
July 11, 2022

Ms. Polly Trottenberg, Deputy Secretary
U.S. Dept. of Transportation
1200 New Jersey Ave. SW
Washington, DC 20590

Subject: I-495 & I-270 Managed Lanes Study
Evidence of scientific fraud in FEIS traffic model

Dear Ms. Trottenberg:

As you know, on June 17 FHWA and the Maryland DOT issued a Final Environmental Impact Statement for the I-495 & I-270 Managed Lanes Study. This project now awaits a Record of Decision.

Last October 18, we wrote to FHWA Administrator Pollack pointing out errors in the traffic model presented in the SDEIS. The FEIS acknowledges that our criticisms "have merit," and in response the FEIS presents new traffic forecasts that are substantially different.

However, the FEIS offers no explanation of what was wrong with the SDEIS model or how the errors were corrected. Moreover, when input and output data and documentation were requested from MDOT, the agency replied that the inquiry would be treated as a Public Information Act request (Maryland's version of FOIA) and no data would be provided in time to review the FEIS.

Examination of the FEIS traffic modeling technical appendix raises even greater concerns. Anomalies in the FEIS traffic forecasts create serious doubt whether the new traffic forecasts could have been generated by correcting previous errors and suggest possible falsification of model outputs.

The clearest evidence we have found of possible scientific fraud is in the modeling of the 2045 No-Build alternative. Changes occur from the SDEIS to the FEIS in patterns that are inconsistent with correction of errors in model inputs, coding, or numerical methods, but would be consistent with arbitrary adjustment of intermediate or final outputs.

**Exhibit D**

For example, the predicted evening rush-hour travel time from Connecticut Avenue to I-95 on the Beltway Inner Loop is 15 minutes faster in the FEIS than in the SDEIS. The travel time from Rock Spring Park to I-95 is half an hour faster. Yet, in the two reports, the number of vehicles exiting the Inner Loop onto I-95 is *exactly identical* in each of the four pm peak hours, 3:00 to 4:00, 4:00 to 5:00, 5:00 to 6:00, and 6:00 to 7:00.

A basic principle of traffic modeling is that drivers tend to choose the fastest route from trip origin to destination. In a model, as in real life, large changes in travel times from southwestern Montgomery County's two major job centers would induce some drivers to change their travel routes. Traffic volumes on the ramp from the Inner Loop to I-95 cannot stay the same, yet that is what the FEIS says.

We have found numerous other anomalies of similar nature. These are described in the attachment to this letter.

President Biden's January 27, 2021 Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking states that:

> It is the policy of my Administration to make evidence-based decisions guided by the best available science and data..... Scientific findings should never be distorted or influenced by political considerations.

The memorandum instructs agencies to "prevent the suppression or distortion of scientific or technological findings, data, information, conclusions, or technical results."

In accordance with this policy, USDOT should take steps to ensure that the Record of Decision for the I-495/I-270 Managed Lane Study is not based on data manipulated to achieve a pre-determined outcome. We request an independent examination to ensure the veracity of the traffic modeling data that undergird this major policy decision. At a minimum, the modeling report should receive an independent peer review.

The Task Force established to implement the President's Memorandum, in its January 2022 report, called for "Increasing Transparency to Support Scientific Integrity." It explained that transparency can "help deter violations of scientific integrity policies and detect them when they occur by making sure relevant information is readily available to all who can use it."

We thus request the release of the data files and documentation of the FEIS model so that outside experts can examine them and comment prior to issuance of the ROD. We also request that MDOT identify the errors in the SDEIS and explain how the model was altered to correct them in the FEIS.

Key aspects of the environmental analysis – among them whether the Preferred Alternative satisfies the Purpose and Need, air and noise pollution, and whether the project will help or harm Environmental Justice populations – are dependent on the traffic model. An independent inquiry into the scientific integrity of that model is needed before a Record of Decision is issued.

Sincerely,

Benjamin Ross, Chair
Maryland Transit Opportunities Coalition

cc: Stephanie Pollack, FHWA Acting Administrator
Dr. Faris Ibrahim, USDOT member of Scientific Integrity Fast-Track Committee
Senator Ben Cardin
Senator Chris Van Hollen
Rep. Jamie Raskin
Rep. Anthony Brown
Peter Shapiro, Chair, Prince George's County Planning Board
Casey Anderson, Chair, Montgomery County Planning Board

# Evidence of Possible Scientific Fraud in Toll Lane Traffic Model

On October 18, 2021, MTOC, CABE, and DontWiden270 wrote to FHWA Administrator Stephanie Pollack regarding errors in Maryland DOT's traffic model for the I-270/I-495 toll lane project. This letter was also submitted as a formal comment on the SDEIS.

