National Capital Region
Transportation Planning Board

Approved

As of 5/19/2023

TPB TRAVEL FORECASTING SUBCOMMITTEE

HIGHLIGHTS OF THE MARCH 24, 2023 MEETING

9:30 AM to 12:00 noon. Meeting was held virtually via web conferencing software. There was no on-site meeting.

MEETING ATTENDEES

MEMBERS, ALTERNATES, AND PARTICIPANTS

- Jonathan Avner (Whitman, Requardt & Assoc.)
- Kelvin Belcher (MDOT-SHA-TFAD)
- Vince Bernardin (Caliper)
- Jim Bunch (Mead & Hunt)
- Valentina Farias (Geo. Mason University)
- Dan Goldfarb (MITRE Corporation)
- Eric Graye (M-NCPPC, Montgomery Co.)
- Erik Jensen (WMATA)
- Chetan Joshi (PTV Group)
- Michelle Lee (RSG Group)
- Li Li (Whitman, Requardt & Assoc.)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Feng Liu (Cambridge Systematics)
- Srikanth Neelisetty (Transurban)
- Krishna Patnam (AECOM)
- Binny Paul (PTV Group)
- Marie Pham (Loudoun Co.)
- George Phillips (Prince William Co.)
- Harun Rashid (NVTA)
- Andrew Rohne (RSG, Inc.)
- Abby Rosenson (RSG, Inc.)
- Rana Shams (MDOT)
- Elham Shayanfar (MDOT)
- Lisa Shemer (MDOT-SHA)
- Howard Slavin (Caliper)
- Ben Stabler (PTV Group)
- Aichong Sun (AECOM)
- Jiaxin Tong (Kimley-Horn & Assoc.)
- Michael Trinh (VDOT)
- Malcolm Watson (Fairfax County DOT)
- Chris Wichman (AirSage)
- Jim Yang (M-NCPPC, Prince George's Co.)
- Yi Zhao (DDOT)

COG STAFF

- William Bacon
- Mackenzie Bosco
- Jamie Bufkin
- Anant Choudhary
- Joe Davis
- Nazneen Ferdous
- Yu Gao
- Ken Joh
- Martha Kile
- Sanghyeon Ko
- James Li
- Nicole McCall
- Mark Moran
- Ray Ngo
- Wanda Owens
- Jinchul (JC) Park
- Jane Posey
- Meseret Seifu
- Justine Velez
- Dusan Vuksan
- Feng Xie
- Zhuo Yang
- Jim Yin

This meeting of the Travel Forecasting Subcommittee (TFS) was chaired by Dr. Zhao

1. OPENING: MEETING ROLES, MEETING RULES, ROLL CALL OF PARTICIPANTS

Mr. Moran discussed roles of the meeting participants (e.g., chair, host, technical host, and note taking), meeting rules, and then performed a roll call of participants.

2. APPROVAL OF MEETING HIGHLIGHTS FROM THE PREVIOUS MEETING

Dr. Zhao began chairing the meeting. The highlights of the January 27, 2023 meeting of the TFS were approved without any changes.

3. MPO HOUSEHOLD TRAVEL SURVEYS - STATE OF PRACTICE

This item was presented by Dr. Joh and Ms. McCall, who spoke from a set of presentation slides. Since the last regional household travel survey conducted in 2017/2018 (the Regional Travel Survey), travel survey methods have been evolving to address the need to capture regional travel patterns more frequently due to emerging technologies and shifts in travel behavior from the pandemic. To address these needs, TPB staff conducted a project to consider the approach and methodology used for future household travel surveys by researching the latest methods and approaches. This presentation focused on findings from interviews, conducted in fall 2022, with peer MPOs, and then concluded with next steps.

Dr. Zhao asked about the Next Generation National Household Travel Survey (NextGen NHTS) and key differences between the approaches for the NextGen NHTS compared with the previous NHTS. Dr. Joh provided background information on the NHTS and explained that the last NHTS, conducted in 2017, used an address-based sampling (ABS) approach and has been, historically, conducted every 7-9 years. He noted the challenges of ABS and the greater need to collect data more frequently. The NextGen NHTS addresses these challenges by moving towards a continuous data collection model of conducting surveys every other year, starting in 2022. For the NextGen NHTS, one-half of the sample uses ABS and one-half uses a panel frame sampling approach, with smaller sample sizes compared with previous NHTS. Dr. Joh noted his participation in the NextGen NHTS Technical Advisory Committee meeting and discussed the pooled fund effort by state DOTs and MPOs to allow these agencies to purchase add-on samples for their jurisdictions.

