

MTOC Response Attachment 2: USDOT Volpe Center Memorandum



Memorandum

Subject: **INFORMATION: I-495 & I-270 Managed Lanes Study, review of MTOC comments and proposed response** Date: August 15, 2022

From: Don Pickrell and Scott Smith

Reply to Attn. of: V-320

To: Gloria Shepherd
Associate Administrator for Planning, Environment and Realty, FHWA

Thru: Gregg Fleming
Director,
Policy, Planning, and Environment Technical Center

The following documents were reviewed:

1. Letter from Benjamin Ross, Chair, Maryland Transit Opportunities Coalition to Polly Trottenberg, July 11, 2022, including attachment entitled “Evidence of Possible Scientific Fraud in Toll Lane Traffic Model”
2. Proposed response to MTOC (“MTOC Letter Follow-Up,” August 9, 2022)

Our focus was on differences between the traffic modeling results reported for 2045 under the No-Build and Preferred (“Build”) alternatives in the SDEIS and FEIS. We do not have an opinion on the merits of the project.

As part of this review, we consulted the following publicly available documents:

1. Sections of the Supplemental Draft Environmental Impact Statement (SDEIS), dated October 2021 and downloaded on 11 August 2022
 - a. Chapter 3, Traffic
 - b. Appendix A, Traffic Evaluation Memo
2. Sections of the Final Environmental Impact Statement (FEIS), dated June 2022 and downloaded on 11 August 2022
 - a. Chapter 4, Traffic
 - b. Appendix A, Traffic Evaluation Memo

Findings:

1. Differences in projected traffic volumes and travel times on selected roadway segments between the SDEIS and FEIS appear to result from three main sources:
 - a. Minor changes in the modeled representation of the road and highway network mostly outside the immediate area of the project, which affect the baseline VISSIM calibration of link-level traffic volumes under the No-Build alternative (see p. 6 of proposed response to MTOC)
 - b. Minor changes in the representation of the Preferred or Build Alternative in the MWCOG¹ regional travel demand model network (pp. 4-5 of the proposed response to MTOC, referring to FEIS p. 3-7)

¹ Metropolitan Washington Council of Governments

I-495 & I-270 Managed Lanes Study, review of MTOC comments and proposed response

- i. Addition of at-grade ramps for ingress and egress between the high-occupancy toll (HOT) lanes and general-purpose lanes in both directions along the west spur of I-270
 - ii. Consolidation of exchange ramps along I-495 between Virginia and Maryland in the vicinity of the George Washington Memorial Parkway
 - c. Reconciliation process of forecast travel volumes from the MWCOG regional travel demand model with those used in localized VISSIM modeling of traffic volumes, particularly in area approaching the METRO Greenbelt Station. This process, which inherently entails manual adjustment of forecast volumes, presumably affects the traffic simulation results for both the no-Build and Build alternatives.
2. These adjustments to the modeled representation of the highway network and to forecast travel volumes produced different results in the traffic modeling conducted for the SDEIS and FEIS, as follows:
 - a. Overall differences in average daily traffic volumes under the No-Build alternative reported in the SDEIS and FEIS, which are a proxy for regional travel demand patterns, are generally minor (see Differences in demand section, below)
 - b. In some locations, overall trip volumes were identical in the SDEIS and FEIS, which could explain the identical volumes on many individual network links in the detailed traffic simulations conducted for the two documents
 - c. Although differences in modeled overall travel demand and simulated link-level traffic volumes are generally minor, these could nevertheless lead to significant differences in modeled travel times on specific links, as the area is highly congested during peak travel periods and delay increases non-linearly as traffic volumes grow.
3. Detailed simulations of traffic volumes on individual network links are generally conducted using fixed traffic volumes produced as part of the traffic assignment stage of a larger-scale, less detailed regional travel demand model as inputs. Because these detailed simulations generally do not entail rerouting of trip flows assigned by the regional demand model, they can sometimes predict changes in delay without accompanying changes in traffic volumes. This is a limitation of detailed traffic simulation modeling that can be addressed by repeated “iterative” solution of a regional travel demand model and the traffic simulation models used for more detailed analysis of localized traffic patterns and travel times, but this process is time-consuming, resource-intensive, and it may be difficult to reconcile the differing temporal and spatial resolutions of the two models.
 - a. Some traffic simulation results reported in the SDEIS showed extremely high localized delays on individual links near the project area, under both the No-Build and Build alternatives. While in practice some traffic would be expected to re-route around these areas to avoid encountering extreme delays, the traffic simulation model cannot by itself produce this expected result, and the modeled delays were not adjusted manually in an effort to replicate such “real world” behavior.
 - b. In response to the changes described in item 1 above, traffic simulation reported in the FEIS show significantly lower delays on these same facilities. Conspicuously, the changes incorporated in the FEIS modeling reduce delays to seemingly more realistic levels under both the No-Build and Build alternatives (see Congestion results section, below), so avoiding the extreme delays evident in the SDEIS modeling is *not* claimed to result from implementing the Build alternative.
4. Major road improvement projects can often affect the performance of other area roads outside their immediate area. While these are often beneficial – for example, moving traffic from a congested arterial to a freeway where the project indirectly improves performance – adverse impacts are also possible, such as worsening bottlenecks on roads carrying additional traffic toward the freeway.

