled runs in the AM and PM peak is very difficult to secure. This introduces increased expense and logistical difficulty associated with longer distance deadheading of vehicles. The lack of adequate bus staging also impacts the ability of commuter bus operators to clean, fuel and maintain fleets.

Lower Manhattan Bus Terminal - There is an absence of adequate commuter bus passenger terminal facilities in lower Manhattan. (There are no indoor terminals akin to the PANYNJ Bus Terminals. There are common staging areas.) The options for addressing this may be limited given the premium on real estate in the area.

* Availability BRT Program Components/Transit Priority Infrastructure to Systems other than the MTA - The street infrastructure envisioned to support Bus Rapid Transit service, as an element of the TCMP, will be needed by all commuter bus operators serving the CPZ. The effectiveness of regional commuter bus in serving the objectives of the TCMP would be greatly enhanced if non-MTA buses were provided access to bus lane and other priority strategies such as signal priority, queue jumps and access to some key BRT stations.

* Cordon Fees for Public transportation Vehicles, Rideshare and Vanpool: A policy exempting all buses, including commuter and charter, from incurring the CPZ cordon charge could further the objective of reducing single occupant auto travel to the Manhattan CBD. Similarly, policies and options for exempting or differentially pricing vanpools and carpools may enhance the effectiveness of an integrated element of the TCMP.

* Regional Fare Policies and Media: The objectives of congestion pricing would be enhanced and supported by implementation of a universal Regional fare media. The kind of long distance trips that are destined for the CPZ are often multi-agency and intermodal in character, involving payments at parking facilities, feeder buses, commuter bus and rail, ferry, subway and BRT. A single fare media can simplify these transactions dramatically for the customer. In addition fare policies supported by a more robust fare media can support strategies to create incentives consistent with congestion pricing objectives such as time of day differential pricing.
**Estimated Public Transportation Actions to Implement the TCMP**

The estimated costs related to non-MTA bus services as a result of ridership increases associated with congestion pricing are as follows.

- The UPA provides for the procurement of an additional 58 commuter/express buses for suburban service. Assuming that a portion of these vehicles are made available by the MTA to expand systems other than the MTA, no additional suburban coaches would be required to support trip diversions;
- Purchase/lease additional suburban commuter/express bus Park and Ride facilities - $20M;
- Passenger shelters/amenities - $10M
- ITS/integrated fare media/traveler information/other transit related technology - $25M

**Data Collection and Sharing Needs**

**Data Collection Plan for Congestion Pricing Monitoring**

The proposed Data Collection Plan will provide the necessary field information to all agencies to evaluate the impacts of congestion pricing by collecting field information before and after congestion pricing is implemented. It is envisioned to be a systematic, well coordinated initiative among regional transportation system operating agencies. The Data Collection Plan will focus only on the collection of ‘gap’ information (data not readily available from current ongoing data collection efforts) so as to minimize costs to all agencies and expedite the collection and analysis process. It is envisioned that any data collected will not only be directly applicable to the evaluation of congestion pricing but will also be useful for overall programming and planning by local agencies.

**Data Collection Approach**

The following approach would accomplish the objectives stated above:

- **Identify CPZ impact areas:** The development of baseline information should be facilitated by using a variety of sources such as Census 2000 Journey-to-work, the NYBPM Model, and the National Household Travel Survey (NHTS). Emphasis will be on the development of baseline traffic and transit flows. Data collection will be most intensive near the CPZ boundary (south of 86th street) and proportionately less comprehensive as the ‘ring of impact’ moves further from the City’s core.
- **Identify CPZ impact corridors and facilities:** The data collection plan should identify arterial corridors, tunnels, bridges, and public transportation facilities that may be impacted by CP. Input from various agencies as well as output from the NYBPM will be used to identify those facilities that may be most impacted and to provide ‘first cut’ guidance as to where data needs are most critical.
Identify effectiveness measures and methodology to evaluate before/after impacts:

Figure 5 – Measures of Transportation Impacts and Monitoring

<table>
<thead>
<tr>
<th>Measure</th>
<th>Methodology</th>
<th>Possible Source(s)</th>
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<tbody>
<tr>
<td>Traffic Volumes</td>
<td>• Cordon counts prior to and after implementation</td>
<td>• NYSDOT</td>
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<tr>
<td></td>
<td>• Use congestion pricing system technology to measure after implementation</td>
<td>• NYCDOT</td>
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<td></td>
<td>• Use congestion pricing system technology to measure after implementation</td>
<td>• PANYNJ</td>
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<td></td>
<td>• Use congestion pricing system technology to measure after implementation</td>
<td>• ITS Operators</td>
</tr>
<tr>
<td>Auto Occupancy</td>
<td>• Cordon counts prior to and after implementation</td>
<td>• NYSDOT</td>
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<tr>
<td></td>
<td>• Spot checks at major entry points</td>
<td>• PANYNJ</td>
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<td></td>
<td>• Spot checks at major entry points</td>
<td>• NYCDOT</td>
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<tr>
<td>Speeds/Delays</td>
<td>• “Floating” car runs</td>
<td>• NYSDOT</td>
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<td></td>
<td>• Use of TRANSMIT system</td>
<td>• NYMTC</td>
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<td>• Automated tracking technologies</td>
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<td></td>
<td>• Automated tracking technologies</td>
<td>• TRANSCOM</td>
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<tr>
<td>Parking Utilization</td>
<td>• Manual parking utilization surveys</td>
<td>• NYCDCP</td>
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<tr>
<td></td>
<td>• Possible use of mobile autoscope or other automated remote monitoring technology</td>
<td>• NYCDOT</td>
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<tr>
<td>Transit Usage</td>
<td>• Passenger counts on NJ TRANSIT, PATH, and Staten Island Ferry, and private bus and ferry routes</td>
<td>• MTA, NJ Transit</td>
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<tr>
<td></td>
<td>• Passenger counts on NJ TRANSIT, PATH, and Staten Island Ferry, and private bus and ferry routes</td>
<td>• PATH</td>
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<td></td>
<td>• Passenger counts on NJ TRANSIT, PATH, and Staten Island Ferry, and private bus and ferry routes</td>
<td>• PANYNJ, Ferry Operators</td>
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<td></td>
<td>• Passenger counts on NJ TRANSIT, PATH, and Staten Island Ferry, and private bus and ferry routes</td>
<td>• NYMTC</td>
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<td></td>
<td>• Passenger counts on NJ TRANSIT, PATH, and Staten Island Ferry, and private bus and ferry routes</td>
<td>• NYCDOT</td>
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<tr>
<td>Bicycle/Pedestrian Usage</td>
<td>• Bicycle/pedestrian counts</td>
<td>• NYCDOT</td>
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<tr>
<td></td>
<td>• Possible modification of and/or addition to NYMTC annual cordon count, which now uses 60th Street as northern boundary</td>
<td>• NYCDOT</td>
</tr>
<tr>
<td>Truck movements to and through the CPZ</td>
<td>• Congestion Pricing (CP) Data</td>
<td>• NYCDOT</td>
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<td></td>
<td>• Shipper surveys</td>
<td>• NYCDOT</td>
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Environmental impacts within and adjacent to the CPZ

- Air quality changes based on VMT and vehicular volumes
- Noise reduction

Socioeconomic Impacts

- Changes in sales tax receipts
- Changes in employment
- Business opening/closing data
- Additional surveys of commuters and visitors

NYBPM Model
Air Quality Monitors – NYSDEC
Air quality monitors - NYCDOH
NYCDOT CP data
NYCDCP
NYC Dept. of Finance

- **Identify locations, type, and frequency of data needs:** The plan should identify specific locations, data types, format, and frequency to support the measures listed in the Figure 5.

- **Inventory existing data collecting efforts and sources:** Transportation operating agencies such as NYSDOT, NYCDOT, the New York State Department of Environmental Conservation (NYSDEC), MTA, PANYNJ, TRANSCOM, ITS Operators, Ferry Operators, New Jersey Department of Transportation, New Jersey Transit, PATH, and others collect a range of data to monitor their system performance. These existing datasets can be used to estimate impact and to monitor congestion pricing.

