

RELEASE OF THE COG/TPB GEN2/VERSION 2.4 TRAVEL DEMAND FORECASTING MODEL

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Agenda

- Background
- Major model enhancements
- Validation performance
- Model transmittal package
- Notes on data requests
- Next steps



Background

- Gen2/Ver. 2.3.78 Model became the adopted, production-use model on March 18, 2020, as the TPB approved the Air Quality Conformity (AQC) analysis of the 2020 Amendment to Visualize 2045.
- TPB staff developed the Gen2/Ver. 2.4 Model in 2020 during the “off-cycle” of the long-range transportation plan (LRTP) update.
- Although it has not yet been used for any AQC analysis, this model has undergone a thorough review by the TPB staff and has been deemed to be production ready.
- As the result, Gen2/Ver. 2.4 Model is released for production use and will be used until Gen3 Model is ready.
- It is planned to use Gen2/Ver. 2.4 Model for the AQC analysis of the 2022 update of Visualize 2045, which the TPB will review, and possibly adopt, in spring 2022.



Major Model Enhancements

- Major model enhancements implemented between Ver. 2.3.78 and Ver. 2.4 Models included:
 - More accurate representation of external-to-internal (X-I) and internal-to-external (I-X) travel patterns
 - Re-calibrated nested-logit mode choice model accounting for improved modeling of commuter rail trips and updated calibration targets
 - Restored the number of iterations used in external trip distribution of HBS and HBO trips
 - Ability to handle extended node ranges for jurisdictions
 - Adjusted V/C ratio toll-search stopping criteria, which is primarily of use to those who run the toll-setting process



Validation Performance: VMT

- Ver. 2.4 Model was validated to year-2014 conditions.
- Validation performance of Ver. 2.4 Model is very similar to that of Ver. 2.3.84 Model, which TPB staff presented at the 1/24/20 TFS meeting.
- Relative to the latest official validation (Ver. 2.3.75), validation of daily VMT by jurisdiction for Ver. 2.4 has generally improved.

Table A-2 Estimated and Observed Year 2014 Daily VMT by Jurisdiction

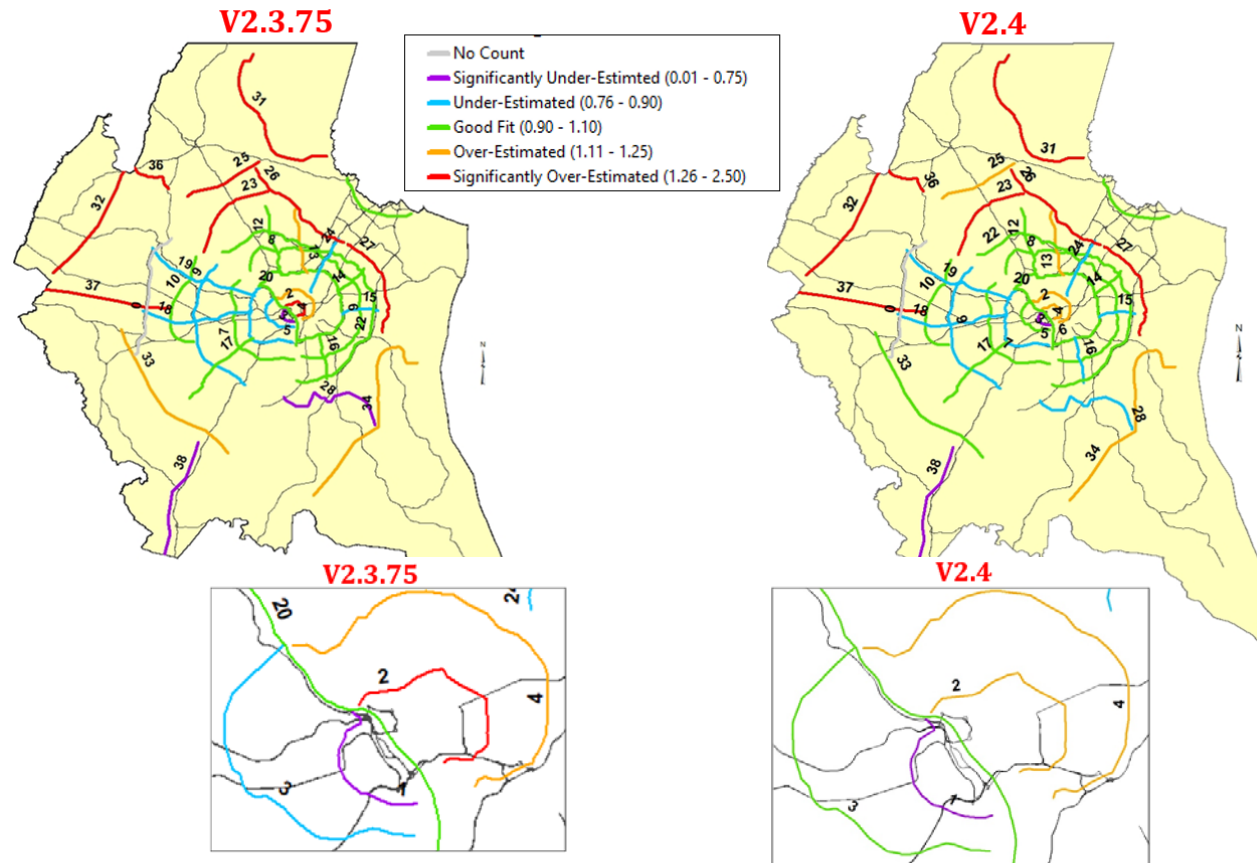
	Observed*	V2.3.75	V2.4	V2.3.75 / Obs	V2.4 / Obs
District of Columbia	7,922,357	8,187,123	7,910,374	1.03	1.00
Montgomery County	19,757,260	21,596,642	20,053,933	1.09	1.02
Prince George's County	23,646,575	23,113,129	21,816,275	0.98	0.92
Arlington County	4,046,638	3,866,042	4,004,099	0.96	0.99
City of Alexandria	2,016,133	2,019,850	2,050,969	1.00	1.02
TPB Member Area					
Fairfax County	26,663,007	26,631,226	26,910,009	1.00	1.01
Loudoun County	6,623,699	7,343,767	6,681,249	1.11	1.01
Prince William County	9,425,332	9,521,281	9,443,949	1.01	1.00
Frederick County	7,798,767	8,785,986	8,716,957	1.13	1.12
Charles County	3,276,575	3,020,140	3,065,323	0.92	0.94
Total	111,176,343	114,085,186	110,653,137	1.03	1.00
Stafford County	4,006,798	4,501,478	4,472,254	1.12	1.12
Calvert County	1,987,808	1,729,059	1,637,084	0.87	0.82
Howard County	10,546,027	11,317,730	10,963,782	1.07	1.04
Anne Arundel County	15,493,973	15,431,752	15,653,162	1.00	1.01
Non-TPB Member Area					
Carrol County	3,290,959	4,097,305	4,114,971	1.25	1.25
St. Mary's County	2,246,712	2,176,268	2,156,753	0.97	0.96
King George County	871,306	789,154	794,934	0.91	0.91
City of Fredericksburg	929,927	864,641	857,116	0.93	0.92
Spotsylvania County †	3,442,058	2,246,698	2,296,448	0.65	0.67
Fauquier County ‡	3,439,861	3,520,312	3,620,994	1.02	1.05
Clarke County	810,485	1,114,449	1,024,839	1.38	1.26
Jefferson County	1,177,470	1,340,054	1,445,730	1.14	1.23
Total	48,243,384	49,128,900	49,038,067	1.02	1.02
Modeled Area Total: §	159,419,727	163,214,086	159,691,204	1.02	1.00



