



**REGION 2
UNIVERSITY TRANSPORTATION RESEARCH CENTER
RFP COVER SHEET**

Title: Evaluation of the New York Best Practice Model

RFP Number: Z-11-03

Contract No. C030561

Sponsor: NYMTC

Date Issued: June 20, 2011

Final Proposal Due at UTRC: **July 27, 2011** (submit through the UTRC Online Submission System at www.utrc2.org)

RFP Closing Date: July 27, 2011

If you plan to apply:

Please contact Penny Eickemeyer at peickemeyer@utrc2.org (cc: ckamga@utrc2.org) to let us know you are assembling a proposal. We will make sure you receive any additional information that becomes available about this RFP.

Proposal submission guidelines:

Please submit your proposal electronically to UTRC at www.utrc2.org. All proposals must include the UTRC cover page (<http://www.utrc2.org/research/assets/Technical-CoverSheet.doc>)

We will confirm that the proposals make comparable budget assumptions and will deliver the electronic proposals to the sponsoring agency by the closing date.

Funding available:

Up to \$50,000 is available from NYMTC. Facilities and Administrative Costs (or Indirect Costs) charged by academic institutions are included in the above amount.

Budget forms can be downloaded at <http://www.utrc2.org/research/assets/budget-Template.xls>

For questions about this RFP, please contact:

Ali Mohseni, (212) 383-7215, amohseni@dot.state.ny.us

cc: Ismet Apdiroglu, iapdiroglu@dot.state.ny.us

For questions about budget preparation, please contact: Camille Kamga, ckamga@utrc2.org

REQUEST FOR PROPOSALS

Contract No. C030561

Proposal Number: Z-11-03

Evaluation of the New York Best Practice Model

New York Metropolitan Transportation Council (NYMTC) is soliciting proposals for evaluation of the New York Best Practice Model (NYBPM) by an independent expert. This RFP is open to universities that belong to the University Transportation Research Center consortium and other university consortia members.

I. INTRODUCTION

A. PURPOSE

The purpose of this study is to conduct a comprehensive evaluation of the NYBPM by independent experts who will review the structure of NYBPM. This includes the estimation process of the original model as well as its two rounds of calibration and validation process in the 2002 base update and the 2005 base update, which are being used for the Conformity Analysis and various projects throughout the New York region.

B. OBJECTIVE

The objective of this study is to have an independent expert's opinion on the development of the NYBPM and its updates and enhancements as a regional travel demand model. It is also to obtain an expert's evaluation of the NYBPM and a list of suggestions and comments for future enhancement and updates. The study also solicits independent expert opinion on the appropriateness of the application of the current NYBPM for different kinds of studies in the region.

C. BACKGROUND

The New York Metropolitan Transportation Council developed the 'Best Practice Model' (BPM) in early 2002. It was developed in response to the Federal Requirements of the Intermodal Surface Transportation Efficiency Act (ISTEA) and the Clean Air Act (CAA) of 1990. It was created to predict changes in future travel patterns in response to changes in demographic profiles and the characteristics of the transportation systems in the region. The focus was on defining the transportation needs of the New York metropolitan region and choosing the right transportation investments to meet those needs.

The development of the NYBPM has been of great interest to planners all over the country because of the size and complexity of the NYMTC region and because of the model's ability to study relationships between current transportation systems and how people in the region travel. The model may assist in understanding how people make their travel decisions, in predicting future travel patterns and evaluating the effectiveness of proposed transportation improvements. In addition, the model will provide decision makers and planners in the region with a valuable tool that could be used for long-range transportation planning and sub-area and corridor analysis.

Currently, the model is being used for regional conformity analysis. It has also been used for corridor studies in several other applications, during which, the need for substantial "re-tooling" of the model has arisen indicating that the model lacks the functionality to meet some of the initially identified needs and intended uses. Additional effort is required to make the

NYBPM more functional and useful to all potential users; to strengthen the understanding of its structure and capabilities; and to help improve future versions while developing accurate technical documentation and reliable and useful instructions for the end user. These insufficiencies create the need for this research project, which would provide critical improvements in transportation planning for the NYMTC region.

A flowchart of the NYBPM is shown below in Figure 1.

