Transportation Facilities, Services and Mobility Impacts

Purpose

This chapter discusses and evaluates the transportation and traffic impacts of the No Build, Transportation Systems Management (TSM) and proposed build alternatives for the I-270/US 15 Multi-Modal Corridor Study. The chapter is organized to present information on public transportation, build alternatives, roadway network effects, highway and multi-modal conclusions.

Public Transportation

The effectiveness of transit service is dependent upon several factors including geographic coverage, hours of operation and frequency of service, door-to-door travel times, travel time reliability, number and convenience of transfers, ride comfort, and safety.

Alternative 6.2, the Transit-TSM Alternative, and build Alternatives 6A and 7A Light Rail Transit (LRT) and 6B and 7B Bus Rapid Transit (BRT) described in **Chapter II** propose to improve service in the corridor in a number of ways, including:

- More frequent service
- Faster service
- Improved reliability and ride quality
- High quality station and stop amenities, including real-time transit information

The demand forecasting analysis conducted to determine potential transit ridership in the corridor used the highway build condition (Alternative 6) as its basis. This allowed technical analysis performed for this report to be consistent with the conservative approach to ridership estimating for the transit modes. Under Alternative 6.1, the No-Build Transit Alternative, north-south transit service would continue to be provided by buses traveling in mixed traffic except along I-270 where transit service could take advantage of the Express Toll Lanes℠ (ETLs℠) and the free-flow traffic conditions. Peak hour travel times would be slower than today in many areas due to the projected growth in traffic volumes and congestion on major roads. Alternative 6.2: Transit TSM also assumes that the highway components of Alternative 6A/B are completed along with transit components as described in **Chapter II**.

Existing Conditions

Table III-1: Existing Transit Service

ROUTE	TERMINAL POINTS	
Ride On 43	Traville Transit Center	Shady Grove
Ride On 54	Lake Forest	Rockville
Ride On 55	Germantown Transit Center	Rockville
Ride On 56	Lake Forest	Rockville
Ride On 61	Germantown Transit Center	Shady Grove
Ride On 63	Shady Grove Metrorail	Rockville
Ride On 66	Traville Transit Center	Shady Grove
Ride On 67	Traville Transit Center	Shady Grove
Ride On 70	Milestone	Bethesda/Med Center
Ride On 71	Kingview Park and Ride	Shady Grove
Ride On 74	Germantown Transit Center	Shady Grove
Ride On 75	Urbana	Germantown Transit Center
Ride On 76	Poolesville	Shady Grove
Ride On 77	Germantown Commons	Shady Grove
Ride On 78	Kingview Park and Ride	Shady Grove
Ride On 79	Milestone	Shady Grove
Ride On 82	Clarksburg	Germantown Transit Center /DOE
Ride On 83	Milestone	Germantown Transit Center
Ride On 90	Milestone	Shady Grove
Ride On 97	Germantown Transit Center	Germantown MARC
Ride On 98	Germantown Transit Center	Seabreeze Court
Ride On 100	Germantown Transit Center	Shady Grove
Ride On 124	MD 124 Park and Ride	Shady Grove
MTA 991	Hagerstown	Shady Grove/Rock Spring Pike
MARC Brunswick Line	Martinsburg, West Virginia	Washington Union Station
Frederick TransIt 10	Frederick Towne Mall	Francis Scott Key Mall
Frederick TransIt 20	Francis Scott Key Mall	Frederick Transit Center
Frederick TransIt 30	Frederick Towne Mall	Frederick Transit Center
Frederick TransIt 40	Frederick Towne Mall	Frederick Transit Center
Frederick TransIt 50	Frederick Towne Mall	Frederick Transit Center
Frederick TransIt 60	Frederick Community College	Frederick Transit Center
Frederick TransIt 70	College Park Plaza	Frederick Transit Center
Frederick TransIt - EC Shuttle	Frederick Community College	Frederick Town Mall
Frederick TransIt - BJ Shuttle	Frederick Transit Center	Brunswick MARC Station
Frederick TransIt - ET Shuttle	Emmitsburg	Frederick Transit Center
Frederick TransIt - BS Shuttle	Bowmans Industrial Park	Frederick Transit Center
Frederick TransIt - POR Shuttle	Frederick Shopping Center	Point of Rocks MARC
Frederick TransIt Frederick MARC Shuttle	Frederick Town Mall	Frederick Transit Center
Frederick TransIt - Walk/MARC Shuttle	Walkersville	Frederick Transit Center
Frederick TransIt - Walk Shuttle	Walkersville	Frederick Transit Center

As of 10/2/2006

The north-south corridor is served by a variety of transit services, including local bus, commuter bus, and commuter rail. Washington Metropolitan Area Transit Authority (WMATA), Montgomery County Ride On, Frederick TransIT, and Maryland Transit Administration (MTA) today provide transit service throughout much of Montgomery County, with commuter bus service extending into Frederick and Washington counties and commuter rail service that extends into Frederick County, terminating in Martinsburg, West Virginia. There is not one transit route or service that currently serves both the entire length of the corridor of the Corridor Cities Transitway (CCT) or its proposed set of destinations. ***Table III-1*** above identifies transit services currently in operation in the study area.