- **Identify gaps in data:** Based on identified needs and available data, gaps in essential data need to be identified and the data collected in a timely fashion. Also, existing sources that can expand their data collection program to incorporate some of the remaining data sets should be identified and contacted.

- **Develop data standards, formats, and metadata to ensure the effectiveness and efficiency of information sharing:** Data collection and reduction activities are complex operations especially when they are spread across various agencies. A quality control and assurance element can eliminate errors which could lead to false conclusions.

- **Develop cost estimate and implementation plan:** Cost estimates for the collection of the remaining data sets should be developed. The implementation plan should address technical and institutional issues associated with the sharing of existing and new data sets. Issues such as access, data management, ownership, liability, standards, etc. can affect the implementation plan.

- **Develop an information gateway:** Develop an information gateway to serve as the data repository for all of the data assembled or collected for congestion pricing monitoring and impact analysis. If paired with a user-friendly, GIS and browser-based interface, the information gateway will provide effective and efficient information sharing and data analysis for congestion pricing monitoring and impact analysis.

**Summary multi-agency (NYSDOT, NYCDOT, NYMTC) estimated data collection and sharing needs to implement congestion pricing**

- One-time capital start-up costs - $12.5M;
- Annual operating expenses - $0.5M.
Capital Needs and Revenue Utilization

**Capital Needs**

NYSDOT has identified a number of technology, information, and operational initiatives that support the TCMP and help ensure that the regional transportation system operates efficiently, which were not funded by USDOT. Implementation of the TCMP will result in both changes in mode and travel patterns of travelers. To support these changing travel patterns and mitigate the impacts of congestion pricing, NYSDOT has identified multimodal capital and operating investments to effectively maintain and operate the regional transportation system and complement the TCMP.

The Department anticipates the following capital projects not included in the current NYSDOT capital program:

**Data Collection**: Data Collection and sharing will help both to respond to changes in the usage of the transportation system and to evaluate the effectiveness of the TCMP. NYC has indicated that it plans to undertake a data collection effort. However, there will be likely regional data collection needs beyond the NYC effort. It is envisioned that any data collected will be shared among regional transportation system operating agencies. That data will not only be directly applicable to the evaluation of the TCMP, but will also be useful for overall programming and planning by local agencies. That additional effort includes but is not limited to: refinement of NYBPM to enable it to better model congestion pricing and corridors; inclusion of collection points outside both the CPZ and NYC; and, better evaluation of transit impacts. The anticipated full cost to collect, share, and evaluate the data is approximately $12.5M.

**Cost** - $12.5M
**Recurring Annual Costs** - $0.5M

**Intelligent Transportation System investments**: Intelligent Transportation System investments would include development of several means of sharing real-time system conditions with travelers, gathering, and analyzing of additional information about system usage, deployment of additional infrastructure, and integration of Transportation Management Centers. A $36.4M capital need for technology and traffic monitoring projects was submitted in the Urban Partnership Agreement application but was not funded. Total costs for ITS projects are $98.6M, of which $17.3M are recurring annual costs.

**One Time Costs** - $81.3M
**Recurring Annual Costs** - $17.3M

**Non-MTA Transit Service**: Developing and supporting the capacity of the regional public transportation network to address demand will require additional capital investments as follows: $20M would provide for additional Park and Ride facilities; $10M for additional passenger shelters and amenities; and, $25M for improved traveler information, integrated fare and media and transit technology.

**One Time Costs** - $55M
Revenue Utilization

Revenue from implementation of the City’s TCMP is estimated by NYC to generate gross revenue of $624M annually and net $390M after funding the costs to operate the system.

The UPA MOU with USDOT provided $354M to assist in implementation of the TCMP. Much of this federal aid was for additional/improved bus transit services. Little was provided by USDOT for the startup infrastructure and operations needed to implement congestion pricing.

The cost to install and operate the infrastructure and technology necessary to implement the TCMP was estimated in at $233M by NYC and needs to be funded either through NYC funds or through revenue generated from congestion pricing. This startup cost may require greater use of congestion pricing resources in the early years, but should diminish over time to the annual cost to operate and maintain the congestion pricing system.

