



# MARYLAND POLICY REPORT

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## GRIDLOCKED PLANNING FOR I-270

### FLAWED MARYLAND STUDY CONCEALS POTENTIAL BENEFITS OF IMPROVING THIS VITAL CORRIDOR

*By PETER SAMUEL*

When the Maryland Department of Transportation's (MdDOT) major planning document for I-270<sup>1</sup> was released last year, the *Gazette* newspaper summarized it with the front-page headline "Drivers may see little improvement with highway changes." The "changes" were works that would cost some \$1.8 to \$2.2 billion. They would rebuild the heavily burdened highway, expanding a section of its northern end from two lanes to four and also upgrading US-15, an important feeder route. Each alternative also includes transit improvements with capital costs of between \$300 and \$860 million.

The *Gazette* newspaper, which draws a large portion of its readership from the I-270 corridor, described the report's conclusions as follows:

Even when more lanes and new interchanges are eventually added to US-15 and Interstate-270, there will be minimal improvement to traffic congestion along the already busy highway.... [N]o matter what design option the state ultimately chooses for the highway, the "level of service" or

condition along I-270 will remain in the failing "D-F" grade range during the morning rush hour and the early evening. This means traffic during peak hours will be quite heavy.

The document's tone was so negative that one local political leader, Frederick County

Commissioner John "Lennie" Thompson, commented, "There is no light at the end of the tunnel, no matter what we do."

When I first read the *Gazette* article – before I read the actual study—I assumed the deep pessimism was "spin" being

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1. The formal name of the report is "I-270/US-15 Multi-Modal Corridor Study, Frederick and Montgomery Counties, Maryland, Draft Environmental Impact Statement and Section 4 (f) Evaluation." We condense that mouthful of a title to "DEIS-270." The study was published under the imprimatur of the U.S. Department of Transportation and MdDOT as part of a federally mandated planning process under the National Environmental Protection Act of 1969 and subsequent amendments and regulations. The actual work was performed by state DOT staff and consultants they hired, so it is most accurately characterized as a MdDOT study.

applied to the report by people disinclined to support significant I-270 improvement. Thompson, for example, is a fervent opponent of most new development. But, after reading the study, I realized the newspaper's unfavorable description of the project and similar dark comments by local political leaders were accurate reporting; the report's projected results from roadway improvement are so meager as to make anyone wonder, "Why bother?"

Yet a close reading shows the DEIS-270 report itself is deeply flawed:

1. It uses an obsolete and unsuitable traffic-forecasting model especially liable to give misleading results for the outer area covered.
2. It reports that more highway lanes will attract so much extra traffic that severe congestion will be perpetuated, when at most this dismal conclusion has been derived from modeling of conditions during a single hour in each peak period.
3. The report fails to mention, let alone quantify, improvements to traffic flow on either side of that single peak hour and thereby misleads the public about benefits from road widening when presently severe congestion lasts three to four hours, twice daily.
4. The report has many less spectacular but important errors and omissions, which cumulatively suggest a lack of professional care in its preparation.

The I-270 study appears to have been influenced by the anti-highways component of the Glendening administration's "Smart Growth" ideology. The Ehrlich administration should reject this DEIS, withdraw it, rework the traffic forecasts with an appropriate and up-to-date forecasting software, and make it report accurately modeled data for each hour of peak periods. The alternatives modeled should include a self-financing toll express or "HOT" lane, since the law requires the department to consider "all reasonable alternatives." The conclusions should report the practical alternatives available to solve a congestion problem, not what is required to conform to the tenets of the anti-automobile Smart Growth ideology. Meanwhile there are several low-cost improvements to the highway that can proceed to construction ahead of finalization of the defective DEIS.

## BACKGROUND

The DEIS-270 study covers 31 miles of the I-270 roadway, from the I-370 interchange in Shady Grove northward to the highway's terminus in Frederick, and then on to U.S. Route 15 as it heads north through the city to Biggs Ford Road on Frederick's northern outskirts. I-270 is both a local transportation corridor supporting linear growth from Rockville through Gaithersburg to Frederick, and a major artery for roadway shipping into Washington, D.C. from the I-70 and I-81 corridors.

