

TYSONS CORNER

Neighborhood Traffic Impact Study

Traffic Analysis Report

Task Order No. 07-077-03

Prepared by:



Prepared for:



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SUMMARY

In tandem with the Transforming Tysons Corner planning effort, the Fairfax County Board of Supervisors initiated this neighborhood traffic impact study in order to assess the operational differences between the existing Comprehensive Plan and the GMU High land use scenario for the year 2030, for neighborhoods on the periphery of Tysons Corner.

Working with the local communities that surround Tysons Corner, the Fairfax County Department of Transportation (FCDOT) selected nineteen (19) intersections for analysis in this study.

Two land use scenarios were considered for this study: the Comprehensive (Comp) Plan land use scenario (the base case) and the GMU High Plan land use scenario. Both the Comp Plan and GMU High future year (2030) traffic volumes were used to assess traffic conditions in the future, as well as to propose mitigation measures to improve the level of service (LOS) of future problematic intersections.

Currently, eleven (11) intersections in the study area operate at acceptable levels of service (defined in this report as LOS D or better) under existing year 2008 conditions (AM and PM peak hours). Under future conditions with no mitigation, eight (8) intersections are projected to operate at acceptable levels of service under both the Comp Plan and GMU High Scenarios. With mitigation measures such as changes in lane configurations and signal timing/traffic control improvements, all intersections, except one under the GMU High scenario, for both the Comp Plan and GMU High Scenarios were able to achieve acceptable levels of service. Table S-1 presents a comparison of results of existing and future intersection capacity analysis under both scenarios.

Cost estimates were developed for the proposed improvements. The cost involved in implementing the Comp Plan proposed improvements was estimated to be **\$13,097,500** whereas the GMU High Plan proposed improvements were estimated to be **\$17,350,000**. The proposed mitigation under GMU High Plan would cost **\$4,252,500** more when compared to the Comp Plan proposed improvements.

In conclusion, mitigation due to both the Fairfax County Transportation Plan, and additional mitigation at the individual intersections, can mitigate the impacts due to the proposed changes to the Comprehensive Plan land use.

Table S-1 : Summary of Intersection Level of Service (LOS)

Intersection	2008 Existing		2030 Comp Plan - No Imp.		2030 Comp Plan - Pro. Imp.		2030 GMU High Plan - No Imp.		2030 GMU High Plan - Pro. Imp.	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Int 1: Great Falls & Dolley Madison Blvd	E	E	E	E	D	D	D	E	D	D
Int 2: Old Dominion Dr & Dolley Madison Blvd	E	D	F	D	D	D	F	D	D	D
Int 3: Leesburg Pike & Lewinsville Road	C	E	D	F	C	D	C	F	C	C
Int 4: Spring Hill Rd & Lewinsville Road	D	D	D	D	-	-	D	D	-	-
Int 5: Swinks Mill Rd & Lewinsville Road *	-	-	-	-	-	-	-	-	-	-
Int 6: Lewinsville Road & Balls Hill Road	B	A	B	A	-	-	B	A	-	-
Int 7: Great Falls St & Chain Bridge Road	C	D	C	D	-	-	C	D	-	-
Int 8: Great Falls St & Magarity Road	B	B	B	B	-	-	C	C	-	-
Int 9: Leesburg Pike & Lisle Avenue	D	D	E	F	D	D	E	F	D	D
Int 10: Leesburg Pike & Idylwood Rd	E	D	F	F	D	D	F	F	D	D
Int 11: Gallows Rd & Idylwood Rd	D	C	F	E	D	D	F	E	D	D
Int 12: Georgetown Pk & Swinks Mill Rd *	F	F	F	F	B	C	F	F	C	D
Int 13: Georgetown Pk & Balls Hill Rd	C	C	C	C	-	-	C	C	-	-
Int 14: Gallows Rd & Cedar Lane	D	C	F	C	D	C	F	D	D	C
Int 15: Old Courthouse Rd & Chain Bridge Rd	F	E	F	D	D	D	F	F	E	D
Int 16: Beulah Rd & Maple Ave	C	D	C	D	-	-	C	D	-	-
Int 17: Lawyers Rd & Maple Ave	E	E	E	E	D	D	E	F	D	D
Int 18: Westbriar Court & Old Courthouse Rd *	F	F	F	F	B	B	F	F	D	B
Int 19: Creek Crossing Rd & Old Courthouse Rd *	-	-	-	-	-	-	-	-	-	-
Operating at either LOS E or F	7	6	10	8	0	0	9	9	1	0
Operating at either LOS E or F: AM and/or PM Peak	8		11		0		11		1	
Operating at LOS D during both AM and PM Peak	11		8		19		8		18	
Total No. of Intersections	19		19		19		19		19	

Note: * - Existing Unsignalized Intersections. Due to limitations of Synchro software, overall intersection level of service for unsignalized intersections could not be determined. Intersection 12 and 18 were considered as failing intersections during the 2030 conditions due to high delays along one or more intersection approach.