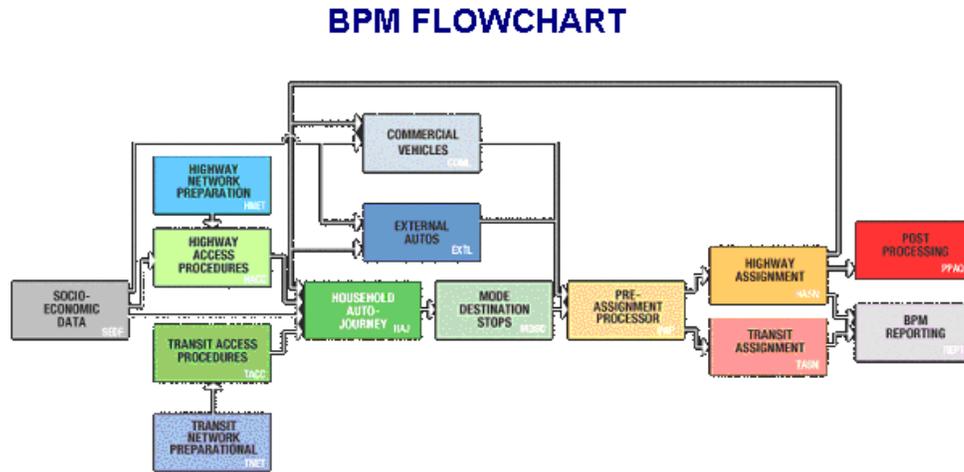


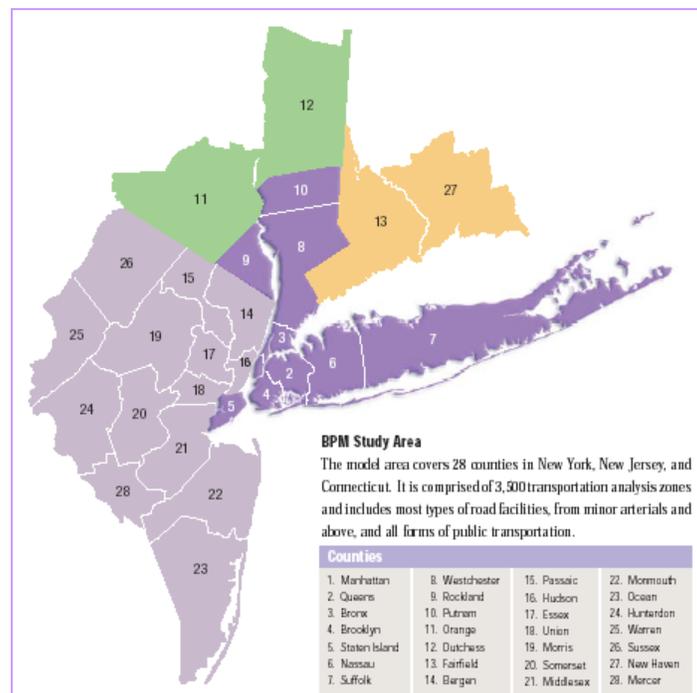
Figure 1: NYBPM Flowchart

Source: <http://www.nymtc.org/BPM>

The flowchart shows the basic structure of the model, including functions and their interconnections.

Study Area

The study area of the model included 28 counties in the tri-state area (New York, New Jersey and Connecticut) and consists of 3,586 transportation analysis zones. Figure 2 shows the region of the study.



Source: <http://www.nymtc.org/BPM/background/BPMnewsltr.pdf>

Figure 2: NYBPM Study Area

All types of road facilities, from minor arterials and above are represented in the highway network as well as all forms of public transportation, which are represented at the individual route level in the transit network database. The GIS based highway network contains 52,794 links, and the transit route system has 1,176 routes (comprising many different types of services such as commuter rail, express bus, local bus, subways, ferries, PATH, and aerial tramway). The extensive set of data was collected through a regional travel survey, conducted by NYMTC in conjunction with the New Jersey Transportation Planning Authority (NJTPA) over an 18-month period, in 1996 and 1997. The survey gathered responses from 27,369 people in 11,263 households in 31 counties, who kept diaries of all their daily travel and activities. The diaries provided information on percentage of trips made by car, bus, commuter rail, subway, foot and other modes. Revealing travel patterns by age, gender, purpose, time of day and other factors, the surveys provided a foundation for transportation decision making in the metropolitan region.

Model Development

The model was developed in two phases:

Phase 1: the Interim Analyses Model IAM was put in place in 1994 as a workable model with available data and trip tables synthesized from the trip tables of the various existing models in the region.

