Maine Turnpike Southern Toll Plaza Replacement Study

Draft Phase I Report
for submittal to the
U.S. Army Corps of Engineers

Presented to
Maine Turnpike Authority
November 5, 2009
Purpose of today’s meeting

1. Deliver the Draft Phase I Report
2. Present our findings regarding alternate locations
3. Present our recommendations
Phase I Report Index

Part 1 – Introduction and Overview
Part 2 – Existing Site Evaluation
Part 3 – Alternate Site Evaluation
Part 4 – Site Screening
Maine Turnpike Southern Toll Plaza Replacement Study

1. Overview of Alternatives Evaluation
2. Brief Review of
   A. Design Guidelines
   B. Review Project Purpose and Need
   C. Existing Conditions and Safety Concerns
   D. Tolling Strategies
   E. Proposed Toll Plaza Sizing
3. Existing Site Evaluation and Recommendations
4. Alternate Site Identification & Screening
5. Phase 1 Recommendation
Maine Turnpike Southern Toll Plaza Replacement Study

Alternatives Evaluation

1. Followed USACE Highway Methodology
2. Followed Section 404 of Clean Water Act
3. Followed DEP Natural Resources Protection Act
4. Objective of the evaluation with respect to resources is:
   A. Avoidance of impacts
   B. Minimization of impacts
   C. Compensation for unavoidable impacts
Maine Turnpike Southern Toll Plaza Replacement Study

Project Purpose & Need Concurrence

Alternatives (Site Identification & Screening)

Corps’ LEDPA

Permitting

Do Nothing

Reconstruct Existing

New Plaza Existing Location

New Plaza New Location

Phase 1: Avoidance then Minimization

Phase 2: Avoidance, Minimization & Compensation

PREFERRED ALTERNATIVE
1. The Maine Turnpike Authority identified a need and authorized a feasibility study to replace/reconstruct the York Toll Plaza.

2. MTA resolved to proceed forward with the implementation of highway speed tolling (now referred to as Open Road Tolling).

3. The preliminary study yielded: 1) existing site alternatives would not meet basic engineering guidelines or environmental reasonableness, 2) 16 alternative sites were identified as meeting basic criteria and environmental reasonableness.

4. MTA hosted the York Selectboard to hear thoughts and concerns.

5. MTA directed, at the request of the York Selectboard, HNTB to re-investigate any possible options at the existing site.

6. HNTB completed the Existing Site Evaluation Report and presented it June 16, 2009 to the Authority and the York Selectboard.

7. MTA approved the Existing Site Evaluation Recommendations and directed HNTB to resume investigation for potential Alternate Sites.

8. HNTB has completed the Alternate Site Identification and Screening and has developed the Phase I report for presentation today.
Review Design Guidelines

Same Design Guidelines and Criteria Applied to Both Existing Site and Alternate Sites Evaluations
Maine Turnpike Authority utilizes nationally recognized engineering guidelines.

4. “State of the Practice and Recommendations on Traffic Control Strategies at Toll Plazas” (FHWA, 2006)
Maine Turnpike Southern Toll Plaza Replacement Study

**Manual on Uniform Traffic Control Devices (MUTCD):**

Excerpt from Section 1A.01 Purpose of Traffic Control Devices: "The purpose of traffic control devices, as well as the principles for their use, is to promote highway safety and efficiency by providing for the orderly movement of all road users on streets and highways throughout the Nation."

**State of the Practice and Recommendations on Traffic Control Strategies at Toll Plazas:**

Excerpt from page 1: “The goal is to achieve a consistent strategy for handling potential points of conflict, controlling flow of various vehicle types and conveying information at toll plazas so that safety and operations are enhanced, better efficiency and economy of design are achieved, and motorist recognition and comprehension are improved.”
A common theme among these guidelines, as it relates to their purpose, is that uniformity of design practices and procedures is a key factor in the safety of travelers on our Nation’s highways. As well, operational efficiency of our roadway network can be improved through the use of these national guidelines and best practices. Another important result of the application of these guidelines is the efficient use of resources and the positive impact it has on our environment.
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Basic Design Criteria for Toll Plazas

1. Separation from Interchanges:
   A. Minimum 1 mile between interchange and center of toll plaza.

2. Separation from overhead bridges:
   A. Minimum 2500" between overhead bridge and center of toll plaza.
   B. Desirably not within footprint (approx 8000")

3. Horizontal Tangent:
   A. Straight stretch of approximately 8,000 feet

4. Crest vertical curve:
   A. Center of straight stretch (toll plaza) at or near the top of a small gradual hill.
Review Project Purpose and Need
Maine Turnpike Southern Toll Plaza Replacement Study

