Status Report on the Version 2.3 Travel Demand Model

Presented to the TPB Technical Committee

January 8, 2010

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TPB's Models Development Program

- Serves to support TPB's travel forecasting capabilities and to implement continuing improvements to the TPB's regional travel forecasting methods and practice

Oversight: Travel Forecasting Subcommittee

Currently adopted model: Version 2.2 (2191 TAZs)

Model in development: Version 2.3 (3722 TAZs)

Version 2.3 history

- The model was released in draft in July 2008, for the 2,191 zone system
- Features of the draft Version 2.3 model:
  1. Updated truck models
     - TPB's "medium" and "heavy" truck models were re-estimated using special truck counts
  2. An advanced mode choice modeling process:
     - Nested Logit (NL) mode choice model; choice set includes 3 highway modes & 4 transit sub-modes
     - Enables the ability to perform transit assignments

Current V2.3 development plans

1. To utilize newly released data sources
   - 2007/2008 Household Travel Survey
   - 2007/ Metrorail Survey and 2008 Regional Bus On-Board Survey
2. To utilize new/more detailed zone system
   - Comprised of 3722 TAZs (up from existing 2191)
   - Was developed with attention to the activity centers and clusters map adopted by TPB and COG Board to guide land use & transportation planning

Version 2.3 activities in motion

- Cleaning and analysis of new transportation surveys
  - 2007/08 Household Travel Survey
  - 2008 Bus On-Board Survey
  - 2007 highway traffic counts (daily, hourly)
- Development of modeling inputs about the revised (3,722) TAZ system
  - Network Development: adapting revised highway and transit networks to the new TAZs
  - Development of land activity supporting the 3722 TAZ system

2007/08 HTS: preliminary findings

- In comparison with the previous 1994 HTS…
  - Motorized HH trip rates have declined (7.65 to 7.15)
  - The work trip share continues to decline (21% to 19%)
  - The total transit share has increased (6.3 to 7.3%)
  - Total auto occupancies have increased (1.28 to 1.38)

    (…but commuting occupancies have decreased (1.12 to 1.06)
  - Proportion of AM, PM peak period travel has declined slightly (about 0.8% in both periods)

Caveat: Methodological differences in the 1994 and 2007/08 surveys should be considered

Network development

- A new GIS-based tool (TPBMAN) for developing/managing highway and transit network inputs to the travel model is now being put into production
  - Joint effort between TPB staff and consultant (DCI) that has been underway for 2 years
  - The size, complexity of the TPB's networks compelled the need to rethink how network development is deployed
  - Overall objectives:
    - An integrated geodatabase and editing capability that is multi-modal, multi-year, and enterprise-wide
    - Improved tracking of TIP project submissions in TPB's network development
  - This approach for network development is innovative

Other network development activities

- The 3722 TAZ system has prompted a comprehensive renumbering of network nodes.
- Highway and transit rail links have been conflated to the NAVTEQ street centerline database; result: higher accuracy level of network nodes and link alignments
- The geodatabase networks have been updated to reflect the most recently adopted plan (i.e., the 2009 CLRP & FY 2010-2015 TIP

Envisioned features to be considered for Version 2.3

- Include non-motorized travel for all purposes
- Revisiting definition of area type; similar to existing density-based definition but more detailed, taking advantage of the more detailed TAZ system
- Subdivide NHB trips purpose into work-related & non-work-related; Create new "HB School" purpose
- Pedestrian Environment Factor (PEF) for MC and pathbuilding
- Expand peak (AM/PM) period definitions beyond 3-hour duration currently assumed

Additional modeling concerns

- The increased zone dimensions will incur longer running times
- Staff work to date to address reduced running times:
  - Application of distributed processing has been tested; results are promising
  - Tests of new traffic assignment algorithms has been reviewed; results are mixed
  - A reduction in speed feedback iterations has also been considered

Timeline for Version 2.3 Model Development

(as of 1/08/10)