



## TPB TRAVEL FORECASTING SUBCOMMITTEE

### HIGHLIGHTS OF THE MAY 17, 2024 MEETING, 9:30 AM TO 11:45 AM

Meeting was held virtually via web conferencing software. There was no on-site meeting.

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### MEETING ATTENDEES

#### MEMBERS, ALTERNATES, AND PARTICIPANTS

- Vince Bernardin (Caliper)
- James Bunch (Mead Hunt)
- Kevin Chai (Fairfax County)
- Manfredo Davila (M-NCPPC, Prince George's Co.)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Feng Liu (Cambridge Systematics, Inc.)
- John Miller (Virginia Transportation Research Council)
- Srikanth Neelisetty (Transurban)
- MiYoung Park (Transurban)
- Maggie Qi (Fairfax County DOT)
- Andrew Rohne (RSG, Inc.)
- William (Bill) Thomas (Michael Baker International)
- Gaurav Vyas (Bentley Systems, Inc.)
- Malcolm Watson (Fairfax County DOT)
- Jun (Jim) Yang (M-NCPPC, Montgomery Co.)

#### COG STAFF

- William (Bill) Bacon
- Anant Choudhary
- Joe Davis
- Nazneen Ferdous
- Jan Mou (James) Li
- Mark Moran
- Erin Morrow
- Ray Ngo
- Wanda Owens
- Jinchul (JC) Park
- Meseret Seifu
- Bahar Shahverdi
- Jessica Storck
- Dusan Vuksan
- Feng Xie

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### 1. OPENING: MEETING ROLES, RULES, AND 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. He noted that the current chair, Harun Rashid, of the Northern Virginia Transportation Authority (NVTA), was not able to make it to today's meeting, so Kevin Chai, Fairfax Co. Department of Transportation, agreed to chair today's meeting.

## **2. APPROVAL OF MEETING HIGHLIGHTS FROM THE MARCH 22 MEETING**

This meeting of the Travel Forecasting Subcommittee (TFS) was chaired by Mr. Chai. The highlights of the March 22, 2024 meeting of the TFS were approved without any changes.

## **3. STATUS REPORT ON THE COG/TPB GEN3 TRAVEL MODEL**

This item was presented by Dr. Xie, who spoke from a set of presentation slides. Dr. Xie provided a status report on the Phase 3 development of the Gen3 Travel Model, which is being led by COG staff, with on-call support from RSG and Baseline Mobility Group (BMG). Dr. Xie went over recent updates to the Gen3 Model, including model enhancements and bugfixes. He talked about the recent extension of the Autonomous Vehicle (AV) specification in the Gen3 Model and preliminary findings from additional scenario analyses. Dr. Xie also provided a status report on the preparation of model inputs for the upcoming Gen3 Model sensitivity testing. Specifically, he talked about the development of exogenous travel demand inputs based on the Round 10.0 Cooperative Forecast land use estimates and the adjustment of the data, particularly regarding special travel markets (such as taxis and school travel), to reflect the effects of the Covid-19 pandemic. Dr. Xie concluded his presentation with next steps for the Phase 3 development. There were no questions at the end of his presentation.

## **4. FEASIBILITY OF ADAPTING VISIONEVAL FOR SCENARIO PLANNING IN VIRGINIA**

This item was presented by Dr. Miller, Associate Director, Virginia Transportation Research Council, who spoke from a set of presentation slides. Dr. Miller presented work done by Dan Flynn, Jeremy Raw, Eric Englin, Lance Dougald, and Sayed Adel (a multi-agency team representing FHWA, Volpe, and VDOT) in which the open-source VisionEval scenario planning tool was applied, on a case study basis, to a region of about 1.4 M people—Fairfax County, Fairfax City, and the City of Falls Church.<sup>1</sup> Dr. Miller noted that the tool has less detail than a travel demand model, e.g., it cannot provide link-level estimates of vehicle miles traveled (VMT) or vehicle hours of travel (VHT), but it provides more detail than sketch approaches. The tool was applied to scenarios which were extracted from the Northern Virginia Transportation Authority's (NVTA's) 2018 Transactions Technical Report and was used to study how certain performance measures of interest — notably mode split, VMT, and greenhouse gas emissions — would change depending on factors that were either within planners' control (e.g., highway and transit service, electrification of household motor vehicles, carsharing vehicles, or transit vehicles, or modifications to how vehicles are taxed) or beyond planners' control (e.g., errors in forecasts of population, household sizes, fuel prices, or telecommuting). The motivation for the study was twofold: first, to understand how VisionEval could fit within a region's planning process, and second, to determine the level of effort required to deploy the tool—and investigate how the results compare with other approaches. For that reason, the study team put quite a bit of time into determining the input files, examples of which are households by "Bzone" (e.g., number of households by transportation analysis zone) or the percentage of employers that offered healthy alternatives to commuting by car (e.g., transit passes, showers for bicycle users, and so forth). Overall, the team estimated that VisionEval required about 500 hours of staff time to deploy—but this may change as VisionEval is modified by its developers.