Phase 2: A household interview survey was conducted in 1996-1997 in the region, along with speed, traffic counts, and cordon count data collection. These data were processed and the New York Best Practice Model (NYBPM) was put in place in early 2002.

Later in 2003 the NYBPM base was updated from 1996 to 2002 and the model was recalibrated and validated. Recently the Base was updated for the second time--the new base represents the

year 2005. The 2005 base was updated with some improvements to the structure of the model and improvements to its functionality.

The NYBPM is a very complex model that attempts to predict the detailed travel patterns of a diverse population using numerous travel modes. It does this by introducing some innovative approaches to traditional travel demand models, such as:

- Unit of travel is journey rather than trip
- A micro-simulation framework is used to track journeys of each individual in the study area from journey generation to the model destination choice
- Stop frequency and stop locations are modeled
- Non motorized mode is analyzed as a separate mode
- Multi-modal assignment is conducted.

Highlights of the Model

Including some of the above-mentioned innovations, the following are some highlights of the NYBPM.

Journey Based Approach

The NYBPM uses the concept of *journeys* rather than the more traditional ‘trips’. A journey, defined as travel between principal locations, identifies anchor points in an individual’s travel pattern, such as home, work or school. The traditional trip, home to work, for example, would identify the point of origin and destination, without including details specific to the individual activity.

Mode Destination Stop Choice (MDSC) Model

Following the journey based approach described above, this model replaces the traditional trip distribution and mode choice model. Based on personal and household characteristics, along with land-use densities around the journey origin, this model predicts which modes of travel each person chooses, where the person goes and if the person stops along the way on the journey. If a person does make a stop on his/her way to work or school or university, this model will predict the location of the stop.

Micro-simulation Method

Where traditional models use an average rate of travel, the BPM uses a *micro simulation method* to simulate the travel pattern of each person in the region. This provides a closer level of detail which, combined with the model’s use of the journey, increases the accuracy and usefulness of analyses.

GIS Mapping

The highway and transit components of the BPM are based on a Geographical Information System (GIS) to provide a more realistic representation of the highway and transit route systems.

The Highway Network

The BPM highway network contains a little less than 53,000 links including most minor arterials. The database includes information on the number of lanes, functional class, speed, parking restriction, truck-usage and traffic flow for each link.

The Transit Network

The transit network in the NYBPM is a very complex network and is based on information provided by the Metropolitan Transportation Authority, New Jersey Transit and other transit operators in the region. The network has 100 New York City subway routes and services, 900 commuter rail routes and services, 2300 bus routes and 50 ferry routes, as well as the sidewalk network in Manhattan. In addition, the transit network components include station-to-station transfer databases, walk/drive links for rail and other transit connectivity, route coding and fare coding.

Household, Auto-Ownership and Journey-Frequency (HAJ) Model

The Household, Auto-Ownership and Journey-Frequency (HAJ) Model in the NYBPM replaces the traditional trip generation model. It estimates the total number of households by income, size, number of children, number of workers and number of autos, and then determines the number of journeys that will be produced for each subgroup over a 24- hour period. This information is very helpful in understanding how variables such as income, number of children and number of workers or autos in a household influence trip making decisions.

In summary, the following are some key features of the NYBPM that could be listed as advantages over most of the traditional methods:

- It is GIS based and thus easy to use and understand
- It uses Journey over traditional Trip
- Uses Micro-simulation, which analyzes each household and each journey
- It separates walk (non-motorized) trips
- Travel Interaction modeling is good, based on auto availability, family interaction and time of the trip

Summary of Future Improvements

Short Term

- Assignment results by purpose, in addition to the results by mode.
- Ability to run the MDSC by individual purpose
- Additional highway and transit calibration.
- Smaller mode specific constants.
- Ability to calibrate the model at a finer level (district level).
- Development of scenario/file management system for both highway and transit coding.
- Review of FTA forecasting guidelines to improve consistency and compatibility of the BPM with FTA New Starts Program.
- Improvement in transit accessibility index.
- Ability to add more zones (cooperative issue with PANYNJ).

Long Term (Development of NYBPM 2.0)

- Farther reaching goals for updates to the BPM include:
- Re-estimation of the models based on new Household Travel Survey.
- Development of a TOD model.