Additional transit services to accommodate vehicular commuters diverted to transit will also require a substantial up front capital cost to purchase vehicles and other infrastructure as well as operate new services. Over time, the need for resources for transit service should diminish to annual operating and maintenance costs, but may fluctuate if diversion to transit increases and additional transit services are needed. MTA will be providing its own estimate of need for revenue to fund MTA transit capital and operating expenses beyond the resources provided by USDOT. Additional non-MTA transit projects are identified in this report.

On the regional highway network, the implementation of the TCMP will require additional capital and operating investments for technology, intelligent transportation systems, and data collection and monitoring. There were no federal funds provided in the Urban Partnership agreement with USDOT to cover these projects. No resources have been identified to cover the capital and operating costs of these investments that help mitigate the impacts of congestion pricing and support the efficient operation of the regional transportation network.

The Congestion Pricing legislation includes the submission of new NYSDOT and MTA capital programs by March 31, 2008. Although the implementation of Congestion Pricing may have an impact on NYSDOT and MTA operations, the excess revenues generated from any Congestion Pricing program above those needed for implementation should be devoted to a balanced program of infrastructure investments in all modes.

Capital Initiatives/Opportunities Created by the TCMP

During the past several years, NYSDOT has been developing and implementing various capital improvements with the goal of developing a comprehensive mobility system for the limited access highways in NYC. These mobility system improvements address congestion, delays, air quality, safety, and emergency routing. These initiatives also support the TCMP by providing mitigation for highway users as well as providing opportunities for highway users to carpool or choose other modes.

The following mobility improvements have already been implemented:

- Staten Island Expressway E/B & W/B concurrent flow bus lanes (Verrazano Bridge toll
Plaza - Slosson Ave),
- Gowanus Expressway inbound a.m. peak period contra-flow/concurrent-flow bus/HOV lane (Verrazano Bridge to Battery Tunnel),
- Prospect Expressway contra-flow bus/HOV lane,
- Queens Midtown viaduct contra-flow bus/HOV lane (Maurice Avenue to the Queens Midtown Tunnel),
- Park and Ride lot at the Korean War Veterans (KWV)/Arthur Kill Road interchange in Staten Island, and
- Park and Ride lot at the West shore Expressway/KWV Parkway interchange, Staten Island

Additional improvements are currently in the study and/or design stages:
- West Shore Expressway/Arthur Kill Road Park and Ride and NYPD Highway Patrol Headquarters (expected implementation ~2012)
- KWV Parkway/Huguenot Ave. Park and Ride lot Upgrading, Amenities, and expansion (expected completion~ 2010)
- Expansion of KWV Parkway/Arthur Kill Rd. Park and Ride lot
- Extension of the Staten Island Expressway Bus Lanes to Richmond/Victory Blvd.
- Support for the City’s Bus Rapid Transit Program. The Department is in discussion with the City regarding possible enhancements to the LIE bus-HOV Lane

The proposed TCMP program presents an opportunity to enhance NYSDOT’s partnership with NYCDOT, MTA, and other agencies to provide additional capital improvements on the State Arterial System that will facilitate the goals of the TCMP. Potential additional capital improvements to the State Highway mobility system include:

Park and Ride lots:
- Construction of new Park and Ride lots in outer boroughs (individual sites would be evaluated),
- improvement/expansion at existing Park and Ride lots, and
- leasing of existing commercial parking lots to allow use for commuter parking – shopping center lots, church parking lots (the “Showplace” at West Shore Expressway/Victory Blvd. is an example of a candidate site for leasing).

Managed Use Lanes

NYSDOT has begun a new study to explore managed use lane (MUL) development opportunities on the entire State Arterial System (SAS) in NYC. This study is expected to take approximately 2 years and provide a ‘blueprint’ for operational enhancements into the next decade. The study is investigating the following MUL strategies:

- HOT Lanes,
- staggered hours of operation for freight and commuters,
- dynamically managed lanes - lanes adjusted in real time in response to changing conditions,
- queue bypass,
- improved intermodal connections, and
- possible development of separate modal corridors.

