Item #4

Consultant contract for assistance with development and application of the TPB travel demand model:

Status of current work activities

Presentation to the TPB Travel Forecasting Subcommittee
March 23, 2012

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

Background

- Objective of this multi-year project: To obtain consultant assistance with the development and application of the TPB travel demand model
- Since past work has included scans of modeling practice at other MPOs, the project is sometimes referred to as the "scan of best modeling practice" project
- Currently in year seven
- Current consultant (FY 2012): AECOM

Overview

- FY 2012 work activities
- TPB staff review of six years of consultant recommendations: Status report

FY 2012 work activities

FY 2012 task orders

Task Order	Description		Auth-orized	Budget
1	Attend meetings, provide written advice, and respond to ad-hoc requests from TPB staff on issues related to applying or developing the travel model		Aug. '11	$40k
4	Reducing model run times		Oct. '11	$20k
2	Improving mode choice modeling	Consultant recommendations	Oct. '11	$15k
3		Enhancements to LineSum transit summary program	Mar. '12	$25k
5		Begin migration to PT and misc. improvements	Mar. '12	$27k
6		External travel, airport passenger travel, visitor/tourist travel	Mar. '12	$23k
			Total	$150k

Task ord. 4: Reducing model run times

- As reported at the last TFS mtg.
  - AECOM sent TPB staff
    - A set of modified scripts and batch files that reduced run times by adding further "parallelization" to the TPB travel model
    - Draft documentation of changes
  - TPB staff implemented these changes to a test version of the TPB travel model.
  - TPB staff began testing and evaluating the suggested modifications

Task ord. 4: Reducing model run times

- Progress **since** the last TFS mtg. (Jan.)
  - TPB staff requested updated documentation from AECOM
  - AECOM sent revised documentation: Memo dated Feb. 27
  - TPB staff is reviewing memo and considering which changes to make to travel model
  - Percent of consultant budget spent: 100%

Task ord. 2: Improving mode choice modeling: Consultant recommendations

- As reported at the last TFS mtg.
  - On Dec. 1, AECOM transmitted a memo to TPB staff, dated Nov. 15
    - Memo highlighted some of the differences between mode choice modeling in Ver. 2.3 vs. recent AECOM work for WMATA using the 2.2 model
    - It also discussed some of the challenges with converting from TRNBUILD transit path builder to Public Transport (PT)
  - TPB staff sent AECOM a memo containing a series of questions and comments regarding the AECOM memo
  - AECOM staff e-mailed responses to many of the TPB staff questions and comments

Task ord. 2: Improving mode choice modeling: Consultant recommendations

- Progress **since** the last TFS mtg. (Jan.)
  - AECOM and TPB staff met on Feb. 1
  - TPB staff transmitted a memo, dated Feb. 29, to AECOM which proposed
    - To refrain from pushing for major updates to the mode choice model until AECOM's current work for WMATA is completed
    - A series of subtasks that TPB staff would like help accomplishing in the short term
  - AECOM bundled these subtasks into three task orders to be completed by the end of the fiscal year: Task Orders 3, 5, and 6 (described in the next few slides)
  - Percent of consultant budget spent: 100%

Task ord. 3: Improving mode choice modeling: Enhancements to LineSum

- Authorized March 7
- Originally intended to implement the recommendations of Task Order 2
- New direction for this task order, and others related to improving mode choice modeling, focuses on short-term improvements to mode choice modeling (TPB staff memo dated Feb. 29)
- Subtasks
  - Updates to the LineSum transit summary program
    - A more aggregated summary of boardings and alightings, by access mode, at Metrorail stations
    - Differentiating between walk-access to MR and bus-access to MR

Task ord. 3: Aggregated summary of boardings and alightings, by access mode, at Metrorail stations

Example of current access summary

Title: Station Access
Modes: 11-16

Stop	Mode	Node	Board	Alight
8001	11	507	12	0
	11	508	23	0
	11	509	89	0
	11	511	155	0
etc.	etc.	etc.	etc.	
	11	752	27	0
	12	22395	9533	2557
	15	11001	12208	0
	11	722	6	0
	11	741	7	0
	11	742	1	0
	11	746	4	0
	Total	51	23365	2557