The study process for the DEIS-270 began in 1994, making it one of the most protracted corridor studies ever performed in this country. It is supposed to address existing congestion and anticipated population growth in both Frederick and Montgomery counties between the years of 2000 and 2025.

The DEIS-270 considers several possible future plans for I-270, including a no-improvement option, a system-management option, and three general improvement schemes each of which would incorporate roadway expansion and increased transit. Those expansion schemes (labeled Alternatives 3, 4, and 5), include the following: Alternative 3 would add lanes only for high-occupancy vehicles (HOV), Alternative 4 would add only general purpose lanes, and Alternative 5 would add both HOV and general purpose lanes.

Each of the three general alternatives has different versions, depending on what sort of transit system improvement they would include. The different possible transit system improvements include light rail, dedicated bus lanes, or buses that would simply use the HOV lanes. A brief description of each of the alternatives is shown in Table 1.

## IMPROVEMENTS AND CONGESTION

The study is skeptical that improvement of the I-270 corridor would improve traffic conditions over the long term. That outlook emerges in the Summary chapter: "Even with the transportation improvements underway or planned, future development that is expected as a response to the increases in population and employment will cause increased congestion" (p. S-2). Further on: "The Frederick County mainline section of I-270 will also continue to operate at LOS-E/F<sup>2</sup> conditions during the 2025 AM and PM peak periods. In general, the section of I-270 between Maryland Route

**Table 1**  
**DEIS-270 IMPROVEMENT OPTIONS**

<b>Alternative</b>	<b>3</b>		<b>4</b>		<b>5</b>		
Roadway improvement	Add HOV lanes		Add general-purpose lanes		Add HOV and general-purpose lanes		
Roadway construction, \$M	1,805		1,805		2,098		
KM at LOS-F	62		43		51		
<b>Option</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>C</b>
Transit	light rail	bus rapid transit	light rail	bus rapid transit	light rail	bus rapid transit	premium bus
Transit construction cost, \$M	857	792	857	792	857	792	296
Annual transit subsidy, \$M	15	38	15	38	15	38	11

121 and I-70 will operate at LOS-E/F conditions regardless of the proposed number of lanes (three lanes in each direction in Alternates 3A/B and 4A/B versus four lanes in each direction in Alternates 5A/B/C). That is due to the travel demand projections which show that additional capacity improvements made along I-270 result in additional traffic volumes along the corridor” (p. S-11).

What are the “peak periods” that the DEIS-270 describes? Most Frederick commuters that I know speak of the peak period as lasting at least three hours in the morning from 6 AM to 9 AM, and a similar time in the afternoon 3:30 PM to 6:30 PM. For Montgomery County commuters, the peak periods are of similar duration but they occur slightly later. The latest systematic aerial survey<sup>3</sup> of congestion by Skycomp Inc. shows congestion at levels between LOS-D and -F for between two and three hours of each rush period, confirming anecdotal impressions of the extent of peak period congestion.

The DEIS-270’s modeling of those peak periods is deceptive. The Maryland Department of Transportation used an old traffic-forecasting model that is only capable of forecasting traffic conditions for a single peak hour, not for the two to three hours that comprise the real morning and evening “rush hours” along I-270. That is a substantial shortcoming that detrimentally affects the report’s ability to

weigh the various advantages of the different I-270 improvement alternatives.

**Extra trips?** Consider, again, the DEIS-270 statement that “additional capacity improvements made along I-270 result in additional traffic volumes along the corridor.” In other words, the report implies that improving I-270 would encourage more people to use the road, and would perpetuate roughly the same level of congestion as now.

But that additional capacity on I-270 would not result in significantly greater total trip making or other roadway use. Highway-induced development and traffic is much talked about by environmental activists and used as a club to beat proposals for highway enhancement. However, when studied by objective analysts, it appears usually to be a minor phenomenon. (See, for example, “Revisiting the Notion of Induced Traffic through a Matched Pairs Study,” by Patricia L. Mokhtarian et al., University of California, Davis, 2001.) Most extra peak traffic coming from road widening is a diversion from parallel roads to the improved facility, or an increased concentration of traffic during the times drivers most want to travel at the expense of the “shoulders” or edges of the peak. Both of those phenomena provide motorist benefits: parallel roads that are relieved of congestion, freer flow before and after the peak time, and more capacity for people who must drive at the worst times. Greater total trip making usually is not large.

