APPENDIX K
YORK TOLL PLAZA REPLACEMENT
TECHNICAL REPORT
IN RESPONSE TO MAINE LD534

MAINE TURNPIKE AUTHORITY

York Toll Plaza Replacement
Technical Report
In Response to Maine LD534

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SECTION 1 - EXECUTIVE SUMMARY

In 2007, the Maine Legislature passed LD 534, A Resolve, Directing the Maine Turnpike Authority to Study the Relocation of the York Toll Booth. The Maine Turnpike Authority (MTA) has prepared this technical report in response to LD 534. The report presents the existing conditions and deficiencies of the York Toll Plaza, the industry standards for design and construction of toll plazas, the public comments on its rehabilitation and relocation, and a final recommendation for addressing the plaza's deficiencies.

Situated seven miles from the New Hampshire border, the 17 lane York Toll Plaza is considered by many interstate travelers to be the "gateway" to Maine. The toll plaza began as a temporary 11 lane structure constructed on the Maine Turnpike in York, Maine in 1969 as part of the realignment of Interstate 95 and the construction of the Piscataqua River Bridge. Numerous maintenance and rehabilitation projects have been constructed to improve the capacity of the plaza, to cope with its aging components, and to provide safety for both the traveling public and toll staff. However, the York Toll Plaza's life expectancy has passed and it is no longer able to provide adequate safety or meet future traffic demands.

There are a number of operational issues related to the plaza's location that affect both capacity and the safety of patrons and staff. 1) The plaza is located 500'-700' from the Exit 7 Interchange causing unsafe merging and weaving of traffic within the plaza limits. This also leads to an inefficient use of toll lanes. 2) The plaza is on a horizontal curve. Southbound traffic tends to drift to the outside of the curve, reducing utilization of all tollbooths, i.e. left side lanes become over-utilized and right side lanes underutilized. The curve also blocks sight to all southbound lanes/booths until approximately 1500' away. This leads to inefficient decisions and unsafe last second lane changes. 3) The plaza is at the low point of a hill. This creates a safety concern due to the potential of heavy vehicles losing their brakes and striking the plaza or stopped traffic. In addition the hill leads to heavy engine braking noise southbound and heavy acceleration noise northbound as commercial vehicles approach and depart the plaza. 4) Last, the plaza is approximately 2200' from the Chases Pond Road bridge. This limits sight distance for northbound traffic to the merging on-ramp traffic, backed-up traffic and toll booths. A driver's line of sight is also blocked by roadway signage All four of these characteristics, nearby interchange, roadway curve, bottom of a hill and nearby bridge, contribute to increased crash potential and decreased operational performance.

In addition to these location related deficiencies, there are numerous infrastructure deficiencies that also must be addressed. 1) The original tollbooth structure was designed in the 1960s and is deficient by today's standards including insufficient space for collector activities and tolling equipment as well as very narrow lanes. 2) Current standards for toll booths incorporate a double concrete bumper to provide safety for the toll collector and driver by redirecting any mis-steered vehicle back into a lane to versus striking a toll booth. York's single bumper design does not adequately protect staff or turnpike patrons and more importantly the existing bumpers have almost completely disappeared due to sinking into the poor soil. 3) The toll collectors' access tunnel beneath the booths is in poor condition and in need of rehabilitation. The tunnel is too narrow due to addition of tolling electronics and modern utilities. The concrete tunnel experiences significant water infiltration due to its age and the many utility penetrations. 4) The structural supports for the existing canopy are at capacity and cannot feasibly handle additional signing including the more modern signs which are larger and heavier than existing. 5) The original plaza was built in an area with poor subsurface soil conditions, mainly consisting of

compressible clay. Due to these soil conditions, the plaza tunnel, booths and canopy were constructed on H-piles to prevent settlement of the entire structure. However, the roadway approaches to the plaza were not pile-supported. As a result, the approaches (and bumpers) have and continue to settle as the clay soil consolidates. The noticeable slope approaching and leaving the plaza is a result of the roadway settling away from the pile-supported plaza. The age of the plaza, the outmoded conditions of the existing tollbooths, canopy, tunnel, and the poor soil conditions all contribute to the overall poor condition and performance of the plaza. These deficiencies contribute to classifying the existing infrastructure as functionally obsolete.

In addition to location and infrastructure deficiencies, the York Toll Plaza will not be able to service future traffic demands. Today, the plaza processes over 16 million vehicles per year up from five million vehicles in 1970. With total traffic expected to grow approximately 2.0% per year over the next 20 years, capacity improvements are needed to efficiently and safely process this ever increasing traffic. The MTA has researched various tolling technologies with the goal to identify a more efficient means of tolling. Based on the percentages of cash and E-ZPass customers, the projected traffic increases, and the amount of infrequent users from out-of-state, the tolling technology that best serves the MTA is Highway Speed Tolling. This allows E-ZPass users to pay their toll electronically while driving thru the plaza at normal highway speeds of 55-65 mph. Cash customers will exit from mainline to pay their toll at traditional cash booths, then accelerate and merge back into the mainline with E-ZPass customers. Following the research, MTA made a decision to implement Highway Speed Tolling at the Southern Toll Plaza as well as at other mainline plazas.

From the evaluation, and in conjunction with the plaza's accident history, the York Toll Plaza is operationally inefficient, structurally deficient, is located such that these conditions compromise overall staff and patron safety. The York Toll Plaza is in need of major rehabilitation or replacement to improve operations and meet current design guidelines. To determine the most effective course of action that addresses immediate and future needs, a comprehensive evaluation of the following five options was completed.

Option 1: No Build (Leave Plaza in Existing Condition and Tolling Arrangement)

Option 1 does not satisfy any of York Toll Plaza's safety or operational needs, present or future. This option leaves the Plaza requiring extensive ongoing maintenance. **This Option is dismissed from further consideration.**

Option 2: Infrastructure Upgrade with No Additional Capacity

Option 2 addresses only the structural deficiencies of the existing infrastructure. This option does not provide the needed additional capacity, does not address the location deficiencies, does not meet current industry design standards and will not address many safety or operational issues for Turnpike patrons and staff. The cost to provide this option would be lost without benefit as it would not remedy any of the truly needed improvements. **This Option is dismissed from further consideration.**

Option 3: Upgrade Existing Site with Conventional Tolling and Increased Capacity

Option 3 increases capacity and upgrades the infrastructure but does not address the safety and operational concerns associated with the current plaza location. The cost of this option would be more than two-thirds the cost of the relocated option but would provide only marginal benefit. In addition, there is no opportunity for implementing modern Highway Speed Lanes with this option. **This Option is dismissed from further consideration.**

Option 4: Upgrade Existing Site with Highway Speed Tolling and Increased Capacity

Option 4 marginally improves traffic capacity and ETC processing time but fails to address the safety concerns associated with the current plaza location. Full efficiency of Highway Speed Tolling will not be realized due to the location on a curve and near a hill. A costly interchange reconfiguration and reconstruction will be necessary resulting in confusing and complicated traffic patterns. The cost of this option is similar to that of the full build option but provides far less benefit. To effect additional safety benefits in traffic movements would require an interchange reconstruction that is far greater than considered here, likely more than doubling the cost of this option. **This Option is dismissed from further consideration.**

Option 5: Relocate Plaza to Alternate Location with Highway Speed Tolling

Option 5 will result in a toll plaza that 1) operates safely for both Turnpike patrons and staff, 2) provides adequate capacity for current and future traffic demands, 3) meets today's industry standards for plaza location and infrastructure needs, and 4) implements modern technology to efficiently process Turnpike traffic with Highway Speed Tolling lanes. This Option is the most cost effective way to meet York Toll Plaza's safety and operational needs and will allow the York Toll Plaza to be a prominent "gateway" to the State of Maine. **This Option is the only reasonable option and is the choice the MTA will pursue.**

<u>Recommendation:</u>

The results of the alternatives analysis support the MTA selecting and pursuing Option 5; constructing a new toll plaza, with Highway Speed Tolling, in a new location. Constructing a toll plaza in a new location will result in 1) safer operations for both Turnpike patrons and staff, 2) adequate capacity for current and future traffic demands, 3) a plaza that meets industry design standards for layout and operations, and 4) the ability to implement modern and more efficient Highway Speed Lanes. **None of the other four options are able to provide all of these features.**

Option 5 is the most cost effective way to meet York Toll Plaza's needs and it will allow the York Toll Plaza to be a prominent "gateway" to the State of Maine. Constructing a new plaza, with Highway Speed Tolling, at a new location is the most prudent direction for addressing existing safety and operational issues and future needs of a Southern Toll Plaza and gives the Maine Turnpike Authority a sound investment in a facility that will provide the public with a safe, efficient, and modern toll plaza today and into the future.

The Maine Turnpike Authority will continue with the York Toll Plaza Replacement project by pursuing the identification of a new location for the plaza that meets national engineering standards and that will accommodate Highway Speed Tolling.

SECTION 2 - INTRODUCTION

In 2007, the Maine Legislature passed LD 534, A Resolve, Directing the Maine Turnpike Authority to Study the Relocation of the York Toll Booth. Section 1 of this Resolve states that "the Maine Turnpike Authority may not relocate the York Toll Booth until the Authority has had the opportunity to study the need for and the expense of replacing a functional toll booth. The Authority shall gather information on various approaches to address the issue of relocating the toll booth. In gathering the information, the Authority shall hold informational sessions for discussions with interested parties." Section 2 states that "the Maine Turnpike Authority shall submit a report to the Joint Standing Committee on Transportation no later than December 15, 2007. This report must include recommendations on whether to relocate the York Toll Booth."

The purpose of this technical report is to respond to the requirements of LD 534. This report will document the feasibility of the following Options with regard to the present and/or a new toll plaza in Southern Maine:

Option 1: No Build (Leave Plaza in Existing Condition and Tolling Arrangement)
Option 2: Infrastructure Upgrade with No Additional Capacity
Option 3: Upgrade Existing Site with Conventional Tolling and Increased Capacity
Option 4: Upgrade Existing Site with Highway Speed Tolling and Increased Capacity
Option 5: Relocate Plaza to Alternate Location with Highway Speed Tolling

Situated seven miles from the New Hampshire border, the 17 lane York Toll Plaza is considered by many interstate travelers to be the "gateway" to Maine. The plaza processes over 15 million vehicles per year which equates to $34 million in revenue (39% of total Maine Turnpike revenue). Truck traffic accounts for nearly 15% of the plaza's use. Today, approximately 50% of total vehicles, and 80% of truck traffic, utilize E-ZPass, the Maine Turnpike's form of Electronic Toll Collection (ETC). It is anticipated that total ETC usage will grow to between 75% - 80% by year 2020. The plaza processes a nearly equal blend of traffic from in-state and out-of-state travelers. Many of the in-state travelers are southern Maine commuters. Recreational traffic increases dramatically during the summer months (June through September), with traffic peaking northbound on Friday evenings and southbound on Sunday afternoons. Two-way traffic through the plaza peaks during the mid-day hours on Saturdays.

The existing toll plaza began as an 11 lane temporary structure constructed on the Maine Turnpike in York, Maine in 1969. During this time period, the US Department of Transportation was trying to phase out toll facilities. However, in more recent years, Federal Legislation tone has changed because of the ever present challenges in funding the nation's transportation system. In the early 1980's the Maine Legislature decided to continue the use of tolls to fund the operation and maintenance of the Turnpike as well as to fund widening, modernization, and the Interchange Program. Numerous maintenance and rehabilitation projects have been constructed to improve the capacity of the plaza and to maintain its aging components.

A few of the major modernizations are described here. In the late 1970's, a two lane plaza expansion was constructed to respond to increased traffic demand. In 1997, the plaza was modified to incorporate electronic toll collection to keep pace with changing toll technology. In 1999 two dedicated ETC lanes were added to form the current configuration of 17 lanes in response to increased traffic and increased use of ETC. In 2001, the canopy over the original lanes was extended to cover all but the exterior dedicated ETC lanes. In 2005, the plaza was

included in the system-wide conversion from TransPass to E-ZPass. As traffic demand continued to grow, vehicle type, size and speeds changed, and tolling technology evolved; it became clear that the majority of these modifications were temporary fixes to improve capacity and extend the plaza's useful life as long as possible.

Based on the evaluation in this report and in conjunction with the plaza's accident history and operational performance, it is clear that the York Toll Plaza is not completely aligned with current practices and design guidelines and is in need of major rehabilitation or replacement to improve operations and meet these guidelines. Current deficiencies impact safety of both Turnpike staff and patrons and increase the overall operation and maintenance costs. Capacity improvements are also needed to efficiently and safely process the ever increasing traffic volumes at a reasonable level of service. While the addition of tolling lanes and ETC have improved the plaza's capacity, additional toll lanes or highway speed toll lanes are needed to meet the future traffic volumes. Similarly, while recent infrastructure upgrades have improved the overall operation for both patrons and employees, these upgrades have only been considered short-term improvements and have met only a portion of the immediate needs. The MTA decided in 2001 that the future needs of the entire plaza should be addressed. A more comprehensive evaluation was necessary to determine immediate and future needs, including what type of modifications would be required to bring the plaza up to current design standards and best practices, and to determine why a new plaza should be built.

