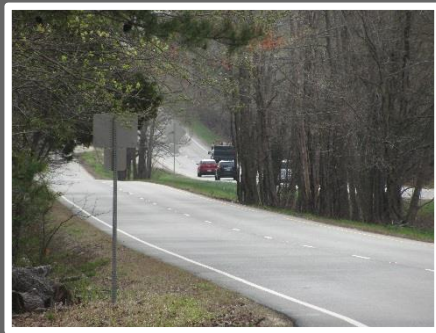
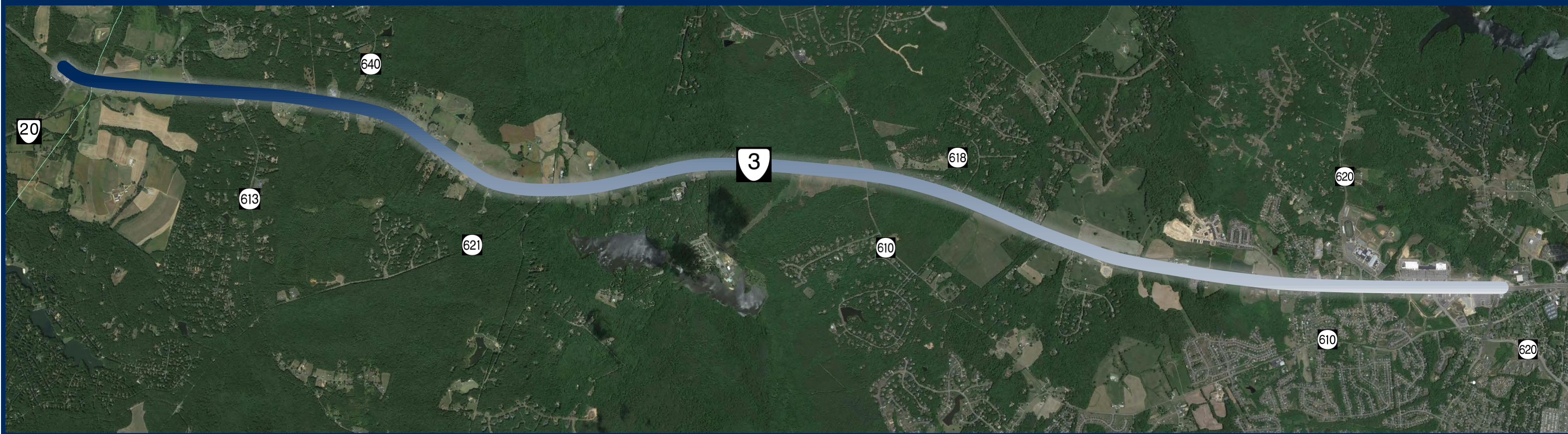


Route 3 Arterial Management Plan

Spotsylvania County, Virginia

Volume I: Report



Route 3 Arterial Management Plan Spotsylvania County

April 11, 2016

Prepared for:

Virginia Department of Transportation



Prepared by:

MICHAEL BAKER INTERNATIONAL



Table of Contents

Chapter 1: INTRODUCTION	1
1.1 STUDY PURPOSE.....	1
1.2 STUDY AREA	1
1.3 REVIEW OF EXISTING STUDIES AND DOCUMENTS	3
1.4 PUBLIC INVOLVEMENT PROCESS	3
Chapter 2: EXISTING CONDITIONS	4
2.1 EXISTING LAND USE	4
2.2 EXISTING INFRASTRUCTURE.....	6
2.3 EXISTING ACCESS POINTS.....	6
2.4 CRASH ANALYSIS	7
2.4 EXISTING TRAFFIC VOLUMES	9
2.5 EXISTING TRAFFIC OPERATIONS	9
Chapter 3: 2040 FUTURE CONDITIONS	16
3.1 FUTURE LAND USE	16
3.2 FUTURE TRAFFIC VOLUMES	22
3.3 MINIMALLY MANAGED CONDITION OPERATIONS AND DEFICIENCIES	29
Chapter 4: RECOMMENDATIONS.....	40
4.1 TOOLBOX OF RECOMMENDATIONS	40
4.2 ROUTE 3 STUDY CORRIDOR RECOMMENDATIONS.....	40
4.3 OPINION OF COSTS	43
4.4 CONCLUSION AND NEXT STEPS.....	51

List of Tables

TABLE 1: EXISTING LAND USE IN THE ROUTE 3 STUDY AREA 4

TABLE 2: MINIMUM SPACING STANDARDS FOR COMMERCIAL ENTRANCES, INTERSECTIONS, AND MEDIAN CROSSOVERS 6

TABLE 3: ROUTE 3 ACCESS POINT SUMMARY 6

TABLE 4: CRASH RATE BY CORRIDOR SEGMENT (2010-2012) 7

TABLE 5: CRASH TYPE AND SEVERITY BY INTERSECTION (2010-2012) 8

TABLE 6: HISTORIC DAILY TWO-WAY TRAFFIC VOLUMES ON ROUTE 3 9

TABLE 7: ALLOWABLE ZONING DENSITIES 17

TABLE 8: ASSUMED DENSITIES FOR ROUTE 3 CORRIDOR 18

TABLE 9: ASSUMED DEVELOPMENT FOR ROUTE 3 CORRIDOR 18

TABLE 10: AVERAGE TRIP GENERATION RATES 19

TABLE 11: FUTURE TOTAL TRIPS 20

TABLE 12: YEAR 2040 ADT AND AVERAGE ANNUAL GROWTH RATE 22

TABLE 13: UNIT COSTS FOR ROUTE 3 RECOMMENDATIONS 43

TABLE 14: ROUTE 3 SUMMARY OF RECOMMENDATIONS AND OPINION OF COST 44

List of Figures

Figure 1: STUDY AREA 2

Figure 2: EXISTING LAND USE 5

Figure 3: 2014 (EXISTING) PEAK HOUR VOLUMES 10

Figure 4: 2014 AM PEAK HOUR DELAY AND LEVEL OF SERVICE 13

Figure 5: ASSUMED FUTURE LAND USE 21

Figure 6: 2040 PEAK HOUR VOLUMES FOR EXISTING CONDITIONS 23

Figure 7: 2040 PEAK HOUR VOLUMES FOR PROPOSED NEW INTERSECTIONS 26

Figure 8: YEAR 2040 CORRIDOR DEFICIENCIES 29

Figure 9: 2040 PEAK HOUR LOS FOR EXISTING INTERSECTIONS – MINIMALLY MANAGED CONIDITION 34

Figure 10: 2040 PEAK HOUR LOS FOR PROPOSED NEW INTERSECTIONS – MINIMALLY MANAGED CONDITION 37

Figure 11: 2040 PEAK HOUR LOS FOR EXISTING INTERESCTIONS 45

Figure 12: 2040 PEAK HOUR LOS FOR PROPOSED NEW INTERSECTIONS 48

Table of Contents

APPENDIX A: ACCESS POINT SPACING 3

APPENDIX B: FUTURE ASSUMED LAND USE 15

APPENDIX C: SYNCHRO ANALYSIS 25

 C.1 EXISTING CONDITION (2014) 26

 C.2 2040 MINIMALLY MANAGED CONDITION 61

 C.3 2040 RECOMMENDATION BUILD CONDITION 115

APPENDIX D: PUBLIC COMMENTS & RESPONSES 164

CHAPTER 1: INTRODUCTION

1.1 STUDY PURPOSE

Using this project as a pilot, the intent is to develop a process for managing the Commonwealth’s arterial highway system as a resource. The process documents an Arterial Management Plan (AMP) that considers the current and future travel needs, as well as potential access for future development along the corridor. The AMP serves as a guide for providing future access to economic development sites that promotes the safety of through travel movements as well as local traffic.

The Commonwealth’s arterial network is the result of major investments in public funds and, given the unclear outlook for financing new transportation improvements, it is critical to develop plans and procedures to better preserve the Commonwealth’s existing transportation investments. Therefore, the purpose of an Arterial Management Plan is to identify ways to ensure the safety and preserve the capacity of the Commonwealth’s arterial highway network without wide-scale roadway widening.

In the future, there will continue to be a need to accommodate new land development along the arterial network, but the access to new sites must be planned in order to minimize the congestion and safety impacts that frequently accompany “strip development”. The Arterial Management Plan will help guide localities and the development community in maximizing capacity, minimizing congestion, as well as planning and designing the appropriate access for the future development.

Route 3, west of I-95, between Gordon Road and Route 20 is predominately a four-lane divided road that has experienced significant growth within the urbanized eastern end of the study area and is expected to see continuous growth to the west. The portion of the Route 3 closest to the I-95 interchange, which is just beyond the study area of this report, has already been widened to six lanes and includes many closely spaced commercial entrances and the turning volumes affect the mobility and safety of vehicles traveling along Route 3. Approved and potential development projects along with aggressive land development in Orange County will serve as a catalyst for more expansion and thus more traffic along the corridor which are expected to further increase this congestion and worsen traffic flow.

Overall this project accomplishes two key items. One was to develop a process/methodology for preparing an Arterial Management Plan. Research was conducted to identify best access management practices and techniques and create a “toolbox” of access management techniques, strategies, and policies to be used by planners statewide. The second item was to conduct a pilot Arterial Management Plan for US Route 3 in Spotsylvania County.

The following initial goals have been established by VDOT for the arterial management plan for Route 3:

- Maintain and protect the efficiency of the corridor through appropriate access management.
- Promote the safety of the corridor.
- Protect and preserve natural and cultural resources (wetlands, streams, Resource Protection Areas (RPAs), open space and buffers, etc.).
- Maintain the cultural values of the historic properties in and around the battlefields.
- Preserve and/or enhance the comprehensive plan for the area.
- Preserve quality of life within the corridor.