Age + Location + Traffic Growth = Plaza Problems

1. Increasingly unsafe for motorists
2. Increasingly unsafe for employees
3. Unnecessary noise
4. Increasing maintenance costs
5. Inability to accommodate new traffic flows and up-to-date tolling technology
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Plaza Lifespan

1. York Toll Plaza built in 1969
2. Planned life thru 1982 (13 +/- years)
3. Structural lifespan = 25 years
4. Current age of plaza = 40 years
Existing Conditions and Safety Concerns
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Conditions and Deficiencies at York Toll Plaza

1. Safety Concerns and Issues
2. Booths, Tunnel and Canopy
3. Plaza (Area) Design
4. Operations (Traffic Flow)
5. Tolling Technology
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Maine Turnpike Southern Toll Plaza Replacement Study

Review Tolling Strategies
Maine Turnpike Southern Toll Plaza Replacement Study

Toll Collection Strategy

1. Collection Strategy
   A. Split Plazas
   B. One-way Tolling

2. Collection Technology
   A. Booth (Stop and Slow Speed – Existing)
   B. All Electronic
   C. Open Road (also known as Highway Speed)

3. Maine Turnpike Authority has adopted Open Road Tolling for the Replacement York Toll Plaza
Open Road Tolling (formerly Highway Speed)

1. EZPass Customers pay tolls at 55-65mph – less congestion – increased capacity – better service
2. Cash customers are physically separated from highway speed customers – increased safety
3. Addresses Existing and Future Traffic Demand – increased capacity – customer service - safety
4. 58% of traffic use E-ZPass at York Plaza
5. Over 80% of York Truck Traffic use E-ZPass
6. Reduced Noise Events
   A. Engine brakes and heavy acceleration
   B. Rumble strips
   C. Similar amount of noise as mainline today
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MTA Decision to Implement Open Road Tolling
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Proposed Toll Plaza Sizing
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Plaza Sizing

= 295'

= 535'

= 435'

= 335'
Existing Site Evaluation and Recommendations
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Recommendations

1. Advance No Build as required by Permit process
2. Advance Option 4A
3. Advance option 4B
4. Revisit Site Identification With Refined Footprint
5. Advance alternate locations that:
   A. better meet design guidelines
   B. adhere to purpose and need
   C. are less environmentally damaging
   D. displaces no homes
   E. minimizes impact to private property
### Maine Turnpike Southern Toll Plaza Replacement Study

**DOES THIS MEET THE BASIC ENGINEERING CRITERIA?**

- On a straight stretch = NO
- One mile from interchange = NO
- Separation from bridge = NO
- On crest of a small hill = NO

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**WHAT WOULD IT TAKE**

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
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<tbody>
<tr>
<td>Potential Home Impacts =</td>
<td>0 Homes</td>
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<tr>
<td>Potential Right-of-Way Impacts =</td>
<td>0 Acres</td>
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<tr>
<td>Potential Wetland and Hydric Soil Impacts=</td>
<td>0 Acres</td>
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<td>Potential Stream Impacts =</td>
<td>0 LF</td>
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<td>Length of Mainline Construction =</td>
<td>400 LF Min</td>
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<tr>
<td>Length of Local Roadway Realignment =</td>
<td>0 LF</td>
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<td>Total Cost =</td>
<td>$12,300,000</td>
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**FIGURE 3 - OPTION 1**

NO BUILD (MAINTENANCE ONLY)
Maine Turnpike Southern Toll Plaza Replacement Study

DOES THIS MEET THE BASIC ENGINEERING CRITERIA?

- ON A STRAIGHT STRETCH = NO
- ONE MILE FROM INTERCHANGE = MARGINAL
- SEPARATION FROM BRIDGE = NO
- ON CREST OF A SMALL HILL = NO

WHAT WOULD IT TAKE

- 0 HOMES
- 8.1 ACRES
- 28.0 ACRES
- 730 LF
- 11,100 LF MIN
- 0 LF
- 9,250 LF MIN
- $56,300,000

FIGURE 6 - OPTION 4A
UPGRADE EXISTING SITE WITH OPEN ROAD TOLLING AND SEPARATE RAMP LANES
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**WHAT WOULD IT TAKE**

