

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
- Consultant budget: \$240k
- Developing the task order:
 - Consultant proposal (9/26);
 - COG/TPB staff to develop model estimation database
 - Consultant to make updates trip-based model
 - COG authorization memo (9/30);
 - Data checklist for model estimation (10/26, evolving);
 - Consultant proposed work plan (10/28)



Task Order 17.2: Division of labor

Entity	Role	Dates
COG/TPB staff	Provide model calibration database to consultant (seven travel surveys & other data sets)	By end of Nov.
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 	Nov. to June 30
COG/TPB staff	<ul style="list-style-type: none"> • Evaluate and test consultant work products • Provide feedback to consultant 	Nov. to June 30
TFS	<ul style="list-style-type: none"> • Accept briefings every two months • Provide feedback to consultant & COG/TPB staff 	Nov. to June 30



Data plans for calibration & validation

- Calibration year: 2007
 - 2007/2008 COG/TPB Household Travel Survey
 - Transit on-board surveys, e.g., 2008 Metrorail Passenger Survey, 2008 Regional Bus Survey
- Validation year: 2014
 - Traffic counts
 - Transit counts
- Other data sets:
 - 2011 & 2012 Geographically Focused Household Travel Surveys (GF HTSs), for non-motorized modeling
 - Others listed in the data checklist for model estimation



Task Order 17.2

- COG/TPB staff will provide the following data to consultant
 - Database of survey data (7 surveys) with enhanced geocoding (to Census Blocks, in addition to TAZs), where possible
 - Complete GIS database that can be used for enhanced non-motorized modeling (e.g., number of intersections by type: 3-leg, 4-leg, cul-de-sac)
 - Year-2007 transportation network in Public Transport (PT) format
 - Latest version of the regional travel model (either Ver. 2.3.57a or Ver. 2.3.66)



Task Order 17.2: COG/TPB staff work

- Survey data
 - Household Travel Surveys
 - 2007/08 COG/TPB Household Travel Survey (HTS)
 - 2011 & 2012 Geographically Focused HTS (GF HTS)
 - Transit on-board surveys
 - 2008 Metrorail Passenger Survey
 - 2008 Regional Bus Survey
 - 2007-2008 On-Board Survey of Maryland Transit Administration (MTA) Riders (used for MARC commuter rail)
 - 2005 Virginia Railway Express (VRE) Passenger Survey (factored to year-2007 conditions)
 - Status: Massive undertaking; Compilation of data sets is underway



Task Order 17.2: COG/TPB staff work

- Regional transit supply data

Data set requested	Status
Metrorail terminal times	TPB staff has collected one component: escalator lengths, station entrance to mezzanine
Reliability: 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.	TPB staff has reached out to WMATA staff. WMATA has provided data for 2014 and 2010. WMATA is investigating 2007 data. Other transit providers not yet contacted.
Transit attributes by transit technology, e.g., <ul style="list-style-type: none"> Branding & visibility of service (3-point scale) Schedule-free service? (yes/no) Span of service (midday? evening?) Vehicle cleanliness (perhaps a 3-point scale) On-board amenities (e.g., outlets, Wi-Fi) 	TPB staff has reached out to WMATA staff, which has provided an estimate for Metrorail and Metrobus. TPB staff would need to estimate comparable values for the other transit modes.



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 	TAZ	Already developed, since these are inputs to the travel model
<ul style="list-style-type: none"> • Highway network connectivity measures, specifically number of intersections by type: cul-de-sacs/dead ends, 3-leg, and 4-leg intersections 	TAZ	Similar work was developed in 2010 by COG GIS staff. We are currently reviewing past work effort.
<ul style="list-style-type: none"> • Area type as currently defined using 1-mile floating density of employment and population • Auto skims • Parking costs • Highway terminal times • Any other zonal variables available (e.g., median income) 	TAZ	In the process of assembling.



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	Census -Block	In progress
2010 Census Block GIS file, including polygon boundaries and centroid points	Census -Block	In progress
One-mile floating density for population and employment	TAZ	Already developed
¼-mile floating density for population and employment	Census -Block	Not started
Other floating density variables: <ul style="list-style-type: none"> • Density of transit stops/stations • Sidewalk density--linear feet of sidewalk/area • Density of bike facilities by type--linear feet of bike facilities by type/area 	Census -Block	Not started. Transit stops, plan to use GTFS. Sidewalks: No existing data at COG; Local govts. have some; possible source is OpenStreetMap (OSM)



Task Order 17.2: COG/TPB staff work

- Other data

Data set requested	Level	Status
<ul style="list-style-type: none"> • Distance to nearest transit stop/station • Distance to nearest bike share station • Distance to nearest trail 	TAZ & Census -Block	Not started. For the transit stop data, we plan to use GTFS data. Regarding bike share, DC's first bike share system, SmartBike DC, began in 2008 with 10 stations/120 bicycles. Capital Bikeshare started in Sept. 2010.
Simpson's diversity index	TAZ & Census -Block	Not started
Entropy	TAZ & Census -Block	Not started



Summary & next steps

- Staff is busy preparing a massive estimation database for CS.
- Staff will send all the files and data sets to CS by the end of Nov.
- Staff has begun preparing the year-2007 transportation network in PT format.
- Progress has been made, but staff still has a lot of work to do.



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- Meseret Seifu for helping develop transportation network in PT format and developing data at TAZ & Census-Block level.
- Hamid Humeida for summarizing survey data, e.g., 2006-2010 ACS/CTPP data.



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