

## I-270/US 15 Multi-Modal Corridor Study

### HOV versus Express Toll Lane: Travel Demand Sensitivity Analysis

The I-270/US 15 Multi-Modal Corridor Study has prepared two major milestone travel forecasts of the seven multi-modal (highway and transit) alternatives including the no-build alternative. These two major milestone travel forecasts were prepared to support the transportation system analysis presented in the 2002 Draft EIS (DEIS) and the soon-to-be-published 2009 Alternatives Analysis/Environmental Assessment (AA/EA). Five of the multi-modal alternatives were modeled for the 2002 DEIS using a 2025 horizon year. The remaining two multi-modal alternatives were modeled for the 2009 AA/EA using a 2030 horizon year.

As a result of local and federal agency reviews of project data, several questions have been brought forward related to the project travel forecasts included in the DEIS as well as those to be presented in the 2009 AA/EA for public review. It should be noted the MWCOC travel demand model and the land use cooperative forecasts have been updated since the 2002 DEIS. One comment/question during the 2009 AA/EA document input reviews stated, there have been numerous changes since the 2002 DEIS (traffic numbers, land use, master plans), without updating the analysis of the alternatives from the 2002 DEIS, how are the current alternatives (6A/B and 7A/B) comparable? The presentation contained herein responds to this topic.

#### **Why is a Sensitivity Analysis being conducted between the DEIS and AA/EA Alternatives?**

There were major differences between the MWCOC travel demand models used for the DEIS and EA alternatives in terms of forecast year, land use and highway network assumptions. DEIS alternatives assumed a forecast year of 2025 and ICC was not part of the highway network. EA alternatives used the current land use Cooperative Forecast with the forecast year 2030 and that incorporated ICC into the highway network. It is important to note, a direct comparison of the 2025 and 2030 travel forecasts developed for the DEIS and EA alternatives, respectively, is not appropriate. However, since the EA document is a companion NEPA document to the DEIS, it is important to recognize that the EA alternatives are studied in conjunction with the DEIS alternatives. A Sensitivity Analysis would be appropriate to determine on what basis the 2002 DEIS and the 2009 AA/EA document alternatives could be comparable.

#### *Effect of Revised MWCOC Travel Forecasting Model*

The I-270/US 15 Multi-Modal Corridor Study travel forecasts of the 2002 DEIS was conducted using MWCOC regionally approved travel forecasting model Version 1 with 2000 CLRP. As noted above, the 2002 DEIS travel forecasts did not include the ICC in the future roadway network. For the 2009 AA/EA travel forecasting, the latest approved MWCOC travel demand model was Version 2.1D#50 with 2004 CLRP. The ICC was included in the 2009 AA/EA travel forecasting results as a future roadway.

The MWCOC Version 2.1D#50 travel demand model (2009 AA/EA) used for the 2030 forecasts has been observed to be more refined when compared to the 2025 forecast Version 1 model. This is due to improvements in the model structure, capacity constraints, feedback loops and land use assumptions. The effect of these changes resulted in the 2030 No Build traffic volumes to decrease for I-270 segments south of Middlebrook Road. The 2030 No Build traffic volumes increased north of MD 118 with the largest increase from MD 80 to MD 85 in Frederick County.

#### *Effect of Regional Cooperative Forecast – Land Use*

The I-270/US 15 Multi-Modal Corridor Study travel forecasts of the 2002 DEIS was conducted using MWCOC Round 6.2 Regional Cooperative Forecasts. The MWCOC updated their land use forecasts to reflect the latest local plans which included any changes associated with the ICC being constructed. The 2009 AA/EA travel forecasting work was based on Round 6.4a Regional Cooperative Forecasts.

#### **Sensitivity Analysis**

The Sensitivity Analysis was performed to provide a travel demand forecast of similar DEIS and AA/EA alternatives at a common horizon year using the same MWCOC travel demand model and the latest regional cooperative land use forecasts. By assessing the similar project alternatives using a consistent baseline, the project team could be assured that the potential solutions were compared on an “apples to apples” basis. This approach is common practice in this region, where land use and development are subject to a sophisticated planning and approval process, and future transportation improvements are only one of many factors that influence growth. As the travel forecasts showed, there would be greater traffic volumes in 2030 under each of the Build Alternatives than under the No Build Alternative. To assess the

alternatives performance, the study team determined a review of the average daily traffic volumes and the total person through-put would provide ample comparison data to judge the travel demand characteristics and similarities.