INTRODUCTION

Background and Purpose of the Study

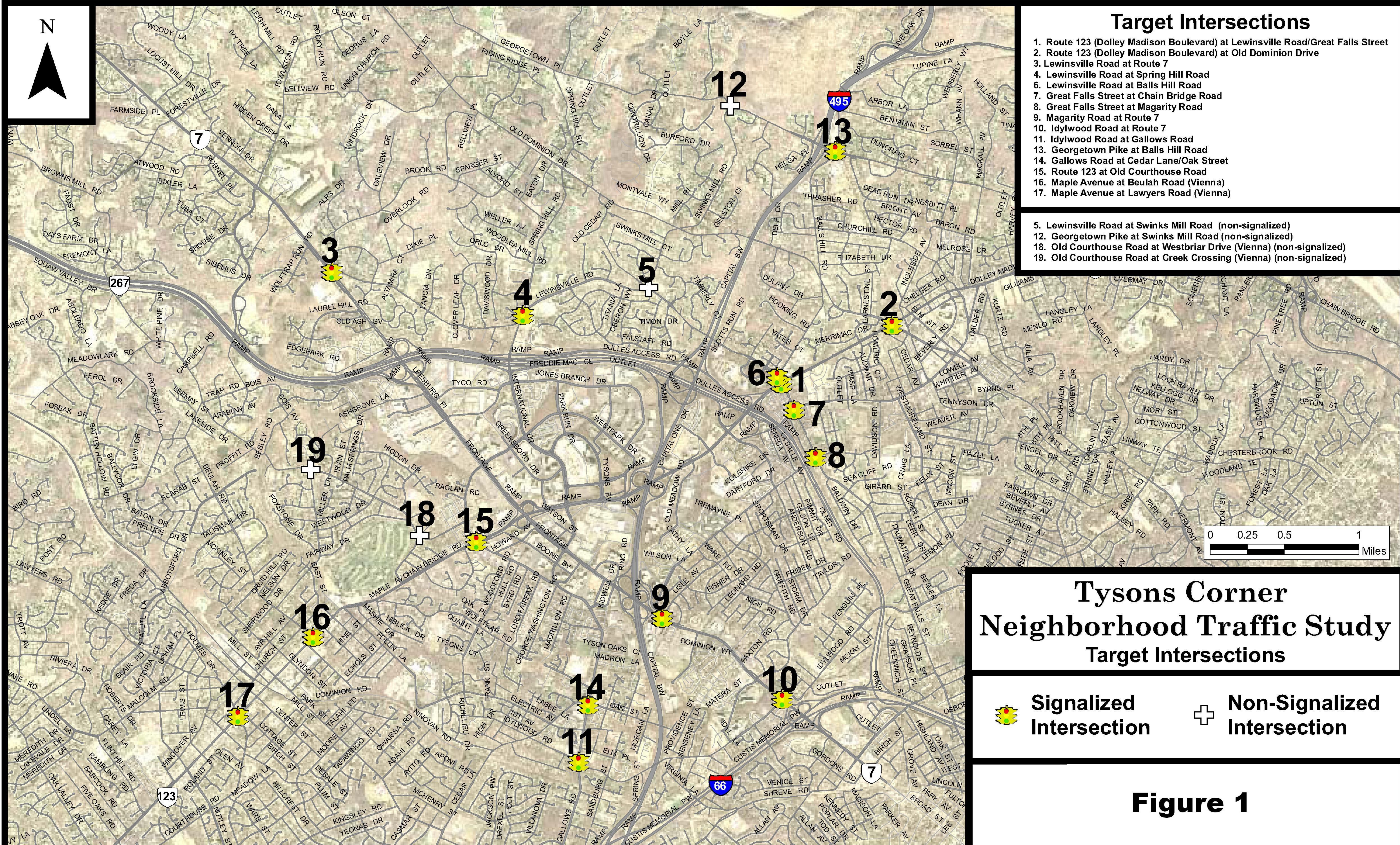
Fairfax County's current Comprehensive Plan provides a vision for substantial change in Tysons Corner. The GMU High Land Use Plan is considered as an alternative to the existing Comprehensive Plan. This report assesses the traffic operational differences between the Comprehensive Plan and the GMU High land use alternative for the year 2030, for neighborhoods on the periphery of Tysons Corner.

This report is a final, condensed version of the draft report that was submitted to VDOT as part of the Chapter 527 analysis. The draft report was modified based on further analysis and collaboration with County staff. Before any of the recommendations of this report would be implemented, additional analysis confirming the findings, including field reviews of the proposed mitigation, and a public involvement process would need to be carried out.