The proposed transit services within the CCT corridor

Table III-2: Transit Service Hours of Operation

TRANSIT SERVICE	WEEKDAY		WEEKEND
	STARTS	ENDS	
Metrorail	5:00 a.m.	12:00 a.m.	7:00 a.m.-3:00 a.m.
MARC	4:30 a.m.	10:30 p.m.	No service
Local Bus	4:30 a.m.	12:30 a.m.-2:00 a.m.	6:00 a.m.-1:00 a.m.

will operate during the same time periods as other regional services, which presently operate as shown in ***Table III-2***. Many bus routes operate on a variable schedule depending on destination and time of day, and some routes do not offer weekend service. Express buses usually operate only during weekday peak periods.

Proposed Transit Improvements

Proposed transit improvements for the CCT are described in **Chapter II** of this document.

With Alternative 6.2, a new express bus route provides service the length of the corridor using the alignment described in **Chapter II** from Shady Grove to COMSAT. Rather than using a separate guideway, Alternative 6.2 would travel along Shady Grove Road, MD 117, MD 118, Crystal Rock Drive, MD 27, MD 355, and other key roadways. The service would be operated with six-minute headways during the peak period and 11-minute headways in the off-peak.

In the LRT Alternatives 6A and 7A, the light rail guideway would include double track operation following the alignment specified in **Chapter II** of this document and travel generally northwest from Shady Grove to COMSAT. Light rail trains would operate between the two terminal stations at Shady Grove and COMSAT and provide service to all stations in between.

In the BRT Alternatives 6B and 7B, the service would travel along the same guideway alignment identified for the LRT using a guideway that would maintain complete separation from existing roadway traffic and provide direct service to all stations.

This exclusive transit alignment is referred to as the *trunkline*. The new trunkline transit associated for all three of the transit alternatives would augment existing bus routes and nearly double service and capacity in the corridor, improving total system capacity and reliability with frequent and more extensive service throughout the I-270 Corridor. Reliability of the trunkline trips would be enhanced with signal priority at major signalized intersections, and transit would be more predictable through the availability of interactive real-time transit information at stations.

Service Quality

Quality of transit service can be an important factor influencing transit ridership. System users who perceive a transit service to be comfortable, convenient, and reliable are more likely to choose that service as their primary form of travel for a given trip.

Low-floor articulated 60-foot long buses will be used for the trunkline service associated with Alternative 6.2 and BRT services included in Alternatives 6B and 7B. These buses will provide a higher capacity than standard buses (90 passengers per bus versus 60 passengers per bus for standard buses), and should enhance the service quality with more comfortable seating and a smoother ride. The light rail vehicles used for alternatives 6A and 7A would also provide more comfortable seating and a smoother ride than typical bus vehicles. Both BRT and LRT services would benefit from faster boardings and alightings than experienced on typical bus services due to the use of multiple doors and remote fare collection.

The transit trip quality would also be enhanced by reducing wait times and by making station facilities more comfortable. More frequent transit service is proposed with Alternatives 6.2, 6A/B and 7A/B, as shown in ***Table III-3***. New stations with enhanced amenities, such as shelters, seating, and NextBus information displays, are proposed in these alternatives as well. These stations are also being designed with improvements in pedestrian, park and ride, and car drop-off access to make the trip to the transit station safer and more pleasant, as well as more accessible.

Feeder Bus Service

To extend the reach of the trunkline service into surrounding neighborhoods, Alternatives 6.2, 6A/B and 7A/B each propose modifications to existing area bus routes to bring passengers to the higher-speed trunkline service.

With Alternatives 6A and 7A, several existing bus routes (Ride On routes 66, 67, 71, 74, 75, 78, and 90) would be re-routed to terminate at an LRT station, allowing passengers to easily transfer from bus to LRT. With Alternatives 6B and 7B, the guideway would be used at various stages to provide access for local bus operation. Some local bus service would continue to operate along streets next to which the guideway is located to serve local bus stops, while others would utilize the CCT to provide more express service.