The FEIS, issued June 17, concedes (buried on page 828 of Appendix T) that the letter's criticisms of the model "have merit" and that changes were made in response:

> Finally, comments questioning certain throughput figures presented in the SDEIS, Appendix A were determined to have merit. While that Appendix presents over 1,500 figures (in Attachment G), these comments identified minor anomalies in that data that the agency re-evaluated in the course of preparation of the FEIS and supporting technical reports. Updated throughput tables are presented in the FEIS (Appendix A, sub-appendix G) and have addressed the concerns identified. Overall, the throughput results summarized in Section 3.3.5 of the SDEIS which were used to evaluate the Preferred Alternative to the No Build Alternative follow expected trends, and the minor data corrections do not impact the overall conclusions presented.

However, the FEIS fails to identify the cause of the errors in the SDEIS model or describe the changes that were made. In addition, MDOT refuses to let expert outside reviewers see the input and output data files while the Record of Decision is pending. Consequently, there can be no confidence that the model has been fixed correctly, and the results in the FEIS continue to lack demonstrated validity.

Moreover, comparison of model results from the SDEIS and FEIS technical appendices reveal new anomalies. The changes in the reported results for the 2045 No-Build model are inconsistent with correction of errors in model inputs, coding, or numerical methods and consistent with arbitrary adjustments of intermediate or final outputs made to obtain a desired result.

A basic concept of traffic modeling is that drivers tend to choose the fastest route from the origin of each trip to its destination. In the models as in real life, if traffic on a highway moves faster, drivers will switch to it from other routes. The FEIS model results violate this principle.

Connecticut Avenue (Beltway exit 33) and Rockledge Drive (I-270 exit 1B) are the main access points to the Beltway for eastbound traffic from the two major employment centers in southwest Montgomery County, Bethesda/NIH/Walter Reed Medical Center and Rock Spring Park. Predicted evening rush-hour travel times from these interchanges to the

Beltway junction with I-95 dropped drastically from SDEIS to FEIS – from 38 to 23 minutes from Connecticut Avenue and 67 minutes to 37 minutes, a full half-hour, from Rockledge Drive. Yet, as the first table shows, the traffic volume on the ramp from the eastbound Beltway to I-95 is *exactly identical* in each of the four evening peak hours.

With such large differences between the two models in predicted travel time, the algorithm *must* reassign some trips that took other routes in the SDEIS model to the eastbound Beltway (the Inner Loop) in the FEIS model. Some commuting trips will switch from the I-270-ICC route to the Beltway-I-95 route; some long-distance trips headed north from Virginia will switch between the east and west sides of the Beltway, etc. These reassignments may well be counteracted by other changes in the model, but it is next to impossible that the changes would exactly cancel out in each of four different hours.

Predicted No-Build pm traffic volumes exiting eastbound I-495 onto I-95

| Time | **SDEIS** | **FEIS** |
|---|---|---|
| 3:00-4:00 | 3655 | 3655 |
| 4:00-5:00 | 3605 | 3605 |
| 5:00-6:00 | 3600 | 3600 |
| 6:00-7:00 | 3865 | 3865 |

This is only one of many such anomalies that emerge when the SDEIS and FEIS are compared.

One clearly erroneous prediction by the SDEIS traffic model was a pattern of "widespread decline in traffic headed out of Washington toward the northeast during the evening rush hour... if the Preferred Alternative is built, compared to no-build." This was obviously wrong; widening I-270 and the American Legion Bridge will not reduce traffic toward Annapolis on US 50. The same error appeared on 7 other interchanges between US 50 and US 29.

