

**MAINE TURNPIKE AUTHORITY
TASK/PROJECT ORDER #1**

**YORK TOLL PLAZA
PRELIMINARY ENGINEERING SERVICES**

August 27, 2014

A. General Description

This work is being performed for the Maine Turnpike Authority (MTA) by Jacobs Engineering Group, Inc. (JEG). The work will consist of engineering services related to alternatives evaluation and conceptual design for replacement of the York Toll.

B. Project:

The MTA is in the process of rehabilitation and/or reconstruction of various toll plazas along the Maine Turnpike. The services include toll plaza replacements or toll plaza rehabilitations and conversions from conventional mixed use lanes (cash and electronic toll collection (ETC) to open road tolling (ORT) type facilities.

The keystone project for the MTA is the relocation of the York Toll Plaza. The existing York Plaza suffers from a number of operational issues as well as infrastructure deficiencies. The MTA has previously commissioned several firms to study initial alternatives including the retention of the existing site as well as a series of new locations resulting in three potential alternatives. With these previous studies in mind the next step in moving forward with the replacement of the York Toll Plaza will be to leverage these previous studies while applying a fresh look and analysis to qualify and quantify the viability of each alternative. The results of the efforts under this task will serve as a mechanism in which the MTA can make a sound, informed and comprehensive decision on the York Toll Plaza rehabilitation or replacement.

The scope under this task will include conceptual design, construction phasing, cost estimate analysis for the existing site. In addition a review of the alternatives previously identified in prior reports. The previously identified alternatives include:

1. **Existing Site** – Rehabilitation and Replacement with a new ORT Facility at mile marker 7.3.
2. **New Site**– Relocation and Replacement with a new ORT facility at a new location. This includes removal of existing toll plaza and replaced with six (6) lane interstate.
3. **Split Level** – Replacement of a new split level ORT facility. This includes removal of existing toll plaza and replaced with six (6) lane interstate. This includes 2 to 3 locations in both the northbound and southbound directions.

C. Scope of Work:

The efforts under this Scope of Work will be executed and carried out in a phased approach. It is anticipated that this Scope of Work will be completed in 4 separate phases comprised of:

- Phase I – Project Management and Meetings
- Phase II – Field Investigation/Inventory and Environment Assessments
- Phase III – Planning and Engineering
- Phase IV – Alternative Evaluation Analysis

PHASE I - PROJECT MANAGEMENT AND MEETINGS

1. Project Management and Coordination - Jacobs will assist with project team coordination, schedule preparation and maintenance, monthly billing and status reports, overall project management, and QA/QC.
2. Meetings/Workshops - the following meetings and workshops are anticipated, including preparation and attendance for each:
 - a. Bi-Weekly progress/status meetings with MTA management as needed during the project. (Webex, conference calls).
 - b. Monthly on-site Status Meetings with MTA management. Exact time date TBD upon NTP.
 - c. Two workshops with MTA to discuss the evaluation of alternative and the 10% design.

PHASE II – FIELD INVESTIGATIONS AND ENVIRONMENT ASSESSMENTS

1. Project Initiation and Data Compilation. Collect and assemble base mapping (aerial and as-built), including ROW information and currently available natural resource data from the existing York Toll Plaza site (MM 7.3) to the Wells exit (MM 19.0). Review traffic assumptions from previous reports to obtain peak hour volumes based on the 30th highest hour traffic flows, processing rates and growth assumptions.
2. Field Survey Natural Resources. Perform field wetland and stream delineations from selected sites south of MM 19.0. The mapping is based upon a corridor width that extends 150 feet beyond the existing limit of improvements on each side of the Turnpike.

Due to the extensive size of the area to be evaluated, it will be important to identify and eliminate areas early on that are not conducive to development due to existing development, high value published mapping and physical constraints. Once this is completed in coordination with the MTA, we may be able to reduce the number of field days. It will be important that we start the field work by mid-September and complete the work in October while vegetation can be identified. We will photo log the wetlands and locate flagging with GPS units so that it can be incorporated into base mapping. Also, please note that it will not be possible to field map vernal pools as vernal pools can only be mapped during the early spring breeding season. We will need to rely on observed physical conditions and published resources. The following spring will require a supplemental field investigation for the preferred development areas. At that time, we will prepare a supplemental scope of work and budget.