This report compares and contrasts various levels of rehabilitation and reconstruction that address some or all of these deficiencies. As part of improving the plaza operations, the report also documents benefits and shortcomings of various tolling strategies including conventional toll booths, electronic toll collection and highway speed tolling. To begin this discussion, the following is a summary of current design guidelines followed by conditions of the existing plaza.

SECTION 3 - TOLL PLAZA DESIGN GUIDELINES FOR MAINLINE LOCATIONS

It is worthy to note, that the existing York Toll Plaza was constructed many years prior to the development of any formal national design guidelines pertaining to toll plazas. Responding to similar situations of the many tolling agencies across the country, the Federal Highway Administration (FHWA) completed a lengthy research project in 2006 aimed at consolidating the most current best practices for the design and construction of toll plazas. A report titled "State of the Practice and Recommendations on Traffic Control Strategies at Toll Plazas, (2006)" was published. The purpose and focus of this report was to develop guidelines for designing and implementing traffic control strategies and devices at toll plazas that, for example, inform drivers which lanes to use for specific methods of payment, reduce speed variance, discourage lane changing and properly install equipment and devices.

In addition the FHWA report for current toll plaza design guidance, the Maine Turnpike utilized the following two references for guidance on how a toll plaza should interface with a Turnpike mainline and adjacent roadways: 1) "Geometric Design of Highways and Streets," (2004) American Association of State Highway and Transportation Officials (AASHTO); and, 2) "Freeway and Interchange Geometric Design Handbook," (2005) Institute of Transportation Engineers (ITE).

The following recommendations, regarding the location of a toll plaza, are based on the FHWA Guidelines unless otherwise noted:

- *Locate toll plaza on a horizontal straight section with no curves.* Placing a toll plaza on a curve 1.) reduces driver sight distance, 2.) causes additional distractions to drivers thereby increasing potential for accidents, 3.) reduces plaza operational efficiency as some booth lanes will be over utilized and some underutilized, and 4.) may create engineering challenges relating to roadway cross slopes and super elevation needs. Locating a toll plaza on a straight section of roadway should result in improved sight distance, driver awareness, and facility safety when compared to a location on a horizontal curve.

- *Locate the toll plaza on a roadway high point.* Placing a toll plaza at the crest of a hill will provide sight distance advantages and plaza operational benefits as the approach upgrade will aide in slowing vehicles down while the departure downgrade will aide in accelerating vehicles. FHWA Studies have been done to determine acceptable levels of grade approaching and departing a toll plaza. Grades 3.0% and steeper have an adverse affect on the performance of commercial vehicles and grades less than 0.5% create drainage problems and possible icy conditions in the winter. Therefore, grades approaching and departing the toll plaza should be within the range of 0.5% to 2.0%.

- *Provide adequate decision sight distance (DSD) in advance of the toll plaza.* This distance is comprised of two individual distances. DSD, as defined by AASHTO, is the distance needed for a driver 1.) to detect an unexpected or otherwise difficult to perceive information source or condition in the roadway environment that may be visually cluttered, 2.) recognize the condition or its potential threat, 3.) select an appropriate speed and path, and 4.) initiate and complete the maneuver safely and efficiently. For highway speed tolling (HST), one DSD requirement is to provide 1,500 ft sight distance before the split point between highway speed and conventional plaza lanes. This distance assumes vehicles are traveling at 70 mph and advance signing is provided in accordance with FHWA Guidelines. The second DSD

requirement for HST and the DSD requirement for conventional toll booths is to provide adequate sight distance from the split point to the toll plaza or approximately 2,000 feet. The driver should be able to see the toll plaza at the point of split between highway speed lanes and conventional plaza lanes.

- *Provide 3,500 ft separation between toll plaza and overhead structures.* This distance is based on previous DSD criteria defined. Ideally, the driver should have unobstructed views of the split point and plaza, thereby improving facility safety. This requirement will also reduce or eliminate potential impacts to existing overhead structures.

- *Provide one mile (5,280 ft) minimum separation between toll plaza and interchanges.* A toll plaza placed near an interchange may create traffic weaving issues, signing difficulty, a wide range of vehicle speeds and general driver confusion.

SECTION 4 - CONDITION OF EXISTING YORK TOLL PLAZA

The York Toll Plaza was constructed on the Maine Turnpike at the current location in 1969. As mentioned in Section 2 Introduction, a number of modifications, rehabilitations and alterations have been implemented since then to increase capacity, improve operations and keep pace with the ever changing traffic stream. However, the plaza is now functionally obsolete. The age of the plaza, the outmoded conditions of the existing tollbooths, canopy, tunnel, and poor soil conditions all contribute to the overall poor condition and performance of the plaza. The proximity to the Exit 7 Interchange and improper geometry compromise staff and motorist safety, and further render the existing facility inadequate. Details of these deficiencies are summarized below. The insufficient capacity York suffers is detailed in Section 6.

A. Horizontal Geometry

The FHWA Guidelines state that a toll plaza should be located on a straight section of roadway and not on a horizontal curve. The York Toll Plaza was built on a horizontal curve. As detailed under the Sight Distance heading, the combination of the existing horizontal and vertical curves reduces the available sight distance to the plaza. Limiting sight distance in this way affects the lane choice decision a driver must make and forces the driver to make that decision in a much shorter period of time. This becomes critical in high volume periods when lane distribution plays a larger role in overall plaza capacity. The horizontal curve also reduces the ability of this location to support Highway Speed Tolling. This will be discussed in more detail later in the report. The curved roadway also has an operational impact on the plaza, specifically in the southbound direction. Vehicles approaching southbound make a sweeping right turn approaching the plaza. This movement creates a tendency for southbound vehicles to travel through toll lanes on the outside of the curve (interior of the plaza) and reduces utilization of the tollbooths on the inside of the curve. Traffic that is not uniformly distributed in the plaza reduces operational efficiency, with some lanes over-utilized and some underutilized. While a certain amount of non-uniform usage is common at plazas, the existing roadway curve exacerbates the skewed distribution.

B. Vertical Geometry

The FHWA Guidelines recommend toll plazas be located on a crest vertical curve. Locating the plaza on a high point will increase sight distance and provide operational benefits, as the approach up-grade will aide in slowing vehicles and the departure down-grade will aide in accelerating vehicles.

The existing York Toll Plaza is located at the low point of a hill that begins just north of the plaza. This vertical geometry presents undesirable conditions for traffic departing northbound and approaching southbound. The northbound impact is primarily operational in nature, since the roadway north of the plaza includes a significant grade of 4.72% that impacts acceleration for departing vehicles, especially trucks. There is currently a truck climbing lane in this area to mitigate this condition. The southbound approach represents a concern from a safety perspective since it is on the downgrade of 4.72%. This creates a condition where vehicles (especially trucks) must brake sooner to compensate for the downgrade in addition to the significant speed reduction required in the plaza area. While the Maine Turnpike has a rule prohibiting excessive noises, this condition also contributes to some truck drivers using noisy engine brakes to assist

with the deceleration. An additional safety concern associated with this down grade is the potential for vehicles which have lost their brakes to strike the plaza.

C. Sight Distance

The FHWA Guidelines imply that toll plazas should be sited such that motorists will be able to see the plaza while driving at posted speeds with adequate stopping and decision sight distance. Bridges and vertical curves can negatively impact the sight distance. There are two crest vertical curves and a horizontal curve that limit decision sight distance to the plaza for Southbound traffic, and the Chase's Pond Road bridge limits these distances for Northbound traffic. As mentioned earlier, limiting sight distance affects the decisions drivers make as well as forces them to make those decisions in a much quicker time. During high volume periods, less informed decisions can lead to poor operation and an increased risk of crashes.

Figure 1 Northbound Sight Distance
Bridge and Horizontal Curve Negatively Impact Sight Distance

Figure 2 Southbound Sight Distance
Horizontal Curve and Down Gradient Are Not Desirable Due To Safety and Operational Concerns

D. Proximity to Overhead Structures

The proximity of the plaza to the Chase's Pond Road bridge limits the available sight distance as seen in Figure 1 Northbound Sight Distance. Desirably, there should be a 3,500 ft separation between the plaza and overhead structures. This distance is based on previously described components of Toll Plaza Decision Sight Distance in Section 3. Ideally, the driver should have unobstructed views of the split point and plaza thereby improving facility safety. The Chase's Pond Road Bridge, being 2,200 feet south of the existing plaza, and being on a horizontal curve, limit the available sight distance for northbound traffic.

E. Proximity to Interchange

The proximity of the Chase's Pond Road Interchange (Exit 7) located immediately south of the toll plaza presents undesirable safety and operational conditions for the plaza from both a traffic weaving and a sight distance perspective. The Federal Highway Administration's (FHWA) recently published "State of the Practice and Recommendations on Traffic Control Strategies at Toll Plazas," recommends a one (1) mile separation between toll plazas and interchanges. The interchange southbound off ramp is less than 1,000 feet from the plaza and the northbound on ramp is less than 500 feet from the plaza. The proximity of these interchange ramps to the plaza creates traffic weaving issues, signing difficulty and driver confusion. The MaineDOT has classified the York Toll Plaza in the northbound direction as a High Crash Location (2003-2005 crash data). This designation is likely a result of the significant weaving that occurs due to the location of the on ramp.

Figure 3 Exit 7 Interchange Ramps South of York Toll Plaza

F. Toll Booths and Concrete Bumpers

The original tollbooth structures were designed in the 1960s and are considered deficient by today's standards from a space, layout, protection and systems perspective. The original design did not anticipate the need for additional equipment required by modern technology such as computers and ETC systems. The current booths have limited space for collector activities and

become extremely crowded during peak periods when all lanes are open, requiring one booth to have two attendants serving both directions. Current toll islands are designed for these smaller booths and will not accommodate the larger modern booths as installed at other locations on the Maine Turnpike. Existing heating systems are outdated, take-up more space than modern components and only provide a minimum amount of comfort. Modern booths are assembled with the latest heating and ventilating systems to provide better comfort.

Current standards for toll booths incorporate a double concrete bumper to provide safety for the toll collector and to redirect an errant vehicle into its lane. The bumper is nearly non-existent in Figure 4 compared to a newer bumper in Figure 5. This is due to poor soil conditions in the area which is allowing these bumpers to settle. Soil settlement is discussed in more detail in a following section.

Figure 4 York Toll Booth, Single Bumper and Settled Island

Figure 5 New Gloucester Toll Booth, Double Bumper and Raised Median

G. Tunnel

A narrow tunnel is located under the York Toll Plaza to serve as the main passageway for employees to safely access the toll booths and as a utility corridor to and from the individual booths. The tunnel is in poor condition and in need of rehabilitation. The tunnel is located in an area of high groundwater and experiences significant water infiltration. The tunnel ceiling has numerous cracks and utility penetrations which also allow for the infiltration of surface water into the tunnel. From a safety perspective, having water in the tunnel is undesirable due to the electrical and communication utilities present, as well as for the Turnpike employees during access to and from the booths. Note the leak stains behind and around the electrical cabinets and data conduits in addition to the significant corrosion to some of these utilities. The majority of these utilities were added to accommodate electronic tolling. These additions have reduced the passage width as well as increased the leaks and safety concerns. Numerous repairs have been completed in the tunnel to mitigate the water infiltration but it remains an ongoing maintenance concern. The extensive costs associated with a comprehensive tunnel repair rival the costs for a new tunnel.

Figure 6 York Tunnel

(Note Leak Stains and Narrow Passageway)

Figure 7 New Gloucester Tunnel

H. Canopy

A canopy is located over the toll lanes as seen in Figure 8. The structural supports for the existing canopy are at capacity due to the signage that has been placed on the structure over time. The placement of electronic variable messages signs on the canopy allows staff to change messages such as “Any Vehicle”, “E-ZPass”, and “Lane Closed”. However, the installation of these larger and heavier signs is not feasible due the condition of the existing canopy.

Figure 8 Canopy and Signs at York Plaza

I. Soil Conditions

The original plaza was built in an area with poor subsurface soil conditions, mainly consisting of compressible clay. With this site condition recognized in the design, the plaza tunnel, booths and canopy were constructed on foundation piers to prevent settlement of the entire structure due to consolidation of the clay soils. However, the roadway approaches to the plaza were not pier-supported. As a result, the approaches have and continue to settle as the clay soil consolidates. In an effort to mitigate the ongoing settlement of the roadway approaches, the addition of pavement has been routinely necessary. Even with the pavement shimming work, the plaza has a noticeable slope approaching and leaving the plaza, with the roadways settling away from the pier-supported plaza. This can be seen in Figure 9. This approach settlement has created a range of adverse conditions, from low bed tractor trailer striking the concrete slab (See Figure 10 Damaged Concrete Slab at Plaza) to excessive settlement of the approach slabs and protective concrete bumpers that were previously discussed. Vehicles that strike the concrete slab with their trailer bottoms increase potential for vehicle accidents, and settlement of the approach slab and concrete bumpers reduces the ability of the bumpers to absorb vehicle collisions increasing risk to toll plaza staff and patrons. Both conditions result in safety concerns.

