



TFS item #6

Developing the Ver. 2.3 travel model on the new zone system: Plans for calibration and timeline

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Version 2.3 - Development Plan Overview

- Development Considerations
 - Development schedule will be constrained
 - Limited in ability to implement new features
- New TAZ system
 - 3,675 internal zones + 47 ext. stations = 3,722 TAZ
- New Surveys
 - 2007/08 HTS
 - 2007 Metrorail Survey
 - 2008 Regional Bus Survey
- Estimation/Calibration Year: 2007

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Version 2.3 - Development Plan Overview

- Enhancements compared to Ver. 2.2
 - Nested Logit Mode Choice Model
 - Updated Truck (Medium/Heavy) Models
 - Transit assignment capability
- Envisioned features to be considered
 - Include non-motorized travel for all purposes
 - Revisiting definition of area type (per new TAZ system & LU data)
 - Similar to existing density-based definition but more detailed
 - Subdivide NHB purpose into work-related & non-work-related
 - Pedestrian Environment Factor (PEF) for MC
 - Expand peak (AM/PM) period definitions (must review HTS & observed congestion data, such as Skycomp)

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Version 2.3 Highway Network Link Attributes

- Nodes & links will be generated from DCI geodatabase
- Facility type classifications
 - Preserved, but associated capacities may be adjusted
- Counts will be updated per calibration year (RTDC consulted)
 - More detailed inventory of hourly counts will be established
 - Need observed VMT by time period => TOD-level validation
- Observed speeds on network to be included in the calibration
 - Skycomp; Arterial speed runs; INRIX (possible)

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Version 2.3 Transit Network

- AEMS-based transit network elements preserved
 - Time periods
 - Mode conventions
 - Headway calculations
 - Path-Building Parameters
- Inputs to be generated from DCI geodatabase
- New base highway network in development

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Version 2.3 - Miscellaneous Travel Updates

- New base year, new TAZ system, and new data
 - Airport Travel (2007 Air Pax Survey)
 - External Travel (updated base year counts)
 - Through (updated base year counts)
 - School, Visitor-Tourist, Taxi trip tables

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Version 2.3 - Demographic (Size, Income, Vehicle Avail.) Submodels

- Aggregate Share Models: HH Size & HH Income
 - Plan to maintain these as is, since there is no Census data at fine geography for 2007
 - Performance of the model will be checked against HTS for reasonability
- Vehicle availability choice models
 - Will be re-estimated using the 2007/08 HTS

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Version 2.3 - Trip Generation

- Trip generation by residents of the region
 - Production models: New cross-classification rates to be re-estimated
 - HH size x HH Income level x veh. Avail.
 - Non-motorized trips subsumed in all of the resident trip purposes (e.g., HBW, HBS, HBO, NHB or NHB-WR/NHB-NWR)
 - Binary (motorized/non-motorized) choice models to be used
 - Density-based variables to be considered
 - Attraction Models
 - Regression or cross classification
 - Attraction rates will be re-estimated
 - Income disaggregation models will be formulated

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Version 2.3 - Trip Distribution

- Trip Distribution of the resident trip purposes (HBW, HBS, HBO, NHB) to be re-calibrated
 - Gravity model
 - Income stratified (as in Version 2.2)
 - Composite highway/transit time impedance (as in Version 2.2)
 - Highway time based on observed speeds (if possible)
 - Minimize the use of K-factors
 - Other (non-resident) trip distribution models will be preserved (e.g. external travel, trucks/commercial vehicle)

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Version 2.3 - Mode Choice

- Continued use of the 15-choice nested-logit mode choice model
 - First developed by AECOM Consult for WMATA study
 - Applied as a post process to the four-step model
 - 3 purposes x 2 time-of-day periods = 6 models
 - Later adopted and re-calibrated for use in COG/TPB travel model
 - Brought into the speed feedback loop
 - 4 purposes x 2 time-of-day periods = 4 models
 - Continued use of AEMS.EXE to apply NL MC model
 - Attempt will be made to statistically re-estimated time/cost coeffs. using the 2007/08 HTS
 - Attempts will be made to reduce no. of nesting constants
- Collection of ridership data for 2007 needed to establish modal “target” values

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Version 2.3 - Traffic Assignment Process

- Three-time-period assignment approach will be preserved
- Time period VMT targets will be established for checking
- Closer attention paid to restrained speed validation
- Refinement of queuing delay function to be investigated
- No. of user equilibrium iterations employed may be larger than Ver. 2.2
- Two-step assignment process to be added
- Consider using more extensive set of screenlines

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Version 2.3 - Speed Feedback (SF) Iterations

- A smaller number of SF iterations is envisioned, relative to Ver. 2.2
- Peak and off-peak speed feedback will be used (as in V2.2)
- Convergence metrics will be produced
 - CS report recommended employing a convergence threshold, but found that few MPOs used one
 - CS cited one exception
 - The DRCOG metric and threshold are as follows: “achieving one percent or less of links with a greater than 10 percent change in link volume.” (Cambridge Systematics, Inc., 2009, p. 10)
 - Others have proposed “Skim matrix root mean square error < 1%”