3. Complete a file review of provided MTA documentation.

- a. Review existing published information to assess potential floodplain, historic and threatened and endangered species impacts within the study area.
4. Prepare and submit resource inventory letters to the Maine Natural Heritage Project, IF&W and Maine Historic Preservation office. The intent of contacting these agencies is to identify potential resources concerns that may exist in the project area.

During our environmental work, investigations, project research and agency coordination it may become necessary to undertake wildlife studies to assess potential project impacts. Until the initial environmental work is completed, it is not possible to determine the need or extent of any wildlife or habitat studies.

5. Subsurface Investigation - The proposed subsurface investigation includes two borings at the existing York Plaza: one boring will be performed on each side of the toll plaza. The borings will penetrate through the existing pavement, fill and clay layers and be finished in the glacial till or on bedrock refusal. Based on the existing boring information, the expected depth to till or bedrock could range between 70 to 85 feet. Standard Penetration Tests (SPT) will be performed and soil samples will be collected at 5-foot depth intervals. Two undisturbed tube samples will be collected and two consolidation tests will be performed on the undisturbed clay samples to assess consolidation properties and maximum past pressures.

PHASE III – PLANNING AND ENGINEERING

1. Review Existing Data and Reports – Reviewing existing documents of the York Toll Plaza.
2. Traffic Analysis –
 - Develop Design hour volumes (DHV's)
 - Develop Traffic Projections (Utilize previous growth assumptions provided in HNTB's latest report for EZ-Pass and Cash lanes)
 - Verify Processing Rates for cash-paying customers, and E-Z pass vehicles utilized by HNTB
 - Perform Initial Plaza Sizing and Configuration
 - Test Via Simulation
3. Typical Sections - Prepare representative typical sections for toll plaza roadways. Label the location of roadway crown line, ORT lanes, cash booth lanes, guardrail location, and pavement structure and material types.
4. Horizontal Geometry - Develop horizontal geometry based on the proposed cross section, horizontal clearances, the proposed design speed and functional classification.
5. Vertical Geometry – Develop vertical geometry based on the proposed design speed with consideration to drainage, clearances, construction costs and correlation with the proposed horizontal geometry.
6. Tolling:
 - Lane Capacity Analysis – Perform lane throughput evaluations to determine potential lane quantity, processing needs and plaza configuration(s). Will also focus lane operational modes and possible efficiencies in operations, changes in lane systems to increase throughput.

- Lane Dimension Evaluation – Assess dimensional requirements for travel lanes, islands and booth structures. Taking into consideration possible expansion of ORT lanes as well as future reduction in conventional mixed use lanes. This effort will also evaluate recommended lane configurations based on lane types and or modes of operations.
 - Toll Operations – Evaluate any potential impacts to toll plaza and facility operations. This will take into account possible modification to staff (collector) staffing and schedule, increase/decreases in staffing, potential changes to operating procedures. Focus will also be placed on staff access to lanes and facilities under an ORT environment.
 - Qualitative Revenue Impacts - Where applicable evaluate the potential of any revenue impacts related to factors such as increased risk of violations, classification of vehicles or other potential forms of loss or leakage.
7. Geotechnical:
- The proposed borings are right at the existing toll plaza location and cover the entire length of the toll booth.
 - Better defined compressible soil depth and thickness by sampling every 5 feet and better defined soil consolidation parameters from additional lab testing.
 - Prepare boring logs and review soil lab test data and prepare a preliminary report summarizing subsurface conditions at the existing toll plaza.
 - Provide an estimate of future settlement and potential impacts, as well as ways to mitigate settlement impacts.
 - The geotechnical data obtained will help to refine the Conceptual Engineer's Estimate.
8. Conceptual Plans – Prepared conceptual plans.
9. Constructability – Develop a plan of the new ORT facility while maintaining the existing toll plaza facility. The plan shall minimize unusual features that would either unduly increase the cost the project or present potential schedule delays or claims for extra work during construction. Particular attention must be given to the proposed construction staging, demolition of existing plaza, traffic management and available right of way.
10. Quality Control (QC) Review - Perform an in depth review of the quality of the documents to ensure that all aspects of the information to be presented to MTA are prepared consistent with the Authority's Standards.