Figure 9 Settlement of Approach Slab

(Note Abrupt Rise at Plaza)

Figure 10 Damaged Concrete Slab at Plaza

J. Summary of Existing Conditions

To summarize, the existing plaza - including both infrastructure and location - is functionally obsolete. The facility is nearly 40 years old and not conducive to safe operation with today's traffic volumes and speeds. With respect to the FHWA's current Design Guidelines and Best Practices, the plaza's layout and location are non-conforming to many standards. Decision sight distance, proximity to an interchange and bridge and capacity, are all current deficiencies that impact the safety of Turnpike staff and patrons and increase overall operation and maintenance costs. In addition, the proximity to Exit 7, Chase's Pond Road, is exacerbating the plaza's High Accident Location status. The poor soil condition also contributes to the overall inadequate condition of the plaza, safety and operations, and seriously jeopardizes the feasibility of site reuse for a toll plaza. Reuse of the site is discussed in Section 7 Alternatives Analysis.

SECTION 5 - TOLL COLLECTION STRATEGIES

Two general types of toll collection systems are in general use today. One is the "ticket system" where motorists receive a ticket upon entering the system and then surrender the ticket and a cash toll upon exiting the system. The other is the "barrier system" where a set cash toll is charged based on a vehicle's number of axles. The Maine Turnpike currently operates a barrier toll system with electronic toll collection in all toll lanes.

With electronic toll transponders, patrons are not required to stop and pay cash. Electronic tolls can be collected in a traditional stop-and-go cash toll lane as well as through a dedicated ETC lane. ETC in both stop and pay lanes and dedicated ETC lanes requires patrons to slow to a maximum speed of 10 mph while passing through the plaza to ensure the safety of staff as well as their own. With the advent of Highway Speed Tolling (HST), ETC patrons are allowed to travel at higher speeds (55-65 mph). For safe operations, these HST facilities physically separate the ETC and cash paying patrons. ETC patrons remain on the mainline of the highway and cash paying patrons exit to the right to a conventional toll plaza. HST and conventional tolling facilities are further discussed in the Toll Plaza Layout segment of Section 6.

A few toll agencies are now operating toll roadways where no cash tolls are collected. In these instances, all of the tolls are collected electronically either by the use of electronic transponders or video tolling where license plate data is recorded. This type of operation is typically feasible on roadways with extremely high commuter traffic. A cashless toll plaza is not currently feasible for the Maine Turnpike at York due to the current level of ETC usage of 50% and the high number of infrequent drivers.

The Maine Turnpike Authority also studied the concept of collecting tolls at York in only one direction in 2005. One-way tolling essentially involves charging twice the one-way fare in one direction, while making the other direction toll-free. The concept of one-way tolling in this area came to the forefront in August 2003, when New Hampshire's Governor authorized the New Hampshire DOT to conduct a one-way tolling experiment at the Hampton Toll Plaza. One-way tolling trials were conducted in the late summer/fall of 2003 and again during the summer of 2004. However, New Hampshire has not identified permanent plans to convert Hampton Toll Plaza to one-way tolling.

The Maine Turnpike Authority voted to cease further consideration of a one-way toll at the York Plaza based on the following findings:

- *Loss in Revenue.* Implementation of one-way tolling is anticipated to result in a net revenue loss of approximately $2.0 million dollars per year.
- *Local Diversion/Traffic Impacts.* The average rate of diversion by implementing one-way tolling is anticipated to be 7.0% or roughly 1,600 vehicles for an average day in 2007 shifting to local roads. (Present diversion rate is 1% - 2%)
- *Toll Opportunity.* Doubling the toll at York in one direction may limit the ability to effectively increase toll rates in the future.

SECTION 6 - TOLL PLAZA CAPACITY, SIZING AND LAYOUT

A. Toll Plaza Capacity

A toll plaza should have adequate capacity to safely and effectively process the anticipated traffic without excessive queues and delays. However, unlike roadways and intersections which have national standards addressing capacity, no such standards exist for toll plazas. Each toll agency typically has its own goal as to adequate capacity. The Maine Turnpike Authority's goal is to have a toll plaza meet two objectives throughout its design horizon of 20 years. The first objective is to keep average delays during the peak hour to approximately one minute or less. The second objective is to keep average queues during the peak hour to 300' or less.

The operations of the existing plaza from 2007 to the design year of 2030 have been evaluated by comparing projected busiest traffic volumes with the capacity of the lane configuration. Northbound and southbound were analyzed separately.

1. Northbound Analysis

The Northbound plaza does not reach its capacity throughout the design horizon of the plaza. However, experience has shown that queuing can be significant when a plaza exceeds 90% of its capacity. Therefore, the NB plaza as currently configured has the potential to experience significant design-hour queuing in the next 20+ years.

In order to remain below capacity, it is critical to periodically alter the configuration of the plaza. Between 2007 and 2024, it is anticipated the E-ZPass volumes will double while cash-paying volumes decline by 25%. Therefore, over time, cash lanes need to be converted to E-ZPass lanes in order to adequately serve the rapidly growing volume of E-ZPass patrons. As can be seen in Table 1, the northbound plaza exceeds 90% capacity now and in the design year regardless of how the existing nine (9) lanes are configured.

Table 1 Forecasted Northbound Capacity of Existing Plaza

Year	Design-Hour Volume		Lane Configuration			% Capacity
	Cash	*E-ZPass*	Cash	Tandem	*E-Z*	
2007	1,979	2,187	5	2	2	92.6%
2008	1,947	2,302	5	2	2	92.6%
2009	1,915	2,419	5	2	2	92.5%
2010	1,883	2,538	5	2	2	92.6%
2011	1,851	2,658	5	2	2	92.5%
2012	1,819	2,780	5	2	2	92.6%
2013	1,787	2,904	5	2	2	92.6%
2014	1,756	3,029	5	2	2	92.7%
2015	1,725	3,156	5	2	2	92.8%
2016	1,693	3,285	5	2	2	92.9%
2017	1,663	3,415	5	2	2	93.0%
2018	1,632	3,547	5	2	2	93.2%
2019	1,603	3,680	5	2	2	93.4%
2020	1,575	3,814	5	2	2	93.7%
2021	1,547	3,950	5	2	2	93.9%
2022	1,519	4,087	5	2	2	94.2%
2023	1,493	4,226	5	2	2	94.5%
2024	1,468	4,365	4	2	3	95.0%
2025	1,444	4,506	4	2	3	95.4%
2026	1,418	4,651	4	2	3	95.8%
2027	1,390	4,800	4	2	3	96.2%
2028	1,362	4,952	3	2	4	96.6%
2029	1,337	5,103	3	2	4	97.1%
2030	1,314	5,255	3	2	4	97.5%

2. Southbound Analysis

Unlike the northbound plaza, the southbound plaza is over-capacity throughout the 23-year analysis period regardless of how the existing lanes are configured, as seen in Table 2. The SB plaza has the potential to experience significant design-hour queuing in each of the next 20+ years.

Table 2 Forecasted Southbound Capacity of Existing Plaza

Year	Design-Hour Volume		Lane Configuration			% Capacity
	Cash	*E-ZPass*	Cash	Tandem	*E-Z*	
2007	2,330	1,906	5	2	2	103.2%
2008	2,300	2,021	5	2	2	102.4%
2009	2,269	2,138	4	2	3	101.7%
2010	2,239	2,256	4	2	3	102.2%
2011	2,209	2,376	4	2	3	104.1%
2012	2,179	2,498	4	2	3	105.4%
2013	2,148	2,622	4	2	3	105.1%
2014	2,119	2,747	4	2	3	104.4%
2015	2,089	2,874	4	2	3	103.7%
2016	2,059	3,003	4	2	3	108.7%
2017	2,030	3,134	3	2	4	108.0%
2018	2,001	3,266	3	2	4	107.3%
2019	1,972	3,400	3	2	4	106.6%
2020	1,945	3,535	3	2	4	106.0%
2021	1,917	3,672	3	2	4	105.4%
2022	1,891	3,810	3	2	4	104.8%
2023	1,866	3,949	3	2	4	109.3%
2024	1,842	4,090	2	2	5	108.7%
2025	1,817	4,233	2	2	5	108.1%
2026	1,792	4,379	2	2	5	107.5%
2027	1,765	4,530	2	2	5	106.9%
2028	1,736	4,684	2	2	5	106.4%
2029	1,705	4,844	2	2	5	105.8%
2030	1,673	5,007	2	2	5	105.2%

3. Temporary Measures to Increase Capacity

Given the capacity constraints of the existing York Toll Plaza and the ever changing directional demand, the three middle lanes have been made reversible; i.e., the lanes can be operated for either northbound or southbound traffic depending on need (Note: these lanes are always on the left for approaching traffic; see the three lane signs to the left of the E-ZPass sign in Figure 8.) This introduces safety concerns and creates a situation that is contrary to the industry standard of locating dedicated ETC lanes on the far left side of available toll lanes; e.g., one or more (reversible) cash lane may be to the left of a dedicated

ETC lane. Slow speed ETC patrons now must travel between stopped traffic on both sides of them.

To meet some of this increasing demand, the Authority has implemented operation of tandem booths. This is a temporary measure until additional capacity can be added by constructing additional temporary booths in line with permanent booths for cash collection. The use of tandem booths requires a flagger to direct drivers into the lane and two toll collectors per lane. This is confusing for the Turnpike patron due to their unfamiliarity with the practice and only results in an additional capacity of 30%, or approximately 100 vehicles per hour. In addition, their use presents accountability concerns relative to toll collector audits. Therefore, due to safety concerns of the flagger operating in the toll lanes, patron confusion, and accountability concerns, the extensive use of tandem booths to address long-term capacity needs is not desirable.

Constructing additional booths for cash paying patrons would require significant widening of the approach and departure zones, relocation of the utility building and significant wetland impacts. In addition, the required widening would have a major impact to the existing interchange located to the south. However, even with the additional lanes, these improvements would solely provide increased capacity to the plaza and would not address any of the operational and safety deficiencies associated with the existing plaza. These deficiencies are further discussed in the following sections.

The York Toll Plaza requires additional capacity. In its current configuration, the northbound side of the plaza will operate at near-capacity levels during peak periods for the next 23 years, with significant queues and delay, while the southbound side is already inadequate for the design-hour demand and experiences lengthy queues and delay. Moreover, in order for the existing plaza to cope with future traffic conditions, the MTA will need to (a) continually modify the lane configuration by adding more ETC dedicated lanes; (b) continue to operate tandem tollbooths (two booths in parallel in a toll lane) during peak periods; and, (c) add additional booths for cash toll collection. Both (a) and (b) are undesirable from a safety and operational perspective and (c) is undesirable due to the costs; all three fail to improve the safety and operational issues associated with sight distance, alignment, plaza settlement and interchange weaving.

B. Toll Plaza Sizing

The process of developing an appropriately-sized toll plaza for the Maine Turnpike is described below:

Step 1 – Develop Design-Hour Volumes (DHV's). The Maine Turnpike Authority is using the absolute highest hour due to the importance of this gateway toll plaza.

Step 2 – Develop traffic projections. In order to evaluate toll plaza operations throughout the design horizon of the toll plaza, it is necessary to estimate the extent to which design-hour traffic will grow over time. At the York Toll Plaza, historical data suggests that design-hour traffic will grow approximately 2.0% per year over the next 20 years.

Step 3 – Identify payment types. In order to properly analyze a toll plaza, it is critical to understand the peak-hour split between cash-paying patrons and E-ZPass patrons. Generally

speaking, the efficiency of a given toll plaza increases as the percentage of E-ZPass patrons increases. In 2007, approximately 50% of the peak-hour patrons at the York Toll Plaza had an E-ZPass. It is also necessary to project how the share of E-ZPass patrons will change over time. Experience has shown that the share of E-ZPass patrons grows by at least 1% - 2% per year. At the York Toll Plaza, peak-hour usage of electronic toll collection has grown from about 10% in 1997 to roughly 50% in 2007.

The end result of Steps 2 and 3 is an estimate of the number of peak-hour patrons (both cash and E-ZPass) passing through the toll plaza during each year of the toll plaza's design horizon.

Step 4 – Perform initial plaza sizing and configuration. Based on the volumes and payment types developed in Steps 3 and 4, it is possible to develop an initial estimate of the appropriate toll plaza size. At the York Toll Plaza, the following operating standards were used to determine plaza size:

- Patrons with an E-ZPass proceed through a conventional toll lane at a rate of 1,100 vehicles per hour (vph).
- Patrons with an E-ZPass proceed through a highway-speed toll lane at a rate of 1,800 vph.
- Patrons paying cash pass through a conventional toll lane at a rate of 289 vph.
- The end result of this step is to identify the total number of lanes (both cash and dedicated E-ZPass) required to handle the peak-hour volumes

Step 5 – Test via simulation. After estimating the appropriate size of the toll plaza, the performance of the proposed size is simulated in VISSIM computer model. The simulation serves two important purposes:

- Provides a visual illustration of the performance of the plaza, providing qualitative feedback concerning the performance of the plaza; and,
- Provides information on queues and delays at the plaza, providing quantitative feedback as well.