Transit service on other bus lines, MARC and Metrorail are generally assumed to operate the same in all five alternatives (6.2, 6A, 6B and 7A, 7B). Some changes may be made to take advantage of the higher speed and reliability of the LRT or BRT service on the CCT corridor, and many passengers should experience improved service. Minor route changes may make transfers easier. For example, transit schedules may be modified, or local bus stops may be added to drop passengers off closer to the new CCT stations. Any proposed changes to existing routes will follow required procedures as specified by MTA, WMATA or Ride On, including public involvement.

Travel Times

Each alternative provides specific improvements to reduce north-south transit travel times along the CCT corridor, including dedicated guideway, traffic signal priority, and improved boarding times.

As would be expected, a dedicated right-of-way which provides more direct connectivity results in travel times that are reduced over similar travel between the same destinations on roadways taking a more circuitous route on exiting roadways. ***Table III-4*** provides a sample of station-to-station travel times for each of the alternatives.

Build Alternatives

Growth in transit ridership is an important measure of success for transit projects. The more riders an alternative can attract, the better it is doing its job of providing improved system mobility. Travel demand modeling provides a number of ways to look at the ridership impacts of a change in transit service. This section summarizes:

- Daily ridership on the CCT
- New transit riders
- Transit boardings at CCT stations
- Transit user benefits (travel time savings)

Table III-3: Transit Service Headways

ALTERNATIVE	PEAK PERIODS (MINUTES)	OFF-PEAK PERIODS (MINUTES)
Alternative 6.1: No-Build Transit	*	*
Alternative 6.2: Transit TSM	6	11
Alternatives 6A/7A (LRT)	7.5	12
Alternative 6B/7B (BRT)	3	8

Note that BRT service is more frequent than LRT service to compensate for the greater number of passengers that can be carried on an LRT vehicle.

** No comparable service assumed for the No-Build-Transit.*

Table III-4: Sample Station to Station Travel Times in 2030 (Peak Period)

ALTERNATIVE	COMSAT TO SHADY GROVE	COMSAT TO GERMANTOWN	GERMANTOWN TO NIST	NIST TO DANAC	DANAC TO SHADY GROVE
Alternative 6.2: Transit TSM	60 min	11.3 min	19.9 min	11.8 min	16.6 min
Alternative 6A/7A (LRT)	36 min	10.6 min	9.1 min	8.3 min	8.1 min
Alternative 6B/7B (BRT)	38 min	11.1 min	9.3 min	8.6 min	8.9 min

Note: Travel times reflect travel and station dwell times. Overall travel corridor travel times for LRT are marginally faster but station-to-station times depend on operational conditions.

Daily Ridership

Table III-5 summarizes the 2030 daily transitway ridership as well as new transit trips. New transit trips show the number of new transit riders. Some riders of the CCT will be people who would take bus transit if the CCT were not built. Others are individuals who might not have made a trip, or who would have used their car instead. Calculating new transit riders is especially important for measuring how well an alternative can achieve the air quality goals outlined in **Chapter I**.

Table III-5: CCT Transitway Ridership

ALTERNATIVE	TOTAL DAILY GUIDEWAY BOARDINGS	DAILY NEW TRANSIT TRIPS VS. NO BUILD
Alternative 6.2: Transit TSM	7,000	7,600
Alternative 6A	30,000	16,300
Alternative 6B	26,000	16,900
Alternative 7A	30,000	16,400
Alternative 7B	27,000	17,000

As shown in ***Table III-5***, the investment in a dedicated right-of-way, such as a light rail or bus rapid transitway, should result in greater numbers of new passengers taking advantage of faster travel times and improved reliability. Alternatives 6A and 7A, each providing LRT service, have the highest ridership; however, Alternatives 6B and 7B also experience higher new transit trips.

Transit Demand by Station

Daily transit boardings by station are summarized in ***Table III-6***. While all stations receive walkup patrons, the greatest peak period boarding volumes are typically at those stations providing major park and ride facilities and feeder bus service, such as COMSAT station, Germantown station, and Quince Orchard station, and stations where major transfers occur, such as the Shady Grove Metrorail station.

Transit patrons will generally walk to a rail station when the distance does not exceed ¼ to ½ of a mile.

Transit User Benefits

In addition to new transit trips, user benefit hours are another measure of potential benefits that can be expected with transit improvements in a corridor. User benefit hours is a measure of the time saved by all transit passengers, those existing passengers who experience a faster trip, as well as new passengers. User benefit hours are used in the calculation of cost effectiveness, described later in **Chapter VI**.

Not surprisingly, the alternatives with the faster travel times (Alternatives 6A, 6B, 7A, and 7B) provide the highest level of user benefits. ***Table III-7*** summarizes the user benefit hours compared to Alternative 6.2.