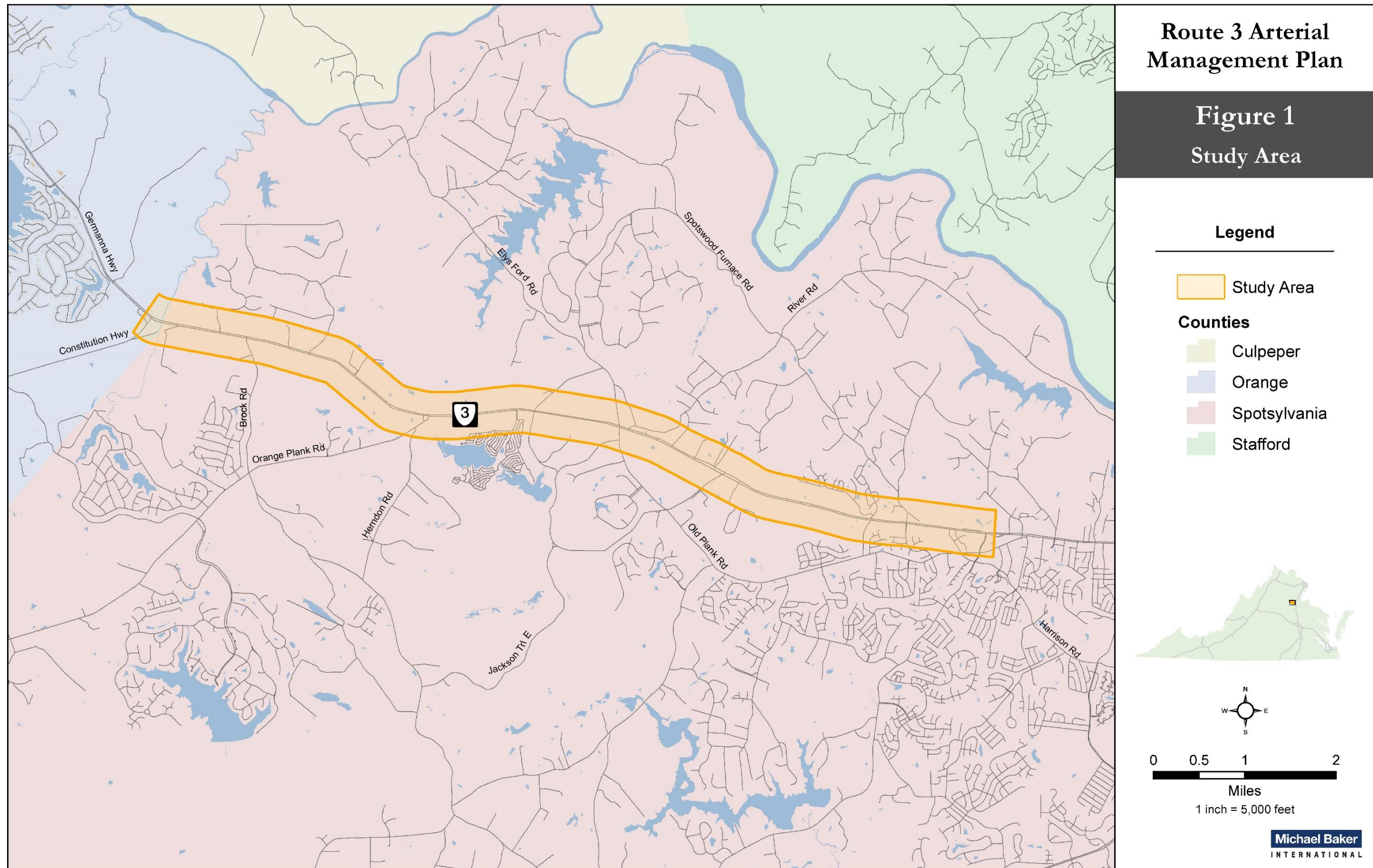
1.2 STUDY AREA

The Route 3 Arterial Management Plan consists of an approximate 9.6 mile corridor section of Route 3 from Gordon Road to Route 20. The corridor width studied was ¼ mile on either side of the Route 3 centerline as shown in Figure

1. Intersections of key concern within the study area include:

1. Route 3 / Route 20
2. Route 3 / Fox Gate Drive
3. Route 3 / Brock Road
4. Route 3 / Black Meadow Road
5. Route 3 / Orange Plank Road
6. Route 3 / Wilderness Road
7. Route 3 / Bullock Drive / Stuart Drive
8. Route 3 / Elys Ford Road / Old Plank Road
9. Route 3 / River Road
10. Route 3 / Nine Mile Run Drive
11. Route 3 / McLaws Drive
12. Route 3 / Andora Drive
13. Route 3 / Big Ben Boulevard
14. Route 3 / Harrison Road
15. Route 3 / Gordon Road

FIGURE 1: STUDY AREA



1.3 REVIEW OF EXISTING STUDIES AND DOCUMENTS

A literature review was conducted of existing documents and studies to gather data for this project as well as to document any proposed developments or projects for the Route 3 corridor within the study area. These documents assisted in the development of land use assumptions and growth patterns, and helped identify potential problem areas along the Route 3 Corridor.

- Spotsylvania County Comprehensive Plan
- Spotsylvania County Capital Improvement Plan (2014-2018)
- Legends of Chancellorsville Rezoning Narrative (2014)
- Route 3 Crossover Study (VDOT)
- Orange County Comprehensive Plan
- Germanna-Wilderness Area Plan (Orange County)

1.4 PUBLIC INVOLVEMENT PROCESS

In order to develop recommendations within the study area, several corridor characteristics required identification and review in conjunction with extensive stakeholder outreach. Land use, corridor demographics, access, traffic, and safety were reviewed to understand the existing conditions and evaluate options for improvement along the corridor roadways. Public and elected officials, project committees, other stakeholders, and citizens within the study area were engaged throughout the entire project process in order to help document existing conditions and develop preferable recommendations.

Transportation Committee Presentations

Briefings on the study were presented to the Spotsylvania County Transportation Committee at key milestones throughout the project process. The purpose of these briefings was to familiarize the members with the study and answer any project related questions. Presentation topics included project history, schedule, study area, existing conditions, public involvement, and recommendations.

Stakeholder Interviews

Early in the public outreach process, Spotsylvania County and VDOT identified several key stakeholders to conduct interviews with to gather information relative to their relationship to the corridors, typical travel patterns along the corridor, and opinions of current and future corridor operations as well as areas of concern. The stakeholders included regional and local property owners, Spotsylvania County officials, and several residents. The questionnaire and results of the stakeholder interviews are included in the Appendix.

Public Meetings

In addition to the stakeholder interviews, two public meetings were conducted on July 21, 2015 and Jan 13, 2016. The first public meeting focused on the goals and objectives of the study along with providing a summary of the existing conditions. Citizens and business owners were given a presentation about the study, informed of the intent of the public meeting, participated in a questions and answers session, and provided input via comment sheets. The second public meeting focused on presenting the Arterial Management Plan recommendations for the study area. Following a similar format as the first public meeting, citizens and business owners were given a presentation about the future conditions and analyses as well as the draft recommended improvements. The public was given time to ask questions about the draft recommendations.

CHAPTER 2: EXISTING CONDITIONS

2.1 EXISTING LAND USE

The existing land use within the study area varies greatly from the eastern to western end. A commercial development on the eastern end called Harrison Crossing has recently been completed with additional commercial properties planned. Just west of this location, from Big Ben Boulevard to Andora Drive, is a large single family home residential development. The remainder of the developed land along the corridor within the study area consists of farms and other rural residential development. There are also large areas of land west of Andora Drive that are either owned by the National Park Service (NPS) or under easements with private preservation groups that will remain undeveloped. Figure 2 shows the existing land uses and analysis zones along the corridor while Table 1 summarizes the square footage of land uses.

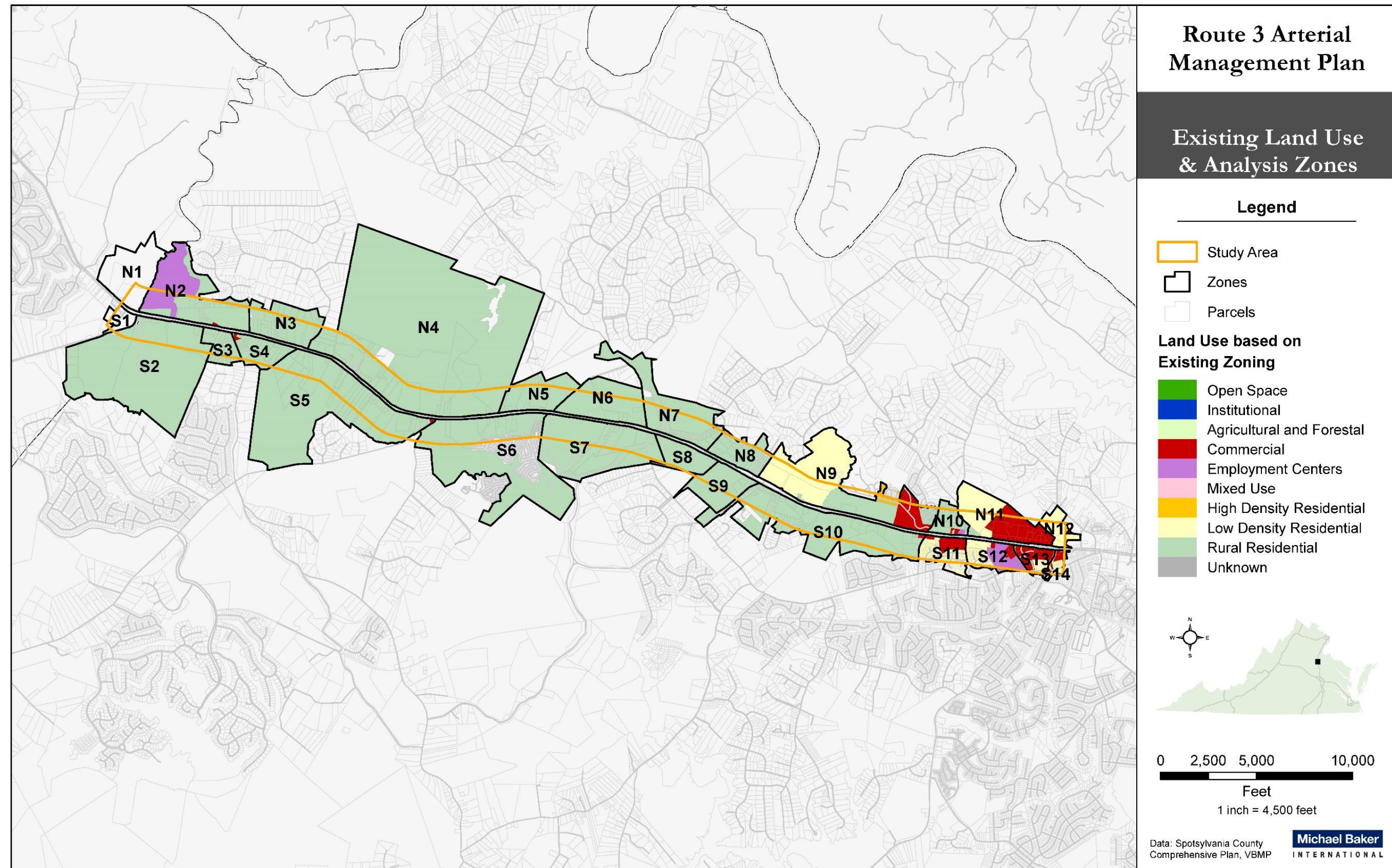
While much of the study area is developed east of Andora Drive, there are a number of parcels in this area that are not developed or are commercial properties currently under construction. This area also includes access management concepts limiting the number of driveways accessing Route 3. West of Andora Drive, many of the undeveloped parcels do not have frontage with Route 3, and would require the construction of access roads.