#### *Model Inputs*

The model inputs for the Sensitivity Analysis include forecasting the travel demand on a common model. To achieve this objective, forecasts were developed for 2030 No-Build, Alternative 3A/B, Alternative 6A/B and Alternative 7A/B. Alternative 3A/B represents the 2002 DEIS HOV alternative where one HOV lane is implemented in each direction between I-370 and I-70. Alternative 6A/B consists of constructing Express Toll Lane(s) (or ETLs) where two ETLs would be implemented in Montgomery County and one ETL in Frederick County. Alternative 7A/B consists of two ETLs in Montgomery and Frederick counties. The MWCOG model used is Version 2.1D#50 and the latest regionally approved cooperative land use forecast Round 7.0. As with Round 6.4a, Round 7.0 includes the ICC and associated land use changes in the future networks.

#### *Average Daily Traffic Results*

The MWCOG Version 2.1D#50 travel demand model with Round 7.0 land use and the 2006 CLRP produced several points of average daily traffic volumes. The forecasts were assembled for the entire study limits (US 15/Biggs Ford Road to I-270/Shady Grove Road) plus I-270 segments south of Shady Grove Road to the I-270 east and west spurs. The table below, "Summary Comparisons of AADT by Segments", indicates the percentage differences between two pairs of project alternatives. The two most similar project alternatives, Alternatives 3A/B (HOV) and 6A/B (1 ETL in Frederick County) show virtually no percent AADT difference within the project limits. The net AADT total volumes for the project limits shows an 857 cumulative vehicle difference between Biggs Ford Road (US 15) to Shady Grove Road (I-270). The largest percent difference of any segment in the study limit occurs from Father Hurley Boulevard to MD 118 with Alternative 6A/B exceeding Alternative 3A/B by five percent. The largest percent difference where Alternative 3A/B exceeds Alternative 6A/B is six percent from Middlebrook Road to Watkins Mill Road.

These results indicate to the study team that making a determination of a Locally Preferred Alternative (LPA) following the AA/EA document public hearing will be achievable. Further detailed operational analysis will be conducted after the public hearing to support the LPA selection.

SUMMARY COMPARISONS OF AADT BY SEGMENTS	Comparisons of 2030 Forecasts (Round 7.0) between Project Alternatives						
	Alt. 6A/B /NB	Alt. 7A/B /NB	Alt. 3A/B /NB	Alt. 3A/B - Alt. 6A/B	Alt. 6A/B/ Alt. 3A/B	Alt. 3A/B- Alt. 7A/B	Alt. 7A/B /Alt. 3A/B
Averages in Frederick (within project limits)	125%	127%	125%	-969	101%	-2708	102%
Averages in Montgomery (within project limits)	119%	124%	121%	3036	99%	-1055	102%
Averages in Montgomery (till I-495)	112%	112%	113%	2550	99%	4578	99%
Overall Averages (within project limits)	123%	126%	123%	857	100%	-1517	102%
Overall Averages for entire I-270/ US 15 Corridor	118%	118%	118%	1073	100%	1970	100%

#### *Total Person Through-put*

The MWCOG Version 2.1D#50 travel demand model with Round 7.0 land use and the 2006 CLRP produced several points of total person through-put data. The forecasts were assembled for the study limits where either the HOV or ETLs were being proposed (MD 85 to I-370). The table below presents the Round 6.2/Year 2025 No-Build and Alternative 3A/B results for daily person through-put on I-270, as well as Round 6.4a/Year 2030 No-Build, Alternative 6A/B and Alternative 7A/B person through-put values. Travel forecasts developed for DEIS and EA alternatives have been developed using different set of model versions, network and land use assumptions. So, comparing these alternatives (Alternative 3A/B (HOV) versus Alternative 6A/B (ETL), and Alternative 7A/B (ETL) using this different set of models is not appropriate. However, it is important to understand how the volumes across different alternatives studied in DEIS and EA compare in terms of vehicle and person through-put. In the vehicle through-put and person through-put value tables, we see that the 2030 forecasts for EA alternatives are lower compared to the 2025 DEIS alternatives. This is due

to the fact that between MWCOG model Version 1 (used in DEIS) and MWCOG model Version 2.1D#50, the MWCOG model underwent major refinements in terms of model structure, capacity constraints, feedback loops and land use assumptions.