Table 3 summarizes the required lane configuration for plaza sizing for each of the five (5) options that are considered in Section 7 Alternatives Analysis. A complete traffic forecast and model was developed for each option including optimizing the way each lane operates. Traffic forecasting and model creation were completed according to the above-described procedure. The exceptions are the No Build and Infrastructure Upgrade scenarios (Options 1 and 2) which both continue to operate with the same number of lanes as they do today. Each option was evaluated and optimized for existing, intermediate and design year conditions, including volumes, ETC usage and heavy vehicle parameters. The operational results of modeling are contained in Table 4 Traffic Queue and Delay Summary below. Expected queues and vehicle delays for the existing plaza configuration as well as for the various options being considered are listed for comparison.

Table 3 Toll Plaza Sizing

		Option 1	Option 2	Option 3	Option 4	Option 5
		Existing Site				Alternate Site
		Existing Layout		New Layout		
		No Build	Infrastructure Upgrade Only	Upgrade with Conventional Tolling	Upgrade with Highway Speed Tolling	Relocate Plaza with Highway Speed Tolling
Northbound						
Total Available Northbound Lanes		10	10	12	11	9
Cash	**One Direction**	7	7	7	7	7
Cash	**Reversible Lanes**	3[1]	3[1]	3[1]	0	0
ETC	**Highway Speed Lanes**	0	0	0	2 (3 future)	2 (3 future)
Ramp	**Dedicated Ramp Booths**	0	0	2	2	0
Southbound						
Total Available Southbound Lanes		10	10	13	12	10
Cash	**One Direction**	7	7	8	8	8
Cash	**Reversible Lanes**	3[1]	3[1]	3[1]	0	0
ETC	**Highway Speed Lanes**	0	0	0	2 (3 future)	2 (3 future)
Ramp	**Dedicated Ramp Booths**	0	0	2	2	0
Total Lanes		17[2]	17[2]	22[3]	23[3]	19[3]
Total Width		295 ft	295 ft	454 ft	549 ft	435 ft

[1] Reversible lanes are capable of being operated as either northbound or southbound.
[2] Existing number of lanes - does not meet plaza size needs for present or future.
[3] Number of lanes required to meet plaza sizing projections.

Table 4 Traffic Queue and Delay Summary

		Option 1 & 2: Existing Site No Build / Infrastructure Upgrade		Option 3: Existing Site Upgrade with Conventional Tolling		Option 4: Existing Site Upgrade with Highway Speed Tolling		Option 5: Alternate Location with Highway Speed Tolling	
	Year	2010	2020	2010	2020	2010	2020	2010	2020
NB Peak Hour (Friday PM)	NB Queue (ft)								
	average	257	211	46	42	124	95	130	96
	max	347	314	276	243	177	140	188	134
	NB Delays (sec)								
	cash	61.0	54.6	35.7	34.6	31.1	22.7	33.8	24.9
	E-Zpass	14.4	21.0	13.4	20.5	5.2	6.6	5.2	4.1
SB Peak Hour (Sun PM)	SB Queue (ft.)								
	average	1347	720	111	93	196	130	198	132
	max	1674	1657	155	299	273	175	267	171
	SB Delays (sec)								
	cash	292.0	200.2	73.1	72.4	62.4	38.0	62.2	39.1
	E-Zpass	153.7	77.1	25.7	21.4	5.6	7.2	4.5	4.6
NB & SB Peak Hour (Sat AM)	NB Queue (ft)								
	average	209	1133	91	169	143	118	142	113
	max	343	1670	376	550	206	166	192	170
	NB Delays (sec)								
	cash	57.0	129.8	50.9	100.2	40.1	28.6	40.2	29.0
	E-Zpass	20.7	63.4	18.4	39.5	4.3	4.6	4.0	3.6
	SB Queue (ft.)								
	average	400	1067	118	163	148	115	176	140
	max	782	1673	354	564	198	158	252	190
	SB Delays (sec)								
	cash	81.7	140.9	61.2	131.6	44.9	36.9	51.8	37.1
	E-Zpass	53.9	80.5	20.2	25.1	3.2	4.7	3.4	3.3

C. Toll Plaza Layout

To begin the task of understanding the requirements, impacts and cost of these various plaza options, the following discussion outlines the physical layout or footprint of the plazas. References used to develop the design of a toll plaza are:

- "State of the Practice and Recommendations on Traffic Control Strategies at Toll Plazas," (2006) Federal Highway Administration (FHWA).
- "Geometric Design Highways and Streets," (2004) American Association of State Highway and Transportation Officials (AASHTO).
- "Freeway and Interchange Geometric Design Handbook," (2005) Institute of Transportation Engineers (ITE).

Two general plaza layouts are feasible for collecting cash and electronic tolls at a barrier toll plaza. One is a conventional toll plaza with toll booths and slow speed dedicated ETC lanes and the other is a conventional toll plaza with toll booths and highway speed tolling lanes. The conventional plaza layout requires all mainline traffic approaching the toll plaza, to slow down to pay the toll either with cash or with E-ZPass at a booth, and then accelerate to regain mainline speed. A highway speed plaza requires the Turnpike patron to choose between highway speed tolling (HST) or exiting the mainline for conventional cash toll collection. The traveling patron choosing HST may continue thru the mainline section of the plaza at the typical highway speed paying the toll using E-ZPass. The Turnpike patron utilizing cash tolls would exit-off the mainline section, come to a stop, pay a toll the traditional way, then accelerate to re-enter the mainline section. The following General Plaza Layout depicts the components of each of these layouts.

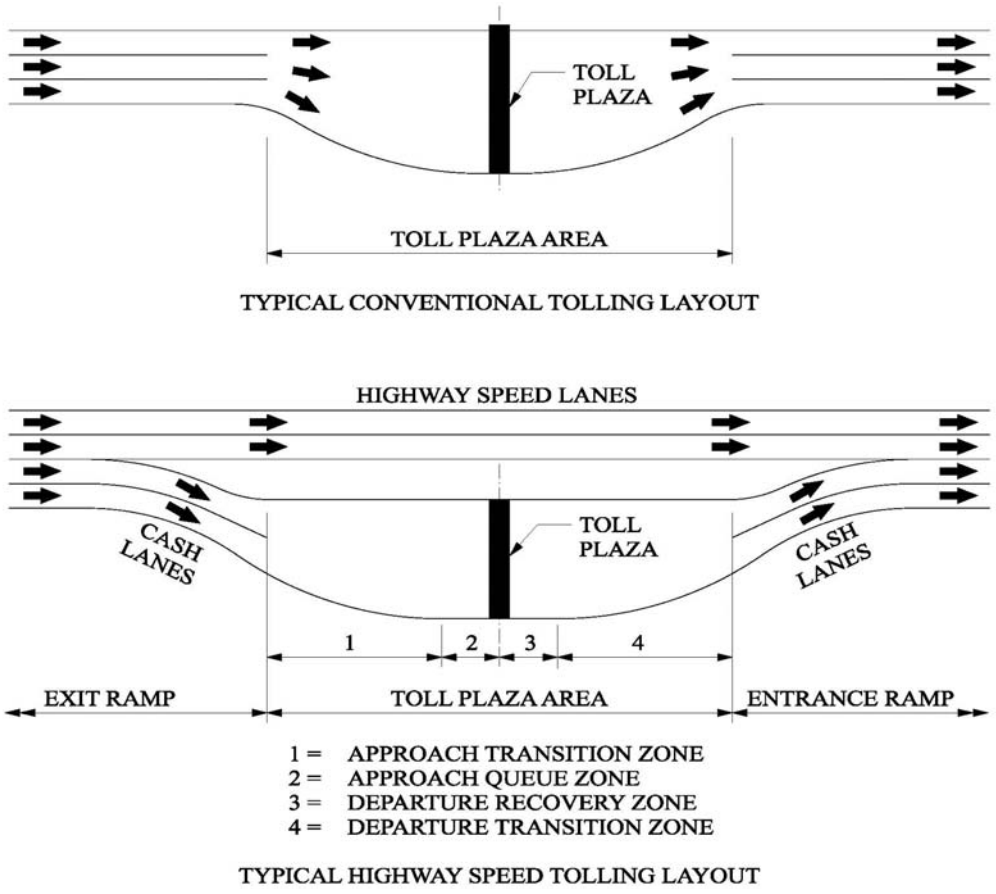

Figure 11 General Plaza Layout – Conventional and Highway Speed

In both of these layouts, the toll plaza area is designed following the guidelines from FHWA's "State of the Practice and Recommendations on Traffic Control Strategies at Toll Plazas." The toll plaza area consists of four zones: Approach Transition Zone, Approach Queue Zone, Departure Recovery Zone, and Departure Transition Zone. The exit/entrance ramps of the highway speed plaza layout are designed according to AASHTO standards. Table 5 Toll Plaza Layout Summary lists the component lengths for each of the identified options and associated tolling layout.

Table 5 Toll Plaza Layout Summary

Components	Length (feet)							
	Option 1 & 2 Existing Site No Build / Infrastructure Upgrade		Option 3 Existing Site Conventional Plaza Layout		Option 4 Existing Site Highway Speed Plaza Layout		Option 5 Alternate Site Highway Speed Plaza Layout	
	NB: 8 Cash Lanes	SB 9 Cash Lanes	NB: 8 Cash Lanes	SB: 10 Cash Lanes	NB: 7 Cash Lanes	SB: 8 Cash Lanes	NB: 7 Cash Lanes	SB: 8 Cash Lanes
Exit Ramp	NA	NA	NA	NA	2500	2500	2500	2500
Approach Transition Zone	200	200	1425	1625	1200	1400	1200	1400
Approach Queue Zone	700	700	300	300	300	300	300	300
Departure Recovery Zone	200	200	200	200	200	200	200	200
Departure Transition Zone	700	700	1425	1625	1200	1400	1200	1400
Entrance Ramp	NA	NA	NA	NA	2500	2500	2500	2500
TOTAL	1800	1800	3350	3750	7900	8300	7900	8300

SECTION 7 - ALTERNATIVES ANALYSIS

The five options for a York Toll Plaza replacement have been developed based on infrastructure need, tolling strategies, and traffic demand. Mindful of developing a complete range of alternatives, the following options vary from a do-nothing or No-Build alternative to a newly constructed plaza with the latest in tolling technology. Considerations for each option included:

- safety;
- capacity;
- operation and physical conditions of the plaza;
- adherence to the previously established FHWA guidelines;
- cost; and,
- natural resource impacts.

Below is a discussion of each option's construction elements, design and operations deficiencies, and benefits and summary. Following this discussion are figures of the layouts and two tables that highlight the option costs and compare the various elements.

Option 1: No-Build
Option 2: Infrastructure Upgrade with No Additional Capacity
Option 3: Upgrade Existing Site with Conventional Tolling and Increased Capacity
Option 4: Upgrade Existing Site with Highway Speed Tolling and Increased Capacity
Option 5: Relocate Plaza to Alternate Location with Highway Speed Tolling

Option 1: No-Build

For comparison purposes a No-Build option is introduced and discussed. This option would not invest in any upgrade or replacement of the facility. As it exists, this plaza is not in conformance with the current FHWA Design Guidelines and Best Practices. According to recent accident records, this plaza is considered a High Crash Location. Noteworthy deficiencies include the plaza not located at a high point or on a horizontal straight section of mainline. The Chase's Pond Road Interchange (Exit 7) is within 1,000 ft exacerbating accident potential especially for the Northbound on ramp merge area. The Southbound off ramp is also very close to the Plaza and requires unsafe weaving maneuvers to access the ramp. Sight distance criteria is not met for either direction of travel. Due to subsurface conditions, the bumpers that protect staff in the toll booths are sinking and creating additional safety concern.

The physical infrastructure, booths, tunnel, and canopy are all in urgent need of major renovation. This alternative will not address any of these issues, most notably are the sinking roadway and deteriorating undersized tunnel.

From an operational perspective, there are currently significant vehicle queue (backup) problems during the busiest periods. During these peak periods, the dedicated ETC lanes have limited access due to inadequate visibility and the lengthy queues that extend back into the mainline three-lane section. Once able to maneuver into one of the two dedicated ETC lanes for each direction, patrons are limited to a 10 mph speed limit which slows processing time. Another concern with the ETC lanes is that this moving traffic is typically sandwiched between stop-and-go traffic of the cash lanes. This occurs due to the need of operating the three middle lanes as reversible depending on the greatest demand. See Table 4 Traffic Queue and Delay Summary

for details on the traffic analysis for this option. Since no upgrades would occur in this option, there is no associated construction cost involved. Future maintenance to improve the condition of the existing infrastructure, such as the leaking tunnel and the sinking approach slabs, will be required. The maintenance costs would be significantly higher than the maintenance costs for new or upgraded plazas. Also, since no improvements would be made to this facility, there would be no associated wetland impacts.

This option does not address the current physical and safety deficiencies which will grow worse with time. The York Toll Plaza will continue to have capacity and operational issues that too will worsen with time. A no-build option for the York Toll Plaza does not meet any of the Maine Turnpike Authority's goals nor is it aesthetically appropriate for the "gateway" to Maine.