2. “LOS” is the traffic engineer’s shorthand for “Level of Service,” which roughly describes traffic flow. The highest possible rating is LOS-A, representing completely free flow; the ratings then move through LOS-B, LOS-C, etc. until it reaches LOS-F, representing failure or stop-and-go congestion.
3. “Traffic Quality on the Metropolitan Washington Area Freeway System,” published by Skycomp Inc., October 2002. See maps on pages 38 and 40.

Total trip making is examined by looking at a much broader area (or “cordon” in traffic engineering jargon). A number of “screenlines” are drawn across both the corridor that is the center of the study and all the parallel roads likely to be influenced by traffic conditions on the primary corridor. Screenline projections in the DEIS-270 (p. V-36) show quite small differences between the I-270/US-15 “no-build” alternative and the most ambitious “build” alternative. The DEIS-270 report is poorly labeled and does not spell out its definitions, but Maryland Transportation Department forecasting staffers say the “corridor” covers I-270/US-15 alone, while the screenline covers a broader area of influence including parallel routes. The only parallel route along the length of the I-270/US-15 corridor is MD-355, the old Rockville Pike built on the alignment of the old colonial turnpike between Georgetown and Rockville to Frederick. It is mostly a two-lane, mixed-traffic distributor with no control of access or grade separation, and no plans for expansion. It goes through the middle of all the settlements along the way, and in many places is a slow commercial strip with business and other buildings directly fronting it. MD-355’s capacity to take traffic from an overcrowded I-270 is very limited. Similarly, the flows on MD-355 are so modest and locally oriented that diversion will not make a substantial difference to I-270. The differences at the various screenlines range between 0.8 percent and 7.0 percent for an average difference of 3.7 percent. So, the modeling does not forecast a significant amount of induced traffic, even if the state elects to construct the most extensive “build” alternative.

Other data on vehicle-miles traveled (VMT) on “non-freeway” roads presented in the DEIS-270 report reinforce this. I-270 and US-15 are the only “freeway” type roads in the area, which helps us to measure any spillover effects. The middle table on p. V-40 of the report, entitled “Changes in Non-Freeway VMT,” shows very little difference in trip making as between the various alternates. The maximum difference in total VMT on all roads including I-270/US-15 is one-tenth of one percent, 214,362,854 vs. 214,107,209. (Unfortunately, the table does not note whether this is daily, monthly, or annual VMT, and the table has no number for citation.)

**Peak compression** If, then, people will not make significantly more trips if I-270 is expanded, the only possible reason for increased congestion from the expansion would be as the result of more people traveling at the same time, i.e., the peak period would become more intense with more lanes, but shorter in duration. The DEIS-270 modeling suggests that, by 2025, the stretch of roadway between two interchanges in the southern commercial area of Frederick (between the interchanges of MD-85 and I-70) will carry 5,900 vehicles per hour southbound in a morning peak hour under the “no-build” scenario versus 8,650 per hour under road improvement Alternative 4 and 9,800 per hour under Alternative 5. Those are 47 percent and 63 percent increases in traffic over what the state claims would be usage if there were no enhancements. To take another example, between MD-109 and MD-80 around Urbana, the peak hour traffic northbound in the PM-peak is projected for 2025 at 4,850, 5,700, and 6,975 vehicles per hour for “no-build,” Alternative 4, and Alternative 5 respectively. In other words, the “build” scenarios supposedly would increase traffic between 18 and 44 percent over the “no-build” scenario.

The inescapable conclusion is that the extra traffic accommodated in the peak hour in the higher alternatives is traffic not traveling on either side of the peak hour. That is good news for motorists – the roads will be free flowing after a much shorter congested period. However, the pessimistically spun DEIS-270 does not acknowledge that good news; it is as if the authors never thought about it, or else decided to suppress the good news lest it be picked up to make the case for road construction.