Example of new option for more aggregated summary

Stop	Mode	Board	Alight
8001	11	1624	0
	12	9533	2557
	15	12208	0
	Total	23365	2557

Task ord. 3: Differentiating between walk-access to MR and bus-access to MR

- Changes to the network coding procedures at Metrorail stations are needed to make this change
- Given the short time frame, this subtask
  - does **not** propose to implement network changes at this time
  - does propose to
    - design the coding rules that will be needed to implement this change
    - Implement the software changes necessary to process the new information
- AECOM will also update the Fortran program to newer software standards and will improve the user interface
- Documentation: New user's guide and transit coding rules

Transition from TRNBUILD to PT

- Ver. 2.3 Travel Model currently uses TRNBUILD transit path building module
  - However, Citilabs is not planning to make any major updates to TRNBUILD and is encouraging its users to migrate to Cube Voyager Public Transport (PT).
- TRNBUILD is a single-path transit path builder.
- By contrast, PT is a multi-user-class, multi-path transit path builder, though it can be forced to operate in a single-path manner
- CS report (2011)
  - Listed a number of the benefits of switching to PT (p. 3-9)
  - Recommended that TPB make the transition to PT and found that "a step-by-step migration to PT seems to be the most reasonable path" (p. 3-18)
- AECOM also recommended the TPB switch to PT
- This became the genesis for Task Order 5 (next slide)

Task ord. 5: Begin migration to PT and misc. improvements

- Authorized March 13
- Subtasks
  - Upgrade ArcLineSum program to facilitate plotting and displaying transit line volumes
  - Begin conversion from TRNBUILD to Public Transport (PT)
    - Conversion of the primary transit files from TRNBUILD to PT format and associated testing
    - Design of coding techniques or software tools to compensate for any TRNBUILD/PT differences
    - Development of a work plan for the work needed next fiscal year to complete the TRNBUILD-to-PT conversion

Task ord. 6: External travel, airport passenger travel, visitor/tourist travel

- Subcontractor: Stump/Hausman (S/H) and Bill Allen
- Goal: To improve the handling of three types of **transit trips** in the regional travel model
  - External travel (XI/IX),
  - Ground access trips made by air passengers using the region's three commercial airports, and
  - Visitor/tourist travel
- S/H proposed narrowing of scope
  - Instead of all transit trips, focus is on **Metrorail trips** in these three markets
- S/H has proposed two phases
  - Phase 1: FY 2012 (about three months remaining)
  - Phase 2: 2013

Task ord. 6: External travel, airport passenger travel, visitor/tourist travel

- Phase 1 was authorized on March 16
- Subtasks
  - Air passenger travel to the region's three commercial airports
    - Adapt an air passenger model, developed in the 1990s by Parsons Brinckerhoff and Cambridge Systematics (PB/CS), to MWCOG data, making minimal adjustments so that the model replicates Metrorail trips for a base year.
  - External Metrorail travel
    - Use a recent Metrorail passenger survey to assess the amount of external travel on Metrorail. Based on this finding, develop one or more models to represent this travel market.
  - Visitor travel on Metrorail
    - Adjust ("Fratar") an observed Metrorail station-to-station visitor trip table, to be developed from available Metrorail on-board surveys.

Task ord. 6: External travel, airport passenger travel, visitor/tourist travel

- Phase 2 (FY 2013) proposes to further develop the three models developed in Phase 1
- The scope of work for Phase 2 will be re-evaluated and adjusted based on discussions with MWCOG and the findings of Phase 1

TPB staff review of six years of consultant recommendations

Status report

TPB staff review of six years of consultant recommendations: Status report

- We had hoped to have the report finished by today, but…
- Report will cover about 25 modeling topics
- Report will be used to develop a short- and long-term plan for models development program
- Each topic in the report will contain three sections
  - A **summary of the consultant findings and recommendations** for the given topic area
    - Emphasis is on the recommendations
    - Findings are presented mainly to give context to the recommendations.
    - We have striven to include all the consultant recommendations, but only a subset of findings.
  - A **discussion** of both the consultant recommendations and the current TPB procedure in the given topic area.
  - The **TPB staff response** to the consultant recommendations.