Study Process

To evaluate the impacts of the two land use scenarios, nineteen (19) intersections were considered. The study intersections are listed below and are shown in Figure 1:

- Intersection 1: Route 123 (Dolley Madison Boulevard) at Lewinsville Road/Great Falls Street
- Intersection 2: Route 123 (Dolley Madison Boulevard) at Old Dominion Drive
- Intersection 3: Lewinsville Road at Route 7
- Intersection 4: Lewinsville Road at Spring Hill Road
- Intersection 5: Lewinsville Road at Swinks Mill Road (Un-signalized)
- Intersection 6: Lewinsville Road at Balls Hill Road
- Intersection 7: Great Falls Street at Chain Bridge Road
- Intersection 8: Great Falls Street at Magarity Road
- Intersection 9: Magarity Road at Route 7
- Intersection 10: Idylwood Road at Route 7
- Intersection 11: Idylwood Road at Gallows Road
- Intersection 12: Georgetown Pike at Swinks Mill Road (Un-signalized)
- Intersection 13: Georgetown Pike at Balls Hill Road
- Intersection 14: Gallows Road at Cedar Lane/Oak Street
- Intersection 15: Route 123 (Chain Bridge Road) at Old Courthouse Road
- Intersection 16: Route 123 (Maple Avenue) at Beulah Road
- Intersection 17: Route 123 (Maple Avenue) at Lawyers Road
- Intersection 18: Old Courthouse Road at Westbriar Drive (Un-signalized)
- Intersection 19: Old Courthouse Road at Creek Crossing Road (Un-signalized)



Target Intersections

1. Route 123 (Dolley Madison Boulevard) at Lewinsville Road/Great Falls Street
2. Route 123 (Dolley Madison Boulevard) at Old Dominion Drive
3. Lewinsville Road at Route 7
4. Lewinsville Road at Spring Hill Road
6. Lewinsville Road at Balls Hill Road
7. Great Falls Street at Chain Bridge Road
8. Great Falls Street at Magarity Road
9. Magarity Road at Route 7
10. Idylwood Road at Route 7
11. Idylwood Road at Gallows Road
13. Georgetown Pike at Balls Hill Road
14. Gallows Road at Cedar Lane/Oak Street
15. Route 123 at Old Courthouse Road
16. Maple Avenue at Beulah Road (Vienna)
17. Maple Avenue at Lawyers Road (Vienna)

5. Lewinsville Road at Swinks Mill Road (non-signalized)
12. Georgetown Pike at Swinks Mill Road (non-signalized)
18. Old Courthouse Road at Westbriar Drive (Vienna) (non-signalized)
19. Old Courthouse Road at Creek Crossing (Vienna) (non-signalized)

Tysons Corner Neighborhood Traffic Study Target Intersections


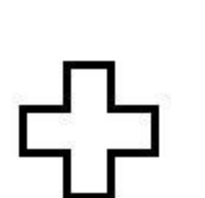
-  **Signalized Intersection**
-  **Non-Signalized Intersection**

Figure 1

The Fairfax County Sub-Area Model, which is based on the regional model developed by the Metropolitan Washington Council of Governments (COG), was used to come up with future year forecasts. The outputs from the Fairfax County Sub-Area Model under the Comp Plan and GMU High Plan land use scenarios were used to project 2030 traffic conditions at the study intersections which in turn were used to determine the future level of service (LOS) under existing roadway conditions.

In each case, the intersections which are projected to operate unacceptably were identified and potential mitigation measures to improve the future intersection operations were developed. A cost estimate was also developed for each intersection to implement the proposed improvements.

This report details existing traffic conditions, future traffic conditions, as well as necessary mitigation measures for both the Comp plan and GMU High plan scenarios.

EXISTING CONDITIONS

Data Collection

Nineteen (19) intersections within the study area were selected for this analysis. Turning movement counts for these 19 intersections between the hours of 7-9 AM and 4-6 PM, were collected during the Spring and Fall of 2008. In addition, field reconnaissance was carried out at these intersections during the peak and off-peak hours from April 13th, 2009 to April 17th, 2009. Out of the nineteen (19) key intersections, fifteen (15) intersections are signalized and four (4) are unsignalized.

Existing Intersection Traffic Operations Analysis

Traffic software Synchro version 7.0 was used to analyze the study intersections under 2008 existing conditions, as well as under 2030 Comp plan and GMU High plan scenarios. The results of the 2008 analysis are summarized in Table 1.

Based on the results of the existing conditions analysis, out of fifteen (15) signalized intersections, ten (10) intersections during the AM peak and eleven (11) intersections during the PM peak operate at acceptable levels of service i.e., LOS D or better. Under existing conditions, two (2) un-signalized intersections are unacceptable, LOS E or F, during both the AM and PM peaks.

Table 1: 2008 Level of Service			
Time Period	No. of Intersections		
	LOS D or better	LOS E or F	Total
AM	10 + 2*	5 + 2*	19
PM	11 + 2*	4 + 2*	19

* Unsignalized intersection.

FUTURE CONDITIONS

As part of the 2030 future intersection capacity analysis, existing lane configurations and signal timing were maintained in order to determine the level of service without mitigation being in place. The results of both the 2008 and 2030 no-build analyses are presented in Table 2.