SDEIS model-predicted change in outbound rush hour traffic

| Highway | No. of Vehicles | Percentage Change |
|---|---|---|
| US 29 | –340 | –2.9% |
| MD 193 | –190 | –2.6% |
| MD 650 | –395 | –3.8% |
| I-95 | +530 | 1.6% |
| US 1 | –950 | –12.8% |
| MD 201 | –1,090 | –15.9% |
| MD 295 | –1,395 | –9.9% |
| MD 450 | –35 | –0.3% |
| US 50 | –1,230 | –4.1% |

The second table, copied from our October 18 letter, lists the SDEIS-model-predicted differences between the Build and No-Build alternatives in traffic headed outbound from the 9 interchanges in this sector. Traffic on each highway is measured on the segment immediately past the ramps on the outside of the Beltway.

In the FEIS model, the 8 interchanges that formerly showed a decrease in outbound traffic volume now show essentially unchanged traffic volumes (within 1%) between the Build and No-Build alternatives. (I-95 now shows a decline of 550 vehicles, or –1.7%, rather than an increase.)

Let us examine in more detail how the predicted outbound traffic changed in and around these 8 interchanges from the SDEIS No-Build model to the FEIS No-Build model.

On US 29, MD 193, MD 650, and US 1, the two reports predict exactly identical traffic volumes outside the Beltway for each of the four hours, while the traffic volumes on the same road inside the Beltway are smaller in the FEIS than in the SDEIS. (The difference is less than 1% on US 29, MD 193, and MD 650, and 2% to 3% on US 1.) On I-95, which only exists outside the Beltway, predicted traffic volumes are identical.

On MD 201, MD 295, MD 450, and US 50, this pattern is reversed. The two reports predict exactly identical traffic volumes inside the Beltway for each of the four hours, and the traffic volumes outside the Beltway are smaller in the FEIS than in the SDEIS. The decreases are 6% or 7% at MD 201 and much smaller at the other three interchanges. To illustrate these patterns, the SDEIS- and FEIS-predicted traffic volumes on US 1 and MD 201 for the four pm rush-hour intervals are shown in the adjoining table.

Predicted No-Build pm traffic volumes

| | Inside Beltway | | Outside Beltway | |
|---|---|---|---|---|
| Time | SDEIS | FEIS | SDEIS | FEIS |
| MD 201 - Northbound | | | | |
| 3:00-4:00 | 2160 | 2160 | 1700 | 1595 |
| 4:00-5:00 | 2410 | 2410 | 1755 | 1645 |
| 5:00-6:00 | 2490 | 2490 | 1905 | 1795 |
| 6:00-7:00 | 2185 | 2185 | 1515 | 1405 |
| MD 201 - Southbound | | | | |
| 3:00-4:00 | 2330 | 2255 | 2065 | 2065 |
| 4:00-5:00 | 2660 | 2575 | 2370 | 2370 |
| 5:00-6:00 | 2620 | 2520 | 2640 | 2640 |
| 6:00-7:00 | 2325 | 2220 | 2330 | 2330 |
| US 1 - Northbound | | | | |
| 3:00-4:00 | 1790 | 1760 | 1775 | 1775 |
| 4:00-5:00 | 1935 | 1895 | 1900 | 1900 |
| 5:00-6:00 | 2280 | 2235 | 2115 | 2115 |
| 6:00-7:00 | 1850 | 1795 | 1625 | 1625 |
| US 1 - Southbound | | | | |
| 3:00-4:00 | 1845 | 1845 | 1645 | 1640 |
| 4:00-5:00 | 1805 | 1805 | 1690 | 1675 |
| 5:00-6:00 | 1890 | 1890 | 1870 | 1850 |
| 6:00-7:00 | 1795 | 1795 | 1755 | 1725 |

This is not how the model should behave. Under conditions of pervasive traffic congestion – a safe assumption near the Beltway during the pm rush hour – an increase in traffic volumes on any stretch of highway will cause additional delay. This, in turn, will cause some drivers to switch to alternative routes.