- 6 HIGHWAY SPEED LANES
- 9 CONVENTIONAL LANES

**WHAT WOULD IT TAKE**

- a. POTENTIAL HOME IMPACTS = 0 HOMES
- b. POTENTIAL RIGHT-OF-WAY IMPACTS = 3.3 ACRES
- c. POTENTIAL WETLAND AND HYDROCIC SOIL IMPACTS = 22.2 ACRES
- d. POTENTIAL STREAM IMPACTS = 599 LF
- e. LENGTH OF MAINLINE CONSTRUCTION = 9,750 LF
- f. LENGTH OF LOCAL ROADWAY REALIGNMENT = 0 LF
- g. LENGTH OF RAMP CONSTRUCTION = 1,350 LF
- h. TOTAL PROJECT COST = $43,000,000

**DOES THIS MEET THE BASIC ENGINEERING CRITERIA?**

- ON A STRAIGHT STRETCH = NO
- ONE MILE FROM INTERCHANGE = NO
- SEPARATION FROM BRIDGE = NO
- ON CREST OF A SMALL HILL = NO

**FIGURE 7 - OPTION 4B**

UPGRADE EXISTING SITE WITH OPEN ROAD TOLLING WITHOUT SEPARATE RAMP LANES
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Project Purpose & Need Concurrence

Corps’ LEDPA

Permitting

Alternatives (Site Identification & Screening)

Do Nothing

Reconstruct Existing

New Plaza Existing Location

New Plaza New Location

Phase 1: Avoidance then Minimization

Phase 2: Avoidance, Minimization & Compensation

PREFERRED ALTERNATIVE
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“LEDPA”

Least Environmentally Damaging Practicable Alternative
Alternate Site Identification & Screening
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Site Identification and Screening

1. Level One Evaluation
   A. Basic Engineering criteria
   B. Physical features

2. Level Two Evaluation
   A. Engineering criteria
   B. Natural resources
   C. Social resources
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Locate “Out-of-Bound” Areas

• Interchanges
• Bridges
• Curves
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Locate “Out-of-Bound” Areas

- Interchanges
- Bridges
- Curves
Maine Turnpike Southern Toll Plaza Replacement Study

Locate “Out-of-Bound” Areas

- Interchanges
- Bridges
- Curves

Exit 19 Wells

Littlefield Road

Tatnic Road

Captain Thomas Road
Locate tangent sections (straight sections) for plaza footprint that are not out-of-bounds.
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Check overhead structures (and sight distance).

Check for gradual hill crest at center of plaza.
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Level One Screening Results

16 Locations Meet the Basic Design Criteria

- South of Chases Pond Road (Exit 7) – 2 locations
- Chases Pond Road to Mountain Road – 7 locations
- Mountain Road to Clay Hill Road – 2 locations
- Clay Hill Road to N. Berwick Road – 1 location
- N. Berwick Road to Capt Thomas Road – 0 locations
- Capt. Thomas Road to Tatnic Road – 0 locations
- Tatnic Road to Littlefield Road – 3 locations
- Littlefield Road to Wells Interchange – 1 location
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Alternate Site ID and Screening Process

Site ID Process Yields 16 Candidate Locations
Level Two Screening – Additional Engineering

- Highway grades
- Sight distances
- Typical cross-section
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Level Two Screening – Social Resources

- Homes
- Schools
- Parks
- Municipal facilities
- Planned development
- Private Property
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Level Two Screening - Environmental Resources

- Wetlands & wetland soils
- Rivers and Streams
- Floodplain
- Aquifers (Groundwater)
- Historic and Archaeological Resources
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Alternate Site ID and Screening Process

Level 2

HNTB
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Alternate Site ID and Screening Process

Level 2

HNTB
Maine Turnpike Southern Toll Plaza Replacement Study

Alternate Site ID and Screening Process

Level 2
Maine Turnpike Southern Toll Plaza Replacement Study

Alternate Site ID and Screening Process

Level 2
Maine Turnpike Southern Toll Plaza Replacement Study

Alternate Site ID and Screening Process

Location 4.5
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Alternate Site ID and Screening Process

Location 5.4
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From Existing Site Evaluation

Location 7.3
Option 4A
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From Existing Site Evaluation

Location 7.3
Option 4B
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Alternate Site ID and Screening Process

Location 8.1

Legend:
- Approximate Tollplaza Footprint
- Inland Waterfowl & Wading Bird Habitat
- FEMA Special Flood Hazard Area
- NIWI Certified Wetland
- Hydric Soil
- Streams

Source: Maine Office of GIS, Town of York
Maine Turnpike Southern Toll Plaza Replacement Study

Alternate Site ID and Screening Process

Location 8.5

Legend
- Approximate Tollplaza Footprint
- Inland Waterfowl & Wading Bird Habitat
- FEMA Special Flood Hazard Area
- NWI Certified Wetland
- Hydric Soil
- Streams

Source: Maine Office of GIS, Town of York
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Location 8.6