Dr. Miller noted that the team had executed VisionEval (VE) with about 40 scenarios and found that with this region of about 1.4 M people, each scenario ran in about 30 minutes—once for a base year

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<sup>1</sup> John Miller et al., "Feasibility of Adapting VisionEval for Scenario Planning" (Richmond, Virginia: Virginia Department of Transportation and Federal Highway Administration, March 2022), [https://rosap.ntl.bts.gov/view/dot/61323/dot\\_61323\\_DS1.pdf](https://rosap.ntl.bts.gov/view/dot/61323/dot_61323_DS1.pdf).

and once for a forecast year. By contrast, for a region of about 0.3 M people, a full travel demand model run took about 90 minutes. Compared to the baseline scenario, VE showed that some areas of uncertainty did not have a big impact, based on a percentage basis. For instance, a policy of rezoning that supports aging in place (say, by allowing accessory dwelling units by right) could cause a 1% swing in emissions compared to a policy that is more restrictive. Similarly, electrification of buses is nice to do, but electrification of household motor vehicles does four times as much. But the study team found that the biggest impact is in telecommuting and electrification of heavy trucks. In sum, VisionEval addresses two key obstacles to enabling scenario planning: multiple potential inputs (e.g., how might increased transit service reduce greenhouse gas emissions compared to converting power plants from natural gas to solar?) and substantial data requirements (e.g., sacrificing precision and link-specific estimates of volume and delay for the benefits of getting rough estimates more quickly).

One meeting attendee asked how heavy truck VMT was estimated. This question is addressed in the concept primer associated with VisionEval, which notes that VisionEval estimates, in the base year, the heavy truck DVMT based on the population, where the ratio of heavy truck DVMT to population was based on the Washington, D.C. urbanized area.<sup>2</sup> Then, heavy truck VMT is grown based on income—although the user could override both the initial estimate of truck VMT and the method of how it is grown. Another question was whether any calibration was done besides aligning 2045 VMT from VisionEval with 2045 VMT from the regional model? In terms of VMT, that was the only calibration that the study team performed. However, the team took some other steps to make sure that the estimated labor force participation rate was reasonable, and the team had to do a special procedure to determine how electrification of household vehicles could reduce emissions, because the team’s initial approach of using carbon intensity did not align with expected results. Additionally, in addition to VMT, the VE model calibration can also include items not necessarily considered in a travel demand model. A third question was how VisionEval represented mileage? VisionEval does not contain a transportation network, but it does allow the user to enter total lane miles. A meeting attendee made a comment that MWCOC modeling tools had shown a similarity to one of the VisionEval results, in that while transit increases may accomplish several key social goals (e.g., better accessibility to jobs) the impact on greenhouse emissions was modest.

Dr. Miller acknowledged both the authors of the study paper and the technical review panel (TRP) for the study. TRP members were Amir Shahpar, Jitender Ramchandani; John Simkins, Bishoy Kelleny, Hyun Cho, and Amy O’Leary. After completion of the study in 2022, a pooled fund study led by FHWA (contact is [jeremy.raw@dot.gov](mailto:jeremy.raw@dot.gov)) has resulted in several improvements to VisionEval, e.g., better code and documentation improvements, extensive guidance on validation and scenario development, and improved usability. New features that are currently underway include accessibility and household transportation cost and integrated transportation impact and health. For details on VisionEval as it presently stands, please see <http://visioneval.org>.

## **5. AGENT: A PLATFORM FOR DEMAND MODELING AND ITS RECENT KEY APPLICATIONS**

This item was presented by Mr. Vyas, Project Manager, Bentley Systems, Inc., who spoke from a set of presentation slides. This presentation included an introduction to the AGENT demand modelling platform and examples of key applications. The emphasis was on the key features of AGENT and how the applications of AGENT benefitted from those features.