Table III-6: Daily CCT Station Boardings

STATION NAME	ALTERNATIVE 6.2: TRANSIT TSM	ALTERNATIVE 6A	ALTERNATIVE 6B	ALTERNATIVE 7A	ALTERNATIVE 7B
COMSAT	130	2,625	1,230	2,620	1,530
Dorsey Mill	200	585	520	595	530
Cloverleaf	440	800	685	790	680
Germantown	770	2,915	2,235	2,860	2,215
Metropolitan Grove	600	2,215	2,210	2,435	2,180
NIST	685	635	1,305	630	1,215
Quince Orchard	515	2,870	2,495	2,795	2,375
Decoverly	315	1,135	925	1,155	930
DANAC	330	990	595	990	600
Washingtonian	565	2,735	2,705	2,785	2,800
West Gaither	830	2,635	2,755	2,645	2,765
East Gaither	495	930	900	930	900
Shady Grove	1,580	9,060	7,930	9,130	8,180
Total	**7,445**	**30,135**	**26,490**	**30,365**	**26,905**

Table III-7: Daily and Annual User Benefit Hours

ALTERNATIVE	INCREASE IN DAILY USER BENEFITS OVER NO BUILD	INCREASE IN DAILY USER BENEFITHOURS OVER ALTERNATIVE 6.2	ANNUAL USER BENEFIT HOURS VS. ALTERNATIVE 6.2
Alternative 6.2: Transit TSM	6,300	–	––
Alternative 6A	13,200	6,900	2,070,000
Alternative 6B	13,700	7,400	2,200,000
Alternative 7A	13,300	7,000	2,100,000
Alternative 7B	13,800	7,500	2,250,000

Traffic on I-270

Roadway Network Effects

The I-270 and US 15 traffic operations for Alternatives 1 (No-Build), 6A/B and 7A/B are presented in this section using the highway forecast volumes produced by the Metropolitan Washington Council of Governments (MWCOG) model (Version 2.1D#50). The I-270 and US 15 forecasted traffic volumes reflect the predicted conditions for year 2030 with future programmed transportation facilities. These facilities, such as the Intercounty Connector (ICC) among others, are listed in the MWCOG 2007 Constrained Long Range Plan (CLRP) (see also **Chapter I, *Table I-1***). The ICC, currently under construction, will be a fully-tolled, six-lane freeway connecting I-270 and I-95. The I-270 connection to the ICC will occur via the I-370 interchange. The Maryland Department of Transportation (MDOT), in cooperation with MWCOG and through its modal agencies, Maryland State Highway Administration (SHA) and the Maryland Transportation Authority (MDTA), has been advancing feasibility studies of a Managed Lanes Network system that would operationally connect managed lanes of several facilities. The ICC, I-270 north and south of I-370, and I-95/I-495 (Capital Beltway) in Maryland would connect with Virginia's I-495 (Capital Beltway) High Occupancy Toll (HOT) lanes, serving as the initial steps toward a Washington, DC-area Managed Lanes Network. The network would provide regional connectivity and managed lanes continuity while assisting to alleviate regional congestion. The I-270 ETLs included in Alternatives 6A/B and 7A/B forms the northern portion of the Managed Lanes Network.

Traffic Analysis

Operations of highway facilities are evaluated using qualitative measures that characterize both the operational conditions within a traffic stream and their perception by motorists and passengers. Traffic operations are often characterized by a Level of Service (LOS) A through F, where LOS A indicates that the facility is operating at free flow conditions and LOS E indicates that the facility is operating at its capacity. LOS F represents the worst conditions of a facility where motorists experience the most congestion. Operational analyses for the I-270 and US 15 corridors were performed using Highway Capacity Software (HCS) version 4.1, which is based on the capacity analysis methodology contained in the *Highway Capacity Manual 2000*. Capacity analyses were calculated to determine the LOS for freeway mainline sections. These HCS analyses were performed for 2030 No-Build and 2030 build alternatives.

Traffic Operations for No-Build Conditions

Table III-8 illustrates the AM and PM peak hour mainline LOS for the 2030 No-Build conditions on the mainline of I-270 and US 15 in the project area.

Operations on the mainline of I-270 and US 15 are projected to continue to degrade significantly from existing conditions to the 2030 No-Build Alternative. Large portions of US 15 and I-270 will experience LOS E/F conditions in the peak direction.

Congestion is expected to worsen during the AM peak hour, with the southbound direction of I-270 and US 15 projected to operate at LOS E/F along I-270 except for the section immediately south of I-370, which would operate at LOS C. Southbound US 15 is projected to operate at LOS E/F except for the sections from I-70 to Jefferson Street and from MD 26 to Monocacy Boulevard, which will operate at LOS D. Also during the 2030 AM peak hour, the off-peak direction, northbound I-270, will operate close to capacity (LOS E) in the section from MD 80 to MD 85.