Daily Person Through-put	Round 6.2 - Year 2025		Round 6.4a - Year 2030		
	No-Build	Alt. 3A/B	No-Build	Alt. 6A/B	Alt. 7A/B
MD 85	204,300	287,800	168,800	217,000	235,800
MD 80	181,900	189,200	161,400	208,300	220,200
MD 75 Extension	149,800	150,900	128,500	166,500	177,100
MD 109	149,800	158,200	128,500	145,800	157,400
MD 121	159,900	164,800	119,100	160,000	173,300
Newcut Rd	217,600	204,800	161,700	200,500	210,100
MD 27	217,600	244,600	161,700	220,100	225,000
MD 118	191,700	230,900	162,100	222,900	227,400
Middlebrook Rd	236,800	262,100	189,000	241,100	243,800
Watkins Mill Rd	312,100	340,000	217,100	268,300	271,000
MD 124	310,100	323,500	207,600	269,300	271,100
MD 117	308,600	319,400	222,000	266,900	268,500
I-370	349,700	378,100	359,900	375,600	377,900
<b>Total</b>	<b>2,989,900</b>	<b>3,254,300</b>	<b>2,387,400</b>	<b>2,962,300</b>	<b>3,058,600</b>

To achieve a direct comparison of the person through-put values, a Sensitivity Analysis was performed using Round 7.0 Regional Cooperative Forecasts with 2006 CLRP. The following table summarizes the person throughput for the alternatives. Comparison of Alternative 3A/B (HOV) and Alternative 6A/B (ETL), and Alternative 7A/B (ETL) person through-puts for the average weekday show they are within four percent of each other.

2030 Person Thru-put Summary (Round 7.0 Land Use)				
	No-Build	Alt. 3A/B	Alt. 6A/B	Alt. 7A/B
Average Weekday (24 hours)	2,374,100	2,936,600	2,815,000	2,893,500
AM Peak Period (6:00 am to 9:00 am)	98,600	135,800	121,650	126,625
PM Peak Period (3:00 pm to 6:00 pm)	126,325	158,525	135,550	140,050

In addition, we have also evaluated the daily person through-put for various segments of I-270 from MD 85 south to I-370. The percent difference of these alternatives ranges as high as nine percent (Alternative 3A/B greater than Alternative 6A/B at Watkins Mill Road). The highest difference with Alternatives 6A/B or 7A/B greater than Alternative 3A/B is 10 percent at MD 109 in northern Montgomery County. The following table provides the person through-put comparison across alternatives for various segments of the project corridor.

Daily Person Through-put	Round 7.0 - Year 2030			
	No-Build	Alt. 3A/B	Alt. 6A/B	Alt. 7A/B
MD 85	162,300	201,000	200,300	202,000
MD 80	168,100	216,000	220,300	222,600
MD 75 Extension	133,500	169,700	163,000	175,600
MD 109	133,500	148,300	146,900	162,600
MD 121	126,900	163,100	157,800	173,800
Newcut Rd	168,200	195,300	182,700	196,200

MD 27	168,200	216,100	214,000	225,900
MD 118	155,700	203,500	204,800	213,400
Middlebrook Rd	174,400	228,100	208,700	219,800
Watkins Mill Rd	213,800	273,400	246,600	248,200
MD 124	214,100	269,800	250,400	255,600
MD 117	239,500	289,700	275,600	266,000
I-370	315,900	362,600	343,900	331,800
<b>Total</b>	<b>2,374,100</b>	<b>2,936,600</b>	<b>2,815,000</b>	<b>2,893,500</b>

### **Conclusion**

From bringing Alternatives 3A/B, 6A/B and 7A/B in this Sensitivity Analysis up to Round 7.0 land use within the MWCOG model Version 2.1D#50, the study team feels it will have the analysis and evaluation tools available after the 2009 AA/EA document public hearing to make an informed choice on the transportation operations and performance factors and determine a Locally Preferred Alternative (LPA) from amongst the DEIS and AA/EA alternatives. The study team also will be updating the traffic operations analysis to support an LPA selection.

**270 / 15 Multi Modal Corridor Study**

Full Team Meeting  
June 2, 2009

SHA Dayton Shop


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**270 / 15 Agenda**

- Introductions
- Update Since Last Meeting in February
- AA / EA Document Overview
- Public Hearings
- Additional Public Outreach
- Resource and Agency Coordination
- Upcoming Schedule / Next Steps
- Project Website Update
- CCT Alternative Alignments
- I-270 Sensitivity Analysis Results
- Upcoming Scheduled Briefings and Wrap-up

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**270 / 15 Study Area**



- Multi-Modal Study by SHA and MTA for MDOT
- Project Team with SHA, MTA, MdTA, Counties and Cities
- 30 miles of Limited Access Highway
- 1.5 miles of New Alignment Highway (MD 75)
- 14 mile Corridor Cities Transitway (CCT)