- Development of a visitors model.
- Development of special model for special generators.
- Destination choice improvement for long (intercity) trips, better representation of non-work journeys.
- Network conflation and improvements, better alignment of mode and path building parameters, calibration/modification of stop-location model to eliminate illogical paths, treatment of “premium modes” (for commuter rail, other rail, express bus, ferries),
- Addressing distance factors for commuter rail and express commuter bus, re-structuring the mode choice model for transit, and more explicit sub-modes.

Data Collection Plan for NYBPM 2.0

Data collection for the NYBPM 2.0 will bring in new information on socio-economics and demographics (SED) and other primary data sources for model calibration and validation.

- SED Data Collection and update
- Travel Time Survey
- NYBPM and GIS Network Conflation and Highway Network Attributes update
- Regional Establishment Survey.
- Regional Taxi Survey.
- Regional Cordon OD Survey/River Crossing OD Survey.
- BUS OD Survey.
- Regional Traffic Counts.

D. LEVEL OF EFFORT

It is expected that the evaluation of the NYBPM be a comprehensive process including the examination of its structure and all of its assumptions.

The estimated budget range for this study is **\$50,000**. This encompasses all expenses related to this research and evaluation, including expenditures for program management, administrative overhead and other miscellaneous expenses.

The schedule should encompass a six month period, which will begin within 10 days of execution.

E. PROJECT SCHEDULE

A. Consultant Selection Schedule

Receipt of proposals
 Consultant interviews
 Consultant selected & notified

Refine scope of work for contract
Sign contract with NYMTC

B. Task Schedule and Deliverables

Task 1:Administrative Structure
Task 2:Development of Evaluation Plan
Task 3:NYBPM Evaluation
Task 4:Future Directions

II. SCOPE OF SERVICES

NYMTC's Responsibilities:

A Project Manager will be designated by NYMTC to work with the selected Consultant. The NYMTC representative will be available to answer questions, provide overall management and secure relevant information readily available from NYSDOT/NYMTC. The Consultant, however, should not consider this individual as a staffing resource.

Consultant Responsibilities:

Under this study the Independent Expert will review the structure of the NYBPM, its estimation process, all coefficients and constants, parameters, input data including Socio-Economic and Demographic (SED) and Household Travel Survey (HTS) and other data or traffic counts used for the validation process. The selected consultant will also review the 2002 base update and re-calibration report and the 2005 base update report and evaluate the changes and improvements to the model and the functionality of the NYBPM in travel pattern prediction in the region. The Expert will also review all the assumptions that went into the calibration process and evaluate the output to verify the reasonability.

TASK 1 Project Administration and coordination

This task will encompass key activities associated with the development of the initial evaluation plan. These include continuous updates of the evaluation plan based upon evaluation progress, a kickoff meeting, and monthly coordination and progress meetings between the consultant and NYMTC to review the evaluation progress and to address technical questions and issues as they may arise.

Deliverables:

Coordination and participation at periodic meetings. Preparation of meetings agenda and meeting minutes.

TASK 2 Development of the Evaluation Plan

The Consultant shall develop an evaluation plan detailing the proposed technical approach. This plan will serve as guidance for the entire project. It should first define the role of the NYBPM as a regional model in NYMTC's transportation planning process. The plan should also indicate the focus areas for the evaluation, including but not limited to:

1. The overall structure of the NYBPM system as well as the model specification of each individual module, including a population synthesizer, journey generation, mode and destination choice, time-of-day, truck and external model, and assignment;

2. The assumptions employed by the model, such as the Socio-Economic Demographic data, the study area, the zone system and external stations, the highway and transit system representation, etc;
3. The estimation, calibration, and validation process for the original model as well as for the two recent model update efforts;
4. The data sources for the estimation, calibration and validation of the model, as well as for the operation of the model.

In light of the current practices in other regions, the Consultant shall develop a set of evaluation criteria for the above focus areas, such as complexity, coverage, reliability, reasonability, etc. The Consultant shall propose other focus areas it deems necessary.

The evaluation plan shall be reviewed and approved by NYMTC staff before the following tasks begins.

Deliverables:

A detailed technical memo indicating the technical approach, the focus area and the evaluation criteria.

TASK 3 NYBPM Evaluation

This task refers to the evaluation process based on the evaluation plan defined in the previous task. The Consultant shall evaluate the NYBPM from all aspects identified in the previous task and will develop a report on the performance of the NYBPM in meeting the criteria defined for each aspect of the model system. NYMTC staff will provide relevant documentation to the Consultant. The Consultant can also refer to the report recently completed regarding sensitivity of the NYBPM.