For both the Comp Plan and GMU High Plan scenarios, eight (8) intersections are operating at acceptable levels of service (LOS D or better) during both the AM and PM peak hours, whereas eleven (11) intersections are failing (LOS E or F).

Table 2: 2030 Level of Service - No Mitigation

Time Period	2008 Existing Conditions			2030 Comp Plan			2030 GMU High Plan		
	LOS D or better	LOS E or F	Total	LOS D or better	LOS E or F	Total	LOS D or better	LOS E or F	Total
AM	10 + 2*	5 + 2*	19	7 + 2*	8 + 2*	19	8 + 2*	7 + 2*	19
PM	11 + 2*	4 + 2*	19	9 + 2*	6 + 2*	19	8 + 2*	7 + 2*	19
AM and PM	9 + 2*	6 + 2*	19	6 + 2*	9 + 2*	19	6 + 2*	9 + 2*	19

* Unsignalized intersection.

MITIGATION MEASURES

To achieve an acceptable level of service, defined for this study as LOS D or better, signal timing and geometric improvements were considered under the Comp Plan and GMU High Plan Scenarios. The purpose of this task is to establish whether the amount of mitigation required for the GMU High Plan Scenario is greater than the amount required for the Comp Plan Scenario.

Methodology:

Using Synchro version 7.0 and SimTraffic, the mitigation measures required by each intersection were determined. Typically the first step in the mitigation process was to optimize the signal timing to improve the level of service. The cycle lengths for each intersection were kept unchanged, with only the signal timing splits being adjusted / optimized for better operations. However, if signal timing optimization did not help reduce the delay to LOS D or better, then depending on the worst movement at the intersection, the adding of turn-bays was considered. If the through volumes are so high that the proposed turn-bays are not able to

improve the level of service, then the addition of through lanes was considered. This approach was adopted for all of the failing intersections (LOS E or F) in the study area. Table 3 presents the Synchro analysis results for the eleven (11) failing intersections. Out of the eleven (11) failing intersections only one (1) intersection, Intersection 15 - Chain Bridge Road at Old Courthouse Road, could not achieve LOS D even with substantial improvements. For the two unsignalized intersections that are failing under both scenarios, Intersection 12 - Georgetown Pike at Swinks Mill Road and Intersection 18 - Westbriar Court at Old Courthouse Road, a traffic signal is recommended as a proposed improvement, however, a signal warrant study was not conducted for these two intersections as part of this study. Furthermore, the proposed mitigation measures recommended in this report have not been field verified.

Table 3: 2030 Level of Service – Existing Geometry and Proposed Improvements										
Direction	Eastbound		Westbound		Northbound		Southbound		Overall Intersection	
Scenario	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS
Int 1: Route 123 (Dolley Madison Boulevard – (NB/SB)) at Lewinsville Road (EB)/Great Falls Street (WB)										
AM PEAK										
2030 Comp Plan - Existing Geometry	66.1	E	82.2	F	53.1	D	46.6	D	55.7	E
2030 Comp Plan with Proposed Improvements	70.9	E	82.1	F	50.7	D	45.6	D	54.7	D
2030 GMU High Plan - Existing Geometry	62.8	E	78.9	E	46.2	D	49.7	D	52.2	D
2030 GMU High Plan w/ Proposed Improvements	62.8	E	78.9	E	46.2	D	49.7	D	52.2	D
PM PEAK										
2030 Comp Plan - Existing Geometry	85.4	F	108.5	F	87.6	F	33.5	C	72.8	E
2030 Comp Plan with Proposed Improvements	127.2	F	109.7	F	40.9	D	23.4	C	54.2	D
2030 GMU High Plan - Existing Geometry	73.5	E	93.7	F	94.1	F	33.2	C	73.2	E
2030 GMU High Plan w/ Proposed Improvements	126.0	F	153.9	F	40.2	D	18.5	B	54.1	D
Int 2: Route 123 (Dolley Madison Boulevard– (NB/SB)) at Old Dominion Drive (EB/WB)										
AM PEAK										
2030 Comp Plan - Existing Geometry	71.7	E	59.2	E	109.1	F	55.3	E	81.5	F
2030 Comp Plan with Proposed Improvements	69.4	E	94.3	F	53.3	D	36.6	D	54.8	D
2030 GMU High Plan - Existing Geometry	75.8	E	61.0	E	111.3	F	76.4	E	88.9	F
2030 GMU High Plan w/ Proposed Improvements	84.1	F	105.1	F	41.5	D	39.9	D	55.0	D
PM PEAK										
2030 Comp Plan - Existing Geometry	81.1	F	79.0	E	20.8	C	47.4	D	44.9	D
2030 Comp Plan with Proposed Improvements	81.1	F	79.0	E	28.5	C	47.4	D	48	D
2030 GMU High Plan - Existing Geometry	83.0	F	80.5	F	31.6	C	45.2	D	48.9	D
2030 GMU High Plan w/ Proposed Improvements	83.0	F	80.5	F	40.0	D	45.2	D	52.3	D