PHASE IV - ALTERNATIVE EVALUATION ANALYSIS –
(To Be Completed at Same Time as 10% Design of Existing Plaza)

1. The existing reports will be thoroughly reviewed relative to alternative sites. A recommendation will be made relative to which alternative sites should be evaluated further if the existing site is not utilized. A technical memorandum will be prepared summarizing our detailed review and recommendations on alternatives sites that should be further evaluated if the existing site is not utilized A screening matrix that describes the advantages or disadvantages of each alternative based on the criteria identified above.

D. Deliverables

JEG will provide the following at the 10% design submittal for the existing site at MM 7.3:

Draft Conceptual (10%) Plans (.pdf format)
Final Conceptual (10%) Plans (.pdf format)
Conceptual Engineer's Estimate (.xlsx and .pdf format)

An Alternatives Comparison and Evaluation Matrix (.xlsx and .pdf format) will be submitted for the review the previously identified alternative sites and a recommendation made on which sites should be considered for further evaluation if the existing site is not utilized.

E. Schedule

The anticipated schedule is as follows:

Signed Task/Project Order	August 28, 2014
Phase I – Project Management	On-Going
Phase II – Field & Site Assessments	
Field Investigation	September 5, 2014
Environmental	September 12, 2014
Phase III – Planning & Engineering	
10% Design (Draft)	September 29, 2014
Workshop	October 7, 2014
10% Design (Final)	November 3, 2014
Conceptual Engineers Estimate	November 3, 2013
Phase IV – Alternative Evaluation Analysis	
Alternative Analysis (Draft)	November 7, 2014
Workshop	November 18, 2014
Alternative Analysis (Final)	December 5, 2014
Board Meeting	December 18, 2014
Completion	December 30, 2014

F. Compensation

JEG's estimated fee for the above described services is \$293,340. Direct expenses (e.g. mileage, printing costs, and sub-consultant expenses) will be billed to the MTA at multiplier of 1.0.

G. Key Personnel

Staff anticipated to be assigned to this project as follows:

Principal in Charge	Mike Desrochers, PE, LEED AP
Project Manager	Rod Emery, PE. PTOE
Technical Advisor	Richard Gobeille, PE
Environmental Lead	Lars Carlson, PhD, PWS
Toll Systems/Program Lead	Jay Johns
Communications/Security	Chris Costello
Civil/Structural Lead	Thom Morin, PE
Highway Engineer	Clinton Mercer, PE
Traffic Engineer	Bob Stathopoulos, PE
Structural	Greg Stefano, PE

Geotechnical
Permitting/Survey
Quality Control

Da Ha, PhD, PE
Owen McCullugh, PE, LEED AP
Steve Berkley, PE

Other JEG staff will be assigned as appropriate.

H. Assumptions

This scope of work has been developed based on the following assumptions:

1. Material will be provided by MTA. This includes but not limited to:
 - a. Reports
 - b. Existing Mapping (.dgn format)
 - c. Proposed Design (.dgn format)
 - d. Traffic data and analysis
2. The latest GIS Data will be downloaded from Maine Office of GIS (MEGIS) website.
3. Existing traffic data will be provided by MTA.
4. MTA will provide access from the turnpike for our wetlands scientist to park along the roadway shoulder and/or MTA staff for any necessary escort requirements for performing wetland delineation field work.
5. Existing geotechnical information will be provided by MTA.
6. One truck mounted drill rig will be utilized on site for the exploration. Field boring work will be inspected and logged by a Jacobs Inspector.
7. MTA will allow lane closures for the subsurface investigation work. MTA will provide traffic control.
8. Subsurface investigation work will be performed during normal weekday hours (7 am to 3 pm).
9. The existing vehicle classification system, utilizing the eight existing categories will be retained.
10. The existing Transcore Infinity System and IVIS Loops will be used for the vehicle classification system.
11. The attached workhour and fee summary assumes wetland mapping will be included in selected sites south of MM 19.0.