Validation Performance: Traffic Volumes

- Validation of traffic volumes has improved relative to Ver. 2.3.75 Model, e.g., on many regional screenlines.

Figure A-1 Screenline crossing performance (Est./Obs. ratios) Map, 2014



Validation Performance: Transit Ridership

- Validation of commuter rail ridership has significantly improved.

2014 Transit Ridership Validation by Mode (Estimated/Observed Ratios)

	Ver. 2.3.75	Ver. 2.4
Metrorail	1.01	1.01
Commuter Rail	0.60	0.76
MARC	0.78	0.86
VRE	0.22	0.64
All Bus	1.10	1.09
Total:	1.04	1.04



Model Transmittal Package

- Model inputs files
 - Model inputs unchanged from the Ver. 2.3.78 Model transmittal package (*i.e.*, 2020 Amendment to Visualize 2045 network inputs and Round 9.1a Cooperative Forecasts of land use)
 - Includes seven analysis years: 2017, 2019, 2021, 2025, 2030, 2040, 2045 (2017, though not part of the latest AQC, was included to provide base-year network inputs)
- Model scripts and batch files
- Model documentation
 - Travel model user's guide
 - Model validation memo
 - Network documentation (unchanged from Ver. 2.3.78)
 - Transmittal memo
- Model outputs not included due to large size (10 GB per scenario)



Notes on Data Requests

- Requests for model transmittal package or modeling data should be submitted via the updated [MWCOG Data Requests webpage](#).
- There are currently two production-use models available for data requests. Please request the correct version for your needs:
 - Ver. 2.3.78 Travel Model: This model has been used in an AQC analysis and has been implicitly adopted by the TPB as part of the AQC.
 - Ver. 2.4 Travel Model: This model has not yet been used in an AQC analysis and thus has not been implicitly adopted by the TPB. However, this model contains enhancements that Ver. 2.3.78 Model does not have and will be used in the upcoming AQC analysis of the 2022 update of the LRTP.



Notes on Data Requests

- If you are requesting data or documentation that is “off the shelf” and limited in scope, then the request will likely be fulfilled in a few days and at no cost to the requestor.
- If you are requesting data or documentation that requires substantial time to find, process, format, or prepare, COG/TPB staff will need to determine what funding source can be used to cover staff time and/or materials needed to fulfill the request.
 - COG/TPB staff does not have an established mechanism for receiving external funds to cover fulfilling data requests.
 - In some cases, existing technical assistance funds can be used, but this requires special approval from the relevant outside entity, typically a state department of transportation (DOTs) or a transit agency.
 - In cases where we cannot identify a funding source, we will generally be unable to fulfill the request.



Next Steps

- TPB staff will accept data requests for the Ver. 2.4 Model transmittal package as of today.
- Ver. 2.4 Model will be used in the AQC analysis of the 2022 update of the LRTP, which the TPB will review, and possibly adopt, in 2022.
- Upon the TPB adoption of this AQC analysis, a new Ver. 2.4 Model transmittal package will be prepared with the updated network inputs from the 2022 update of the LRTP and new land use inputs (likely from Round 9.2).



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