Congestion is also projected to worsen for the northbound direction of I-270 and US 15 during the 2030 PM peak hour. Northbound I-270 will operate at LOS E/F except for the sections from immediately south of I-370 to MD 117 and from MD 118 to Father Hurley Boulevard, which will operate at LOS D, and the section from MD 117 to MD 124, which will operate at LOS C. Northbound US 15 will degrade significantly during the 2030 PM peak hour, operating at LOS E/F except for the section from I-70 to Jefferson Street, which will operate at LOS C.

The off-peak southbound direction of I-270 and US 15 during the PM peak hour will continue to worsen, with sections from MD 85 to I-70 and from US 40/MD 144 to Rosemont Avenue projected to operate at LOS F, and sections from MD 80 to MD 85, from Jefferson Street to US 40/MD 144, and from Rosemont Avenue to 7th Street will operate at LOS E.

Traffic Operations for 2030 Build Alternatives

Table III-8 compares the AM and PM peak hour mainline and ETL LOS between the projected 2030 traffic for Alternatives 6A/B and 7A/B.

Alternatives 6A/B

Alternatives 6A/B result in improved traffic operations along the I-270/US 15 corridor compared to 2030 No-Build conditions, especially on US 15 northbound and southbound during AM and PM peak hours, respectively. Over the entire 32± mile corridor study area, the proposed improvements of Alternatives 6A/B result in approximately four fewer miles of failing (LOS F) roadway northbound and approximately eight fewer miles of failing (LOS F) roadway southbound as compared to the 2030 No-Build condition.

Specifically, in the northbound direction, during the PM peak hour, the mainline is projected to operate at LOS F in the sections from Watkins Mill Road to Middlebrook Road and from Newcut Road to MD 85. The sections of the I-270/US 15 corridor from I-370 to MD 117, from Father Hurley Boulevard to Newcut Road, from MD 85 to I-70, from Jefferson Street to US 40/MD 144, and the section immediately north of Biggs Ford Road are all projected to operate at LOS E. All other segments of the corridor are projected to operate at LOS D or better. All sections of the northbound ETLs are also projected to operate at LOS D or better during the PM peak hour.

In the southbound direction, during the AM peak hour, the mainline is projected to operate at LOS F from MD 85 to Father Hurley Boulevard and LOS E in the sections from Watkins Mill Road to MD 124, from MD 118 to Middlebrook Road, from US 40/MD 144 to Jefferson Street, and the section immediately north of Biggs Ford Road. All other segments are expected to operate at LOS D or better. For the ETL system, all sections will operate at LOS D or better except for the one-lane section immediately south of I-370, which is projected to operate at LOS E during the AM peak hour.

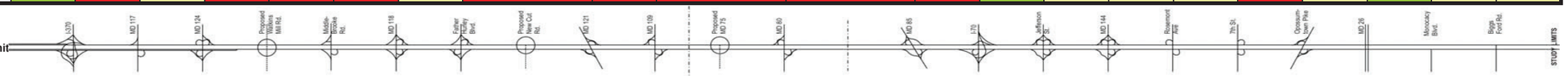
Alternatives 7A/B

Alternatives 7A/B offer even greater potential congestion relief than Alternatives 6A/B. Over the entire 32± mile corridor study area, Alternatives 7A/B are projected to have 26 fewer miles of mainline freeway operating under failing (LOS F) conditions compared to the 2030 No-Build Alternative (or 14 fewer miles of failing roadway compared to Alternatives 6A/B).

In the northbound direction, during the PM peak hour, the mainline of I-270 is projected to operate at LOS F from MD 121 to MD 109, and from MD 75 to MD 85. LOS E operations are projected for the sections from I-370 to MD 117, from Watkins Mill Road to Middlebrook Road, from Father Hurley Boulevard to MD 121, from MD 85 to I-70, and from Jefferson Street to US 40/MD 144. All other sections, including US 15 and the ETL, will operate at LOS D or better.

In the southbound direction, during the AM peak hour, the I-270/US 15 corridor is projected to operate at LOS F from MD 85 to MD 80 and from Watkins Mill Road to MD 124, and LOS E for the US 15 section north of Biggs Ford Road, from MD 80 to MD 75, and from MD 109 to Father Hurley Boulevard. All other general purpose lane sections of I-270 and US 15 are projected to operate at LOS D or better. In the southbound direction, the entire ETL system is projected to operate at LOS D or better except for the one-lane ETL section south of I-370, which is projected to operate at LOS E.

