Status report on the consultant-assisted project for development of the COG/TPB travel demand model

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Mark S. Moran, COG/TPB staff

National Capital Region Transportation Planning Board (TPB)
Metropolitan Washington Council of Governments (COG)

Background

- Consultant-assistance project for model development is now in its tenth year

- Purpose
  - Assist COG/TPB staff in development and application of COG/TPB travel demand model
  - Perform scans of current modeling practice
  - Help ensure that COG/TPB travel model is consistent with state of the practice in the U.S.

Status of FY 15 task orders

	Description	Date Authorized	Amount
15.1	Attend relevant meetings and respond to ad-hoc requests	7/17/14	$35,000
15.2	Develop a strategic plan for models development	1/9/15	$88,000
15.3	Review of transit modeling w.r.t. FTA guidance	10/22/14	$28,000
	Total funds authorized (out of $200k)		$151,000

- Thus, one new task order authorized since last TFS meeting

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Task Order 15.3: Review of transit modeling w.r.t. FTA guidance

□ Status since last TFS meeting

□ No significant progress to report

Credit: Mark Moran

Task Order 15.2

Developing a strategic plan for COG/TPB models development

Background

- Last strategic plan for models development at COG
  - Occurred over 20 years ago (1993 by Parsons Brinckerhoff)
  - 7-year plan (FY 1993-1999)
- Intervening years
  - TRB review (2003-2004)
  - Consultant-assistance w/ model dev. (2005 to present)
  - TPB staff review of first six years of consultant recommendations from consultant-assist. project (2012)
  - But no formal strategic plan (until now)

Deliverables: 3 reports

- Two reports will provide input to the strategic plan
  - Potential shortcomings of the current travel demand model (Version 2.3.57) and opportunities for improvement
  - Status report on the use of activity-based models and dynamic traffic assignment at MPOs
- Third report will be the plan itself:
  - A strategic plan for the improvement of the TPB regional travel demand model

Report 1: Shortcomings of the current model & possible improvements

☐ Identify current actual and perceived issues

☐ Assemble preliminary solutions

☐ Focus areas

- Highway assignment
- Tolling, modeling HOV lanes/HOT lanes
- Transit modeling/assignment
- Non-motorized travel
- Transit path building

- Mode choice model
- Visitor/tourist travel
- Land use inputs
- Freight modeling
- Version control software, bug/issue-tracking software

Report 1: Shortcomings of the current model & possible improvements

- Preliminary activities
  - Review the previous model development plans from TPB and selected other MPOs
  - Review and consider the previous recommendations made by consultants over the past 10 years from the TPB contract for consultant assistance w/ models development
    - Includes TPB staff summary of first 6 years consultant recommendations (2012)
  - Review of best practice related to the topics listed above

Report 1: Shortcomings of the current model & possible improvements

□ Final notes

- A discussion of modeling issues and/or solicitation of stakeholder priorities should be made in cooperation with TPB staff

  - Example: WMATA letter dated 10/30/14 & COG response dated 12/3/14

- The resulting report will document findings as well as identify areas for further refinement or improvement
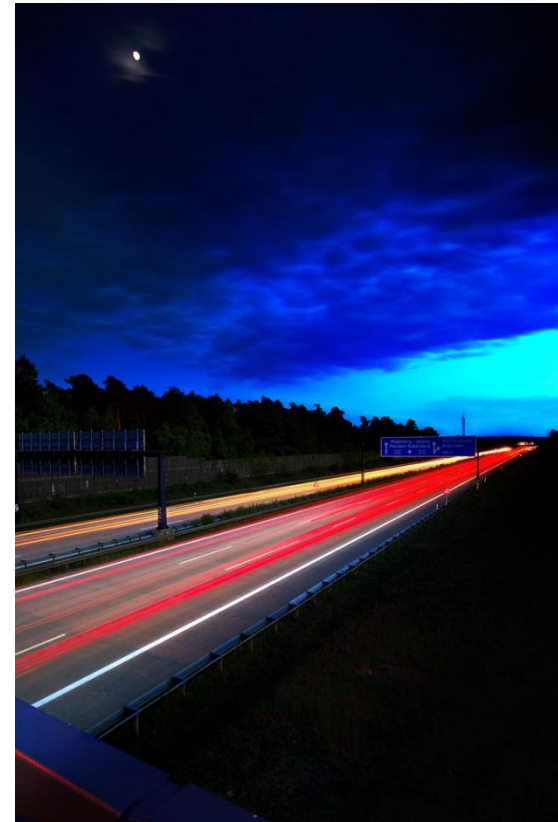
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Report 2: Status report on MPO use of ABMs & DTA

- CS will write a report that describes what other MPOs are doing in the area of implementing activity-based models (ABMs) and dynamic traffic assignment (DTA).