Using GIS data obtained from the Virginia Fish and Wildlife Services, the study team identified multiple wetlands existing within the Route 3 study area. The largest areas of wetlands are at the western part of the corridor, south of Route 3 and west of Old Plank Road. There is a smaller area of wetlands north of Route 3, in the western area of the corridor. These areas are included in the undevelopable land shown in Figure 5.

TABLE 1: EXISTING LAND USE IN THE ROUTE 3 STUDY AREA

Zone	Employment	Commercial	Industrial	Office	Total Dwelling Units	Commercial	Industrial	Office	Total Dwelling Units	
N1	13.1 KSF	0 KSF	0 KSF	0 KSF	0 DU	N10	13.1 KSF	0 KSF	0 KSF	10 DU
N2	7.1 KSF	0 KSF	0 KSF	0 KSF	11 DU	N11	248 KSF	0 KSF	0 KSF	93 DU
N3	0 KSF	0 KSF	0 KSF	0 KSF	12 DU	N12	0 KSF	0 KSF	0 KSF	224 DU
N4	0 KSF	0 KSF	0 KSF	0 KSF	78 DU	S1	196 KSF	0 KSF	0 KSF	0 DU
N5	0 KSF	0 KSF	0 KSF	0 KSF	14 DU	S2	6.5 KSF	0 KSF	0 KSF	100 DU
N6	0 KSF	0 KSF	0 KSF	0 KSF	15 DU	S3	0 KSF	0 KSF	0 KSF	7 DU
N7	0 KSF	0 KSF	0 KSF	0 KSF	18 DU	S4	13.1 KSF	0 KSF	0 KSF	9 DU
N8	0 KSF	0 KSF	0 KSF	0 KSF	20 DU	S5	6.5 KSF	0 KSF	0 KSF	32 DU
N9	320 KSF	0 KSF	0 KSF	0 KSF	82 DU	S6	0 KSF	0 KSF	0 KSF	17 DU
S7	0 KSF	0 KSF	0 KSF	0 KSF	0 DU	S8	0 KSF	0 KSF	0 KSF	0 DU
S8	0 KSF	0 KSF	0 KSF	0 KSF	0 DU	S9	0 KSF	0 KSF	0 KSF	0 DU
S9	0 KSF	0 KSF	0 KSF	0 KSF	0 DU	S10	13.1 KSF	0 KSF	0 KSF	35 DU KSF
S10	13.1 KSF	0 KSF	0 KSF	0 KSF	35 DU KSF	S11	143.7 KSF	0 KSF	0 KSF	31 DU
S11	143.7 KSF	0 KSF	0 KSF	0 KSF	31 DU	S12	52.3 KSF	156.8 KSF	156.8 KSF	10 DU
S12	52.3 KSF	156.8 KSF	156.8 KSF	156.8 KSF	10 DU	S13	169.9 KSF	0 KSF	0 KSF	14 DU
S13	169.9 KSF	0 KSF	0 KSF	0 KSF	14 DU	S14	6 KSF	0 KSF	0 KSF	12 DU
S14	6 KSF	0 KSF	0 KSF	0 KSF	12 DU	GRAND TOTAL	1,208	157	157	844
GRAND TOTAL	1,208	157	157	157	844					

FIGURE 2: EXISTING LAND USE



2.2 EXISTING INFRASTRUCTURE

Route 3 is predominately a four lane divided road with limited to no paved shoulders and open ditches. The section between Harrison Road and Gordon Road has been recently widened to six lanes with curb and gutter. The Route 3 alignment follows the surrounding land with overlapping horizontal and vertical curves within the middle of the corridor. Route 3 is classified as a Principal Arterial.

The Route 3 corridor is the only major east/west facility in the region and includes an interchange with Interstate 95 approximately three miles east of the study area. Travelers from Orange County and Culpeper County use Route 3 to access the Interstate along with travelers from Spotsylvania County. Sidewalks exist at the Harrison Crossing developments between Harrison Road and Gordon Road. No other pedestrian or bicycle facilities exist along the corridor. Within the study area the posted speed limit on Route 3 is 45 mph between Andora Drive and Gordon Road. West of Andora Drive, the posted speed limit is 55 mph.

2.3 EXISTING ACCESS POINTS

The access points along the Route 3 corridor were counted and the distance between each point was measured. Spacing between all access points within the study area are present in the Appendix. Table 2 was taken from Appendix F of the *VDOT Road Design Manual* and shows the minimum spacing standards between intersections, commercial entrances, and median crossovers for various types of roadways. West of Andora Drive, Route 3 is a major arterial with a 55 mph speed limit. Table 3 provides a summary of the number of access points on Route 3 and shows that there are many entrances along Route 3 that violate these standards.

TABLE 2: MINIMUM SPACING STANDARDS FOR COMMERCIAL ENTRANCES, INTERSECTIONS, AND MEDIAN CROSSOVERS

Highway Functional Classification	Legal Speed Limit (mph) ^①	Minimum Centerline to Centerline Spacing (Distance) in Feet			
		Spacing from Signalized Intersections to Other Signalized Intersections ^②	Spacing from Unsignalized Intersections & Full Median Crossovers to Signalized or Unsignalized Intersections & Full Median Crossovers ^③	Spacing from Full Access Entrances & Directional Median to Other Full Access Entrances and Any Intersection or Median Crossover ^④	Spacing from Partial Access One or Two Way Entrances to Any Type of Entrance, Intersection or Median Crossover ^⑤
Principal Arterial	≤ 30 mph	1,050	880	440	250
	35 to 45 mph	1,320	1,050	565	305
	≥ 50 mph	2,640	1,320	750	495
Minor Arterial	≤ 30 mph	880	660	355	200
	35 to 45 mph	1,050	660	470	250
	≥ 50 mph	1,320	1,050	555	425
Collector	≤ 30 mph	660	440	225	200
	35 to 45 mph	660	440	335	250
	≥ 50 mph	1,050	660	445	360
Local Street ^⑥	Commercial entrance spacing: See Figure 4-11.				

TABLE 3: ROUTE 3 ACCESS POINT SUMMARY

Roadway	Number of Access Points	Access Points Per Mile	Per VDOT Spacing Guidelines	
			Compliant	Non-Compliant
Route 3	222	25	111	111

2.4 CRASH ANALYSIS

An evaluation of corridor safety was conducted based on an analysis of crash summary information. A crash data analysis for the Route 3 corridor within the study area was conducted using the latest three years of available crash data (January 1, 2010, to December 31, 2012) obtained from VDOT’s Roadway Network System. For analysis purposes, the Route 3 study corridor is divided into three segments. The segments are as follows:

- Segment 1: Constitution Avenue / Route 20 to Wilderness Road
- Segment 2: Wilderness Road to Andora Drive
- Segment 3: Andora Drive to Gordon Road

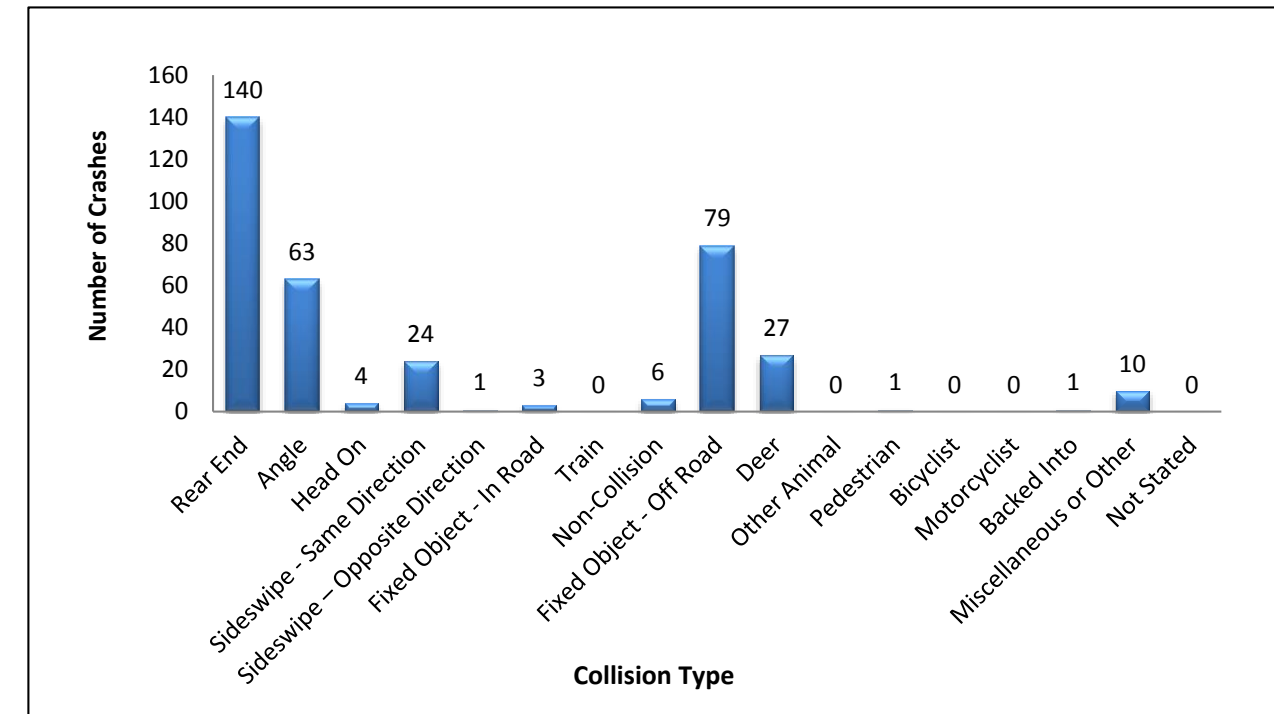
Key Findings

- The section of the corridor with the highest number of collisions is Segment 2. Section 1 is the only segment of the corridor with a crash rate (183 crashes per 100 million miles) that is higher than the statewide average (120 crashes per 100 million miles). This segment is the area of the corridor with the most development and signalized intersections.
- 42% of crashes were rear end collisions. The next highest collision type, fixed object – off road, makes up 19% of the total crashes.
- In 64% of crashes, there were no injuries or fatalities.
- The number of crashes is higher at signalized intersections. There is an average of four crashes per year per intersection in the entire corridor. For the signalized intersections, the average increases to six crashes per year per intersection.