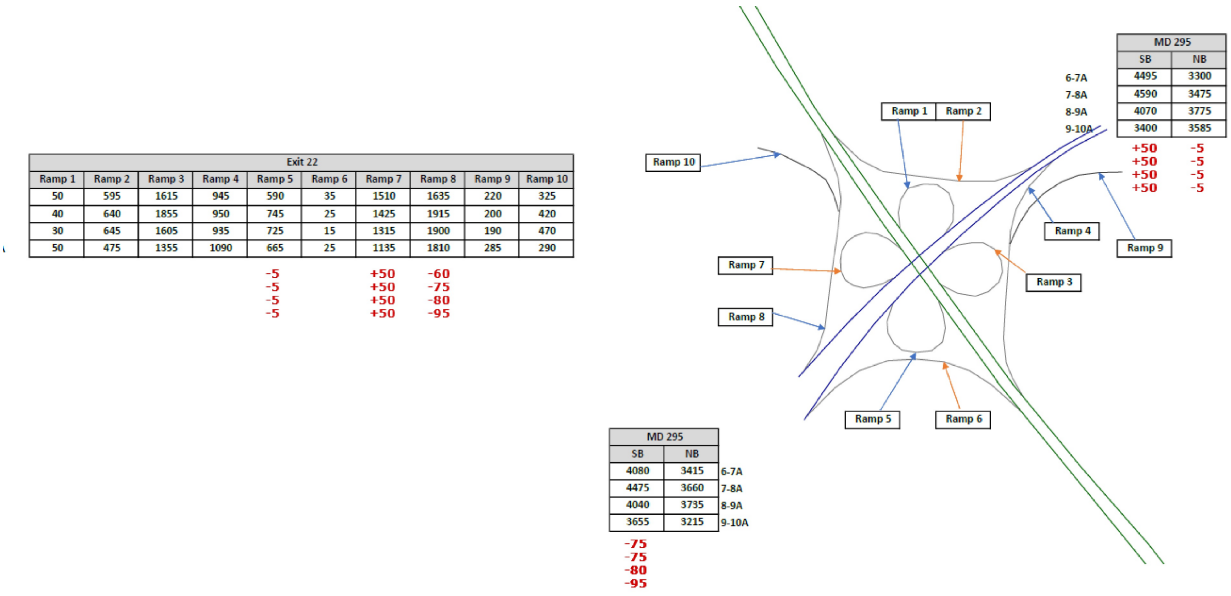
Thus, if the FEIS model run puts fewer drivers on northbound MD 201 north of the Beltway, it will predict that some drivers switch to MD 201 from other highways. In other words, removing northbound vehicles from MD 201 north of the Beltway will induce an increase in predicted northbound traffic on that road south of the Beltway. Changes elsewhere in the model might counteract that effect, but it is extremely unlikely that independently determined changes in traffic volume would add up exactly to zero in each of four hours. And essentially impossible for that to occur at each of eight interchanges.

This pattern could, however, arise from ad hoc alteration of model outputs for the purpose of generating a desired conclusion. For example, the Greenbelt Metro Interchange,

mentioned briefly on page 4-1 of the FEIS, might have been incorporated into the FEIS No-Build alternative results by adding traffic on some but not all Beltway ramps, without rerunning the model. We have not identified any other reasonable explanation of this pattern of changes in predicted traffic volumes from SDEIS to FEIS, and MDOT certainly has not offered any.

Predicted vehicle movements within the interchanges exhibit anomalous patterns as well. Not only do the northhbound and southbound traffic volumes on each cross highway change between SDEIS and FEIS on only one side of the Beltway, but the hourly changes in traffic on the highway typically are equal to the changes on a single ramp. Traffic volumes on the other ramps of the interchange are mostly unchanged, with a few small changes of 5, 10, or at most 15 vehicles per hour.

The Baltimore-Washington Parkway (MD 295) interchange provides a clear example of this. The figure shows evening rush-hour traffic volumes from the SDEIS modeling[1] with changes from SDEIS to FEIS listed beneath in red. Where there are no red numbers, the SDEIS and FEIS numbers are identical.

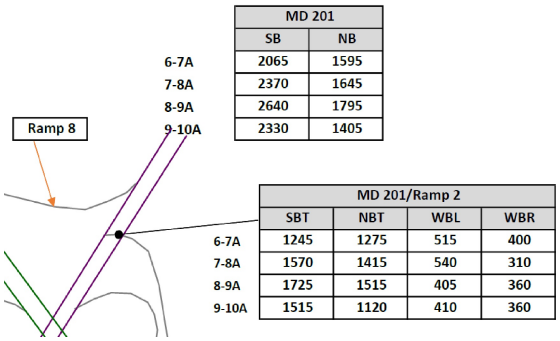



The change in traffic on northbound MD 295 outside the Beltway exactly matches the change in traffic entering from Ramp 3; there is no change in through traffic or on the other three connecting ramps. The change in southbound traffic approaching the Beltway exactly matches the change in traffic on ramp 7 onto the eastbound Beltway. The change

[1]The times of the four hourly intervals are incorrectly labeled as 6-7A, 7-8A, 8-9A, and 9-10A in numerous evening peak figures for the No-Build Alternative in both SDEIS and FEIS.

in southbound traffic beyond the interchange matches the change in traffic on Ramp 8 from the eastbound Beltway in 3 of 4 one-hour intervals; there is a 15-vehicle discrepancy in the 3:00-4:00 hour.