Int 3: Lewinsville Road (SB) at Route 7 (Leesburg Pike – (EB/WB))										
AM PEAK										
2030 Comp Plan - Existing Geometry	28.2	C	32.2	C	89.2	F	94.0	F	36.3	D
2030 Comp Plan with Proposed Improvements	21.8	C	33.1	C	71.9	E	35.9	D	26.4	C
2030 GMU High Plan - Existing Geometry	17.4	B	57.8	E	87.9	F	29.8	C	29.2	C
2030 GMU High Plan w/ Proposed Improvements	18.3	B	44.1	D	86.7	F	18	B	25.1	C
PM PEAK										
2030 Comp Plan - Existing Geometry	24.0	C	82.1	F	90.9	F	317.5	F	104.6	F
2030 Comp Plan with Proposed Improvements	27.8	C	50.4	D	73.5	E	90.4	F	50.3	D
2030 GMU High Plan - Existing Geometry	76.7	E	53.0	D	90.9	F	455.7	F	143.0	F
2030 GMU High Plan w/ Proposed Improvements	24.7	C	36.4	D	76.5	E	15.2	B	28.8	C
Int 9: Magarity Road (NB/SB) at Route 7 (EB/WB)										
AM PEAK										
2030 Comp Plan - Existing Geometry	38.2	D	39.4	D	192.0	F	234.7	F	72.3	E
2030 Comp Plan with Proposed Improvements	43.3	D	51.2	D	105.4	F	64.8	E	52.5	D
2030 GMU High Plan - Existing Geometry	43.7	D	64.3	E	96.5	F	124.5	F	65.5	E
2030 GMU High Plan w/ Proposed Improvements	38.8	D	45.1	D	93.0	F	76.3	E	47.8	D
PM PEAK										
2030 Comp Plan - Existing Geometry	48.9	D	41.1	D	128.9	F	263.1	F	85.0	F
2030 Comp Plan with Proposed Improvements	42.9	D	37.5	D	162.3	F	83.8	F	54.8	D
2030 GMU High Plan - Existing Geometry	43.0	D	39.1	D	155.1	F	373.7	F	102.1	F
2030 GMU High Plan w/ Proposed Improvements	41.6	D	38.3	D	87.4	F	110.1	F	54.4	D
Int 10: Idylwood Road (NB/SB) at Route 7 (EB/WB)										
AM PEAK										
2030 Comp Plan - Existing Geometry	121.4	F	68.0	E	96.9	F	121.3	F	98.6	F
2030 Comp Plan with Proposed Improvements	50.4	D	38.3	D	91.7	F	87.2	F	55.0	D
2030 GMU High Plan - Existing Geometry	105.0	F	74.8	E	127.2	F	107.6	F	97.7	F
2030 GMU High Plan w/ Proposed Improvements	47.4	D	49.3	D	76.9	E	72.5	E	54.7	D
PM PEAK										
2030 Comp Plan - Existing Geometry	111.0	F	66.3	E	137.1	F	131.3	F	95.8	F
2030 Comp Plan with Proposed Improvements	52.9	D	39.0	D	56.2	E	58.2	E	47.7	D
2030 GMU High Plan - Existing Geometry	126.6	F	66.3	E	143.6	F	130.8	F	103.4	F
2030 GMU High Plan w/ Proposed Improvements	53.4	D	39.7	D	46.1	D	73.6	E	48.5	D

Int 11: Idylwood Road (EB/WB) at Gallows Road (NB/SB)

AM PEAK

2030 Comp Plan – Existing Geometry	137.2	F	67.7	E	137.2	F	38.2	D	106.7	F
2030 Comp Plan with Proposed Improvements	137.2	F	67.7	E	37.8	D	27.0	C	48.1	D
2030 GMU High Plan – Existing Geometry	142.4	F	63.5	E	162.0	F	39.6	D	120.8	F
2030 GMU High Plan w/ Proposed Improvements	142.4	F	63.5	E	40.9	D	27.5	C	49.0	D

PM PEAK

2030 Comp Plan – Existing Geometry	84.3	F	110.4	F	81.7	F	19.6	B	62.6	E
2030 Comp Plan with Proposed Improvements	98.2	F	56.5	E	41.1	D	26.3	C	39.4	D
2030 GMU High Plan – Existing Geometry	91.5	F	135.9	F	82.5	F	22.0	C	67.3	E
2030 GMU High Plan w/ Proposed Improvements	91.5	F	135.9	F	36.1	D	17.4	B	47.0	D

Int 12: Georgetown Pike (EB/WB) at Swinks Mill Road (NB)

AM PEAK

2030 Comp Plan – Existing Geometry	0.2	A	1.1	A	284.0	F	13.2	B	53.2	-
2030 Comp Plan with Proposed Improvements	15.8	B	10.8	B	14.2	B	19.5	B	13.8	B
2030 GMU High Plan – Existing Geometry	0.2	A	0.6	A	437.6	F	-	F	-	-
2030 GMU High Plan w/ Proposed Improvements	24.8	C	10.7	B	24.8	C	14.8	B	20.1	C