Based on various existing reviews of the modeling practices for MPOs in regions of comparable size and complexity, the Consultant shall summarize the strengths and the areas for potential further enhancement in the NYBPM.

Following the evaluation, the Consultant shall specify the suitability of using the NYBPM to gauge the impacts of projects at different scales. Various studies have utilized the NYBPM either directly (usually involving projects with regional significance) or as a foundation for detailed local analysis, which uses the NYBPM outputs as a starting point.

Deliverables:

A detailed technical memo indicating (1) the evaluation process and the findings, summarizing the current practice in the nation in comparison with NYBPM, and (2) the strengths and areas for enhancements of the NYBPM, including a summary of the types of projects/studies that can use NYBPM directly and indirectly.

TASK 4 Future Directions and Final Report

Taking into account the emerging needs for analysis of climate change and livability, the Consultant shall recommend potential enhancements to the NYBPM, so that it will be able to have the modeling capabilities to respond to new policies and strategies in travel demand management, congestion mitigation, urban growth and land development, environmental

concerns, etc. The recommendations shall be structured for both short- and long-term applicability in light of the involved efforts and resources.

Deliverables:

A detailed draft and final technical memos indicating recommendations for the NYBPM enhancements in both short- and long-term framework.

Draft and Final written reports containing all tasks including the evaluation process and criteria, the performance of the model, the suitability of using the NYBPM for projects at various scales, the strength of the model and suggested the area of future improvements and developments.

III. PROPOSAL FORMAT AND CONTENTS

Respondents are requested to submit their proposal electronically using the following format: There is no limitation on the number of pages permitted, but concise proposals are requested. Proposals should be as detailed as necessary to explain their approach to the project and the technical methods to be implemented.

For the purpose of evaluation, each proposal must be submitted in two (2) parts. Part I shall be comprised of the Evaluation of the New York Best Practice Model. Part II is the Cost and Contract Submittal. Each part of the proposal must be complete in itself in order that the evaluation of both parts can be accomplished independently and concurrently. Cost information

is not to be included in the Evaluation of the New York Best Practice Model Submittal. Each proposal should follow the format listed below:

A. Part I: Evaluation of the New York Best Practice Model Submittal

1. Title Page, indicating:

Name, address and phone number of the proposer, including a contact person and the name of the person(s) who prepared the proposal.

2. Table of Contents

3. Executive Summary

Provide a brief description of your approach and highlight how your team's accomplishments and experiences will help the Council achieve its objectives.

4. Approach and Scope of Services

Describe your approach to accomplish the project objectives life cycle. Provide a detailed scope of work which describes what will be done and addresses NYBPM evaluation objectives. The proposal should reflect understanding and comprehension of project scope and objectives. You may base the tasks in your scope of services on the outline provided under Section II., or suggest alternatives/modifications to the task structure which could improve the evaluation process.

NYMTC intends to allow maximum flexibility for the ideas, initiative, and creativity of the proposer. Alternative tasks and suggestions are encouraged and will be reviewed with interest within the framework of the stated objectives and scope of the project. Fully explain and justify your approach.

5. Evaluation Approach and Methodology

Describe the proposed approach and how this approach will aid in attainment of the proposed objectives.

6. Experience

Describe the experience of your organization and the proposed accomplishments related to the air quality research studies. Prior air quality software development experience of the proposer is of great importance to NYMTC. Research experience in air quality study is highly desirable. Include information about the team credentials in this type, size, and scope of project. Supplement with a list of key staff and their assignments who have worked on such projects.

7. Organization, Staffing and Schedule

Identify the assignee who will serve as project manager as well as the names and titles of all key workforces who will be assigned to work on this project (including any sub-consultants). Provide the estimated amount of time required for each task and describe the level of involvement. Describe the level of interaction contemplated with NYMTC. In case of a cross assignment within the university consortium, explain the arrangement, and detail how the coordination will be achieved between the parties.

It is expected that all the work will be accomplished within 6 months. Consultant will propose the milestones and time duration for each task separately and supplement this schedule with charts (e.g. Gantt chart).

It is recommended that this section will include graphic or tabular illustration of the projected schedule for all planned activities. This information should be sufficiently detailed to provide an appropriate basis for monitoring contract compliance during the life of the agreement, and should clearly demonstrate how the program will be delivered within the proposed schedule.

B. Part II: Cost and Contract Submittal

Part II of the proposal should describe a cost proposal which sets forth the estimated costs, fee, and total lump sum price for research studies, software development and implementation.