- Report will
  - Discuss which MPOs are actively using one or both of these two approaches
  - Indicate how long the MPO has been using the approach
  - Indicate whether the usage is part of the production travel model or whether it is in a developmental or testing stage

Report 2: Status report on MPO use of ABMs & DTA

- Report will
  - Discuss any MPOs that began developing ABM, but then abandoned its use or development
  - Explore the technical requirements (e.g., hardware, software, training) needed for these two approaches
  - Investigate why many MPOs that have moved to an ABM have continued to use static traffic assignment from their trip-based model
  - Investigate whether there are any examples of trip-based demand models paired with DTA.

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Report 2: Status report on MPO use of ABMs & DTA

- Report will
  - Include a survey of the 20 largest MPOs by population (TPB is #9)
    - Also include some smaller MPOs known for innovation, such as
      - SACOG, Sacramento (#22)
      - Portland Metro (#36)
      - MORPC, Columbus, OH (#37)

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Report 2: Status report on MPO use of ABMs & DTA

- Survey information to be included
  - MPO name and abbreviation (e.g., NCRTPB)
  - States in planning area
  - Major city
  - Planning area, sq. mi.
  - Population
  - Status of trip-based/four-step model
  - Status of tour-based/activity-based model
  - Status of DTA
  - Travel demand forecasting software used (e.g., Cube, TransCAD)
  - Land-use forecasting type (e.g., LU model or Delphi approach)
  - Resolution for land use forecasting (e.g., parcel, grid cell, TAZ, TAD)

Report 3: Strategic plan for models development

- Goal: To ensure that the TPB travel demand modeling process is, at least, state of the practice, and, possibly, state of the art, when compared with peer MPOs

- Inputs
  - Two previous reports (described earlier)
  - Prioritization of potential improvements so they can be phased over the seven-year planning horizon
  - Existing policy requirements (e.g., MAP 21 & FTA guidance) and TPB planning efforts (e.g., TPB Vision, Region Forward, and activity centers).

Subtask 3: Strategic plan for models development

□ Inputs

  □ Existing and planned uses of the TPB model, e.g., air quality conformity, CLRP evaluation, project planning, scenario analyses

  □ Stakeholder meetings

    ■ TPB staff, including senior management

    ■ Other users of the model

      ■ State DOTs

      ■ Local governments

      ■ Other users, such as consultants & WMATA

Subtask 3: Strategic plan for models development

- ☐ Schedule
  - ◘ Task order was authorized on 1/9/15
  - ◘ CS will develop a calendar-based working schedule for progress and collaboration
    - ■ Goal: To complete the effort over a five-month time period, by end of fiscal year (6/30/15)

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Carry-over work from FY 14: HOT-lane modeling

- Last fiscal year, AECOM sent COG/TPB staff a revised version of the regional model w/ new proposed procedures for modeling HOT lanes and performing toll setting

- COG/TPB staff continues to review & test the revised modeling scripts
  - We stitched together the Ver. 2.3.57 model with the AECOM-recommended enhancements and are testing the new model
  - We have reached out to Minnesota DOT for information about their HOT-lane modeling activities

Carry-over work from FY 14: Conversion to Public Transport (PT)

- No recent updates, since staff has been focusing on two other efforts:
  - Analysis of O/D data derived from mobile phones and other cellular devices (from AirSage)
  - Developing additional staff capacity to run models associated with estimating greenhouse gas emissions
    - e.g., Energy and Emissions Reduction Policy Analysis Tool (EERPAT)

Next steps

- ☐ Task Order 15.2: Strategic plan
    - ☐ CS will coordinate w/ COG/TPB staff to develop schedule for both project and stakeholder outreach
- ☐ COG/TPB staff & CS will determine best use of remaining project funds ($49k)
- ☐ COG/TPB staff will continue testing AECOM's proposed modeling enhancements (HOT lane & toll setting)

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Closing

- Acknowledgements
  - Jay Evans and Feng Liu, Cambridge Systematics, Inc., for their work on the consultant-assistance project
  - Dzung Ngo, COG/TPB staff, for his testing of AECOM's recommended model updates to improve HOT-lane modeling
- Questions?
  - Mark Moran (mmoran@mwcog.org)