Even if, during the shorter peak periods each morning and evening, an improved I-270 is likely to remain a lousy LOS-F, the increased traffic accommodated in that period would significantly improve the level of service before and after the congestion peak, and would reduce the duration of congested conditions significantly. If contemporary forecasting models had been used for the DEIS-270, the positive effect of greater capacity under Alternatives 3, 4, and 5 could have been quantified. Even with the state’s use of an obsolete forecasting model, this positive effect should have been mentioned in the report’s commentary. Its omission has to rank as a serious misrepresentation; put bluntly, it is a major deception.

**Odd results** The modeling presented deeper in the report does show 2025 benefits even in the peak-hour from Alternative 4, and it notes that those improvements are superior to just adding an HOV lane as proposed in Alternative 3. But oddly, it finds that adding an HOV lane as well as a general-purpose lane (Alternative 5) creates worse congestion.

There are a number of similar odd results from the modeling. For example, in the MD-109 to MD-80 leg of I-270, the southbound AM rush period under the “no-build” scenario is supposed to carry 4,475 vehicles per hour in 2025. But with the addition of an HOV lane under Alternative 3, it is supposed to experience 4,825 vehicles per hour in the two general-purpose lanes plus an additional 1,075 vehicles in the HOV lanes for a total of 5,900 vehicles per hour. It makes no sense that the addition of an HOV lane would increase traffic in the adjacent general-purpose lanes, and that they would operate at a worse level of service than they would without the HOV lane. Also, the notion that the addition of an HOV lane would increase total traffic by 32 percent seems far-fetched. The state Transportation Department staff has claimed that this projected increase would result from I-270’s attraction of extra traffic on US-15 in Frederick north of I-70. In that case, Alternative 4 is highly unbalanced in its design, contriving a bottleneck in the segment between MD-109 and MD-80. Unbalanced designs creating new bottlenecks should not be presented as alternates; that is akin to a surgeon proposing a procedure that he knows will have adverse side-effects and leave the patient in worse health overall than before she went under the knife!

**Questionable assumptions** Some base assumptions used in the DEIS-270 to generate the traffic numbers look dubious. According to the study, the corridor legs in Montgomery County will see an increase in traffic of 50 percent between 1998 and 2025, while population in the county is expected to rise only 19 percent. Over the same time frame, traffic in Frederick County is projected to increase 80 to 120 percent while the population will grow only 50 percent. To be sure, per capita trips have risen over the past several decades as the vehicle ownership paradigm shifted from one vehicle per household to one per licensed driver, but it is quite unclear that a new paradigm will emerge that will further drastically increase the trips-per-capita.

The DEIS-270 assumes per capita increases in trip making of 25 percent on I-270 in Montgomery County and about 33 percent on I-270/US-15 in Frederick County. That seems highly improbable; increases of five or 10 percent seem more plausible, given that the major force behind past increases in per capita car use – first-time car owners getting cars – is now dissipating. If modest increases in per-capita travel were assumed in the DEIS-270 forecasting, then levels of service would be greatly improved even in the modeled peak hour.

## TRANSIT

The report’s presentation on transit operating costs suggests that light rail has major operating cost advantages over rapid-transit bus service and even over regular bus service. For example, on p. V-29, Table V-3 shows light rail’s operation and maintenance costs to be at only \$24.8 million annually while a bus rapid transit system would cost \$63.9 million annually and a “premium” bus service would cost \$32 million annually.

Those projections are quite at odds with the conventional wisdom, which is that bus is usually similar to or lower in operating costs – and of course far lower in capital cost – than rail. For example, the U.S. General Accounting Office report “Mass Transit: Bus Rapid Transit Shows Promise” (GAO-01-984, September 2001) reported lower operating costs with bus rapid transit except in cases where it was deployed on routes with notably less traffic than rail and hence lower utilization – an invalid comparison. Where bus rapid transit is deployed in comparable corridors, its costs are lower than light rail, according to GAO and other analysts. There are a number of reasons for this:

1. Buses are cheaper to maintain because they are mass-produced vehicles that can be serviced by ordinary mechanics, whereas rail requires specialized mechanics.
2. Bus right-of-ways, being constructed of pavement, are far cheaper to maintain than light rail’s specialized tracks and many switches.
3. Buses have no elaborate power rails or other infrastructure to maintain and no specialized signaling, unlike rail.