In the WebEx chat box, Mr. Phillips asked if he could get a copy of the survey. Ms. McCall responded that the 2017/2018 Regional Travel Survey (RTS) dataset can be obtained by submitting a data request. She also noted resources available on the RTS website. Ms. McCall added that we are currently exploring options for the next household travel survey, so that survey data is not available yet.

Mr. Wichman noted that the New York Metropolitan Transportation Council (NYMTC) recently posted a request for information, asking big data companies, survey companies, and others to provide input on how NYMTC should conduct future surveys and how to leverage big data and data fusion. He encouraged TPB staff to reach out to them to hear what they learned. Ms. McCall thanked Mr. Wichman for the suggestion.

4. COG/TPB GEN3 TRAVEL MODEL: STATUS REPORT

This item was presented by Mr. Rohne, who spoke from a set of presentation slides. Mr. Rohne provided an update on the Gen3 Model (Phase 2) calibration and validation. The presentation included information about the recent update to ActivitySim (version 1.2), followed by calibration updates showing tours by auto sufficiency group, auto ownership, work from home, non-mandatory tours by destination, tour mode choice, trip mode choice, and stop out-of-direction distance.

Mr. Moran stated that COG/TPB staff has generally been satisfied with the model calibration/validation, but he noted that staff would like to see better validation regarding transit, adding that RSG continues to work on transit validation. Mr. Rohne said that the transit validation has been challenging. Mr. Xie noted that RSG has been working diligently to fix the overestimation of VMT in DC, and he asked why RSG is focused on the DC origination market rather than the DC destination market, given that much of the VMT that occurs in DC is not by DC residents. Mr. Rohne noted that that is a good point, adding that he can look more into that. Initially, however, RSG staff had decided to focus on DC-based origins first. Mr. Xie also noted that the current Gen3 Model is overestimating Metrorail trips, but these are unlinked transit trips on Metrorail. Mr. Xie wondered whether we look at linked trips coming out of the mode choice model, e.g., for Metrorail only or bus plus Metrorail. For example, how are those submarkets validating against the survey data? Mr. Rohne said that he would have to look more into that. He noted that Binny Paul, who is no longer with RSG, wrote a lot of the scripts. Mr. Rohne said that, in the validation scripts, linked trips are used for rail and unlinked trips for bus. The scripts go through the stop-to-stop files and then the boardings file to determine the correct numbers to use. Mr. Xie stated that this mismatch could come from the ActivitySim model, especially, the mode choice model. He also noted that it could come from the PT factor files, in terms of the transfer rate. So, we probably want to look at both linked and unlinked trips.

In the chat box, regarding slide 30 ("Rail Loadings"), Mr. Bunch asked how the estimated-to-observed ratio for all rail (1.51) be larger than any of the submode rail ratios (which ranged from 0.84 to 1.23). Mr. Rohne said that this was an error on the slide and said that a new version of the slide would be uploaded to the website later in the day [In the new version of the slide, the estimated-to-observed ratio for all rail is now 1.15].[1] In the chat box, Ms. Yuanjun Li noted that transit path-building and skimming is different the two models -- Gen3 uses Citilabs Public Transport (PT) and Gen2/Ver. 2.4 uses Citilabs TRNBUILD (TB) – and she wondered how that difference affects the modeled results. Mr. Rohne said that that question is difficult to answer, but he noted the main difference between the two transit-path-building methods is that TB uses single-best path between zone pairs and PT uses multipathing. In the chat box, Mr. Bunch asked if RSG had looked at VMT in DC by DC's four quadrants. Mr. Rohne stated that the model is not being validated to that level and, thus, RSG has not looked at VMT by DC quadrant. Dr. Zhao noted that he and DDOT are interested in the best model calibration for DC that is possible and suggested that DDOT and COG staff may want to meet in the future to discuss this. Mr. Moran made the point that the COG/TPB travel model is a regional model and is calibrated and validated to regional level metrics and jurisdiction-level metrics. By contrast, many projects and jurisdictions can benefit from using a sub-area model, which usually

[1] Andrew Rohne, "MWCOG Gen3 Model with ActivitySim Implementation Update," https://www.mwcog.org/events/2023/3/24/travel-forecasting-subcommittee/.

begins with the regional model, but then re-validates the model to the sub-area.[2] In the chat box, regarding slide 14 ("Maintenance Tours by Destination"), Ms. Yuanjun Li asked why The Gen3 Model was overestimating maintenance tours to Montgomery County. Mr. Rohne stated that one does not want to make too many adjustments (e.g., added constants) to the model, and, in this case, no jurisdiction-specific adjustments had been made to Montgomery County, which is why the model fit is not better for that jurisdiction. He added that we do not want to make an adjustment that may make the model look good in model validation, but which could be detrimental to the model's ability to make unbiased forecasts.