Option 2: Infrastructure Upgrade with No Additional Capacity

This option would upgrade the infrastructure within the immediate area of the toll plaza. The current lane configuration would remain with no increased capacity. The infrastructure to be replaced would include: toll booths and bumpers, canopy, tunnel, approach slabs and toll equipment. The upgrade would not include: altering vertical and horizontal alignment, addressing the entire plaza's geotechnical issues, or improving access to Exit 7 On/Off ramps. The layout of this option can be seen in Figure 12.

From an operational perspective, one of the major constraints of this option is the need to maintain toll collection capability and capacity during construction. It is estimated that an additional one to two years of construction would be necessary to consider plaza replacement in-place. Rehabilitation in-place is deemed infeasible when considering need for continuous toll operation and the current lack of capacity. This option assumes that the upgraded toll plaza would be located approximately 200 feet north of the existing facility. Moving the plaza 200 feet north allows for construction phasing and minimizes interruptions to toll plaza operations. Replacement of the tunnel and approach slabs would be done with consideration of poor soil conditions and projected settlement. However, the settlement of adjacent roadway would not be addressed here due to the poor soil limits extending up to 1,000 feet in each direction. (This would essentially be Option 3 without any additional capacity.)

Additionally, the existing significant queuing problems during the busiest periods would remain as they are today. During these peak periods, the dedicated ETC lanes have limited access due to the lengthy queues that extend back into the mainline three-lane section. Once able to maneuver into one of the two dedicated ETC lanes for each direction, patrons are limited to a 10 mph speed limit which slows processing time. Another concern with the ETC lanes is that this moving traffic is typically sandwiched between stop-and-go traffic of the cash lanes. This occurs due to the need of operating the three middle lanes as reversible depending on the greatest demand. See Table 4 Traffic Queue and Delay Summary for details on the traffic analysis for this option.

With respect to FHWA's Design Guidelines and Best Practices, this plaza would continue to be non-conforming to several standards. The plaza is not at a high point or located on a horizontal straight section. The Chase's Pond Road Interchange (Exit 7) is within 1,000 feet exacerbating a high crash location at the NB on ramp merge area. Sight distance design criteria is not met for either travel direction. The estimated construction cost to replace existing infrastructure is approximately $10.4 million; see Table 6 Cost Comparison Table for details of this cost.

Since the improvements are being made within the existing footprint, no wetland impacts are expected. With this option, the majority of current infrastructure deficiencies will be addressed but many safety deficiencies will still exist and will grow worse with time. The York Toll Plaza will also continue to have capacity and operational issues that too will worsen with time. An "infrastructure upgrade" option for the York Toll Plaza does not meet all of the Maine Turnpike Authority's goals for safety, operation and maintenance, and will not address the outwardly visible aspects, operation and capacity, of essentially the "gateway" to Maine.

Option 3: Upgrade Existing Site with Conventional Tolling and Increased Capacity

This option would upgrade the infrastructure, as noted in Option 2, along with additional conventional tolling capacity to meet peak traffic volumes. Several layouts were investigated during the design process altering the horizontal alignment to avoid the existing utility building and separating ramp traffic from mainline traffic. The chosen layout, seen in Figure 13, consists of 22 tolling lanes: eight (8) Northbound and ten (10) Southbound mainline toll lanes with two (2) dedicated ramp toll lanes for Exit 7 in each direction and either two or three dedicated ETC lanes per direction on mainline. This design minimizes the weaving conflicts of ramp and mainline traffic. This layout assumes that the upgraded toll plaza would be located approximately 200 feet north of the existing facility. Moving the plaza 200 feet north allows for construction phasing and uninterrupted toll plaza operations. Rehabilitation in-place is infeasible when considering the need for continuous toll operation and the current lack of capacity. Replacement of the tunnel and approach slabs would be done with consideration of projected settlement. Lightweight fill will be considered to minimize differential settlement. For purposes of this report, conventional fill is utilized and included in the estimate. Advance signing for the Exit 7 Interchange and dedicated ramp lanes must be incorporated with the toll plaza signing. It will likely be complicated and potentially confusing to the public.

With this layout, vehicle processing time improves with the expanded plaza, but ETC users are still limited to slow vehicle speeds. This plaza would accommodate the heaviest traffic volumes with minimal queuing. See Table 4 Traffic Queue and Delay Summary for details on the traffic analysis for this option.

With respect to FHWA's Design Guidelines and Best Practices, this plaza would continue to be non-conforming to several standards. Although vertical adjustments are proposed, the toll plaza is not located on a high point. The plaza is also not located on a horizontal straight section. The Chase's Pond Road Interchange is within 1,000 ft of the toll plaza however, dedicated ramp booths minimize conflicts by physically separating mainline traffic from ramp traffic. Sight distance design criteria is not met for either travel direction.

The estimated construction cost to upgrade the existing infrastructure and additional conventional tolling is approximately $27.3 million; see Table 6 Cost Comparison Table for details of this cost.

The existing site is surrounded by wetlands. Potentially, 16 acres of wetland will be impacted. Mitigation costs for these impacts are approximately $6.6 million assuming a 4:1 replacement ratio.

Although traffic capacity will be improved, the $27 plus million construction cost to update this facility - while not addressing the safety and geometric deficiencies - is not prudent.

Option 4: Upgrade Existing Site with Highway Speed Tolling and Increased Capacity

This option would upgrade the existing facility with highway speed tolling. Layouts investigated during the design process included altering the horizontal alignment to avoid the existing Administration Building, reconfiguring the Exit 7 Interchange, and separating ramp traffic from mainline traffic. The final layout developed accepted impacts to the Administration Building in exchange for an improved horizontal alignment and minimized environmental impacts. The layout consists of seven NB and eight SB cash toll lanes, two highway speed toll lanes and two dedicated ramp toll lanes for each direction. This can be seen in Figure 14.

This design minimizes the weaving conflicts of ramp and mainline traffic. This layout assumes that the upgraded toll plaza would be located approximately 200 ft north of the existing facility. Moving the plaza 200 ft north allows for a more accommodating construction phasing and uninterrupted toll plaza operations. Rehabilitation in-place is infeasible when considering the need for continuous toll operation and the current lack of capacity. Replacement of the tunnel and approach slabs would be done with consideration of projected settlement. Lightweight fill will be considered to minimize differential settlement. For purposes of this report, conventional fill is utilized and included in the estimate. The advance signing for the Exit 7 Interchange and dedicated ramp lanes, in concert with signing for highway speed tolling that must be incorporated with the toll plaza signing, will likely be complicated and potentially confusing the public.

With this layout, vehicle processing time improves with the expanded plaza as ETC usage increases. This plaza would accommodate the heaviest traffic volumes with minimal queuing for both cash and ETC patrons. Toll plaza personnel will be interacting with the stopping traffic and not the free flowing ETC traffic which will result in improved safety at the toll plaza area. See Table 4 Traffic Queue and Delay Summary for details on the traffic analysis for this option.

This Option would continue to be non-conforming to several standards. Although vertical adjustments are proposed, the toll plaza is not located on a high point. The plaza is not located on a horizontal straight section. The Chase's Pond Road Interchange is within 1,000 ft of the toll plaza however, dedicated ramp booths physically separate mainline traffic from ramp traffic. Sight distance design criteria is not met.

The estimated construction cost to upgrade the existing facility with highway speed tolling is approximately $37.3 million; see Table 6 Cost Comparison Table for details of this cost.

The existing site is surrounded by wetlands. Potentially, 26 acres of wetland will be impacted. Mitigation costs for these impacts are approximately $10.6 million assuming a 4:1 replacement ratio.

Although traffic capacity and ETC processing time will be improved, the $37.3 million construction cost and $10.6 million wetland mitigation cost to update this facility, while not addressing the safety and geometric deficiencies, is not prudent.

Option 5: Relocate Plaza to Alternate Location with Highway Speed Tolling

This option would locate the plaza to a new location with a combination of highway speed tolling and conventional cash tolls. This layout was developed with seven NB and eight SB cash toll lanes and two highway speed toll lanes in each direction. This can be seen in Figure 15. Locating a toll plaza the appropriate distance away from an interchange would eliminate the undesirable vehicle weaving maneuvers that are present for all options at the existing site. Construction phasing will be less complicated than the other options since nearly all of the work can occur without hindering the mainline traffic or toll collection at the existing plaza. Coordination of the new facility opening and demolition of the existing facility will also be less complicated.

With this layout, processing time improves with the expanded plaza as ETC usage increases. This plaza would accommodate the heaviest traffic volumes with minimal queuing for both cash and ETC patrons. The potential vehicle and pedestrian conflicts still exist within the cash toll booth area however, it is minimized by not having any slow speed dedicated ETC lanes. See Table 4 Traffic Queue and Delay Summary for details on the traffic analysis for this option.

This option would adhere to the previously mentioned industry standards. The plaza would be located on a high point and on a horizontal straight section. Sight distance design criteria would be met. The construction cost to build a new tolling facility with highway speed tolling in a new location is approximately $38.4 million; see Table 6 Cost Comparison Table for details of this cost.

Depending on the chosen alternate site, 1-11 acres of wetland will potentially be impacted. Mitigation costs for these impacts would range from approximately $0.5 to $4.2 million assuming a 4:1 replacement ratio.

This Option will result in a toll plaza that 1) operates safely for both Turnpike patrons and staff, 2) provides adequate capacity for current and future traffic demands, 3) meets today's industry standards for plaza location and infrastructure needs, and 4) implements modern technology to efficiently process Turnpike traffic with Highway Speed Tolling lanes. The construction and wetland mitigation costs are in upwards of $38 million, which are very similar to other options that fail to provide these improvements. This Option is the most cost effective way to meet York Toll Plaza's safety and operational needs and will allow the York Toll Plaza to be a prominent "gateway" to the State of Maine.

Date:2/22/2008

Filename: ...\Fig2-ExistingSiteUpgrade.DGN

Scale: 300 0 300 600
1" = 300'

No.	Revision	By	Date

Designed by:

HNTB

	By	Date		By	Date
Designed	LEM	09/07	Checked	DM	09/07
Drawn	RWH	09/07	In Charge of	RAL	09/07

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MAINE TURNPIKE

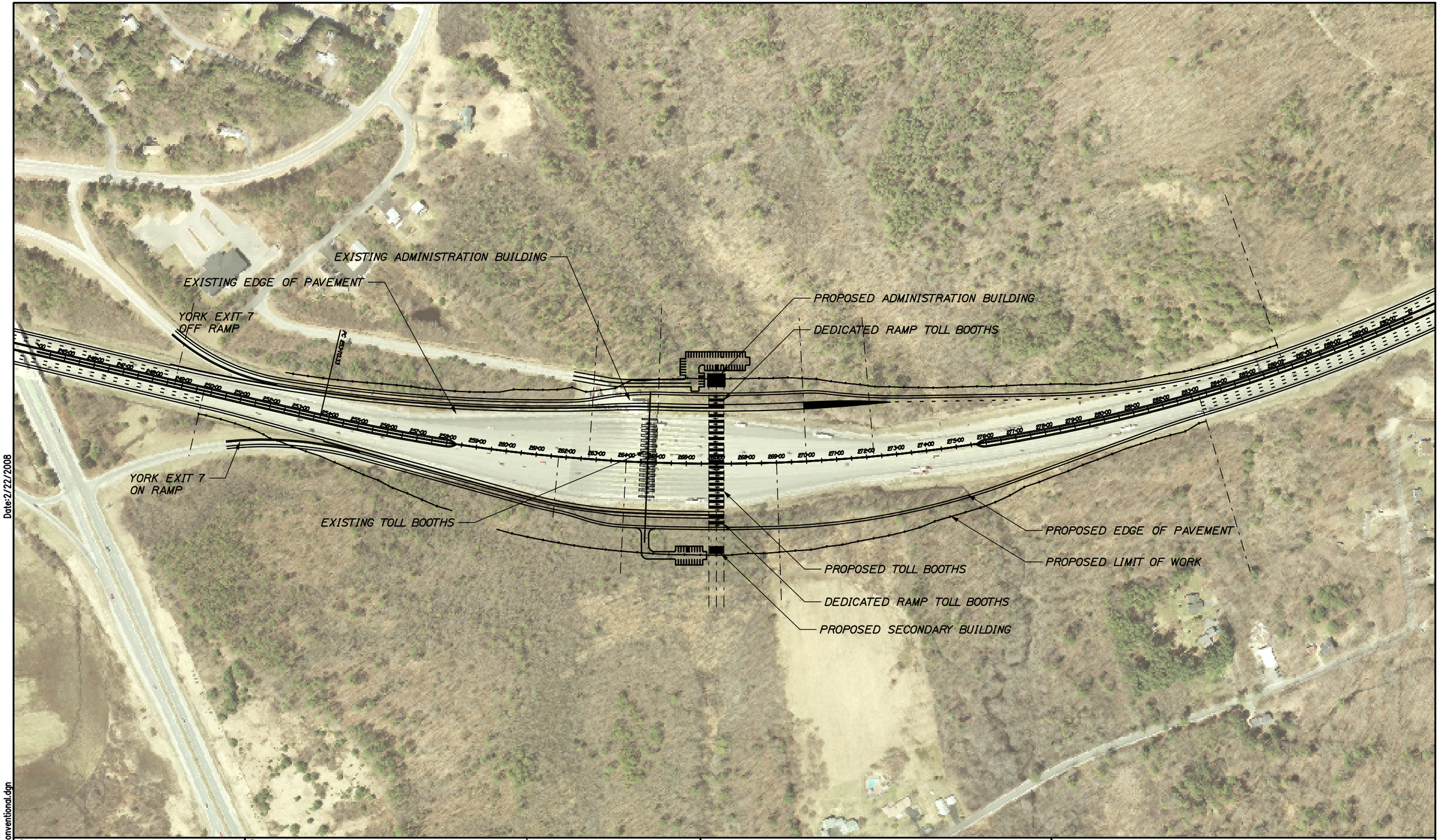
THE GOLD STAR MEMORIAL HIGHWAY

YORK TOLL PLAZA REPLACEMENT

FIGURE 12
OPTION 2: EXISTING SITE INFRASTRUCTURE UPGRADE

SHEET NUMBER:

CONTRACT:



Date:2/22/2008

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No.	Revision	By	Date

Designed by:

HNTB

	By	Date		By	Date
Designed	LEM	09/07	Checked	DM	09/07
Drawn	RWH	09/07	In Charge of	RAL	09/07

HNTB CORPORATION
2 Thomas Drive
Westbrook, ME 04092
TEL (207) 774-5155
FAX (207) 772-7410

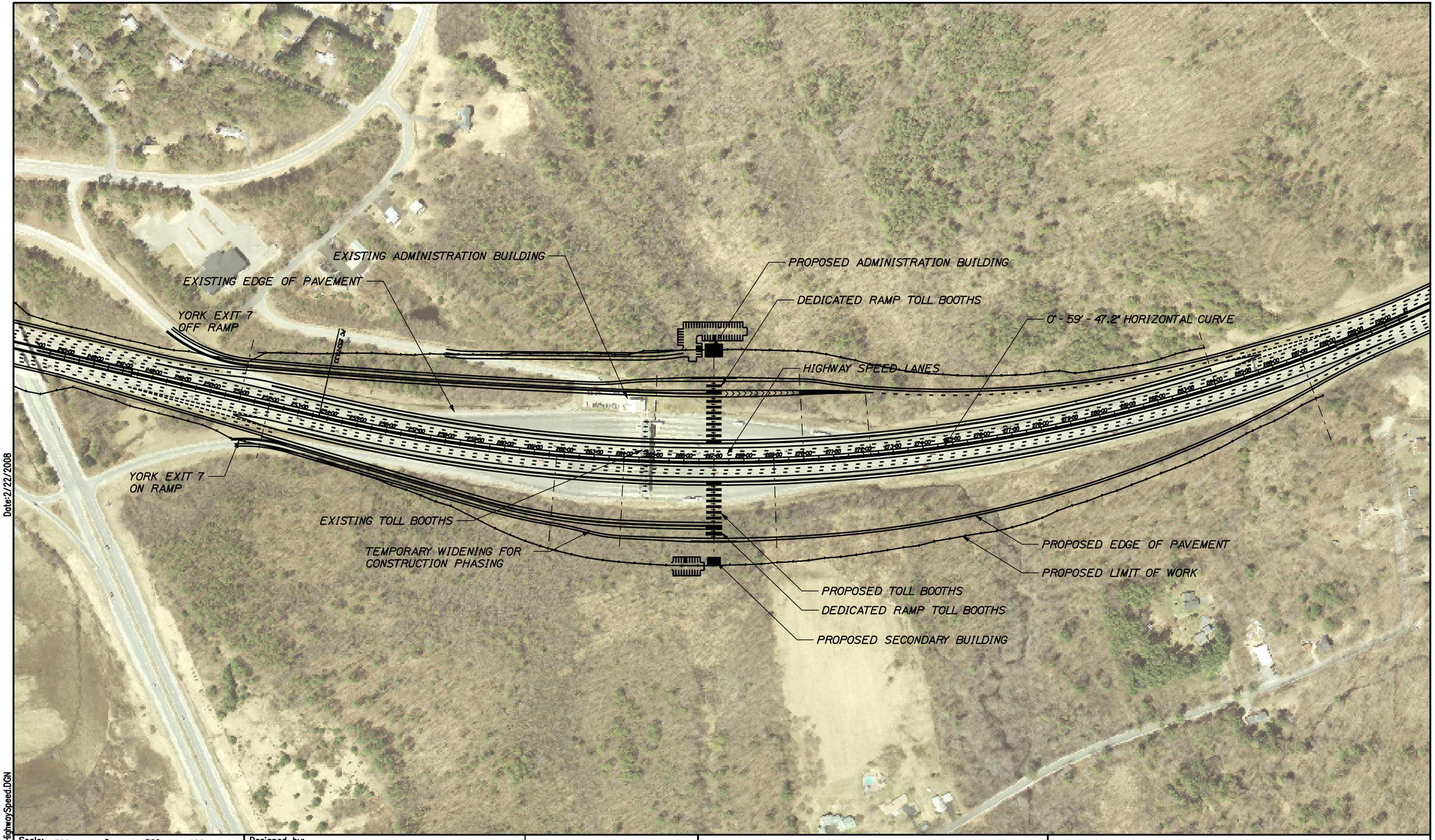
MAINE TURNPIKE

THE GOLD STAR MEMORIAL HIGHWAY

YORK TOLL PLAZA REPLACEMENT
FIGURE 13
OPTION 3: EXISTING SITE
CONVENTONAL PLAZA LAYOUT

SHEET NUMBER:

CONTRACT:



Date:2/22/2008

Filename: ...\Fig4-ExistSiteHighwaySpeed.DGN

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1" = 300'

No.	Revision	By	Date

Designed by:

HNTB

	By	Date		By	Date
Designed	LEM	09/07	Checked	DM	09/07
Drawn	RWH	09/07	In Charge of	RAL	09/07

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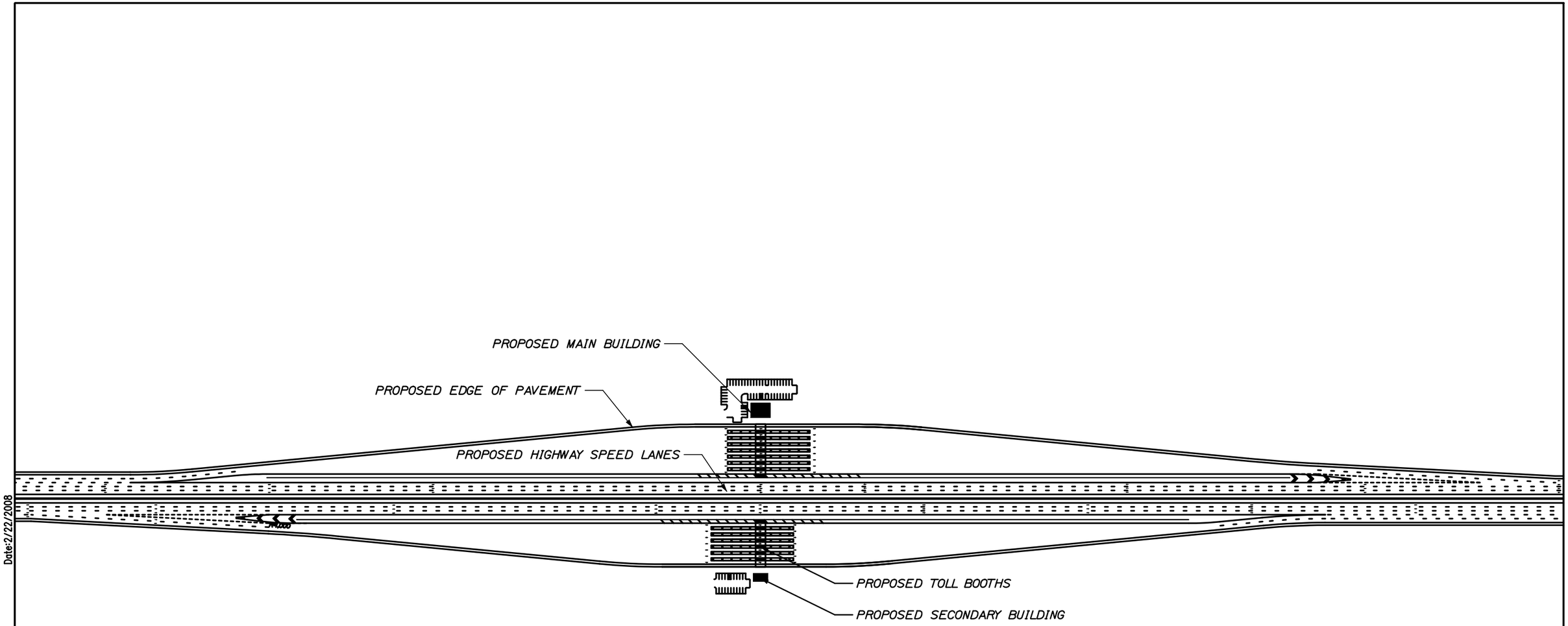
MAINE TURNPIKE

THE GOLD STAR MEMORIAL HIGHWAY

YORK TOLL PLAZA REPLACEMENT
FIGURE 14
OPTION 4: EXISTING SITE
HIGHWAY SPEED PLAZA LAYOUT

SHEET NUMBER:

CONTRACT:



Date:2/22/2008

Filename: ...\Fig5-AltSiteHighwaySpeed.DGN

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1" = 300'

No.	Revision	By	Date

Designed by:

HNTB

	By	Date		By	Date
Designed	LEM	09/07	Checked	DM	09/07
Drawn	RWH	09/07	In Charge of	RAL	09/07

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MAINE TURNPIKE

THE GOLD STAR MEMORIAL HIGHWAY

YORK TOLL PLAZA REPLACEMENT

FIGURE 15
ALTERNATIVE LOCATION
HIGHWAY SPEED PLAZA LAYOUT

SHEET NUMBER:

CONTRACT:

Table 6 Cost Comparison Table

Item Description	Option 2 Existing Site Infrastructure Upgrade Only	Option 3: Existing Site Upgrade with Conventional Tolling	Option 4: Existing Site Upgrade with Highway Speed Tolling	Option 5: Alternate Location with Highway Speed Tolling
Clearing	$0	$101,000	$190,000	$195,000
Common Excavation	$150,000	$468,000	$976,800	$3,084,600
Rock Excavation	$0	$62,500	$127,500	$967,500
Common Borrow	$34,500	$822,000	$871,500	$491,250
Hot Mix Asphalt	$483,000	$4,221,000	$7,140,000	$7,420,000
Gravel	$173,000	$1,782,000	$2,880,000	$3,166,000
Removing Pavement Surface	$0	$162,000	$538,800	$123,750
Drainage	$0	$852,000	$1,282,000	$1,403,250
Concrete Barrier And R/W Fence	$0	$1,000,500	$2,274,000	$2,023,500
Loam, Seed, Mulch, Erosion Control	$0	$314,500	$632,700	$649,350
Utilities	50,000	$175,000	$175,000	$399,750
Lighting	100,000	$441,000	$441,000	$441,000
Maintenance Of Traffic	$1,200,000	$1,200,000	$1,200,000	$1,200,000
Permanent Guide Signs	$0	$700,000	$700,000	$700,000
Administration Building	$0	$3,450,000	$3,450,000	$2,930,000
Plaza Infrastructure	$3,100,000	$4,700,000	$4,900,000	$4,300,000
Toll Equipment	$1,600,000	$1,900,000	$3,300,000	$2,900,000
Chase's Pond Road Bridge Modifications	$0	$0	$300,000	$0
Removal Of Existing York Toll Plaza	$2,500,000	$2,500,000	$2,500,000	$2,500,000
Miscellaneous @ 10%	$944,930	$2,485,150	$3,387,930	$3,489,495
Total*	$10,400,000	$27,300,000	$37,300,000	$38,400,000

* Estimate does not include ROW and wetland mitigation costs.