To be sure, rail can reduce operating costs per seat because of the larger capacity of rail vehicles. However, the GAO and other studies suggest any driver economies are more than offset by disecono-

mies in other costs. The larger size of rail vehicles carries a penalty in service: for a given passenger load, there is lower frequency and fewer choices of travel time.

Despite the DEIS-270's bias in presentation of operating costs in favor of rail, the modeled results in the study favor bus transit. The bus alternates are clearly superior to the rail, the study finds, in attracting new riders. According to the modeling, bus rapid transit will attract an extra 11,400 riders daily, and premium bus service will attract 10,800. In contrast, light rail will attract only 2,800 more riders daily (p. S-10).<sup>4</sup> As the DEIS-270 report underscored, bus has the advantage of providing "a one-seat trip" for more riders than rail, which requires shuttles and park-and-ride. The report notes, "There was (projected) five times as much of an increase in transit trips for [bus rapid transit] and Premium Bus Alternates as there was for the [light rail] Alternate. Specifically, Premium Bus serves Frederick County better than any of the other alternates" (p. V-43).

The study projects large percentage increases in transit use, led by a jump in MARC commuter rail ridership from 5,100 to 24,000 per day – a stunning 370 percent increase. (That projection was probably made before the extension of MARC to Frederick; the new leg opened to a disappointing ridership of around 250 per day as compared to first-year state forecasts of 1,600 per day.) The DEIS-270 makes the highly dubious prediction that, by 2025, 10 percent of all work-trips on the corridor will be made via mass transit. Nevertheless, the report concedes "this increase in MARC ridership would not have a substantial effect on congestion relief in the corridor." The report refutes the popular notion that large transit expenditures will relieve highway congestion: "The travel demand modeling results concluded that the limited capacity on I-270 in Alternates 3A/B and 4A/B (six lanes on I-270 between MD 121 and I-70 in Alternates 3A/B and 4A/B versus eight lanes in Alternates 5A/B/C) does not affect the transit ridership. In addition, none of the transit modes provide a substantial positive impact on the highway travel

demand" (p. V-27). The study instead justifies transit enhancements that would provide additional options for commuters and more consistent travel times. The transit options do help commuters with trip origins and destinations convenient to transit, but they are no help to the majority of commuters with trip origins and destination inconvenient to transit.

Even with optimistic assumptions of being able to attain a near four-fold increase in transit ridership, 90 percent of commuters will be driving cars solo in 2025, according to the DEIS-270 modeling. Cars remain the predominant mode of transportation in this area. The report does not underscore that fact, which is unfortunate because it would raise appropriate questions about plans to devote up to 30 percent of scarce capital funds to a transit system that would, under the sunniest projections, provide only 10 percent of trips.

**Where is the HOT option?** Disappointingly, the DEIS-270 does not discuss a very promising highway option for providing consistent travel times – namely, a "HOT" or "toll express" premium service lane in each direction. HOT lanes allow high occupancy vehicles free access, which encourages carpooling, but also allow other vehicles to use the lanes if they pay a toll. Toll payment is by transponder at normal highway speed. The toll rate is adjusted periodically throughout the day to ensure free flow. A premium service lane system offers far wider benefits to commuters; the omission of consideration of such lanes is a violation of the principle laid down in law and regulations that corridor studies should consider "all reasonable alternatives."

## TECHNICAL CRITICISMS

For a report that is supposed to aid policymakers in determining how to spend billions of tax dollars and provide for the mobility needs of hundreds of thousands of people for decades to come, the DEIS-270 is sloppily written, poorly documented, and badly labeled in many places. Among the criticisms to which the report is susceptible:

4. Nevertheless, under the Glendening administration, the Maryland Transit Administration was prepared to support the rail alternative for a 13.5-mile transit line between Shady Grove and the Comsat office complex on I-270, even though a bus line would be more economical, more flexible, and would allow higher levels of service in terms of frequency.