15 August 2022

2

I-495 & I-270 Managed Lanes Study, review of MTOC comments and proposed response

- a. The SDEIS modeling apparently provided an example of worsening bottlenecks, where failing to adjust signal timing at intersections on a roadway carrying increased traffic to the major route the project would affect resulted in extreme queueing and delays.
 - b. To identify these impacts and understand their sources, it is often necessary to feed the traffic volumes and travel times estimated by the more detailed traffic simulation model back to a model that offers the capability to change trip routings in response to resulting changes in the travel times used as the basis for the initial route assignments, such as the VISUM routing model or the MWCOG model.
 - c. As indicated above, the process described in 4b is often a complex and time-consuming effort, given the differences in these models' temporal resolution of daily travel demand and in the detail with which they represent the road network. It appears that this feedback step was not part of the analysis conducted for the FEIS (See FEIS Appendix A, Figure 2-11: Modeling Methodology).
 - d. Both the SDEIS and the FEIS presented detailed traffic volume and delay modeling for the local network in the project area (see SDEIS Table 3-13 and FEIS Table 4-11), which consistently showed the preferred alternative leading to a reduction in delay on arterial streets in the surrounding area. While this result seems plausible, it is unclear how it was obtained – was it the product of feeding travel times initially estimated by the traffic simulation model into a routing-type model (or even into the larger MWCOG regional model) and using the adjusted routings it produced to revise the traffic simulation results, or of some other process? Furthermore, the reported changes in local network delays are identical in the SDEIS and FEIS, suggesting that whatever process generated this result in the SDEIS analysis was not revised as part of the more recent FEIS modeling.
5. We could not find a detailed explanation of the adjustments to projected future travel demands that were made between the SDEIS and FEIS (see 1.c. above), so we cannot assess their plausibility or validity.
 6. MTOC makes two major points in its letter that MD SHA should probably address in detail as part of its response letter.
 - a. Predicted evening rush-hour travel times on the Beltway from Connecticut Avenue (exit 33) and Rockledge Drive (exit 1B) eastbound to its junction with I-95 dropped by 15 and 30 minutes from the SDEIS to the FEIS, but traffic volumes on the ramp from the eastbound Beltway to I-95 during each of the four evening peak hours are identical in the SDEIS and FEIS. Some re-routing of both evening commute and through trips would have been expected to occur in response to such large changes in travel time, and while it's possible that such responses did occur, it's unlikely that they would have left travel volumes unaffected.
 - b. Differences between the No-Build and Build alternative in outbound traffic volumes on some (4 out of 8) routes carrying traffic from DC toward the northeast during the evening rush hour changed from the SDEIS to the FEIS in ways that are difficult to reconcile with the changes in travel speeds the project is expected to produce. In addition, the Build vs. No-Build differences in traffic volumes on ramps connecting these routes with the Beltway changed between the SDEIS and FEIS in ways that seem inconsistent with the expected impact of the project on through and connecting traffic at those interchanges.

15 August 2022

3

I-495 & I-270 Managed Lanes Study, review of MTOC comments and proposed response

Differences in demand

Table 1 ADT: differences between the SDEIS (Table 3-2 and 3-3) and FEIS (Table 4-2)

Corridor	Segment	Average Daily Traffic (ADT)				
		Existing (2017)	SDEIS (2045 Projected)		FEIS (2045 Projected)	
			No-Build	Build	No-Build	Build
I-270	I-370 to MD 28	226,000	274,000	277,000	270,000	284,000
	MD 28 to I-270 Spur	259,000	308,000	311,000	299,000	320,000
I-495	American Legion Bridge	243,000	285,000	309,000	280,000	306,000
	MD 190 to I-270 Spur	253,000	289,000	317,000	283,000	318,000
	Between I-270 Spurs	119,000	129,000	135,000	126,000	136,000
	MD 355 to I-95	235,000	256,000	267,000	250,000	253,000
	I-95 to US 50	230,000	248,000	250,000	248,000	250,000
	US 50 to MD 214	235,000	256,000	258,000	256,000	258,000
	MD 214 to MD 4	221,000	249,000	251,000	249,000	251,000
MD 4 to MD 5	198,000	223,000	224,000	223,000	224,000	

The detailed no-build travel demands SDEIS (Appendix A, page 118) and FEIS (Appendix A, page 737) are similar, but not identical, consistent with the summarized comparison in Table 1.

Congestion results

There are some extremely high travel time indices (calculated as the ratio of peak-period to off-peak travel time) in the SDEIS, with significant differences in the PM Peak.

Table 2 Selected travel time indices, from SDEIS (Table 3-8) and FEIS (Table 4-5)

PM Peak Hour Segment	SDEIS (2045 Projected)		FEIS (2045 Projected)	
	No-Build	Build	No-Build	Build
Inner loop VA193 to I-270	6.6	6.9	3.8	4.0
Inner loop I-270 to I-95	4.8	3.0	2.8	2.4

Modeled travel times are contained in Table 2 (p 10) in SDEIS appendix A, and Table 5-2A in FEIS Appendix A.

15 August 2022

4