Table 7 Comparison Matrix

	Option 1: Existing Site No Build	Option 2: Existing Site Infrastructure Upgrade with No New Capacity	Option 3: Existing Site Upgrade with Conventional Tolling	Option 4: Existing Site Upgrade with Highway Speed Tolling	Option 5: Alternate Location with Highway Speed Tolling
Plaza Capacity	Current capacity issues would escalate while the lane configuration of the plaza would have to be continually changed to optimize the available lanes.		Plaza would accomodate all but the heaviest traffic volumes with acceptable queing.	Plaza would accomodate the heaviest traffic volumes with minimal queing for cash patrons and free flow for ETC patrons.	
Vehicle Delays 2010 (seconds)	NB Peak Hour Cash: 61.0 ETC: 14.4 SB peak Hour Cash: 292 ETC: 153.7	NB Peak Hour Cash: 61.0 ETC: 14.4 SB peak Hour Cash: 292 ETC: 153.7	NB Peak Hour Cash: 35.7 ETC: 13.4 SB peak Hour Cash: 73.1 ETC: 25.7	NB Peak Hour Cash: 31.1 ETC: 5.2 SB peak Hour Cash: 62.4 ETC: 5.6	NB Peak Hour Cash: 33.8 ETC: 5.2 SB peak Hour Cash: 62.2 ETC: 4.5
Vehicle Delays 2020 (seconds)	NB Peak Hour Cash: 54.6 ETC: 21.0 SB peak Hour Cash: 200.2 ETC: 77.1	NB Peak Hour Cash: 54.6 ETC: 21.0 SB peak Hour Cash: 200.2 ETC: 77.1	NB Peak Hour Cash: 34.6 ETC: 20.5 SB peak Hour Cash: 72.4 ETC: 21.4	NB Peak Hour Cash: 22.7 ETC: 6.6 SB peak Hour Cash: 38.0 ETC: 7.2	NB Peak Hour Cash: 24.9 ETC: 4.1 SB peak Hour Cash: 39.1 ETC: 4.6
Operations	Similar alignment to the toll plaza, reducing the need for patron decision making. There is familiarity with this traffic pattern.			Vehicles must decide to use highway speed lanes or exit to toll lanes. This will be a new traffic pattern for motorists.	
	Electronic toll vehicles must slow as they enter the toll plaza area.			Provides ETC customers with specific at-speed lanes with minimal queuing or speed reduction. This provides the best possible level of service for ETC customers with the higher speeds leading to more efficient operation.	
	Processing of patrons remains the same.		Processing of cash patrons improved with expanded plaza but processing of ETC patrons limited to slow vehicle speed.	Increased efficiency of processing patrons - both ETC and cash paying.	
	Vehicles must access the dedicated toll lanes via the toll plaza approach area. Excessive vehicle queue in the approach area impacts access and efficiency of dedicated toll lanes.			ETC patrons are not effected by queuing at tolling lanes. Cash lane queues minimized by removal of ETC patrons from cash lanes.	
Construction Cost	$0	$10.4 Million	$27.3 Million	$37.3 Million	$38.4 Million
Wetland Mitigation Costs	$0		could exceed $6.6 million	could exceed $10.6 million	$0.5 to $4.2 million or more
Potential wetland impacts (NRCS soils)	0 acres		Potential 16 acres impacted.	Potential 26 acres impacted.	Potential 1 to 11 acres impacted
General Layout	Existing plaza remains	Replace plaza approximately 200 ft north of existing plaza.			Replace plaza at alternate location.
	n/a	n/a	Chase's Pond Road Ramp Traffic is separated to/from plaza.		n/a
Horizontal Alignment	Plaza is not located on tangent.				Plaza Area would be located on a tangent.
Vertical Alignment	Existing Plaza is at a low point, not the recommended high point.		Vertical grade adjustment would be required to create localized high point. Plaza still at base of 5% hill to the North.		Plaza at high point, minor vertical grade adjustments possible.
Sight Distance	Decision sight distance is not completely satisfied.				Decision sight distance is satisfied.
Proximity of plaza to interchanges / bridges	n/a	n/a	Modification to Chase's Pond Road Bridge is anticipated.	n/a	n/a
	Recommended 1 mile separation from plaza and interchange is not met. Close proximity of Chase's Pond Rd Exit creates safety issues for vehicles. NB mainline lanes between entrance ramp and plaza is a high crash location.		Recommended 1 mile separation from plaza and interchange is not met.		Recommended 1 mile separation from plaza and interchange will be met.
Constructability	n/a	Complicated construction phasing due to close proximity of new plaza while maintaining operations at existing plaza. Requires temporary booths to maintain 8 tolling lanes in each direction during construction.			Construction phasing required. Impacts to mainline traffic to be minimized.
Local Road Access	No additional local access needed				Local access to be provided to main utility building
Tunnel & Plaza Work	Costs to repair tunnel are extensive.	Tunnel and Plaza Replacement is assumed			New Tunnel and Plaza will be constructed
Geotechnical conditions	Existing site has settlement issues. Approach slabs and bumpers at toll booths are settling. This creates hangup points for vehicles with low ground clearance and safety issues for toll attendants.		Geotechnical issues at toll plaza may require use of light weight fill.		Geotechnical issues are unknown.
Utility Building	Existing building functions properly.		Replace Existing Utility Building and construct auxiliary utility building		New Utility Buildings
Utilities	No modification to utilities.		Utilities exist but modifications are anticipated.		Utilities will be brought to alternate location
Potential displacements	No displacements.	No displacements.	No anticipated displacements	No anticipated displacements	Potential displacements

Level of Acceptability: **Best**    **Worst**

SECTION 8 - PUBLIC INVOLVEMENT

An integral part of the evaluation of York Toll Plaza's future is public input. As is common on MTA projects during the planning process, and as requested by the Maine Legislature, the MTA conducts a number of public informational meetings with local and interested citizens. As is shown below, a number of meetings and presentations were held to share and gather information surrounding the York Toll Plaza Replacement project. Due to the many commitments and previously scheduled meetings for these groups during October and November of 2007, the public input portion of this project ultimately delayed the delivery of this Final Report. The final presentation and information gathering session was held with the Joint Select Boards of Wells, Ogunquit and York on January 23, 2008.

The MTA continues to seek input from the public during the entire project. The purpose of these early input meetings is to better understand community requests, desires, and concerns. Meetings were held with a wide range of groups or audiences including Town Officials, Boards of Selectpersons from area Towns, State and Federal Environmental Resource Agencies, Local and Interested State Legislators, and the general Public. These meetings were designed to incorporate two-way communication, both project information sharing as well as listening, understanding, and answering questions and concerns. Following is a summary of the meetings that have been conducted:

- Town staff input and information sharing - throughout
- Town Managers' meetings
  - 1st meeting Sept. 26, 2006
  - 2nd meeting Nov. 29, 2007
  - 3rd meeting January 22, 2008
  - 4th meeting February 15, 2008
- Joint Select Board meeting – Oct. 25, 2006
- State/Federal Interagency meeting – Oct. 10, 2006
- Legislative Tour & Briefing – Aug 9, 2007
- Legislative Tour & Briefing – Aug 10, 2007
- Legislative Tour & Briefing – Sep 21, 2007
- Legislative Tour & Briefing – Dec 10, 2007
- Joint Select Board presentation – January 23,2008

Individual Meeting Notes are contained in Appendix A.

SECTION 9 – RECOMMENDATION

From the evaluation, and in conjunction with the plaza's accident history, the York Toll Plaza is operationally inefficient, structurally deficient, and is located such that these conditions compromise overall staff and patron safety. Replacement of the York Toll Plaza needs to occur to improve operations and meet current design guidelines. To determine the most effective course of action that addresses immediate and future needs, this report documents the comprehensive development and evaluation of five strategies or Options. Following is a summary of these five options along with recommendations.

Option 1: No Build (Leave Plaza in Existing Condition and Tolling Arrangement)

Option 1 does not satisfy any of York Toll Plaza's safety or operational needs, present or future. This option leaves the Plaza requiring extensive ongoing maintenance. **This Option is dismissed from further consideration.**

Option 2: Infrastructure Upgrade with No Additional Capacity

Option 2 addresses only the structural deficiencies of the existing infrastructure. This option does not provide the needed additional capacity, does not address the location deficiencies, does not meet current industry design standards and will not address many safety or operational issues for Turnpike patrons and staff. The cost to provide this option would be lost without benefit as it would not remedy any of the truly needed improvements. **This Option is dismissed from further consideration.**

Option 3: Upgrade Existing Site with Conventional Tolling and Increased Capacity

Option 3 increases capacity and upgrades the infrastructure but does not address the safety and operational concerns associated with the current plaza location. The cost of this option would be more than two-thirds the cost of the relocated option but would provide only marginal benefit. In addition, there is no opportunity for implementing modern Highway Speed Lanes with this option. **This Option is dismissed from further consideration.**

Option 4: Upgrade Existing Site with Highway Speed Tolling and Increased Capacity

Option 4 marginally improves traffic capacity and ETC processing time but fails to address the safety concerns associated with the current plaza location. Full efficiency of Highway Speed Tolling will not be realized due to the location on a curve and near a hill. A costly interchange reconfiguration and reconstruction will be necessary resulting in confusing and complicated traffic patterns. The cost of this option is similar to that of the full build option but provides far less benefit. To effect additional safety benefits in traffic movements would require an interchange reconstruction that is far greater than considered here, likely more than doubling the cost of this option. **This Option is dismissed from further consideration.**

Option 5: Relocate Plaza to Alternate Location with Highway Speed Tolling

Option 5 will result in a toll plaza that 1) operates safely for both Turnpike patrons and staff, 2) provides adequate capacity for current and future traffic demands, 3) meets today's industry standards for plaza location and infrastructure needs, and 4) implements modern technology to efficiently process Turnpike traffic with Highway Speed Tolling lanes. This Option is the most cost effective way to meet York Toll Plaza's safety and operational needs and will allow the York Toll Plaza to be a prominent "gateway" to the State of Maine. **This Option is the only reasonable option and is the choice the MTA will pursue.**

The results of the alternatives analysis support the MTA selecting and pursuing Option 5; constructing a new toll plaza, with Highway Speed Tolling, in a new location. Constructing a toll plaza in a new location will result in 1) safer operations for both Turnpike patrons and staff, 2) adequate capacity for current and future traffic demands, 3) a plaza that meets industry design standards for layout and operations, and 4) the ability to implement modern and more efficient Highway Speed Lanes. **None of the other four options are able to provide all of these features.**

Option 5 is the most cost effective way to meet York Toll Plaza's needs and it will allow the York Toll Plaza to be a prominent "gateway" to the State of Maine. Constructing a new plaza, with Highway Speed Tolling, at a new location is the most prudent direction for addressing existing safety and operational issues and future needs of a Southern Toll Plaza and gives the Maine Turnpike Authority a sound investment in a facility that will provide the public with a safe, efficient, and modern toll plaza today and into the future.

The Maine Turnpike Authority will continue with the York Toll Plaza Replacement project by pursuing the identification of a new location for the plaza that meets national engineering standards and that will accommodate Highway Speed Tolling.

SECTION 10 NEXT STEPS

The Maine Turnpike Authority will continue with the York Toll Plaza Replacement project by pursuing the site identification and screening process to find a new location for the plaza. The site identification and selection process to be followed is in accordance with the Alternatives Evaluation per the Army Corp of Engineers Highway Methodology, complies with Section 404 of the Clean Water Act and complies with the Department of Environmental Protection's National Resource Protection Act. A brief summary of the tasks or steps to accomplish this project is offered here for reference.

- Site Selection Studies - completed
- Conceptual Designs and Estimates – refinements underway
- Site Screening & Preferred Site Selection - underway
- Public Participation
- Preliminary Design & Mitigation
- State and Federal Permit Applications
- Final Design
- Public Process per Permit Requirements
- Permit Development and Approval Process
- Construction

APPENDIX A

MEETING MINUTES

HNTB Corporation
2 Thomas Drive
Westbrook, ME 04092
(207) 774-5155

Subject: Southern Toll Plaza Date: September 26, 2006

Place: Maine Turnpike, York Maintenance Facility

Attendees:
- ☒ Philip Clark, Town of Ogunquit
- ☒ Jane Duncan, Town of Wells
- ☒ Jim Kanak, York County Coast Star
- ☒ Jon Speers, Town of Ogunquit
- ☒ Steve Burns, Town of York
- ☒ Conrad Welzel, MTA
- ☒ Jonathon Labonte, MTA
- ☒ Joe Grilli, HNTB
- ☒ Paul Godrey, HNTB
- ☒ Don Ettinger, HNTB

By: Don Ettinger

Copy: HNTB File No: 09009-xw-005-011

Minutes

Introduction

1. Conrad provided a history of the southern section of the Maine Turnpike and discuss traffic volumes on the turnpike and on Route 1. The revenue generated by the York Toll plaza was discussed. The perception of traffic diversion was discussed in length by the attendees.
2. It was explained that one way tolling was studied and determined not prudent.
3. Conrad explained that highway speed tolling is recommended for the replacement plaza.

Study Purpose

Conrad & Joe explained that the study purpose is to find the most suitable location for replacing MTA's southern toll plaza.

Project Need

The condition of the existing plaza and need for replacement was explained. Geotechnical issues, horizontal and vertical geometry, safety, traffic congestion, as well as the age of the existing facility were noted as reasons for replacement.

Technical Scope

1. The technical scope was explained. Effort to include establishment of design criteria, development of plaza footprint, considerations for reuse of the existing plaza, considerations for single vs split plazas, screening of possible plaza locations considering human resources, natural resources, and engineering constraints.
2. Detailed evaluation of short-listed plaza locations will be conducted and recommendations will be documented in a report.
3. Environmental agency coordination will be included in the process. Steve Burns mentioned that City environmental permits may be required as well.

4. The study area was defined from Chase's Pond Road to Wells interchange. Jane Duncan requested the study limits be extended south of Chase's Pond Road. HNTB to review federal incumbencies and traffic diversion associated with locating a plaza south of Chase's Pond Road.
5. HNTB to reach out to municipalities for latest tax map data (recent developments, subdivisions etc). Municipalities have recent aerial photos.