A column of erroneous numbers in the FEIS chart for the MD 201 interchange gives further support to the hypothesis that numbers were generated by ad-hoc adjustments. The northbound traffic volume exiting the interchange (the column labeled NB) should equal the traffic turning right off Ramp 2 (WBR) plus the northbound through traffic at the Ramp 2 intersection (NBT). The numbers do not add up because the numbers shown for the through traffic are incorrect.[2] The discrepancies for the four hours are 80, 80, 80, and 75. An error of this nature could easily be made by someone adjusting previously obtained results by hand, but would be unlikely to arise in the output of a regional traffic model.




| MD 201 | |
|---|---|
| SB | NB |
| 2065 | 1595 |
| 2370 | 1645 |
| 2640 | 1795 |
| 2330 | 1405 |

| | MD 201/Ramp 2 | | | |
|---|---|---|---|---|
| | SBT | NBT | WBL | WBR |
| 6-7A | 1245 | 1275 | 515 | 400 |
| 7-8A | 1570 | 1415 | 540 | 310 |
| 8-9A | 1725 | 1515 | 405 | 360 |
| 9-10A | 1515 | 1120 | 410 | 360 |

These anomalies come on top of MDOT's failure to explain the changes made to correct admitted errors in the modeling and its resistance to release of input and output data files. It is impossible to rely on the FEIS traffic modeling report for any purpose, pending a thorough inquiry that rules out the possibility of scientific fraud, identifies the errors in the SDEIS model, and demonstrates that the modeling errors have been corrected.

[2]That the error is in the through traffic, and not the turning traffic or the sum, can be verified by adding up traffic volumes on the other legs of the interchange, which are shown in the FEIS figure from which this detail was taken.

# Benjamin Ross, Ph.D.

**Work Experience:**

| | |
|---|---|
| 2014 – | Self-employed author and part-time environmental consultant |
| 1984 – 2014 | President of Disposal Safety Incorporated, a firm specializing in analysis of contamination by hazardous chemical and radioactive wastes. Developed computer model of underground gas flow at proposed Yucca Mountain nuclear waste repository. Published important scientific papers on multiphase flow in the subsurface, including the movement of dense non-aqueous phase liquids (DNAPLs). Reviewed numerous ground-water contamination investigations throughout the United States. Expert witness for the U. S. Dept. of Justice and private attorneys in numerous court cases, including *ICO v. Honeywell*, where he was the hydrogeology expert for plaintiffs who won an order requiring a $400,000,000 remediation. Edited issue of *Engineering Geology*: "Models of Nuclear Waste Repository Performance." |
| 1992 – 1999 | President of European Analytical Services, Inc. Represented a leading Russian scientific organization, the V. G. Khlopin Radium Institute, in U. S. sales of laboratory services and high-technology products. |
| 1981 – 1984 | Senior Research Scientist at GeoTrans, Inc. |
| 1976 – 1981 | Studied nuclear waste disposal at The Analytic Sciences Corp. |
| 1975 – 1976 | Energy Resources Company. Deputy Manager, Policy Division. |

**Education:** A.B., Physics, Harvard University (summa cum laude), 1971.

Ph.D., Physics, Massachusetts Institute of Technology, 1976.

**Committees:** National Academy of Sciences, Board on Radioactive Waste Management, Committee on Remediation of Buried and Tank Wastes, 1993-2000.

USEPA Science Advisory Board, Subcommittee on Natural Attenuation Research, 2000.

USEPA Science Advisory Board, HLW/Carbon-14 subcommittee, 1992.

**Languages:** Fluent in French, good German and Russian, some Hebrew.

**Books:**

B. Ross, *Dead End: Suburban Sprawl and the Rebirth of American Urbanism*, Oxford University Press, New York, 2014.

B. Ross and S. Amter, *The Polluters: The Making of Our Chemically Altered Environment*, Oxford University Press, New York, 2010.

**Scientific publications:**

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