Table III-8: 2030 No-Build and Build Alternatives Peak Hour Mainline LOS and Volume to Capacity (V/C) Ratios Along I-270 and US 15

				Interstate 270														US 15								
SOUTHBOUND I-270 and US 15	PM PEAK HOUR	Alternative 7A/B (2 ETLs north and south of Clarksburg)	LOS V/C	B 0.41	B 0.42	A 0.28	C 0.51	B 0.43	B 0.49	B 0.38	C 0.56	C 0.56	C 0.52	B 0.46	C 0.53	C 0.54	B 0.43	C 0.59	B 0.45	D 0.78	C 0.64	C 0.52	C 0.47	B 0.38	B 0.42	B 0.39	B 0.35
		Alternative 6A/B (1 ETL north of Clarksburg and 2 ETLs south of Clarksburg)	LOS V/C	B 0.43	B 0.44	B 0.31	C 0.53	B 0.45	C 0.52	B 0.40	C 0.59	C 0.63	C 0.58	C 0.52	C 0.59	C 0.62	C 0.55	C 0.54	B 0.43	D 0.78	C 0.64	C 0.53	C 0.47	B 0.38	B 0.42	B 0.40	C 0.52
		Alternative 1 - No Build	LOS V/C	B 0.37	C 0.60	B 0.47	C 0.54	C 0.59	C 0.69	B 0.48	D 0.74		D 0.75	D 0.82		E 0.89		F 1.42	C 0.52	E 0.89	E 0.89	E 0.92	D 0.83	D 0.71	C 0.57	C 0.59	C 0.51
	AM PEAK HOUR	Alternative 7A/B (2 ETLs north and south of Clarksburg)	LOS V/C	D 0.75	D 0.84	C 0.61	F 1.03	D 0.80	D 0.87	C 0.70	E 0.95	E 0.98	E 0.98	D 0.82	E 0.99	F 1.22	F 1.05	D 0.74	C 0.65	D 0.87	D 0.72	C 0.62	C 0.65	C 0.59	D 0.69	D 0.69	E 0.89
		Alternative 6A/B (1 ETL north of Clarksburg and 2 ETLs south of Clarksburg)	LOS V/C	D 0.76	D 0.84	C 0.61	E 1.00	D 0.84	E 0.92	D 0.82	F 1.11	F 1.16	F 1.29	F 1.14	F 1.32	F 1.54	F 1.34	C 0.67	C 0.65	E 0.89	D 0.73	C 0.62	C 0.65	C 0.59	D 0.69	D 0.70	E 0.89
		Alternative 1 - No Build	LOS V/C	C 0.67	F 1.14	E 0.93	F 1.08	F 1.15	F 1.28	E 0.90	F 1.31		F 1.58	F 1.57		F 1.94		F 1.71	D 0.70	E 0.92	E 0.92	E 0.99	F 1.04	E 0.98	D 0.77	E 1.00	E 0.89
Corridor Segments			Study Limit																									
NORTHBOUND I-270 and US 15	AM PEAK HOUR	Alternative 1 - No Build	LOS V/C	B 0.39	B 0.41	A 0.26	B 0.46	B 0.49	B 0.40	B 0.39	C 0.57		C 0.68	D 0.73		E 0.89		C 0.47	B 0.34	D 0.69	D 0.84	D 0.73	C 0.60	C 0.54	B 0.44	B 0.38	B 0.38
		Alternative 6A/B (1 ETL north of Clarksburg and 2 ETLs south of Clarksburg)	LOS V/C	B 0.35	B 0.46	A 0.26	B 0.34	B 0.49	B 0.40	A 0.30	B 0.46	B 0.46	C 0.52	B 0.44	C 0.55	C 0.60	C 0.62	C 0.60	B 0.32	C 0.63	C 0.52	B 0.46	B 0.38	B 0.32	B 0.37	B 0.29	B 0.33
		Alternative 7A/B (2 ETLs north and south of Clarksburg)	LOS V/C	B 0.35	B 0.45	A 0.25	B 0.33	B 0.47	B 0.38	A 0.29	B 0.44	B 0.42	C 0.51	B 0.43	C 0.52	C 0.61	C 0.48	C 0.48	B 0.32	C 0.63	C 0.52	B 0.45	B 0.38	B 0.31	B 0.36	A 0.28	A 0.14
	PM PEAK HOUR	Alternative 1 - No Build	LOS V/C	D 0.86	D 0.86	C 0.58	E 0.97	F 1.07	E 0.91	D 0.84	F 1.32		F 1.65	F 1.70		F 1.99		E 0.90	C 0.58	E 0.93	F 1.14	F 1.04	F 1.10	F 1.03	F 0.93	F 1.05	F 1.05
		Alternative 6A/B (1 ETL north of Clarksburg and 2 ETLs south of Clarksburg)	LOS V/C	D 0.80	E 0.92	C 0.56	C 0.65	F 1.01	D 0.84	C 0.62	E 1.00	F 1.03	F 1.22	F 1.06	F 1.29	F 1.60	F 1.37	E 0.89	C 0.55	E 0.89	D 0.73	C 0.65	D 0.70	C 0.61	D 0.76	D 0.76	E 0.96
		Alternative 7A/B (2 ETLs north and south of Clarksburg)	LOS V/C	D 0.80	E 0.90	C 0.53	C 0.65	E 0.95	D 0.79	C 0.58	E 0.94	E 0.95	F 1.02	D 0.84	F 1.06	F 1.24	F 1.08	E 0.95	C 0.57	E 0.89	D 0.72	C 0.65	D 0.70	C 0.60	D 0.76	D 0.76	C 0.58