Community Input

1. It was explained that another meeting with attendees would occur when the report was completed and just prior to a public meeting likely to occur in December.
2. Towns suggested no meetings in December. Public meeting to occur in January.
3. Towns suggested MTA reachout the Town planning boards early in this process, prior to any recommendations. It was agreed to meet with Town planning boards (Wells, Ogunquit, York) at a joint meeting tentively scheduled for Oct 25th, 6:30pm in Ogunquit. The meeting would be recorded and brought back to each community and retelevised in each community as a means of public outreach.

Schedule

The schedule was discussed. The study would be completed by end of the year. Public process in January, 07. Final design and permitting in 2007. Construction to begin spring of 2008 and extend for two construction seasons.

MEETING NOTES

Date: January 22.2008

HNTB Project No.: 09009-XW-005-011

Meeting Name: Project Update & Work Session With Town of York Manager and Community Development Director

Location: York Town Office

Purpose: Project Update and Public Meeting Preparation

Attending: Rob Yandow, Steve Burns, Jonathan LaBonte, Dale Mitchell

- What review authority does/will the Town of York have?
- Noise has been a local concern especially from neighborhoods near MM8.1.
- Highway Speed Tolling is viewed by most as an improvement and a good idea.
- It would be viewed as a good gesture to make as much data as possible available online; possibly providing a link from the Town website to the MTA website.
- Town has Local Access television and can use it for advertising the meeting
- Town asked MTA to investigate what permitting is going to be required and report back.

This is our understanding of items discussed and decisions reached. Please contact us if there are changes or additions.

Submitted by,

HNTB CORPORATION – Dale A. Mitchell, P.E.

MEETING NOTES

HNTB

Date	January 23, 2008
HNTB Project No.:	09009-XW-005-011
Meeting Name:	Joint Select Board Presentation
Location:	Town of Ogunquit – Dunaway Center
Purpose:	Gain Public Input on Decision to Replace the York Toll Plaza in a New Location Final Informational Session per LD 534
Attending:	SelectBoards of Wells, York and Ogunquit; Public Maine Turnpike: Conrad Welzel, Dan Paradee HNTB Corporation: Dale Mitchell, Paul Godfrey, Roland Lavallee

1. Has the MTA looked at removing the York Toll Booth completely? Whatever revenue is lost should then be collected someplace north.
   a. There is a Toll Rate Structure group studying many possibilities.
2. The O-D survey was carried out on the wrong day, it was raining and a Friday. The rain caused more folks to be on the road. Because of this the results are not valid.
   a. The sun was out by 11:30am. Friday traffic, especially these summer volumes, is exactly what we were asked to base our research on.
3. Why is there a $1.75 toll at York? Why not reduce the toll amount and add exit tolls back into the program?
   a. This would essentially be going back to a 'ticket system' which had other backups and delays associated with it.
4. Good idea to upgrade or replace the plaza. Presentation makes a good case for the replacement as well as for the new Highway Speed Tolling.
5. Where are the potential sites that are being considered for a new plaza? How can we answer your replacement question if we don't know where the sites are?
   a. Purpose of meeting is to discuss the need for plaza replacement and to validate that a new site is warranted; not where it might be located.
   b. Study underway with results likely available for a late February or early March meeting. Currently, 16 identified sites have been narrowed to 4-6 sites.
6. Consider locating the new plaza in Ogunquit. Should also consider an interchange in Ogunquit.
7. What is the estimated cost of replacing the Plaza? Will this cause increased tolls?
   a. Costs will be investigated when we arrive at a smaller number of sites.
   b. Conceptual estimates of a new plaza are approximately $35 million.
8. Can a new plaza be smaller; less of a structure?
   a. Highway speed tolling will use typical mainline widths and remove need for as many cash toll booths.
9. Can the overhead structures be removed? Technology is surely available to either put sensors in the ground or on short shoulder mounted poles.
   a. There are different types of sensors available and research is being done. At present, reading a toll tag requires some type of overhead viewer. Side mounted readers will not work for multiple lanes.
10. Biggest issue with Diversion is the truck traffic. Trucks leave the York Industrial Park and head north to wells, over local roads, to avoid the York Toll. The Wells toll plaza should be modified to collect these tolls and most importantly discourage these diverted trips.
11. Southern Maine residents should be given a discount on tolls; it should be based on home zip code. When you go through the York Toll Booth, this discount should be given.
    a. Interstate Commerce Act prohibits this type of activity.
12. Biggest issue is toll inequity! Plaza replacement is secondary to fixing the toll rates.
    a. A Toll Rate Structure group is currently meeting to investigate the overall system.
13. Consider adding more E-ZPass readers to at least make all E-ZPass trips equitable. More research needs to be done to make cash customer tolls more equitable.
    a. A Toll Rate Structure group is currently meeting to investigate the overall system.

14. Relocation of the toll plaza south of the York plaza is not a good idea from a change in traffic pattern perspective. Replacement is a good idea based on current needs. Continue considering those locations north of the existing plaza.
15. Why are sites south of the York plaza not part of the short list of sites? There are plenty of open spaces.
    a. The area south of York was evaluated with only two candidate locations identified. These two sites fell out following the secondary screening.
    b. Site ID criteria included: straight stretch, no interchanges, no bridges and small hill. Site screening criteria included environmental and human resource impacts.
16. Aren't there restrictions for building south of York?
    a. There are still Federal and State restrictions and implications for this but there are also technical reasons to not build in this area.
17. Consider locating a plaza south of Littlefield Road. At the same time an interchange should be built at some location south but as close to this as possible.
18. What exactly should we learn from the diversion numbers? Are these values good or bad?
    a. Diversion rates are within the range estimated. At this time, these values are considered typical and are similar or lower than other toll way diversion rates.
19. Were Diversion numbers collected for commercial vehicles? These vehicles are creating safety concerns when diverting because they are using small local roads.
    a. No, commercial vehicles were not surveyed.
20. Are Maine based accounts the same as out-of-State?
    a. Maine based accounts benefit from the discount plans; others do not.
21. Did this (LD534) process slow things down? We were hoping to learn alternative sites tonight?
    a. The LD report contains data and information normally investigated and reported. However, because the request came when it did, time was spent to go backwards and rejustify the conclusion we had already come to, i.e. replace the plaza in a new location with highway speed tolling.

This is our understanding of items discussed and decisions reached. Please contact us if there are changes or additions.

Submitted by,

HNTB CORPORATION – Dale A. Mitchell, P.E.

MEETING NOTES

HNTB

Date: February 15, 2008

HNTB Project No.: 09009-XW-005-011

Meeting Name: Project Update & Work Session With Town of York Manager and Community Development Director

Location: York Town Office

Purpose: Project Update and Public Meeting Preparation

Attending: Rob Yandow, Steve Burns, Jonathan LaBonte, Dale Mitchell

- Reviewed draft agenda for upcoming Public Information Meeting. Public needs to understand the selection process.
- Comparison Matrix is helpful but for now it should not have colors. Allow the Public to provide input then factor the colors in later.
- Development of a Fact Sheet to be left at Town Offices is a good idea. This can be left with display graphics. Plan and Profile along with Corridor Limits and 16 alternatives will work.
- For Public Meeting it would be useful to have a comparison matrix, without data, as one of the displays; basically to give people a sense that there is a methodology to the process.
- Be sure to answer all questions. There has been some public input that questions were not really answered instead there was some evasion.
- The presentation must be convincing and credible!
- If Public input is going to be used then share with Public how it is to be used. Do not give false hopes, be clear and honest on how much influence the Public has on the site selection.
- Following review of the Noise Video: Video has some good data and it would be useful at a later point in time. They do not believe it would add much to the purpose of the 2/27 meeting - Site ID and initial screening. Consider showing this as a tool when a preferred site is selected.
- Let the Public request additional information before giving it to them.
- Video should include some type of point-of-reference for the dBA values.
- Send Public Notice to the Town for inclusion on their Local Access Channel.
- Asked if MTA could install some temporary markers at the 4 Alternative Sites. They wondered if folks might find a visual helpful.
- Eventually, graphics and reports should be made available on a website. Likely the best way would be to have a link from the Town's site to the MTA website.

This is our understanding of items discussed and decisions reached. Please contact us if there are changes or additions.

Submitted by,

HNTB CORPORATION – Dale A. Mitchell, P.E.

APPENDIX B

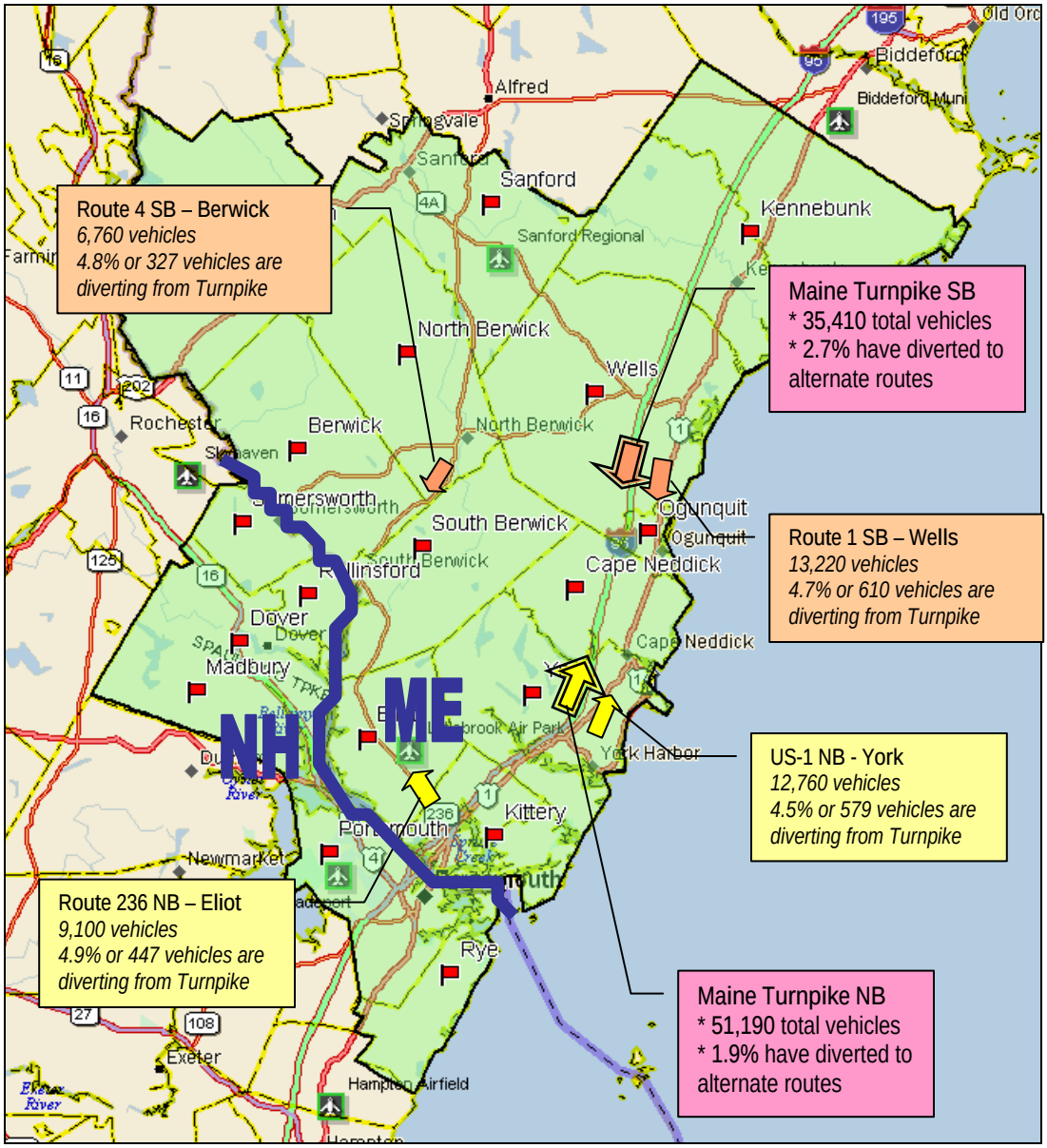
YORK TOLL DIVERSION STUDY 2007

Executive Summary

HNTB Corporation conducted a diversion study for the Maine Turnpike Authority along the southern portions of the Maine Turnpike between Wells and York. The study included a broad interview survey and a smaller-scale license plate trace survey. The purpose of this study is to understand the level of traffic diverting from I-95 to major local routes in order to avoid the York Toll Plaza

Figure 16 summarizes the key results of the interview survey.

Figure 16: Diversion Summary Map



As Figure 16 illustrates, the interview survey indicated that about 4-5% of the traffic on the two alternate routes were comprised of vehicles diverting around the York toll plaza. This equates to less than 2000 diverting vehicles out of almost 130,000 vehicles on the Maine Turnpike and parallel corridors during the survey period of a typical Friday in the summer months of July and August. Overall, the interview survey suggested that approximately **2-3%** of the traffic on I-95 diverts to avoid the toll plaza.

The license plate trace survey focused on the Route 1 diversion route. This survey indicated that about **0.7%-1.6%** of vehicles on I-95 divert around the toll plaza on Route 1. **This range is consistent with the result of the interview survey**.

More details are available from the Maine Turnpike Authority in the full version of the York Toll Diversion Study 2007.