TABLE 4: CRASH RATE BY CORRIDOR SEGMENT (2010-2012)

Roadway Segment	From/To	Segment Length (mi)	Functional Classification	Three Year Total Number of Crashes ³	Crashes per 100-Million Vehicle Miles Traveled ²
Segment 1	Constitution Ave / Route 20 to Wilderness Rd	5.41	Rural Other Principle Arterial	111	85
Segment 2	Wilderness Rd to Andora Dr	5.21	Rural Other Principle Arterial	127	77
Segment 3	Andora Dr to Gordon Rd	1.63	Urban Other Principle Arterial	121	183

CRASH ANALYSIS EXHIBIT 1: COLLISION TYPE



CRASH ANALYSIS EXHIBIT 2: CRASH SEVERITY

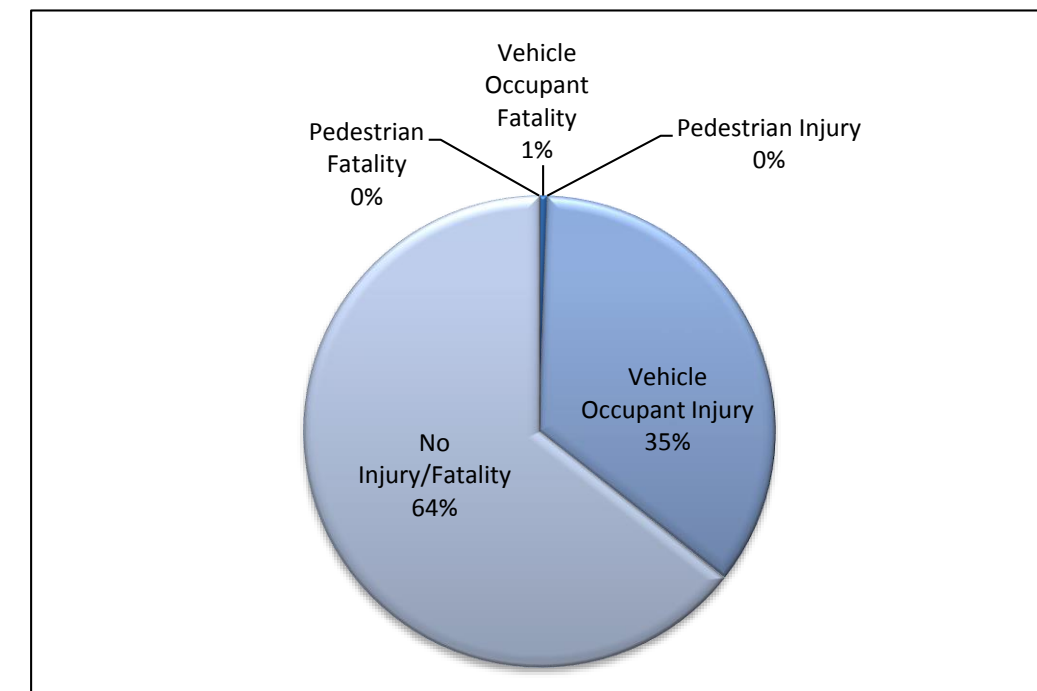


TABLE 5: CRASH TYPE AND SEVERITY BY INTERSECTION (2010-2012)

	Intersection	Rear End	Angle	Head On	Sideswipe – Same Direction	Sideswipe – Opposite Direction	Fixed Object - In Road	Train	Non-Collision	Fixed Object – Off Road	Deer	Other Animal	Pedestrian	Bicyclist	Motorcyclist	Backed Into	Misc.	Not Stated	Total	Pedestrian Fatality	Vehicle Occupant Fatality	Pedestrian Injury	Vehicle Occupant Injury	No Injury / Fatality	Total
Segment 1	Route 3 / Route 20	9	10	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	22	0	0	0	13	9	22
	Route 3 / Fox Gate Dr	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	0	0	0	1	1	2
	Route 3 / Brock Rd	4	2	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0	11	0	0	0	4	7	11
	Route 3 / Black Meadow Rd	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
	Route 3 / Orange Plank Rd	7	1	0	1	0	0	0	0	2	1	0	0	0	0	0	0	0	12	0	0	0	5	7	12
Segment 2	Route 3 / Wilderness Rd	0	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	5	0	0	0	3	2	5
	Route 3 / Bullock Dr / Stuart Dr	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	1	1	2
	Route 3 / Elys Ford Rd / Old Plank Rd	14	4	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	22	0	0	0	8	14	22
	Route 3 / River Rd	9	4	1	0	0	0	0	0	2	2	0	0	0	0	0	1	0	19	0	0	0	5	14	19
	Route 3 / Nine Mile Rd	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
	Route 3 / McLaws Dr	0	1	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	5	0	0	0	0	5	5
Segment 3	Route 3 / Andora Dr	7	4	0	2	0	0	0	0	1	0	0	0	0	0	0	1	0	15	0	0	0	4	11	15
	Route 3 / Big Ben Blvd	8	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	8	7	15
	Route 3 / Harrison Rd	14	9	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	26	0	0	0	8	18	26
	Route 3 / Gordon Rd	16	3	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	21	0	0	0	5	16	21
Total	90	47	4	9	0	1	0	1	20	4	0	0	0	0	0	4	0	181	0	0	0	65	116	181	
Percentage of Total	50%	26%	2%	5%	0%	< 1%	0%	1%	11%	2%	0%	0%	0%	0%	0%	2%	0%	100%	0%	0%	0%	36%	64%	100%	

2.4 EXISTING TRAFFIC VOLUMES

Existing peak hour traffic volumes were developed using turning movement counts collected in spring, 2014. Volumes between intersections and driveways were balanced when applicable. The AM and PM peak hour turn movement volumes are shown in Figure 4. The AM peak hour represents a typical weekday morning peak while the PM peak is for a typical afternoon/evening peak hour. Truck percentages along Route 3 are 3% and 4% for the eastbound AM and PM peak hours and 8% and 2% for the westbound AM and PM peak hours, respectively.

Table 6 shows the two-way historic annual average daily traffic (AADT) on Route 3 from 2010 through 2014. Daily traffic volumes on Route 3 within the study area range from 21,000 on the western portion to 51,000 east of Gordon Road. Limited to no growth has occurred along Route 3 within Spotsylvania County in the last five years. West of the study area in Orange County, the average annual growth rate on Route 3 is approximately three percent.

2.5 EXISTING TRAFFIC OPERATIONS

Existing traffic volumes were analyzed in Synchro using the Highway Capacity Manual (HCM) module for both the AM and PM peak hours. Existing traffic volumes are shown in Figure 3 and delay and level of service (LOS) results are shown in Figure 4. West of Andora Drive, along the rural portion of the corridor, the study intersections operate at a LOS C or better during the AM peak hour with the exception of the intersection of Route 3 & Old Plank Road / Elys Ford Road, which operates at a LOS E. The operational deficiencies at Route 3 & Old Plank Road / Elys Ford Road are

due to the relatively high traffic volumes on the side streets and each approach only having one lane for all movements. Furthermore, these side streets are given a significant amount of green time which impacts the through movements. The intersections of Route 3 with Andora Drive and Big Ben Boulevard are just west of the Route 3 widening to six lanes and these intersections operate with LOS's D and E, respectively, for the AM peak hour. The intersections of Route 3 with Harrison Road and Gordon Road both have three lanes in each direction along Route 3 and operate with an overall LOS C. The green time for the side streets at these locations is sacrificed to allow the through movements on Route 3 to operate at LOS C or better.

During the PM peak hour, the intersections west of Andora Drive all operate with a LOS C or better except for the intersections of Route 3 and Old Plank Road / Elys Ford Rd, which operates at LOS E, and Route 3 and Route 20, which operates at LOS D. As with the AM peak hour, this is due to the relatively high traffic volumes on the side streets and each approach only having one lane for all movements. The intersections of Route 3 with Andora Drive, Big Ben Boulevard, and Harrison Road all operate with an overall LOS C, D and D, respectively. The intersection of Route 3 and Gordon Road operates with a LOS C during the PM peak hour. Again, side street operations are sacrificed at these locations to allow better operations for the through movements on Route 3.

TABLE 6: HISTORIC DAILY TWO-WAY TRAFFIC VOLUMES ON ROUTE 3

	From	To	2010	2011	2012	2013	2014	Average Annual Growth Rate
Rte. 3 (Plank Rd.)	Culpeper/Orange County Line	Rte. 20 (Constitution Hwy.)	13,000	13,000	13,000	13,000	15,000	3.1%
	Rte. 20 (Constitution Hwy.)	Orange/Spotsylvania County Line	24,000	24,000	24,000	24,000	25,000	0.8%
	Orange/Spotsylvania County Line	Rte. 610 (Elys Ford Rd)	22,000	23,000	22,000	23,000	21,000	-0.8%
	Rte. 610 (Elys Ford Rd)	Rte. 626 (Andora Dr)	31,000	29,000	29,000	28,000	30,000	-0.6%
	Rte. 626 (Andora Dr)	Rte. 627 (Gordon Rd)	39,000	37,000	37,000	37,000	40,000	0.6%
	Rte. 627 (Gordon Rd)	Rte. 639 (Salem Church Rd)	57,000	55,000	54,000	54,000	51,000	-2.2%

Source: VDOT Traffic Engineering on-line counts. Volumes shown are annual average daily traffic (AADT).