IV. PROPOSAL EVALUATION CRITERIA

A. GENERAL

Proposals will be evaluated by the designated selection committee based on the technical, management, programmatic, and cost criteria described below. Technical considerations are of greater importance than pricing considerations. However, price is a significant factor in NYMTC's evaluation of proposals. Programmatic considerations will impact NYMTC's final award selections.

Technical proposals will be scored based on the information provided under Section IV, Part I: Evaluation of the New York Best Practice Model Submittal in accordance with the pre-established criteria listed in Section B below.

The cost portion of Section IV, Part II: Cost and Contract Submittal will be point scored in accordance with the pre-established criteria listed in Section C below. Programmatic considerations will not be point scored; however, they may impact NYMTC's final award selection.

Proposal evaluation shall be accomplished by a representative committee comprised, as appropriate, of technical, program, and management personnel.

Award shall be made to the offeror whose proposal in NYMTC's judgment represents the best overall value to the state considering all technical and cost/price evaluation factors.

At the conclusion of the evaluation period, all proposers will be advised in writing of their status under the solicitation. However, it is expressly understood that this Request for Proposals does not commit NYMTC/NYS DOT to award a contract, pay any costs incurred in the preparation of a proposal to this request, or to procure or contract services or supplies. Further, NYMTC/NYS DOT will have no obligation or liability whatsoever to the vendor selected as a result of this solicitation unless and until a contract satisfactory to NYMTC/NYS DOT is executed. Non-selected proposers have 10 days from sending the written notification to request a debriefing.

B. TECHNICAL CONSIDERATIONS

The technical portion of proposal will be scored and will represent 80% of total score of a proposal.

1. Experience and Credentials

- a. Quality, extent and relevance of experience of key personnel to be assigned to each task
 - b. Quality, extent and relevance of current and prior experience of the team (including subconsultants) in conducting similar project efforts.
2. Methodology and Approach
Evaluation methodology and approach and how this approach will aid in attainment of the proposed objectives.
 3. Tasks accomplishment and schedule
This subsection should emphasize on timely accomplishment of milestones and quality of attained goals.

C. COST AND CONTRACT (20%)

The cost portion of the cost payable by NYMTC and contract proposal will be point scored and will represent 20% of the total score for a proposal. The calculation of a cost score will be determined by comparing the cost proposed for each competitive proposal to the lowest priced, technically acceptable proposal.

Proposals should indicate direct and indirect costs, hourly rates and hours by task and by person (with rates), travel costs, and material costs to assist NYMTC in understanding how the total cost for the work was estimated. Participation by other, contributing research entities should be incorporated into these tables but separately distinguished on each. The winning proposal will result in a fixed cost contract based on details provided.

FUNDING

\$50,000 has been budgeted for this project. NYMTC believes this is a reasonable estimate for the total cost of the work being requested.

Proposals with a NYMTC cost over the budgeted amount will also be considered, provided the NYMTC cost does not exceed the budget estimate by more than 10%. Proposed costs are not to be exceeded, fixed price offers.

SPECIAL NOTES

- Principal investigators should be familiar with and follow the requirements of New York State (the Compliance Procurement Lobbying Law of 2005) with regard to consultant contract procurement. Information can be found on the NYSDOT web site (www.NYS DOT.gov) under “Business Center,” then “Consultants,” then “Non-Architectural Engineering,” then “Active Solicitations.”

In particular, please note that communications between Contractors, Consultants/Principal Investigators, and Vendors with the Department are restricted during the period of time when services for more than \$15,000 have been requested (Request for Proposals issued), up until the time when the Consultant is selected. During this time communications, where a reasonable person would infer that the communication was intended to influence the procurement, should be limited to Department staff identified in the solicitation as “designated contacts.” Any communication with an employee, who is not a designated contact which is intended to influence the solicitation, could result in the outside party being prohibited from competing for

the solicitation. A second violation will ban the Consultant/Principal Investigator from competing for any Department solicitation for four years.

The designated contacts for this solicitation are:

Ali Mohseni, 212-383-7215, mail to: amohseni@dot.state.ny.us

Copy: Ismet Apdiroglu, iapdiroglu@dot.state.ny.us

- Proposals must be received by July 27, 2011. NYMTC has a contract in place with the University Transportation Research Center, and this Request for Proposals is being offered to the universities affiliated with the consortia. Members should submit proposals through the administrators of that consortium.