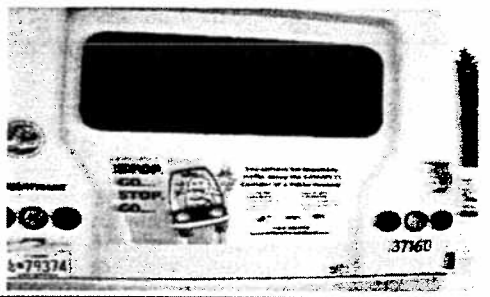
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**270 / 15 Project Update**

- Team received over 100 comments from FHWA, FTA, USFWS and NPS and incorporated them into the AA/EA. **Document released May 29.**
- Aggressive Environmental Justice (EJ) outreach effort is currently underway.
- Media blitz to advertise public hearings (bus backs, flyers, mass mailings, Metro stops).
- Community-level briefings are taking place.
- Staff-level briefings and state/local elected official briefings are being scheduled.
- Public Hearings scheduled for **June 16 and 18.**
- Comment period ends July 31, 2009.

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**270 / 15 Bus Backs**





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**270 / 15 AA/EA Document Overview**



- What's the purpose of the AA/EA?  
Alternatives Analysis (AA) – provides a means of comparing the cost-effectiveness and impacts of the various transit modes being considered, in order to comply with FTA's New Starts criteria.
- Environmental Assessment (EA) – serves as a complement to the Draft Environmental Impact Statement (DEIS), that was signed in 2002. The EA is intended to introduce the new alternatives that use Express Toll Lanes, and compare the benefits and effects of them to the same level as the other build alternatives.

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 AA/EA Format 



- Signature Page and Introduction
- Executive Summary
- Purpose and Need
- Alternatives Considered
- Transportation Facilities, Services and Mobility Impacts
- Environmental Resources and Consequences
- Transit Costs and Funding
- Evaluation of Alternatives
- Comments and Coordination
- Appendices
- Technical Reports (on accompanying CD)

 6 



 AA/EA Format 



- List of Technical Reports
  - Air Quality (June 2007)
  - Indirect and Cumulative Effects (February 2009)
  - Natural Environmental (June 2007)
  - Noise and Vibration (January 2008)
  - HAZMAT Preliminary Screening Assessment
  - Project Correspondence (February 2009)
  - Section 4(f) Evaluation (January 2009)
  - Socio-Economic / Land Use (December 2007)

 7 



 AA/EA Format 



- List of Technical Reports (CCT)
  - CCT Capital Cost Methodology Report (February 2008)
  - CCT Detailed Definition of Alternatives (October 2007)
  - CCT Operating and Maintenance Cost Estimate Report (March 2008)
  - Operation and Maintenance Facilities (May 2007)
  - Travel Demand Report – Phase I

 8 



 Public Hearings 



June 16, 2009 5:00 p.m.	June 18, 2009 5:00 p.m.
<b>Gaithersburg Middle School</b> 2 Teachers Way Gaithersburg, MD	<b>Monocacy Middle School</b> 8009 Opossumtown Pike Frederick, MD
Both hearings will have an "open house" from 5:00 p.m. through 9:00 p.m., where staff will be available to answer questions about the project.	Public testimony will take place starting at 7:00 p.m. Speakers will be limited to 3 minutes each. Private testimony will be taken from 5:00 until 8:30.

 9 



 Public Hearings 

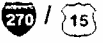

- Welcome Table
- Boards (Entrance Hall and Cafeteria)
  - Welcome, Purpose of the Study, Study Area
  - Planning Process, Schedule, Purpose and Need
  - Planning Context
  - Alternatives, including those in the DEIS
  - Mapping will include plan views and typical sections between selected interchanges
  - Environmental Resources (mapping and impacts)
  - National Park Service / Section 106 / Section 4(f)
  - Right of Way
  - Related Projects (MTA, SHA, and local)

 10 



 Public Hearings 



- Comment Cards
- Public Testimony (Gymnasium)
  - Hearing officers
  - Introductory script, no formal presentation
  - Elected officials will speak first, followed by those who pre-registered, then walk-ins
  - Speakers are limited to three minutes; currently have 12 signed up to speak in Gaithersburg and three in Frederick.
- Translators – Spanish provided, other languages available via request.

 11 



 **Public Hearing Staffing** 

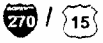

- Local government departments and other team members are encouraged to present items of interest (such as master plan updates, other projects in the area, etc.)
- Sign-in sheet has a place to check off which hearings you would like to attend.
- The Core Team is currently developing a layout for each school and a staffing list. Update will be sent with the speakers' list after June 9<sup>th</sup>.
- All requests to speak or to provide translators will need to be requested through Russ Anderson by June 9<sup>th</sup>.