FIGURE 3: SHEET 1 OF 3: 2014 EXISTING PEAK HOUR VOLUMES

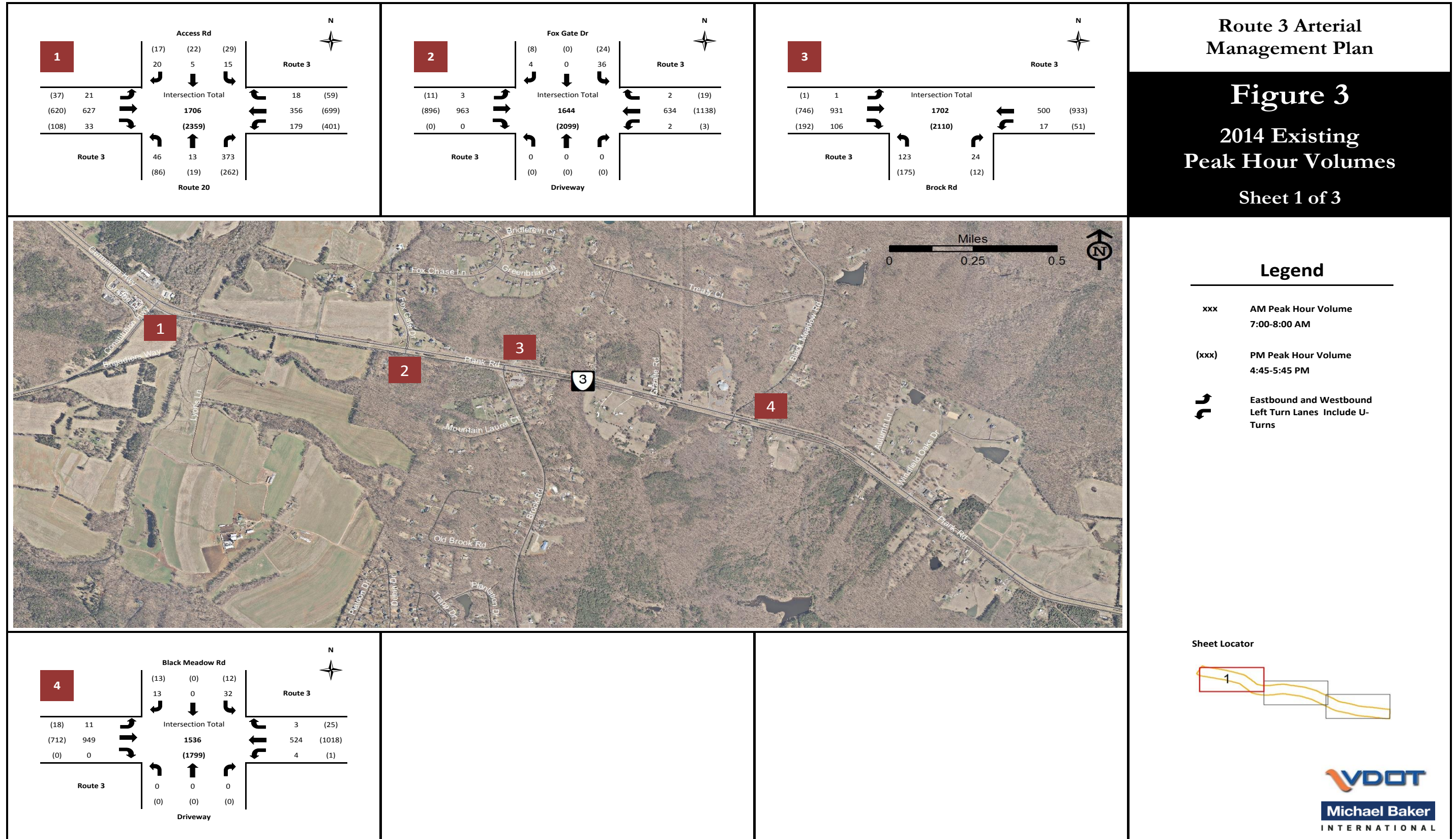


FIGURE 3: SHEET 2 OF 3: 2014 EXISTING PEAK HOUR VOLUMES

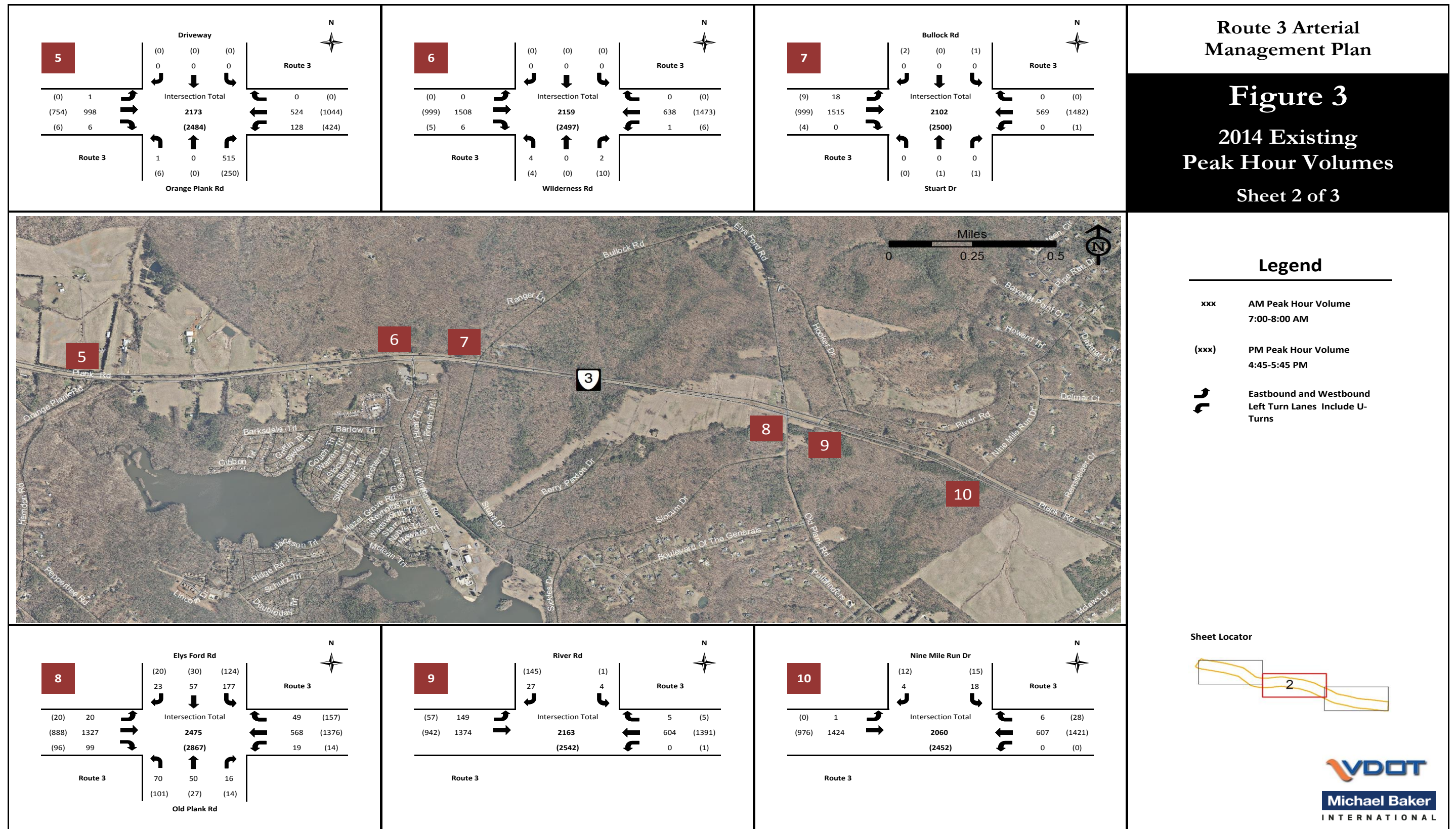


FIGURE 3, SHEET 3 OF 3: 2014 EXISTING PEAK HOUR VOLUMES

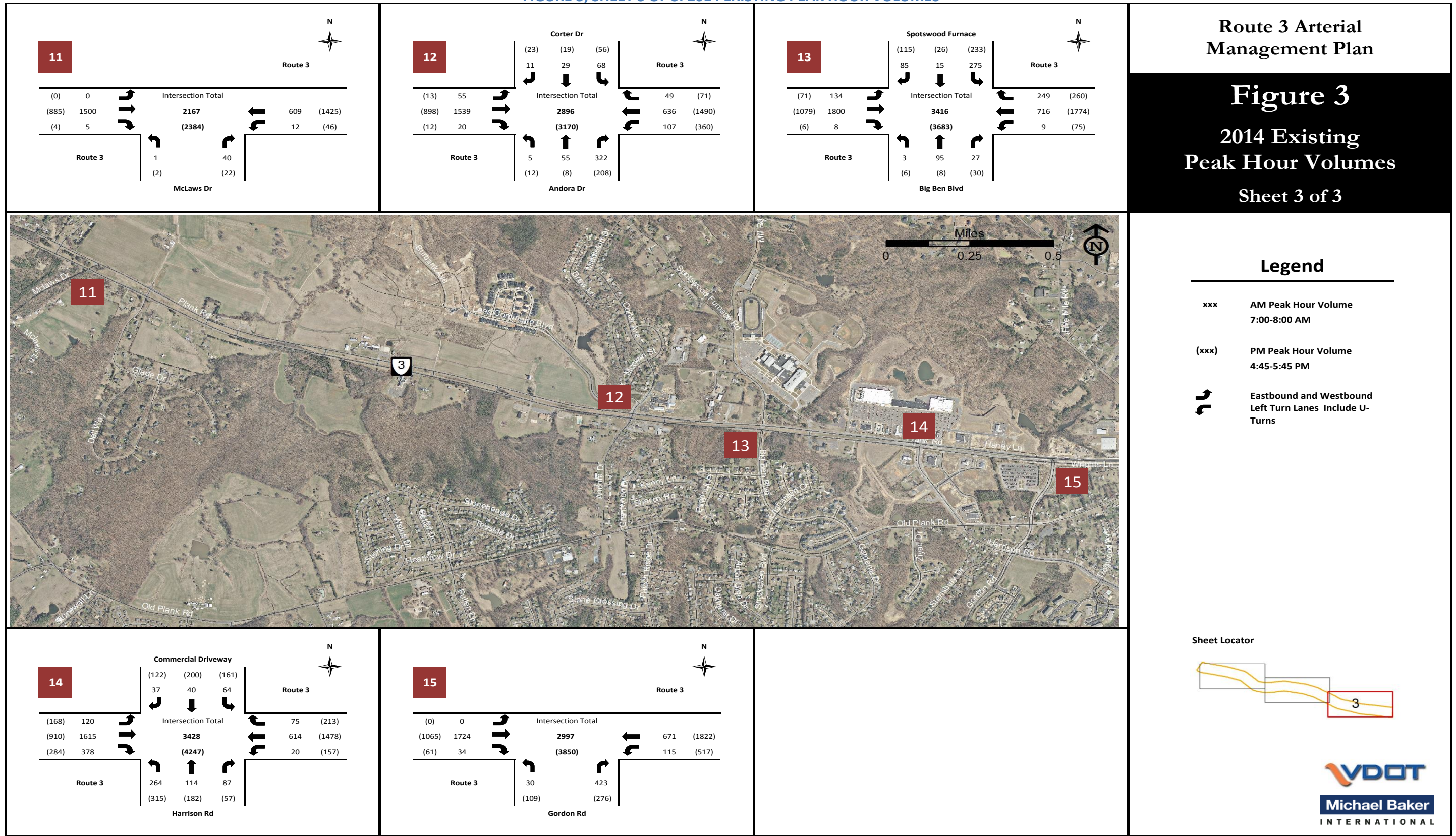


FIGURE 4, SHEET 1 OF 3: 2014 PEAK HOUR DELAY AND LEVEL OF SERVICE

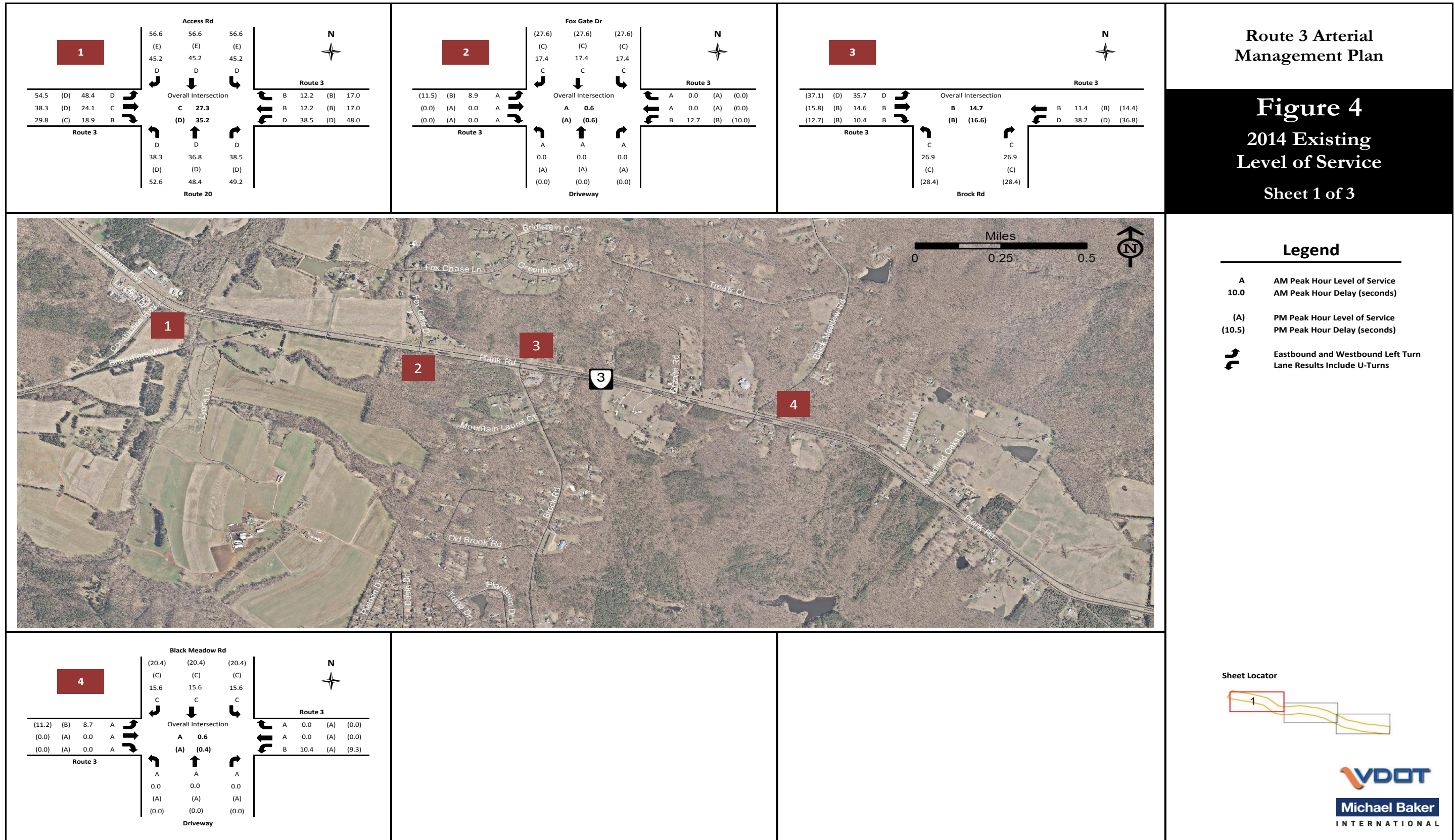
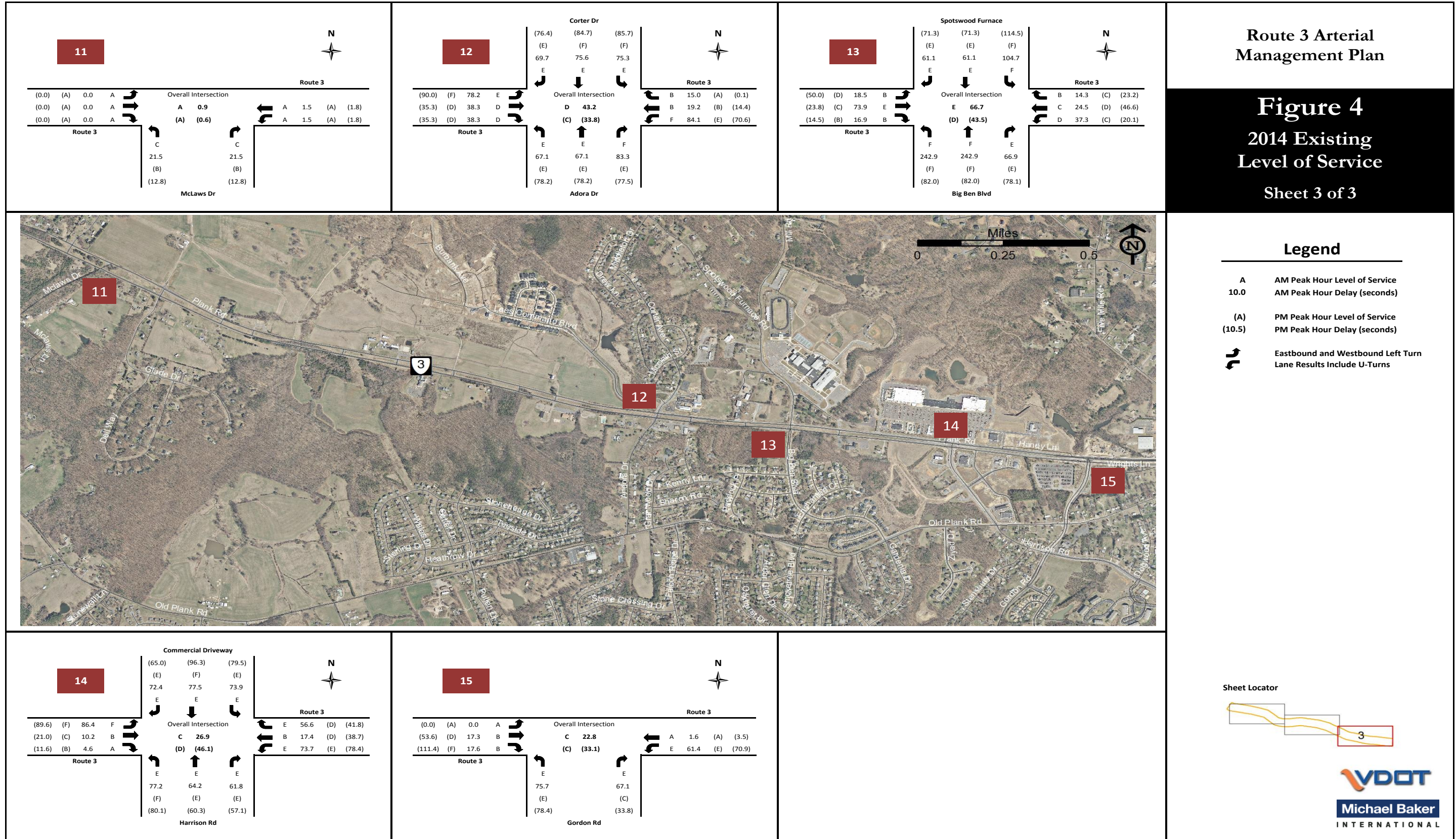


FIGURE 4, SHEET 2 OF 3: 2014 PEAK HOUR DELAY AND LEVEL OF SERVICE



FIGURE 4, SHEET 3 OF 3: 2014 PEAK HOUR DELAY AND LEVEL OF SERVICE



CHAPTER 3: 2040 FUTURE CONDITIONS

3.1 FUTURE LAND USE

In order to estimate 2040 future traffic in the Route 3 Corridor Study, the study team made a series of assumptions and decisions on future land use and trip generation. This section outlines the methodology, level of analysis, assumptions, and trip generation rates used by the study team to estimate future trip generation within the Route 3 Corridor.

STEP 1: DETERMINE FUTURE DEVELOPMENT TYPE AND DENSITIES

In order to project future trip generation for the Route 3 Corridor, the study team needed to determine the likely type of land uses that will develop along the corridor, how much of the available land is already developed, and how much of the open land can be developed. Assumptions about densities that will likely occur on the developable land were then made.

Zones

The study team divided the study area into analysis zones to simplify the future land use analysis. With the use of analysis zones, the study team can make future land use assumptions for small sections of the corridor without making specific assumptions for each parcel. Zones for the Route 3 Arterial Management Plan area are based on the street grid, as there are few key intersections identified for this project. The project study area consists of a nine mile section of Route 3, for which the study team designated twenty-six analysis zones. Zones north of Route 3 are numbered starting with an “N” while zones south of Route 3 are numbered starting with an “S”. To reference the location of the analysis zones, please see Figure 1 in section 2.1.

