

Status report on COG/TPB's travel demand modeling improvement efforts

COG/TPB staff work in support of Task Order 17.2

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Model improvement strategic plan

- Three phases over seven years

	Description	Fiscal Years
1	Updates to the existing trip-based, four-step model (FSM)	2016-2017
2	Development of an activity-based model (ABM) with existing data	2018-2020
3	Development of an ABM with new data *	2021-2022

* New household travel survey to be conducted in FY 17; ready for use in FY 20



Task Order 17.2

- Collaborative effort between COG/TPB staff and consultant



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Task Order 17.2: Division of labor

Entity	Role	Dates
COG/TPB staff	Provide surveys and other datasets that can be used for model estimation and calibration	By end of Dec.
Consultant (Cambridge Systematics & Gallop)	Implement a series of updates to the existing, regional trip-based travel model <ul style="list-style-type: none"> • Non-motorized model enhancements • Mode choice model enhancements • Managed-lane modeling enhancements 	Dec. to June 30
COG/TPB staff	<ul style="list-style-type: none"> • Evaluate and test consultant work products • Provide feedback to consultant 	Dec. to June 30
TFS	<ul style="list-style-type: none"> • Receive briefings every two months • Provide feedback to consultant & COG/TPB staff 	Dec. to June 30



Overview of surveys and datasets

- Household Travel Surveys
- Transit data
 - Transit on-board surveys
 - Regional transit supply data
- Other data
 - TAZ-level data
 - Census-Block level data
 - 2010 Census Block GIS file
 - Floating density variables
 - Distance variables (TAZ & Census-Block)
 - Simpson's diversity index and entropy
 - Transportation network in Public Transport (PT) format



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Task Order 17.2: COG/TPB staff work

- Household travel surveys & transit on-board surveys

Data set requested	Status & notes
Household Travel Surveys:	Delivered: Data files and memos
<ul style="list-style-type: none"> 2007/08 COG/TPB Household Travel Survey (HTS) 	Trip and household files: Added 2010 Census Blocks
<ul style="list-style-type: none"> 2011 & 2012 Geographically Focused HTS (GF HTS) 	Trip and household files: Added 2010 Census Blocks
Transit on-board surveys:	Delivered: Data files and memos
<ul style="list-style-type: none"> 2008 Metrorail Passenger Survey 	Added 2010 Census Blocks
<ul style="list-style-type: none"> 2008 Regional Bus Survey 	Added 2010 Census Blocks
<ul style="list-style-type: none"> 2007-2008 On-Board Survey of Maryland Transit Administration (MTA) Riders (used for MARC commuter rail) 	Added 2010 Census Blocks
<ul style="list-style-type: none"> 2005 Virginia Railway Express (VRE) Passenger Survey (factored to year-2007 conditions) 	Survey collected geographic info. at only Zip code level



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- Regional transit supply data

Data set requested	Status and notes
Metrorail terminal times	Delivered a data file and a memo
Reliability data: On-time performance, travel time reliability, or other reliability-related information by transit operator. Metrics that vary by time of day are also desirable, if available.	Delivered data files: <ul style="list-style-type: none"> • Metrorail: WMATA’s Vital Signs reports for 2010 & 2014 • Metrobus: <ul style="list-style-type: none"> • Route level bus on-time performance data for 2007 and 2014. • Regional-level bus and rail on-time performance data for 2007 and 2014
Transit attributes by transit technology, e.g., <ul style="list-style-type: none"> • Branding & visibility of service • Schedule-free service? • Span of service (midday? evening?) • Vehicle cleanliness • On-board amenities (e.g., outlets, Wi-Fi) 	Delivered a table for ten transit modes and notes in the transmittal memo dated 12/2/16



Task Order 17.2: COG/TPB staff work

- Other data

Data set requested	Level	Status
<ul style="list-style-type: none">• Employment (total and by type/industry)• Population• Households• Land area• Auto skims• Highway terminal times• Area type as currently defined using 1-mile floating density of employment and population• Parking costs (drive-access transit)	TAZ	Delivered the 2007 data and a technical memo dated 12/2/16
<ul style="list-style-type: none">• Highway network connectivity measures, i.e., number of intersections by type: cul-de-sacs/dead ends, 3-leg, and 4-leg intersections	TAZ	Delivered DBF data file and a technical memo dated 11/21/16



Task Order 17.2: COG/TPB staff work

- Other data

Data set requested	Level	Status
Employment (total and by type/industry) Population Households Land area ¼-mile floating density for population & employment	Census -Block	Delivered the 2010 Census Block data files and a memo dated 12/14/16
2010 Census Block GIS file, including polygon boundaries and centroid points	Census -Block	Delivered
Other floating density variables: Density of transit stops/stations	TAZ & Census -Block	Delivered data files and a technical memo



Task Order 17.2: COG/TPB staff work

- Other data

Data set requested	Level	Status
Distance to nearest transit stop/station	TAZ & Census -Block	Delivered data and notes in a memo
Simpson's diversity index and Entropy	TAZ & Census -Block	Delivered data and notes in a memo
Transportation network in PT format	TAZ	Delivered the data and its memo



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- Additional data requested

Data set requested	Level	Status
COG/TPB Travel Model Ver. 2.3.66 and its inputs for year-2007 model run	TAZ	Delivered
Floating density of road intersections, by intersection type (3-leg/4-leg vs. cul-de-sac), zone type (TAZ and Census Block), and floating distance (0.25 mile and 1.0 mile)	TAZ & Census -Block	Delivered
Floating density of transit stops, for distances of 0.25 mile and 1.0 mile, for both TAZs and Census Blocks.	TAZ & Census -Block	Requested by CS on Jan. 13. Currently being developed by TPB staff.



Summary & next steps

- Status of transmitting datasets to CS
 - Most requested datasets were transmitted
 - A few could not be transmitted (relating to sidewalks and bikeshare facilities)
 - One is currently being developed
- CS developed an updated work plan to reflect time spent refining data
- CS & TPB staff will continue to have check-in teleconferences every two weeks
- TPB staff will review all technical documents and work products as they are completed by consultant team
- TFS will be consulted on a regular basis



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- Ron Milone: Program management and preparing revised HTS and GF HTS datasets with more detail for HH income and travel modes.
- Dzung Ngo: Preparing on-board transit survey data and helping prepare presentation slides
- Network development staff (Jim Yin, Wanda Hamlin, and Joe Davis):
 - Floating-point densities for intersections & transit stops
 - Assisting with analyzing truck data and Simpson's Diversity Index
 - Assisting with analyzing the 2016 Metrorail Pax. Survey



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