LEGEND

VOL = 2030 Traffic Volume (vehicles per hour) LOS = Levels of Service	V/C = Volume-to-Capacity Ratio A –D = Free or Stable Flow/Reduced Speeds E = Irregular Flow/Speeds/With Occasional Stop-and-Go F = Congested; Stop-and-Go Conditions	V/C Ratio Range (70 mph) South of I-370 to Father Hurley Blvd.	A 0.00 – 0.30	C 0.51 – 0.71	E 0.90 – 1.00	V/C Ratio Range (65 mph) Father Hurley Blvd. to Biggs Ford Rd.	A 0.00 - 0.29	C 0.48 – 0.68	E 0.89 – 1.00
			B 0.31 – 0.50	D 0.72 – 0.89	F >1.00		B 0.30 – 0.47	D 0.69 – 0.88	F >1.00

Park and Ride Lots and Transit Station Parking

Park and Ride Lots

In October 1997, SHA completed an I-270 Park and Ride Site Identification Study that examined the feasibility of various sites for new or expanded parking opportunities. From this data and a corridor reconnaissance, park and ride lots exist or are planned (as noted) directly along the I-270/US 15 corridor at the following locations: I-270/MD 117 interchange northeast quadrant (existing); I-270/MD 124 southwest quadrant (existing); I-270/MD 121 northwest quadrant (proposed); MD 80 northeast and southeast quadrants (existing); MARC Monocacy Station (existing); US 15/ Monocacy Boulevard interchange northeast quadrant (proposed). Park and ride lots are being considered in each of the proposed alternatives. A preliminary concept has been developed at Biggs Ford Road in Frederick County in the northwest quadrant of the proposed US 15/Biggs Ford Road interchange. Additional park and ride lots may be considered in the following locations: along Observation Drive in Montgomery County and in the northeast quadrant of the proposed I-270/MD 75 extended interchange in Frederick County. These potential lots may be considered further as the study progresses or if SHA, MTA, or the counties decide to pursue them in advance of this study's completion.

Transit Station Parking

Table III-9 provides transit station parking demand and proposed capacity for proposed LRT and BRT. As summarized in ***Table III-1***, the travel demand forecasts assigned constrained parking capacity at the Rockville and Shady Grove Metrorail stations, and unconstrained parking capacity at other existing Metrorail stations and the proposed CCT stations. There is sufficient proposed parking capacity for the overall CCT alignment to meet the estimated parking demand. The CCT station parking capacities were established to discourage drive access trips to CCT stations closest to the Shady Grove Metrorail station. CCT passengers will be able to use the proposed feeder bus service to access all CCT stations. Stations further away from the Shady Grove Metrorail station are proposed with more parking

capacity to encourage longer distance trips to change transportation modes from single occupant vehicles onto transit. In addition, the northern CCT stations with the largest parking capacities (Metropolitan Grove, Germantown and COMSAT) are accessible via ETL direct access ramps from I-270.

Highway Conclusions

Table III-8 shows the LOS along mainline I-270 and US 15 will degrade significantly through year 2030. In general, the 2030 No-Build scenario results in LOS E/F conditions along mainline I-270/US 15 during the AM and PM peak periods.

With the proposed Montgomery County highway improvements (Alternatives 6A/B and 7A/B), the I-270 mainline sections will show improving conditions during the 2030 AM and PM peak periods. The improvement is due to the ETLs providing relatively congestion-free travel speeds past existing bottlenecks caused by entering/exiting interchange traffic. Also, ETL usage by former general purpose lane vehicles reduces the general purpose lane traffic densities, thus improving operating conditions. In northern Montgomery County (north of MD 121), Alternative 7A/B further improves roadway congestion by offering a second ETL for motorists to choose a reliable travel time versus the potentially congested general purpose lanes.