Assumed Land Use

The study team then used the 2013 Spotsylvania County Comprehensive Plan and identified other potential development opportunities to make assumptions on the future land use in the Route 3 study area. For the Route 3 Corridor, assumed land uses are Residential, Commercial, Employment Center, Institutional, and Open Space. Details on the future land use by zone are shown in Figure 5.

Developable Land

Developable land is the amount of land that is suitable for construction and development. The study team identified parcels that were currently undeveloped or there was an expectation that a change in future land use would occur based on the 2013 Spotsylvania County Comprehensive Plan. For these parcels, the study team calculated the total

developable area based on the identified constraints. The study team estimated the amount of developable land based on three constraints:

Wetlands

The study team identified wetlands by a GIS shapefile retrieved from the Virginia Fish and Wildlife Services. Wetlands and land within 100 feet of the wetlands were eliminated from developable land due to environmental regulations, preservation, and unsuitability for construction.

Slope

For this analysis, slope is based on GIS calculations. It is assumed that the land with a slope above 15% were unsuitable for development without major earthwork effort or retaining walls. Therefore, the study team eliminated land with slopes that were greater than 15% from the total developable land.

Historic Designation

The study team identified historic parcels by the listed owner in the parcel file provided by Spotsylvania County. Parcels identified as historic properties were eliminated as developable land due to their historic status and the assumption that these properties will be preserved in the future. Parcels with the following owners listed were eliminated from developable land and are shown as hatched in Figure 5:

- U.S. Department of the Interior
- Central Virginia Battlefield Trust
- The Civil War Preservation

Densities

Densities were based on those in the county zoning code for within and outside the Primary Settlement District. Maximum allowable densities are shown in Table 7. The last column of the table shows the corresponding Comprehensive Plan land use categories assumed for each zoning category. The allowable densities are too high to consider for the whole zones and would result in overestimating future traffic, therefore assumed densities were developed for the Route 3 Corridor. Table 8 shows the assumed densities used for this study.

The Harrison Crossing South development was reviewed to help determine the assumed densities for commercial and employment centers. Based on what has been build and the site plan, the FAR (Floor to Area Ratio) for parcels ranged from 0.056 to 0.189. A higher FAR of 0.15 was assumed for commercial and a FAR of 2.0 for institutional land use. Due to the rural nature a large portion of the corridor, a lower FAR of 0.10 was assumed for employment centers. Densities for residential land uses were taken directly from the zoning.

TABLE 7: ALLOWABLE ZONING DENSITIES

Spotsylvania County Existing Land Use		Density			Assumed Land Use
Existing Land Use Code	Existing Designation	Residential		Non-Residential	
		Density w/Public Utilities (Dwelling Unit per Acre)	Density w/o Public Utilities (Dwelling Unit per Acre)	FAR	
A2	Agricultural 2	0.20	0.20	0.10	Rural Residential Land use
A3	Agricultural 3	0.10	0.10	0.10	Agricultural and Forestal Land Use
RA	Resort Agricultural District	0.50	0.50	0.20	Rural Residential Land use
R1	Residential 1	0.50	0.50	0.20	Low Density Residential
R2	Residential 2	0.20	0.50	0.20	Low Density Residential
R3	Residential 3	1.00	0.50	0.20	Low Density Residential
R8	Residential 8 (Max)	8.00	None	None	High Density Residential
R12	Residential 12 (Max)	12.00	None	None	High Density Residential
RR	Residential Resort	0.50	None	0.2	Rural Residential Land use
PDH8	Planned Development Housing District	8.00	8.00	None	High Density Residential
RMHP	Residential Manufactured Home Park	6.00	0.33	None	Low Density Residential
O1	Offices 1 (Max)	None	None	0.70	Employment Centers
O2	Offices 2 (Max)	None	None	1.00	Employment Centers
C1	Commercial 1 District (Max)	None	None	0.50	Commercial Land Use
C2	Commercial 2 District	None	None	0.70	Commercial Land Use
C3	Commercial C3 Highway District (Max)	None	None	1.00	Commercial Land Use
RC	Resort Commercial	None	None	0.50	Commercial Land Use
I1	Industrial 1 District (Max)	None	None	1.00	Employment Centers
I2	Industrial 2 District (Max)	None	None	1.50	Employment Centers
PDC	Planned Development Commercial District (Max)	None	None	1.50	Commercial Land Use
RU	Rural	0.33	0.33	0.10	Rural Residential Land use
V	Village District	6.00	None	1.00	Mixed Land Use
PRR	Planned Residential Rural	Unique, depending on the district.	Unique, depending on the district.	Unique, depending on the district.	Rural Residential Land use
MU	Mixed Use	Unique, depending on the district.	Unique, depending on the district.	Unique, depending on the district.	Mixed Land Use
Unknown	Unknown	NA	NA	NA	

The assumed densities in Table 8 were applied to the developable land acreage for each zone to determine the amount of future development within the corridor. Table 9 summarizes the amount of future development for each zone. With regards to the amount of growth in the study area, the study team calculated trips based on a complete build out rather than allocating growth in certain areas of the corridor.

TABLE 8: ASSUMED DENSITIES FOR ROUTE 3 CORRIDOR

Assumed Land Use	Assumed Density
Agricultural and Forestal Land Use	1 Dwelling Unit/ACRE
Rural Residential Land Use	0.2 Dwelling Unit/ACRE
Low Density Residential	0.5 Dwelling Unit/ACRE
High Density Residential	8 Dwelling Units/ACRE
Employment Center	0.1 FAR
Commercial Land Use	0.15 FAR
Institutional	0.2 FAR

TABLE 9: ASSUMED DEVELOPMENT FOR ROUTE 3 CORRIDOR

Zone	Employment	Commercial	Industrial	Office	Total Dwelling Units	Zone	Employment	Commercial	Industrial	Office	Total Dwelling Units	Zone	Employment	Commercial	Industrial	Office	Total Dwelling Units	
N1	Employment	Commercial	39.2	39.2	60.4 KSF	N10	Employment	Commercial	20	20	0	S7	Employment	Commercial	0	0	86	86
		Employment Centers	20	20				Employment Centers	0	0				Employment Centers	0	0		
	Population	60	60.4 KSF	Population			87	87	Population	0			0	Population	86	86		
N2	Employment	Commercial	0	0	258	N11	Employment	Commercial	65.1	65.1	0	S8	Employment	Commercial	0	0	0	0
		Employment Centers	0	0				Employment Centers	0	0				Employment Centers	0	0		
	Population	0	0	Population			0	0	Population	0			0	Population	0	0		
N3	Employment	Commercial	0	0	0	N12	Employment	Commercial	101.1	101.1	0	S9	Employment	Commercial	0	0	0	0
		Employment Centers	0	0				Employment Centers	0	0				Employment Centers	0	0		
	Population	0	0	Population			0	0	Population	0			0	Population	0	0		
N4	Employment	Commercial	0	0	219	S1	Employment	Commercial	0	0	0	S10	Employment	Commercial	0	0	470	470
		Employment Centers	0	0				Employment Centers	0	0				Employment Centers	0	0		
	Population	0	0	Population			0	0	Population	0			0	Population	217	217		
N5	Employment	Commercial	0	0	1	S2	Employment	Commercial	0	0	0	S11	Employment	Commercial	0	0	0	0
		Employment Centers	0	0				Employment Centers	0	0				Employment Centers	0	0		
	Population	0	0	Population			0	0	Population	0			0	Population	0	0		
N6	Employment	Commercial	0	0	0	S3	Employment	Commercial	0	0	5	S12	Employment	Commercial	45.7	45.7	0	0
		Employment Centers	0	0				Employment Centers	0	0				Employment Centers	0	0		
	Population	0	0	Population			5	5	Population	0			0	Population	21.8	21.8		
N7	Employment	Commercial	0	0	101	S4	Employment	Commercial	0	0	2	S13	Employment	Commercial	104.5	104.5	0	0
		Employment Centers	0	0				Employment Centers	0	0				Employment Centers	0	0		
	Population	0	0	Population			2	2	Population	35			35	Population	2	2		
N8	Employment	Commercial	0	0	329	S5	Employment	Commercial	0.0	0.0	0	S14	Employment	Commercial	0	0	34.8	34.8
		Employment Centers	0	0				Employment Centers	0	0				Employment Centers	0	0		
	Population	0	0	Population			0	0	Population	564			564	Population	1	1		
N9	Employment	Commercial	0	0	243	S6	Employment	Commercial	0	0	1	GRAND TOTAL	Employment	Commercial	375.6	375.6	2078	2078
		Employment Centers	0	0				Employment Centers	0	0				Employment Centers	20.1	20.1		
	Population	0	0	Population			0	0	Population	709.3			709.3	Population	709.3	709.3		

STEP 2: DETERMINE FUTURE DEVELOPMENT TRIP GENERATION CHARACTERISTICS

The study team estimated the number of trips generated by the land use, for both the existing and future land uses. In order to estimate the number of trips generated, the study team selected representative trip generation rates for each assumed land use from the ITE Trip Generation Manual Version 9. Since many different land uses with varying trip generation characteristics can occur within a given land use category, average generic trip generation rates were calculated for each land use. For example, the trip generation rate for a high density residential land is a blended rate between ITE land use 220 (apartments) and 230 (condos/townhouses). Different trip generation rates were used for rural/low density residential and high density residential.

In order to accurately estimate the total number of trips, two land uses were broken into subcategories: Employment Center and Commercial. Employment centers were divided into Industrial and Office. These subcategories were applied to account for the different types of employment and commercial services that could occur.

In order to calculate the appropriate number of generated commercial trips, three different trip generation rates are used in the analysis. These trip generation rates were based on the amount of traffic for different types of businesses: high turnover, medium turnover, and low turnover. Again blended rates of several specific land uses were used to calculate trip generation rates for each subcategory of land use. The specific land uses identified are consistent with the Comprehensive Plan. For example, the average trip generation rate for a medium vehicle turnover commercial land use was calculated from trip generation rates for supermarkets, sit-down restaurants, and pharmacies. The average rates and land uses used to generate the rates are shown in Table 10.

STEP 3: CALCULATE FUTURE TRIP GENERATION

The third and final step was to calculate the future trip generation for each analysis zone. The amount of future development by land use calculated in Step 1 was multiplied by the respective trip generation rates determined in Step 2. The total future trips generated for each analysis zone are summarized in Table 11. Daily, AM and PM peak hour trips were estimated as well as the percentage ingress and egress for each peak period. It should be noted that the trip generation does include pass-by trips, internal corridor capture between analysis zones, and trips diverted by interparcel connections to other facilities. Therefore, not all of the trips shown in Table 11 will be added to Route 3. The next step in the process was to distribute the trips to Route 3 and surrounding network when the land use assumptions were finalized.