PM PEAK

2030 Comp Plan – Existing Geometry	0.2	A	7.8	A	235.9	F	305.9	F	33.7	-
2030 Comp Plan with Proposed Improvements	4.3	A	51.9	D	25.6	C	50.9	D	31.2	C
2030 GMU High Plan – Existing Geometry	0.2	A	9.3	A	444.6	F	-	F	126.6	-
2030 GMU High Plan w/ Proposed Improvements	5.2	A	91.9	F	35.2	D	49.3	D	52.4	D

Int 14: Gallows Road (NB/SB) at Cedar Lane (EB)/Oak Street(WB)

AM PEAK

2030 Comp Plan – Existing Geometry	74.1	E	394.3	F	258.1	F	28.2	C	199.5	F
2030 Comp Plan with Proposed Improvements	77.7	E	56.1	E	53.5	D	31.3	C	54.4	D
2030 GMU High Plan – Existing Geometry	83.9	F	485.2	F	241.4	F	29.1	C	199.2	F
2030 GMU High Plan w/ Proposed Improvements	141.1	F	65.2	E	30.3	C	18.5	B	54.7	D

PM PEAK

2030 Comp Plan – Existing Geometry	78.0	E	64.4	E	30.3	C	23.4	C	33.5	C
2030 Comp Plan with Proposed Improvements	75.2	E	40.7	D	38.8	D	15.3	B	30.9	C
2030 GMU High Plan – Existing Geometry	78.7	E	84.7	F	31.8	C	30.2	C	39.0	D
2030 GMU High Plan w/ Proposed Improvements	78.7	E	84.7	F	27.9	C	19.0	B	32.2	C

Int 15: Old Courthouse Road (NB/SB) at Chain Bridge Road (EB/WB)										
AM PEAK										
2030 Comp Plan - Existing Geometry	41.4	D	124.1	F	318.7	F	90.0	F	119.8	F
2030 Comp Plan with Proposed Improvements	43.2	D	18.9	B	66.8	E	80.9	F	49.5	D
2030 GMU High Plan - Existing Geometry	38.7	D	73.8	E	351.5	F	200.8	F	143.6	F
2030 GMU High Plan w/ Proposed Improvements	51.0	D	45.4	D	77.7	E	68.1	E	59.1	E
PM PEAK										
2030 Comp Plan - Existing Geometry	44.3	D	34.7	C	85	F	74.1	E	54.4	D
2030 Comp Plan with Proposed Improvements	32.6	C	26.2	C	50.7	D	52.4	D	36.6	D
2030 GMU High Plan - Existing Geometry	31.8	C	31.9	C	176.0	F	83.8	F	81.6	F
2030 GMU High Plan w/ Proposed Improvements	43.6	D	47.5	D	51.5	D	52.4	D	48.7	D
Int 17: Maple Avenue (EB/WB) at Lawyers Road (NB/SB) (Vienna)										
AM PEAK										
2030 Comp Plan - Existing Geometry	52.9	D	50.9	D	113.9	F	96.3	F	67.3	E
2030 Comp Plan with Proposed Improvements	42.6	D	36.7	D	71.8	E	96.9	F	54.9	D
2030 GMU High Plan - Existing Geometry	68.4	E	51.7	D	119.0	F	96.9	F	76.3	E
2030 GMU High Plan w/ Proposed Improvements	46.8	D	34.5	C	60.9	E	95.7	F	54.9	D
PM PEAK										
2030 Comp Plan - Existing Geometry	51.8	D	61.8	E	107.1	F	81.2	F	70.2	E
2030 Comp Plan with Proposed Improvements	47.2	D	36.0	D	93.6	F	75.8	E	54.5	D
2030 GMU High Plan - Existing Geometry	63.9	D	53.3	D	198.8	F	135.2	F	85.9	F
2030 GMU High Plan w/ Proposed Improvements	37.9	D	24.8	C	94.7	F	84.0	F	49.0	D
Int 18: Old Courthouse Road (EB/WB) at Westbriar Drive (NB/SB) (Vienna)										
AM PEAK										
2030 Comp Plan - Existing Geometry	0.1	A	0.4	A	177.1	F	721.0	F	53.4	-
2030 Comp Plan with Proposed Improvements	16.2	B	4.7	A	25.8	C	26.1	C	17.3	B
2030 GMU High Plan - Existing Geometry	0.1	A	0.5	A	599.5	F	-	F	-	-
2030 GMU High Plan w/ Proposed Improvements	34.6	C	4.6	A	64.2	E	85.2	F	39.6	D
PM PEAK										
2030 Comp Plan - Existing Geometry	0.2	A	2.7	A	126.5	F	35.7	E	10.0	-
2030 Comp Plan with Proposed Improvements	3.4	A	15.9	B	36.6	D	30.5	C	14.8	B
2030 GMU High Plan - Existing Geometry	0.5	A	3.9	A	572.3	F	83.3	F	31.6	-
2030 GMU High Plan w/ Proposed Improvements	3.1	A	19.5	B	52.5	D	39.2	D	17.4	B