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<sup>2</sup> “Chapter 3 Concept Primer,” in *VisionEval User Guide*, 2024, <https://visioneval.org/docs/conceptprimer.html>.

Mr. Moran asked whether AGENT is an agent-based platform. Mr. Vyas noted that, in the AGENT help manual, an agent is defined as the decision-making entity which could be zones, origin-destination pairs, households, persons, tours, and trips. Hence the software is called AGENT. The platform is designed to work with various kinds of travel demand models (e.g., four-step, hybrid, tour-based, ABMs) but, in the current set of features, the agents do not learn from each other, so AGENT is not currently configured to support agent-based models.

Dr. Xie asked whether Bentley Systems shares/maintains the models for different agencies. For example, if one agency using the AGENT software updates their model, can the other agencies get the update? Mr. Vyas said that it is up to the agencies whether they want to share model specifications and updates with other agencies. Bentley maintains the software tools/features to support travel models.

Mr. Ngo asked about the comparison between AGENT and ActivitySim. For example, what do you think of ActivitySim as a competitor? Has Bentley reached out to the ActivitySim consortium and/or agencies directly to show how AGENT can help them? Mr. Vyas said that Bentley Systems does not see ActivitySim as a direct competitor but noted that some of the tools in AGENT can help the community in improving their travel models. Bentley staff have not reached out to the ActivitySim consortium directly but we have converted the Metropolitan Transportation Commission's (MTC's) Travel Model 1.5 to AGENT to demonstrate the automated calibration feature.

## **6. ROUNDTABLE DISCUSSION OF CURRENT MODELING EFFORTS AROUND THE REGION**

Mr. Chai asked if any agencies had any planning study or modeling updates to provide to the subcommittee. But there were no subcommittee updates offered.

## **7. OTHER BUSINESS**

Mr. Chai noted that the next planned TFS meeting is scheduled for Friday, July 19, 2024, 9:30 AM to 12:00 noon. However, Mr. Moran noted that, due to a meeting conflict, COG staff plans to change the meeting date to Friday, July 12. The mailout for that meeting would be either July 3 or 5.

Mr. Moran noted that three COG staff would be retiring soon or had recently retired. First, Paul DesJardin retired from COG on May 7 after working at COG for over 40 years. He was the Director of COG's Department of Community Planning and Services, where he directed programs focused on regional land use planning, economic analysis and demographic forecasting, affordable housing and homelessness, public health, and foster care/child welfare. Second, Joe Davis will retire from COG on May 23. Joe started working at COG in 1988, so he has been working at COG for 36 years. Joe is a transportation engineer, working mainly in network development. Working under Jane Posey and Dusan Vuksan, Joe has created many transportation networks used by the regional travel model. In retirement, Joe plans to travel with his wife, Andi, and continue his work with a charity group that provides clean water to small villages in Africa. Third, Martha Kile will be retiring in June. Martha joined COG in 1990 and was tasked with developing COG's Geographic Information System (GIS) capability. She has been credited with bringing COG into the "GIS Age." Martha helped convene COG's GIS Committee and she helped create the National Capital Region Geospatial Data Exchange. In addition to her GIS work, Martha has led numerous technical transportation analysis projects and processes. Mr. Moran noted that we wish Paul, Joe, and Martha healthy and happy retirements!

Regarding planned presentations at upcoming TFS meetings, Mr. Moran noted the following:

- July 12
  - COG/TPB Gen3 Travel Model: Status report (Feng Xie)
  - Briefing on the COG/TPB 2023 Air Passenger Survey (Kenneth Joh)

- Sep. 20
  - COG/TPB Gen3 Travel Model: Status report (Feng Xie)
  - AADT comparison between StreetLight Data and traffic counts (Yu Gao)
  - Origin-destination analysis of two big data providers: Replica and StreetLight Data (Zhuo Yang)
- Nov. 22
  - COG/TPB Gen3 Travel Model: Status report (Feng Xie)
  - An update on the status of Travel Demand Modeling in Prince George's County (Manfredo Davila, M-NCPPC, and Krishna Patnam, AECOM)

## **8. ADJOURN**

The meeting was adjourned at about 11:35 AM.

Attribution: This meeting summary was developed using a variety of sources, including notes from participants, a recording of the meeting, presentation slides, and a meeting summary generated by artificial intelligence (AI). Any sections of the meeting summary based on AI-generated content were reviewed and edited for accuracy by humans. The primary authors of the meeting summary were the meeting presenters and Mark Moran.