**Intelligent Transportation Systems:**

NYSDOT will be completing the full instrumentation of the arterial system over the next 5 years. Completion of this system and its connection to the new Traffic Management Center (TMC) in Long Island City (due to come on line in 2008) will provide comprehensive highway condition information in real time and enhance the ability of the City and State (jointly managing the TMC) to respond to system operation problems.

**Freight Movement Issues**

The New York metropolitan area is one of the most truck dependent areas in the nation. The proposed congestion pricing fee in the TCMP will likely have an impact on truck movements. Truck trips that cannot change routings or time of day to access the CPZ may pass the congestion pricing fee on to consumers. Other trucks may change travel patterns to avoid the CPZ, which may impact other highway facilities. Collection of additional information on truck movements resulting from TCMP would assist the region’s transportation agencies in responding to new traffic patterns.

**Transportation Improvement Program (TIP)/Conformity Issues**

The congestion pricing plan impacts and is impacted by the Federal metropolitan planning requirements and related air quality conformity regulations. Projects related to the pricing program that are classified as “non-exempt” must appear in the fiscally-constrained element of the Regional Transportation Plan and a fiscally-constrained Transportation Improvement Program (TIP) in order for the projects to be eligible for Federal funding and be included in a regional emissions analysis for an air quality conformity determination. These projects resulting from the TCMP would need to be amended into both the TIP and the Regional Plan.

In order for Federal funding to be obligated in 2009 for any of the elements of the TCMP, the characteristics of the proposal and the specific projects resulting from it must also be included in a regional emissions analysis which leads to an air quality conformity determination. This determination is a requirement in order to be placed on the TIP.

The TCMP projects would need to be submitted for regional emissions analysis on either November 1, 2007 or May 1, 2008. Submission by November 1, 2007 would result in adopted TIP and Plan amendments by May 1, 2008. If submission can not be made by November 1, 2007, the next opportunity for submission would be on May 1, 2008, which would result in adopted TIP and Plan amendments by November 1, 2008. Thus, either submission date would result in the ability for Federal money to be obligated in 2009, assuming that air quality conformity can in fact be demonstrated as part of the amendment process.
Monitoring/Future Considerations

The New York State Legislature, in enacting the legislation to create the Commission, and requiring the mayor of the city of New York to develop a traffic congestion mitigation plan, found that action must be taken to address the problems caused by traffic congestion as soon as possible. NYSDOT supports the goal of reducing congestion and urges the Commission to take appropriate action to evaluate the TCMP proposed by NYC. The alternative to taking action is maintaining the status quo, an option which NYSDOT agrees is not appropriate. PlaNYC cites the costs of congestion for the region at more than $13 billion dollars every year. The cost of congestion and the limited options for addressing it are reasons to put a congestion mitigation plan in place, evaluate, and adjust it appropriately based on actual results.

The TCMP is being implemented as a pilot program. To ensure the flexibility to adjust the components of the TCMP, NYSDOT suggests the establishment of mechanisms to allow for changes to the plan if traffic diversions are significantly different than anticipated. This may be particularly important during the first months of implementation, but minor adjustments should be allowed throughout the pilot period.

The Urban Partnership Application submitted to USDOT by New York City, NYSDOT, and the MTA, and subsequently provided to the Commission by NYC, states that Congestion Pricing will be rolled out as a three-year pilot program with an interim evaluation after 18 months. NYSDOT recommends that whatever implementation plan is ultimately adopted by the Commission, the 18 month evaluation be retained. While the NYBPM can provide a reasonable basis on which to model overall congestion pricing impacts, it may not provide the detailed information on localized impacts. No model can substitute for actual experience. An 18 month interim evaluation will allow better data to be collected and analyzed.

Equally important to monitoring changes to the congestion pricing structure, is having funding available to pay for changes. If all anticipated congestion pricing revenues are allocated at the beginning of the pilot program, it could be very difficult to make necessary adjustments and corrections to the congestion pricing system. While the initial implementation of congestion pricing results in a more capital intensive use of resources, over time the balance will shift to increased operating needs. To allow for maximum flexibility, a portion of anticipated revenues could be held in reserve to meet future needs. This would allow for changes that could benefit the entire transportation system, the transportation system users, and the region as a whole.