5. INTEGRATION OF ACTIVITYSIM AND PTV VISUM SOFTWARE

Mr. Stabler, who spoke from a set of presentation slides, presented PTV's new Visum ActivitySim ABM integration features. He summarized the steps to install ActivitySim using the new ActivitySim installer which was contributed to the ActivitySim project by PTV. He discussed how Visum's integrated demand supply and demand data model can efficiently manage all ABM data including ABM objects such as persons, households, tours, trips, and activities. He noted that Visum provides support for multiple zone systems including skimming of travel time/cost matrices and traffic/transit assignment, which enables a streamlined implementation of the ABM system. Mr. Stabler described the elements of Visum's PopulationSim and ActivitySim interfaces and the steps to configure them. He then presented Visum's features for advanced ABM analysis including tracing ABM tours and trips, viewing activity profiles, and generating demographic distributions from select-link analyses. He described how ABM outputs can be exported to the PTV cloud to create custom dashboards for public viewing and collaboration. Finally, Mr. Stabler summarized the benefits of integrating ActivitySim with Visum.

Mr. Moran asked if PTV plans to develop their own ABM. Mr. Stabler responded that PTV Visum supports a variety of ABMs and models including tour-based models. Mr. Xie asked, if an agency wants to purchase the Visum ActivitySim ABM Integration, is the agency purchasing an add-on specific to ActivitySim, given that the data structure could be different for other ABMs. Mr. Stabler clarified that there is only one activity-based model extension for Visum, noting that this VISUM extension is designed to handle ActivitySim, CT-RAMP, DaySim, and VISEM (which is used in Europe). Mr. Stabler noted that PTV is has built a system that can support many different flavors of activity-based modeling. In the chat box, Mr. Ngo asked whether Visum Publisher is included in the client's license or does it require an additional cost. Mr. Stabler noted that Publisher is an additional module, but there are options to bundle software. Mr. Ngo asked whether the integration between PTV Visum and ActivitySim has been completed or are updates still being made. Mr. Stabler stated that it is essentially completed. For example, PTV has established sample models for Karlsruhe, Germany featuring a one-zone system, two-zone system, and three-zone system. He finished by saying that the ActivitySim integration is basically done for now, but improvements will likely be done over time.

6. COVID SNAPSHOTS: SUMMARY ANALYSIS

Beginning in the spring of 2020 and continuing through December of 2022, COG/TPB staff conducted analyses of regional roadway traffic and of air passenger boardings ("enplanements") at the region's three major airports. The results of these analyses were published on the COG website as a series of snapshots. Martha Kile of COG/TPB staff discussed how these snapshots showed changes in travel trends throughout the pandemic. Continuous Count Station (CCS) data collected by

[2] See, for example, CDM Smith et al., *NCHRP Report 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design*, National Cooperative Highway Research Program (NCHRP) (Transportation Research Board of the National Academies, 2014), https://www.trb.org/Publications/Blurbs/170900.aspx.

the District of Columbia, Maryland, and Virginia from 2020 through 2022 was compared with pre-pandemic data. The roadway data was analyzed for the TPB modeled area and each of the jurisdictional groupings of the Core, Inner, and Outer Rings. Monthly enplanement data provided by the Metropolitan Washington Airports Authority (MWAA) and BWI Thurgood Marshall Airport was compared for 2019 through 2022.

Monthly data for each sensor, day, and hour were checked and analyzed. The data were summarized to produce three charts for the region and each of the three jurisdictional groupings. These included: monthly average percent change in traffic from 2019 levels, monthly average daily traffic on weekdays and weekends vs 2019 levels, and weekday hourly traffic patterns. Charts showing monthly enplanements at the region's major airports for 2019-2022 were also included. The full series of snapshots are available here (https://www.mwcog.org/documents/2022/05/10/covid-19-travel-monitoring-snapshot-covid19-featured-publications-traffic-monitoring/).