1. The report's discussion of "peak period" conditions is based on modeling that examines only a single peak hour, which is a major and repeated misrepresentation. In addition, the report makes repeated pessimistic characterizations of continued congestion that suggest that those conditions will be pervasive at all times of day when, in fact, they only describe peak period conditions.
2. One map of traffic volumes and levels of service is clearly wrong (Figure IV-7, Plate 2 of 5, of the MD-121-to-MD-109 leg of I-270). According to the map, all the traffic numbers for 2025 are low and identical to 1998 numbers! State transportation officials acknowledge the mistake but, despite requests, have not sent out a corrected version.
3. The report never defines the I-270 "corridor" or the broader cordon area, though they are central to the modeling. State officials have informed me verbally that the "corridor" is just I-270/US-15, but the cordon area subject to the screenline analysis remains a mystery. A simple map would be sufficient to provide that explanation.
4. Tables are mislabeled and insufficiently explained, leaving readers uncertain as to what data are being conveyed.
5. Much of the report's base data go back to the 1990 Census and ignore the results of the 2000 Census.
6. Current conditions data used in the study go back to 1998, although better and more up-to-date data are now available as a result of the 2002 Skycomp survey "Traffic Quality on the Metropolitan Washington Area Freeway System." The new data show significantly different levels of congestion from the older data used in the DEIS-270.
7. Mysterious "cost-effectiveness indices" for each transit alternate have a "\$"-sign attached (Table V-3, p. V-29), but indices should be whole numbers.

## CONCLUSION

The press, officials, and the public have been seriously misled by the DEIS-270. This shoddy vehicle was apparently designed under the influence of the anti-automobile "Smart Growth" ideology of the former Glendening administration. It seems intended to understate any benefits from road construction and to undermine the case for road improvement.

The Maryland Department of Transportation report needs to be re-examined by incoming Ehrlich officials who should insist that the report be immediately revised to accurately describe the results of the modeling. The numbers should be re-crunched using up-to-date software and should consider more data for outlying counties such as Frederick County. Forecasters say the model used for forecasting the DEIS-270 has very coarse coverage of outer areas. The new modeling should also do "sensitivity analyses" of assumptions of more modest increases in per-capita trip making. Perhaps, in doing so, analysts might discover that road widening could bring benefits to area drivers.

Finally, the modeled alternates should include HOT lanes along the lines of those successfully implemented on the 91 Express Lanes and I-15 HOT lanes in southern California. Extra I-270 capacity as toll lanes would not only provide new choices for reliable travel, but could raise a worthwhile revenue stream that could support a bond issue, reducing the cost to taxpayers of I-270 improvements. No major project of this kind should be studied without considering some form of toll financing.

Correction of the errors in the DEIS-270 report need not delay a start on actual improvements. Upgrades are already being designed at the MD-26 and MD-85 interchanges. Much of the most congested stretch of the highway, north of MD-121 in Clarksburg, can be widened with one new lane in each direction that can be built without study in the central grass median. At a number of interchanges, simple lengthening of merge lanes will reduce congestion. (Skycomp's aerial survey noted the backups caused on the mainline from abrupt merges that result from the old design of entry ramps.)

Funding for the more elaborate and expensive measures examined in the DEIS-270 (such as extension of collector-distributor roadways in Montgomery County, additional lanes, and associ-

ated rebuilding of interchange bridges elsewhere) will likely not be available for many years, so the state certainly has time to correct and improve the report. Finalization of the current DEIS-270 would only result in poor long-term decisions and a contaminated decision-making environment for years to come.

—*Peter Samuel is a journalist specializing in reporting of highway issues, and is editor of **Toll***

**Roads Newsletter**, an independent periodical on toll and road pricing issues. He is an adjunct scholar at the Reason Public Policy Institute where he has written several policy studies on road issues, and he has written for such publications as **Eno's Transportation Quarterly**, **World Highways**, and **ITS International**. Samuel is also a resident of Frederick, Maryland. He can be contacted by email at [tollroads@aol.com](mailto:tollroads@aol.com).