With the proposed Frederick County highway improvements (Alternatives 6A/B and 7A/B), the I-270 mainline section will also show improving conditions during the 2030 AM and PM peak periods. Although the two build alternatives add highway capacity, the general purpose lanes both experience LOS F conditions for either all or most of the highway segments from the Montgomery County line to MD 85. Alternative 7A/B experiences better overall traffic operational conditions due to the additional ETL lane over Alternative 6A/B. The proposed traffic volumes of the two build alternatives are relatively close in their forecasts with Alternative 7A/B having approximately five percent more ADT than Alternative 6A/B but providing approximately 22 percent more vehicle capacity.

The general trend along US 15 through the City of Frederick is that the build alternative traffic conditions will improve over the No-Build condition and remove all LOS F conditions from year 2030. Alternative 7A/B will experience one LOS E segment while Alternative 6A/B will experience two LOS E segments (Jefferson Street to US 40/MD 144 and north of Biggs Ford Road). Each of the build alternatives yield similar results along US 15 due to the identical improvements in this segment.

The overall traffic analysis shows that I-270 and US 15 will continue to experience congested segments (with the proposed build alternatives) to 2030 and beyond due to the existing and projected growth along the corridor. However, the build alternatives do provide congestion relief for segments of I-270 and US 15 as well as for those motorists who choose to travel in the ETLs. In addition, the projected traffic operations would be worse under the No-Build Alternative. ***Table III-10*** reviews the difference in mainline segment miles that operate under LOS F conditions for the 2030 build alternatives and 2030 No-Build conditions and illustrates the congestion relief for the general purpose lanes gained with the 2030 build alternatives.

Alternative 6A/B would provide a 12-mile total reduction in the mainline segments operating at LOS F (four miles reduction northbound, eight miles reduction southbound). Alternative 7A/B would provide a 26-mile total reduction in the mainline segments operating at LOS F (eight miles reduction northbound, 18 miles reduction southbound). Therefore, Alternative 7A/B offers the greatest reduction in LOS F mileage along the corridor in 2030 when compared to the expected No-Build and Alternative 6A/B conditions.

Multi-Modal Conclusions

The travel demand modeling results concluded that neither transit mode (LRT or BRT) causes a significant reduction in highway travel demand and peak hour volumes; however, the proposed build alternatives do provide additional mobility and modal options with free-flow conditions and consistent travel times. A multi-modal approach, either implemented simultaneously or phased, is a prudent option for the corridor since the highway and transit improvements under consideration serve different users, travel markets (long-range vs. commuter) and trip origins and destinations.

Table III-9: Transit Station Parking Requirements

STATION LOCATION		PARKING CAPACITY	PARKING DEMAND BY ALTERNATIVE			
FIRST STATION	LAST STATION		ALTERNATIVE 6A (LRT)	ALTERNATIVE 6B (BRT)	ALTERNATIVE 7A (LRT)	ALTERNATIVE 7B (BRT)
Shady Grove[1]	Shady Grove	N/A	150	150	150	150
East Gaither (King Farm)	Washingtonian	450	700	750	700	800
DANAC	Decoverly	250	350	250	350	300
Quince Orchard	Metropolitan Grove	1,500[2]	1,050	1,000	1,000	950
Germantown	Cloverleaf	1,100	600	500	600	450
Dorsey Mill	COMSAT	1,500	500	600	550	650
Total		**4,800**	**3,150**	**3,250**	**3,350**	**3,300**

[1] *Shady Grove Metrorail Station parking will be accommodated by expanded Metrorail parking. Cannot determine access mode since station shares parking with Metrorail.*

[2] *Metropolitan Grove CCT Station parking capacity of 1,000 spaces excludes the existing 350 spaces at the Metropolitan Grove MARC Station.*

Source: Phase I Year 2030 Washington Area Model; I-270/US 15 Multi-Modal Corridor Study Corridor Cities Transitway Detailed Definition of Alternatives (October 2007).

Table III-10: I-270/US 15 Level of Service Improvements

	2030 NO-BUILD	ALTERNATIVES 6A/B	ALTERNATIVES 7A/B
Year 2030 Mainline Segment Mileage of LOS F Operating Conditions*			
I-270/US 15 Northbound (PM Peak Hour, Peak Direction)	20	15.8	11.6
I-270/US 15 Southbound (AM Peak Hour, Peak Direction)	23.2	15.5	5.7
Total Mileage of LOS F Segments	43.2	31.3	17.3
Year 2030 Mileage Reduction of LOS F Segments from No-Build and TSM/TDM Alternates			
I-270/US 15 Northbound (PM Peak Hour, Peak Direction)	N/A	4.2	8.4
I-270/US 15 Southbound (AM Peak Hour, Peak Direction)	N/A	7.7	17.5
Total Mileage Reduction of LOS F Segments	**N/A**	**11.9**	**25.9**

* *I-270/US 15 corridor within project limits is approximately 32.1 miles for a total length of 64 miles.*