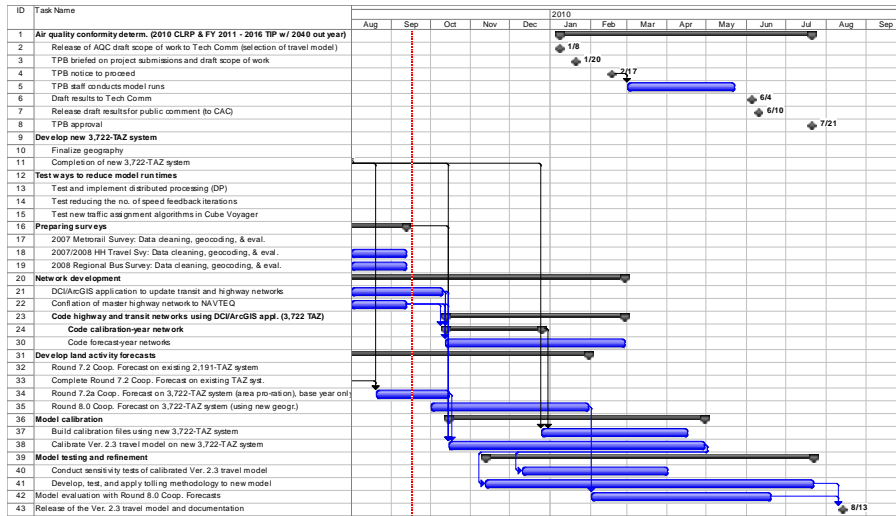
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Timeline (See separate hand out)



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Conclusions & next steps

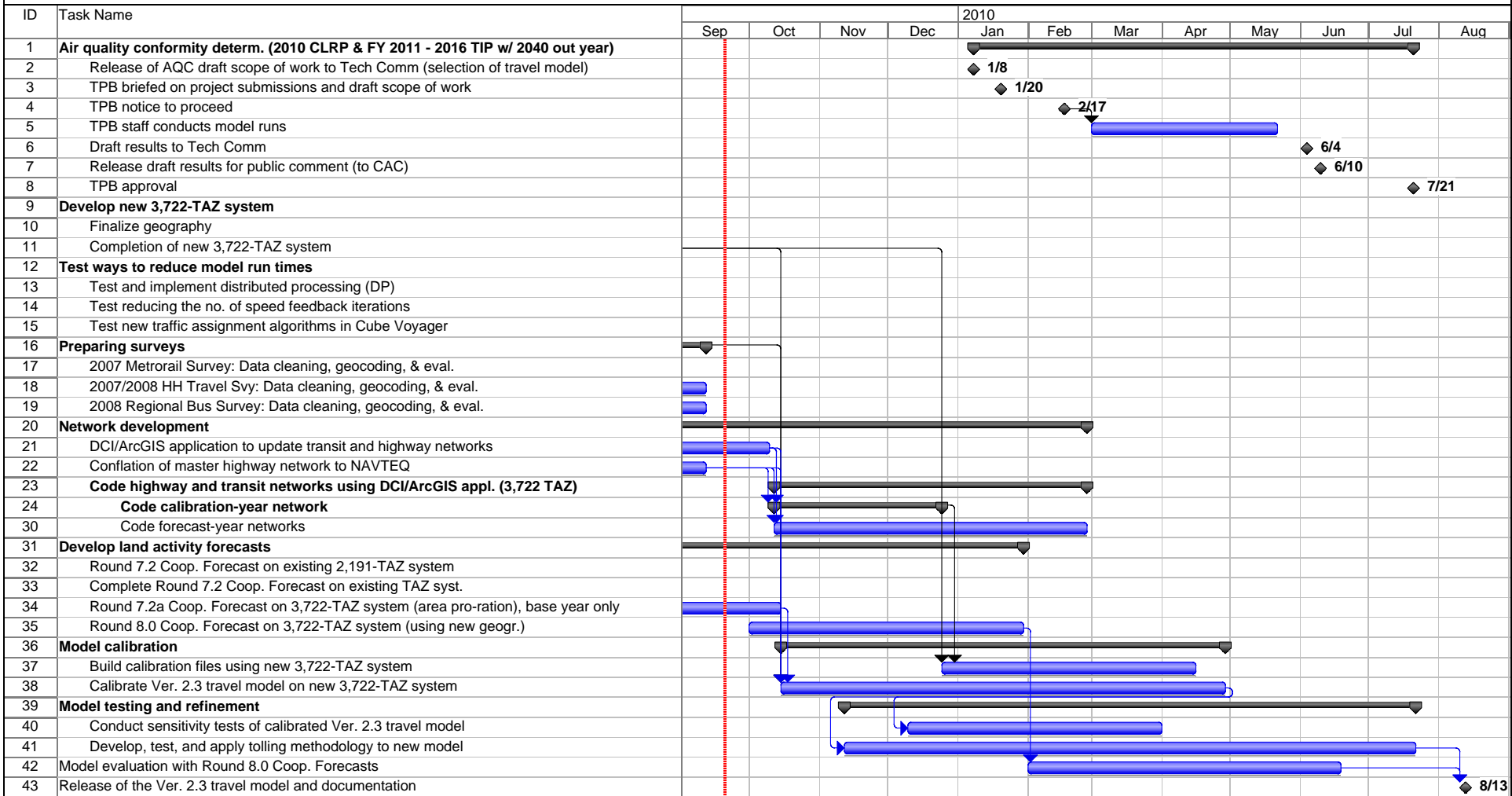
- The production schedule for Ver. 2.3 has slipped, due primarily to slippages in the preparation of inputs
- The improvements in the Ver. 2.3 model on the new zone system will be incremental
- We will provide more detailed info. on the HTS survey validation checks and logic checks
- We will be working on finalizing the base-year highway and transit networks
- We will be developing small-area forecasts of Round 7.2a land activity data on the 3,722-TAZ system (using area pro-ratio and other imputation techniques, e.g., using Dun & Bradstreet employment data)

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Timeline for developing the Version 2.3 travel model on the new 3,722-zone system (as of 9/11/09)



Project: Timeline for developing the Version 2.3 travel model on the new 3,722-zone system
 Date: Sun 9/20/09

Task		Project Summary	
Split		External Tasks	
Progress		External Milestone	
Milestone		Deadline	
Summary			