  12



 **Additional Public Outreach** 

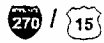

- Newsletter (March 2009)
- Public Hearing Postcard (April 2009)
- Newspaper Advertisement (May 2009)
- Bus Backs and Billboards (May 2009)
- Press Release (June 2009)
- EJ Flyer Distribution (June 2009)
- Metrorail and MARC Stations (June 2009)
- Meetings with communities, HOA's, NAC's, and churches in the corridor (Ongoing)

  13



 **Resource and Agency Coordination** 



- Team is available for staff-level briefings to all agencies prior to the close of the comment period (July 31, 2009)
- Update the "master list" of stakeholder groups.
- Section 106 / Section 4(f) coordination with resource superintendents/owners and consulting parties.
- Follow-up with NIST, DOE, GSA and park resources.
- Coordination with proposed development projects, local improvements, and breakout projects in the area.
- Provide comments on Master Plan updates and annexations.
- Hold meetings with agencies as the team develops the Locally Preferred Alternative (LPA).

  14



 **Upcoming Schedule** 



- Public Hearings – June 16 & June 18
- Staff-level Briefings, Community Outreach – June/July
- Comment Period Ends – July 31
- Recommendation of LPA – Fall 2009
- Project Splits into Transit and Highway – Winter 2010

  15

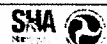

 **Next Steps - Highway** 

- Compile comments, recommend LPA
- Complete environmental and engineering studies to prepare Tier 1 FEIS.
  - Updating traffic to 2035 (compare all alternatives)
  - *De minimis* determinations for Section 4(f) resources
  - Coordinate with Section 106 resources regarding degree of studies to be completed and conceptual mitigation
  - Explore minimization opportunities along the corridor
- Prepare Tier 1 FEIS, identify Logical Termini for Tier 2 projects, secure Record of Decision (ROD) for Tier 1.

  16

 **Next Steps - Transit** 

- Compile comments, recommend LPA.
- Continue evaluation of alternative alignments.
- Phase 2 Ridership Modeling
- Submit New Starts Application      Late 2009/Early 2010
- Request Entry for Preliminary Engineering      Early 2010

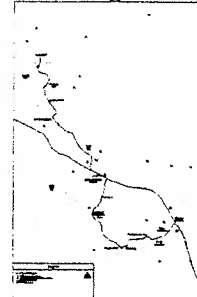
  17

**270 / 15 Project Website Update**

- Updated with all project information needed for hearings.
- Future enhancements will include videos, an FAQ section, and direct links to all corridor projects.
- Team is looking into an e-comment page, where people can enter their public hearing comments directly from the site.
- Team is also looking at the possibility of instituting a "blog", provided there is staff available to maintain it.

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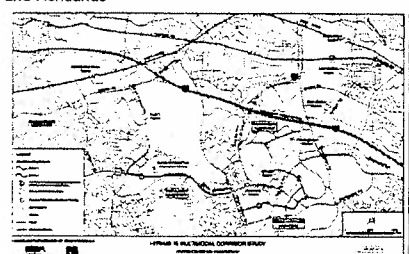
**270 / 15 CCT Alignment**



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**270 / 15 CCT Alternative Alignments**

- Crown Farm, Shady Grove Life Sciences Center/Belward Farm, and Kentlands



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**270 / 15 I-270 Sensitivity Analysis**

The goal of the traffic "sensitivity analysis" was twofold:

1. Compare the 2025 traffic levels to the 2030 traffic in the corridor, and assess the LOS effects.
2. Compare the person-throughput of the proposed ETL lanes versus an HOV alternative.

The methodology used was to compare Build 3 (HOV) to Build 6 (ETL) using Round 7.0 land use.

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**270 / 15 Questions / Wrap-Up**

Project Website: [www.i270multimodalstudy.com](http://www.i270multimodalstudy.com)

Highway: Russ Anderson  
([randerson2@sha.state.md.us](mailto:randerson2@sha.state.md.us))

Transit: Rick Kiegel  
([rkiegel@mtamaryland.com](mailto:rkiegel@mtamaryland.com))

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**270 / 15 Thank You**

Questions/concerns or for additional information:

**Highway:**  
Russ Anderson  
([randerson2@sha.state.md.us](mailto:randerson2@sha.state.md.us))

**Transit Related:**  
Rick Kiegel  
([rkiegel@mtamaryland.com](mailto:rkiegel@mtamaryland.com))

SHA State Highway MTA Maryland