The proposed physical improvements are presented as intersection diagrams overlaid onto aerial photos (please see Appendix). The improvements required to achieve acceptable levels of service (LOS D or better) during the AM peak and PM peak hours under each land use scenario are listed as follows:

Intersection 1 – Route 123 (Dolley Madison Blvd) at Lewinsville Road/Great Falls Street

Comp Plan Land Use Scenario

No physical improvements will be needed to achieve an overall intersection LOS D. Only signal timing changes will be necessary.

GMU High Plan Land Use Scenario

No physical improvements will be needed to achieve an overall intersection LOS D. Only signal timing changes will be necessary.

Intersection 2 – Route 123 (Dolley Madison Blvd) at Old Dominion Drive

Comp Plan Land Use Scenario

No physical improvements will be needed to achieve an overall intersection LOS D. Only signal timing changes will be necessary.

GMU High Plan Land Use Scenario

No physical improvements will be needed to achieve an overall intersection LOS D. Only signal timing changes will be necessary.

Intersection 3 – Lewinsville Road at Route 7 (Leesburg Pike)

Comp Plan Land Use Scenario

No physical improvements will be needed beyond what is called for in the Fairfax County Transportation Plan in order to achieve an overall intersection LOS D. Signal timing changes will be necessary.

GMU High Plan Land Use Scenario

In order to achieve an overall intersection LOS D the only physical improvement that will be needed beyond what is called for in the Fairfax County Transportation Plan is an acceleration lane west of Lewinsville Road along Route 7. Signal timing changes will also be necessary.

Intersection 9 – Magarity Road at Route 7

Comp Plan Land Use Scenario

In order to achieve an overall intersection LOS D the only physical improvement that will be needed beyond what is called for in the Fairfax County Transportation Plan is the addition of a right turn lane on the southbound approach of Magarity Road. Signal timing changes will also be necessary.

GMU High Plan Land Use Scenario

In order to achieve an overall intersection LOS D the only physical improvements that will be needed beyond what is called for in the Fairfax County Transportation Plan is the addition of a right turn lane on the southbound approach of Magarity Road, and a right turn lane on the northbound approach of Ramada Road. Signal timing changes will also be necessary.

Intersection 10 – Idylwood Road at Route 7

Comp Plan Land Use Scenario

In order to achieve an overall intersection LOS D the only physical improvements that will be needed beyond what is called for in the Fairfax County Transportation Plan are:

- An additional left turn and right turn lane on the eastbound and westbound approaches of Route 7.
- An additional right turn lane on the northbound and southbound approaches of Idylwood Road.
- An acceleration lane on southbound Idylwood Road.

Signal timing changes will also be necessary.

GMU High Plan Land Use Scenario

In order to achieve an overall intersection LOS D the only physical improvements that will be needed beyond what is called for in the Fairfax County Transportation Plan are the same physical improvements called for under the Comp Plan land use scenario with the exception of an additional right turn lane on the northbound approach of Idylwood Road. Signal timing changes will also be necessary.

Intersection 11 – Idylwood Road at Gallows Road

Comp Plan Land Use Scenario

No physical improvements will be needed beyond what is called for in the Fairfax County Transportation Plan in order to achieve an overall intersection LOS D. Only signal timing changes will be necessary.

GMU High Plan Land Use Scenario

No physical improvements will be needed beyond what is called for in the Fairfax County Transportation Plan in order to achieve an overall intersection LOS D. Only signal timing changes will be necessary.

Intersection 12 – Georgetown Pike and Swinks Mill Road

Comp Plan Land Use Scenario

In order to achieve an overall LOS D, a traffic signal is required as well as a right turn lane on the northbound approach of Swinks Mill Road.

GMU High Plan Land Use Scenario

In order to achieve an overall LOS D, a traffic signal is required as well as a right turn lane on the northbound approach of Swinks Mill Road.

Intersection 14 – Gallows Road at Cedar Lane/Oak Street

Comp Plan Land Use Scenario

No physical improvements will be needed beyond what is called for in the Fairfax County Transportation Plan in order to achieve an overall intersection LOS D. Only signal timing changes will be necessary.

GMU High Plan Land Use Scenario

No physical improvements will be needed beyond what is called for in the Fairfax County Transportation Plan in order to achieve an overall intersection LOS D. Only signal timing changes will be necessary.

Intersection 15 – Old Courthouse Road and Chain Bridge Road

Comp Plan Land Use Scenario

In order to achieve an overall intersection LOS D the only physical improvements that will be needed beyond what is called for in the Fairfax County Transportation Plan are:

- An additional left turn lane on both the eastbound and westbound approaches of Chain Bridge Road.
- An additional left turn lane on the southbound approach of Gosnell Road.