Alternate Site ID and Screening Process

HNTB
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Alternate Site ID and Screening Process

LOCATION 8.7

Newly constructed 120' cell tower

Legend:
- Approximate Toll Plaza Footprint
- Inland Waterfowl & Wading Bird Habitat
- FEMA Special Flood Hazard Area
- NWI Certified Wetland
- Hydric Soil
- Streams

Source: Maine Office of GIS, Town of York
Maine Turnpike Southern Toll Plaza Replacement Study

Alternate Site ID and Screening Process

Location 8.8
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Alternate Site ID and Screening Process

Location 9.9
Maine Turnpike Southern Toll Plaza Replacement Study

Alternate Site ID and Screening Process

Location 11.3
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Alternate Site ID and Screening Process

Location 13.2

Legend
- Approximate Toll plaza Footprint
- Inland Waterfowl & Wading Bird Habitat
- FEMA Special Flood Hazard Area
- NWM Certified Wetland
- Hydric Soil
- Stream

Source: Maine Office of GIS, Town of York
Maine Turnpike Southern Toll Plaza Replacement Study

Alternate Site ID and Screening Process

Location 15.8
Maine Turnpike Southern Toll Plaza Replacement Study

Alternate Site ID and Screening Process

Location 16.5

Legend:
- Approximate Toll Plaza Footprint
- Inland Waterfowl & Wading Bird Habitat
- FEMA Special Flood Hazard Area
- NVI Certified Wetland
- Hydric Soil
- Streams

Source: Maine Office of GIS, Town of Wells
### Maine Turnpike Southern Toll Plaza Replacement Study

**Table:** Engineering Criteria vs Natural Resource & Built Environment Impacts

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<th>Location/Evaluation Parameter</th>
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<td><strong>Separation from Interchange (&gt;1 mile)</strong></td>
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<td><strong>Separation from Overhead Structure (&gt;2000 feet)</strong></td>
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<td><strong>Sight Distance</strong></td>
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<td><strong>Potential Right-of-Way Impacts (Acres)</strong></td>
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<td><strong>Potential Home Displacements (Homes)</strong></td>
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### Footnotes:

1. Location would change tolling structure (plaza south of exit 7). New weight station required to replace displaced weight station. Additional environmental impacts for new weight station likely but not estimated here.
2. Vertical grade excessive at toll plaza.
3. Taking of any homes is considered a “high-range of impacts.”
4. Barrier separated ramps to accommodate an interchange would require additional environmental and social impacts. Additional impacts not estimated here.

### Legend:

- **Low-Range of Impacts:**
  - High Range: 17.4 - 29.8
  - Medium Range: 9.9 - 19.8
  - Low Range: 4.9 - 0.9

- **High-Range of Impacts:**
  - High Range: 15.3 - 22.5
  - Medium Range: 7.5 - 14.3
  - Low Range: 2.8 - 0.9
Maine Turnpike Southern Toll Plaza Replacement Study

Example of Location Not Advanced

Alternate Site ID and Screening Process

Level 2

LOCATION 5.4

Legend
- Inland Waterfowl & Wading Bird Habitat
- FEMA Special Flood Hazard Area
- NWI Certified Wetland
- Hydric Soil

Source: Maine Office of GIS; Town of York

Maine Turnpike Authority
Southern Toll Plaza Replacement Study
Location 5.4
Maine Turnpike Southern Toll Plaza Replacement Study

Level Two Screening Results

14 Alternate Locations NOT Advanced

- South of Chases Pond Road (Exit 7) – 2 (of 2) locations
- Chases Pond Rd to Mountain Rd – 5 (of 7) locations
- Mountain Road to Clay Hill Road – 2 (of 2) locations
- Clay Hill Road to N. Berwick Road – 1 (of 1) locations
- N. Berwick Rd to Capt Thomas Rd – 0 (of 0) locations
- Capt. Thomas Road to Tatnic Road – 0 (of 0) locations
- Tatnic Road to Littlefield Road – 3 (of 3) locations
- Littlefield Road to Wells Interchange – 1 (of 1) locations

Plus: One Existing Site Option NOT Advanced

- Existing Site – 1 (of 2) options
Maine Turnpike Southern Toll Plaza Replacement Study

Recommendations

• The following three locations, along with the no-build option, are proposed to be further evaluated and compared in Phase II of the Highway Methodology.
  – Advance No Build as required by Permit process
  – Advance Existing Site Option 4A
  – Advance Alternate Site MM8.7
  – Advance Alternate Site MM9.1
Maine Turnpike Southern Toll Plaza Replacement Study

Discussion

Questions & Answers

Thank-You!