Ms. Kile also discussed a follow-on analysis of 2022 weekday traffic that was not included in the Covid snapshots. The analysis found that, in the study months of May, June, September, and October, the share of traffic by day of week was very similar between 2019 and 2022. Traffic on Mondays was consistently the lowest of the weekdays. The core days of Tuesday, Wednesday, and Thursday had similar traffic. Friday traffic was the highest of the week, but the pattern is different than most weekdays with higher midday and evening traffic.

The final takeaways from the series of Covid snapshots were:

- After a swift decline in March and April of 2020, traffic began to rise again on the region's roadways and, at the end of 2022, was over 95 percent of 2019 levels.
- Traffic in the Regional Core was the slowest to rebound while traffic in the Outer Ring approached 2019 levels by the spring of 2021.
- The pace of traffic recovery slowed in the Inner and Outer Rings during the spring and summer of 2022 while it increased in the Regional Core. This could have resulted from a return to the office and an increase in recreational travel.
- No large increase in traffic during the core days of Tuesday, Wednesday, Thursday was observed in 2022.
- Plane travel at the region's major airports continues to increase. Enplanements at DCA have been higher than 2019 in every month since April 2022.
- Reliable continuous count data is of paramount importance when performing these analyses. COG/TPB staff is not able to continue to produce the snapshots in part due to lack of maintenance of CCS equipment.

Mr. Rashid said that NVTA has been producing similar traffic trends summaries for Northern Virginia. Highway traffic is still down about five percent. He asked Ms. Kile if it was her opinion that traffic has reached a new normal, or will it continue to increase to a level higher than pre-pandemic soon. Ms. Kile responded that these data are from the end of 2022, she has noticed on that traffic seems to have picked up this spring, she would like to have reliable CCS data to compare March 2023 with that of 2019, but she does believe that traffic will continue to creep up. Mr. Rashid said that in Northern Virginia, NVTA saw a distinct pattern of higher traffic on Tuesday through Thursday and was surprised that it was different in the region. Ms. Kile responded that this is just what was observed at the CCS stations for which we have reliable data, we cannot separate out only commuter traffic. She would be interested to see how the NVTA data compares.

7. ROUNDTABLE DISCUSSION OF CURRENT MODELING EFFORTS AROUND THE REGION

Mr. Rashid mentioned that NVTA had held a travel model workshop on March 10. This was a follow-up to our November 2021 working group meeting. NVTA and its consultant team (Cambridge Systematics and Arizona State University) chose to integrate the TPB's aggregate, trip-based travel demand forecasting model (Gen2) with dynamic traffic assignment (DTA), for a modeled area covering Northern Virginia. The DTA software, DTALite, is open source. The workshop had participants from FHWA, MPOs (including TPB staff and FAMPO staff), state DOTs, and local governments. NVTA also chose to use General Modeling Network Specification (GMNS) to address the fact that different scales of transportation networks would be used. The study made use of an analytical DTA to address the issue of network convergence. Mr. Rashid expressed his thanks to those who participated and provided their input and comments. Mr. Moran noted that he and Mr. Xie attended the NVTA modeling workshop and found it very interesting.

There were no other updates from the group.

8. OTHER BUSINESS

The next planned TFS meeting will be Friday, May 19, 2023, a 9:30 AM.

Mr. Moran provided an update on planned presentations at upcoming TFS meetings:

- May 19 TFS meeting (3rd Friday)
    - Leveraging different data sources for automated calibration of travel demand models in Agent software (Gaurav Vyas, Bentley)
    - Planned updates to the COG/TPB production-use, aggregate, trip-based travel demand forecasting model, known as the Gen2/Ver. 2.4.6 Travel Model (Ray Ngo)
    - Status report on the COG/TPB developmental, disaggregate, activity-based travel demand forecasting model, known as the Gen3 Travel Model (RSG staff)

TPB staff strives to have at least one external/non-COG presenter at each TFS meeting. At the current time, there are no scheduled non-COG presenters for the July, September, and November meetings (other than RSG's status report on the Gen3 Travel Model). Mr. Moran requested that people interested in making presentations to the TFS please contact him, so that he can schedule the presentation.

9. ADJOURN

The meeting adjourned at about 12:00 noon.