Signal timing changes will also be necessary.

GMU High Plan Land Use Scenario

The same improvements under the Comp Plan land use scenario are recommended for the GMU High plan land use scenario. Even with these improvements in place the best LOS for the intersection is a LOS D in the PM with a LOS E in the AM. There are no additional at-grade improvements that could improve the LOS to D in the AM.

Intersection 17 – Maple Avenue at Lawyers Road (Vienna)

Comp Plan Land Use Scenario

In order to achieve an overall intersection LOS D an exclusive right turn lane is recommended for the northbound and southbound approaches of Lawyers Road/Courthouse Road, as well as the westbound approach of Maple Avenue. Signal timing changes will also be necessary.

GMU High Plan Land Use Scenario

In order to achieve an overall intersection LOS D an additional left turn lane is recommended for the westbound approach of Maple Avenue and the southbound approach of Lawyers Road. Additional improvements include an exclusive right turn lane on the northbound approach of Courthouse Road, as well as an exclusive right turn lane on the southbound approach of Lawyers Road. Signal timing changes will also be necessary.

Intersection 18 – Old Courthouse Road and Westbriar Drive (Vienna)

Comp Plan Land Use Scenario

In order to achieve an overall LOS D, only a traffic signal will need to be installed.

GMU High Plan Land Use Scenario

In order to achieve an overall LOS D, only a traffic signal will need to be installed.

Planning Level Cost Estimates

Planning level cost estimates for the improvements listed previously were developed based on the criteria and assumptions outlined below. Construction costs were only established for improvements beyond what is called for in the Fairfax County Transportation Plan.

The Total Project Cost estimates are broken down into two categories: Total Construction Cost and Total Right of Way/Utilities Cost. Project costs were established using VDOT statewide planning level cost estimates (NOVA/Hampton Roads). All costs are given in terms of 2010 dollars.

Construction Cost

VDOT statewide planning level cost estimates are given in terms of cost per mile (CPM), so the cost estimates associated with this analysis are not as specific as would be carried out with more detailed construction cost estimates (cost per square yard, cubic yard, linear feet). Construction can include several items such as the removal of existing pavement, medians, sidewalks, and curb/gutter, as well as grading, and the addition of new asphalt concrete pavement. It is assumed as part of this analysis that all such construction costs are captured by the planning level cost estimates.

Right Of Way Acquisition and Utility Relocation Costs

Under the VDOT planning level cost estimate methodology, right of way (ROW) and utility relocation costs are a function of the total construction cost. Expressed simply as a percentage of the total construction cost, ROW and utility relocation costs can vary anywhere from 25% to 150% of the total construction cost depending on which kind of area the project occurs in. The VDOT statewide planning level cost estimates classify ROW and utility relocation costs as falling

in either a rural, suburban low density, suburban high density, or a central business district (CBD) area. The CBD classification has the highest ROW and utility costs. For this analysis it was assumed that all of the projects fell within a CBD due to the high value of land within the Tysons area. Based on this assumption, ROW and utility relocation costs were assumed to be equal to 125% of the construction costs.

Total Project Cost

The Total Project Cost is based on the summation of the construction costs, ROW and utility relocation costs.

Table 4 provides a summary and a comparison of the costs involved in implementing the required mitigation under the Comp Plan and GMU High Plan scenarios. Based on this information, it is estimated that the GMU High plan improvements would cost approximately **\$4,252,500** more when compared to the Comp Plan improvements.

Table 4: Cost Estimates for Proposed Mitigation Beyond the Transportation Plan			
Intersection	Cost For Mitigation		Cost Difference GMU High Plan Vs. Comp Plan
	Comp Plan	GMU High Plan	
1. Dolley Madison Boulevard at Lewinsville Road/Great Falls St	\$0	\$0	\$0
2. Dolley Madison Boulevard at Old Dominion Drive	\$0	\$0	\$0
3: Lewinsville Road at Route 7 (Leesburg Pike)	\$0	\$742,500	\$742,500
9: Magarity Road at Route 7	\$742,500	\$1,485,000	\$742,500
10: Idylwood Road at Route 7	\$5,557,500	\$6,300,000	\$742,500
11: Idylwood Road at Gallows Road	\$0	\$0	\$0
12: Georgetown Pike at Swinks Mill Road	\$1,362,500	\$1,362,500	\$0
14: Gallows Road at Cedar Lane/Oak Street	\$0	\$0	\$0
15: Old Courthouse Road at Chain Bridge Road	\$2,587,500	\$2,587,500	\$0
17: Maple Avenue at Lawyers Road (Vienna)	\$2,227,500	\$4,252,500	\$2,025,000
18: Old Courthouse Rd at Westbriar Dr (Vienna)	\$620,000	\$620,000	\$0
Total Cost of Mitigation	\$13,097,500	\$17,350,000	\$4,252,500