TPB staff review of six years of consultant recommendations: Status report

- Seven consultant reports reviewed, covering six years
  - Vanasse Hangen Brustlin, Inc. (VHB):
    - Results of FY 2006 Travel Forecasting Research (2006)
    - Results of FY 2007 Travel Forecasting Research (2007)
    - Expanded Evaluation of Peak Spreading (2008a)
    - Estimating the Impact of Exurban Commuters on Travel Demand (2008b)
  - Cambridge Systematics, Inc. (CS):
    - Fiscal Year 2009 Task Reports, Final Report (2009)
    - Fiscal Year 2010 Task Reports, Final Report (2010)
    - Fiscal Year 2011 Task Reports, Final Report (2011)

TPB staff review of six years of consultant recommendations: Status report

Report section	Status
Summary of consultant recommendations	**Finished;** About 100 recommendations and 40 findings covering about 25 topic areas
Discussion of recommendations and current TPB modeling procedure	In progress
TPB staff response	In progress

- Report will need to be reviewed by TPB staff before it is presented to TFS
- Goal: Present report to TFS by May TFS meeting

TPB staff review of six years of consultant recomm's: **Topic areas by consultant/year**

	VHB FY 2006	VHB FY 2007	VHB FY 2008	CS FY 2009	CS FY 2010	CS FY 2011
Data collection and surveys				x		
Inputs to the travel model				x		
External and through travel	x		x			
Socio-economic models				x		
Trip generation				x		
Trip distribution and destination choice				x		
Mode choice				x	x	
Time-of-day/peak spreading		x	x	x	x	
Traffic assignment	x	x		x	x	
Modeling HOT/managed lanes	x			x	x	x
Speed feedback in the travel model		x		x	x	
Dynamic traffic assignment (DTA)		x				
Reducing model run times				x		
Modeling transit		x			x	x
Transit path building using TRNBUILD vs. Public Transport						x
Special generators, including modeling airport access trips	x	x		x	x	
Modeling non-motorized (walk and bike) trips				x		
Model sensitivity to land use policies such as smart growth				x		
Tour-based & activity-based models (ABMs)	x			x		
Calibration, validation, sensitivity testing	x					
Screenlines/cutlines		x				
Fuel prices in travel models				x		
Review of travel demand forecasting software						x
Review of TPB's travel modeling scripts						x
Miscellaneous	x	x		x	x	

- Each "x" may represent either one or multiple recommendations
- Coverage is a function of TPB requests
- Some reports covered more topic areas than others, e.g., CS 2009
- Topics that received most coverage (4 Xs):
  - Time-of-day/peak spreading
  - Traffic assignment
  - Modeling HOT/managed lanes
  - Special generators, including modeling airport access trips
- However, again, one "x" can represent multiple recommendations

Next steps for FY 12 consult. assist.

Tsk Ord	Description		Next Steps
1	Attend meetings, provide written advice, & respond to ad-hoc requests from TPB staff		Continue progress
4	Reducing model run times		TPB staff: 1. Finish review of Feb. 27 AECOM memo 2. Decide which enhancements to implement
2	Improving mode choice modeling	Consultant recommendations	**Finished**
3		Enhancements to LineSum transit summary program	Consultant work has just begun; TPB staff will review when product is ready
5		Begin migration to PT and misc. improvements	Ditto
6		External travel, airport pax. travel, visitor/tourist travel	Ditto

Next steps for TPB staff review of six years of consultant recommendations

- Finish writing report
- Internal review by TPB staff
- External review by TFS
- Development of short-term and long-term models development work plan
- Lesson learned:
  - Don't wait six years for next TPB staff review
    - E.g., develop TPB staff responses on an annual or biannual basis

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