Shown in the Appendix of this document are large tables that show the resulting land use assumptions (Step1), amount of development and trip generation type/characteristic (Step 2), and trip generated for each analysis zone (Step 3).

TABLE 10: AVERAGE TRIP GENERATION RATES

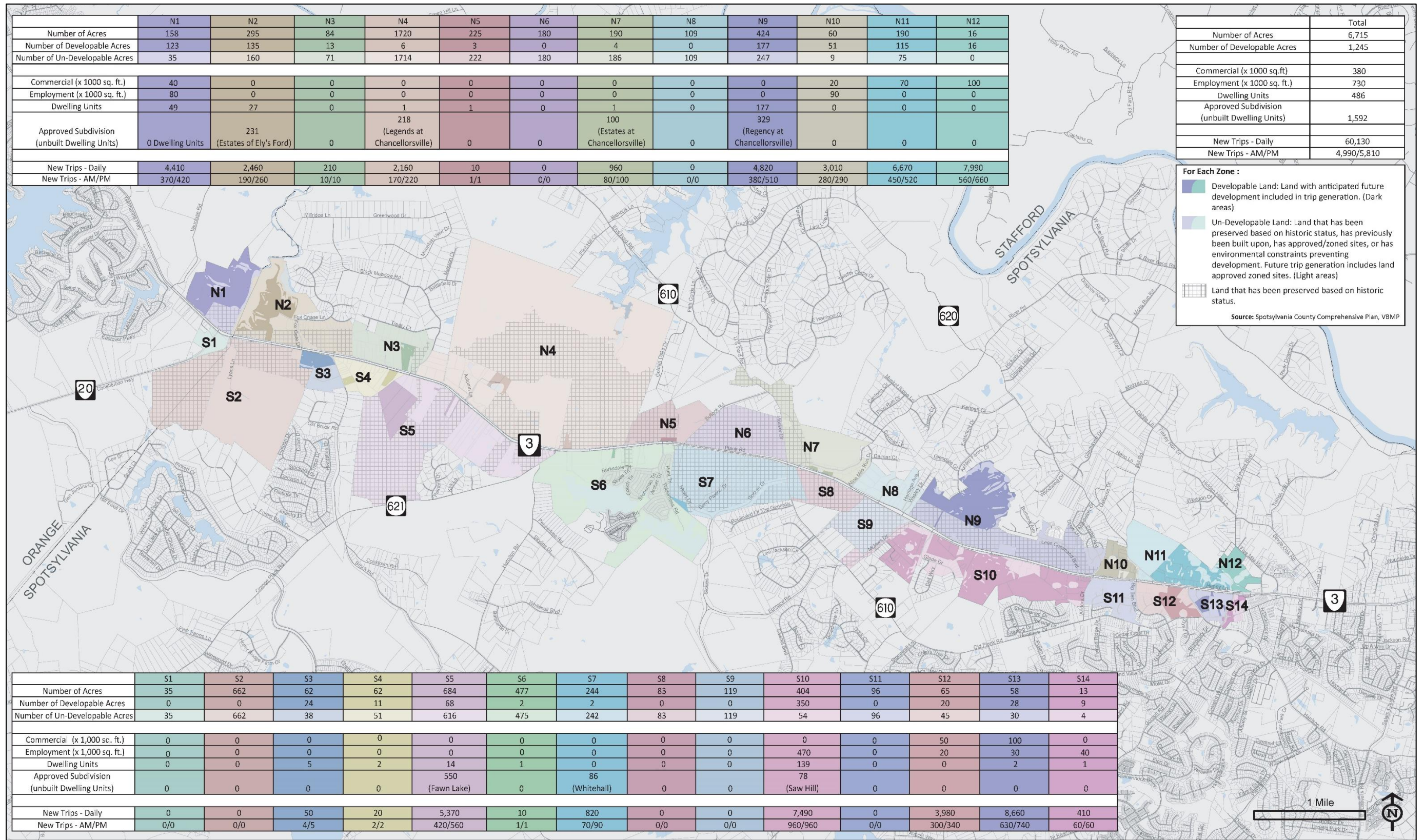
Trip Generation Category (Future Land Use)	ITE Description	ITE Land Use Code	Units	Daily	AM*	PM*	AM Ingress	AM Egress	PM Ingress	PM Egress
Agriculture	Agriculture (Open Space)	-	Acres	2.00	0.20	0.02	-	-	-	-
Commercial - High Turnover	Convenience Marts/ Gas Stations/ Fast-food/	851/ 853/ 934/ 937/ 945	1000 SF GFA	774.60	67.22	55.25	51%	49%	51%	49%
Commercial - Low Turnover	Shopping Center/ Neighborhood Retail/ Medical	720/ 820 /826/ 841/ 848	1000 SF GFA	36.06	2.04	3.35	70%	30%	41%	59%
Commercial - Medium Turnover	Supermarket/ Restaurant/ Pharmacy	881/932/850	1000 SF GFA	108.77	5.89	9.75	56%	44%	54%	46%
Employment Center - Industrial	General Light Industrial/ Industrial Park	110/130	1000 SF GFA	6.90	0.87	91%	85%	15%	17%	84%
Employment Center - Office	General Office Building/Single Tenant/Office Park	710/715/750	1000 SF GFA	11.37	1.69	1.57	0.89	0.11	0.15	0.85
High Density Residential	Apartment/Residential Condo/Townhouse	220/230	Dwelling Units (DU)	6.23	0.48	0.57	19%	82%	66%	34%
Institutional - Church	Church	560	1000 SF GFA	9.11	0.56	0.55	62%	38%	48%	52%
Institutional - Elementary School	Elementary School	520	Students	1.29	0.45	0.15	55%	45%	49%	51%
Institutional - High School	High School	530	Students	1.71	0.43	0.13	68%	32%	47%	53%
Rural & Low Density Residential	Single-Family Detached Housing	210	Dwelling Units (DU)	9.52	0.75	1.00	25%	75%	63%	37%

*Peak Hour Adjacent Street Traffic
 AM – One hour between 7:00 AM and 9:00 AM
 PM – One hour between 4:00 PM and 6:00 PM

TABLE 11: FUTURE TOTAL TRIPS

Zone	Daily Trips			AM Peak Hour Trips			PM Peak Hour Trips		
	Daily Total	Ingress	Egress	AM Total	Ingress	Egress	PM Total	Ingress	Egress
N1	4,406	2,203	2,203	372	235	137	419	172	247
N2	2,458	1,229	1,229	193	48	145	258	163	95
N3	210	105	105	13	8	5	13	6	7
N4	2,160	1,080	1,080	169	43	126	223	140	83
N5	10	5	5	1	0	1	1	1	0
N6	0	0	0	0	0	0	0	0	0
N7	962	481	481	76	19	57	101	64	37
N8	3,132	1,566	1,566	247	62	185	329	207	122
N9	2,314	1,157	1,157	182	46	137	243	153	90
N10	3,012	1,506	1,506	284	210	74	294	96	197
N11	6,668	3,334	3,334	452	260	192	517	248	268
N12	7,994	3,997	3,997	555	314	241	660	317	343
S1	0	0	0	0	0	0	0	0	0
S2	0	0	0	0	0	0	0	0	0
S3	48	24	24	4	1	3	5	3	2
S4	20	10	10	2	1	2	2	1	1
S5	5,370	2,685	2,685	424	106	318	564	356	209
S6	10	5	5	1	0	1	1	1	0
S7	818	409	409	65	16	49	86	54	32
S8	0	0	0	0	0	0	0	0	0
S9	0	0	0	0	0	0	0	0	0
S10	7,494	3,747	3,747	963	749	214	961	252	709
S11	0	0	0	0	0	0	0	0	0
S12	3,984	1,992	1,992	296	179	117	340	152	188
S13	8,658	4,329	4,329	633	376	257	738	335	403
S14	406	203	203	60	52	8	56	9	47
TOTAL	60,134	30,067	30,067	4,992	2,725	2,269	5,811	2,730	3,080

FIGURE 5: ASSUMED FUTURE LAND USE



3.2 FUTURE TRAFFIC VOLUMES

Traffic volumes for the year 2040 were developed based on the trip generation discussed in the previous chapter as well general background growth. The future background traffic on Route 3 will be primarily due to the aggressive growth in Orange County to the west. Due to the lack of other east-west roadways, this background traffic is projected to use the Route 3 corridor to access Interstate 95 for regional travel. A projected annual growth rate of 1.8 percent was applied to the existing traffic volumes to calculate the future background traffic volumes. The hourly traffic calculated from the trip generation was added to the background traffic demand to develop the volumes to be used in the AM and PM peak hour analyses. The projected 2040 Average Daily Traffic (ADT) volumes along the corridor are shown in Table 12. The calculated future volumes for the study (existing) intersections are shown in Figure 6 and are represented by numbers. Future traffic volumes for new access points along the corridor are shown in Figure 7 and are represented using letters. An explanation for the location of each access point is shown in the text boxes within each figure. Deficiencies along the corridor are detailed in Section 3.3.

Analyses were completed for a Minimally Managed Condition and a Recommendation Build Condition. The Minimally Managed condition includes only those improvements to allow a development to have a direct access point to Route 3 and to make that access point operate acceptably. For example, if traffic from a development warranted a traffic signal at the access point to Route 3, the signalized intersection would be constructed to operate at an acceptable LOS. The Recommendation Build Condition incorporates those improvements from the Minimally Managed Condition as well as all of the recommendations that are outlined in Chapter 4. The same overall future volumes were applied to both scenarios and are based on the ultimate development build-out along the corridor. It should be understood that development would occur gradually over time and the ultimate build-out may occur beyond the Year 2040. However, for the purpose of this study, we have assumed a full build-out condition in 2040.

TABLE 12: YEAR 2040 ADT AND AVERAGE ANNUAL GROWTH RATE

	From	To	2014	2040	Average Annual Growth Rate
Rte. 3 (Plank Rd.)	Orange/Spotsylvania County Line	Rte. 610 (Elys Ford Rd)	21,000	31,100	1.8%
	Rte. 610 (Elys Ford Rd)	Rte. 626 (Andora Dr)	30,000	44,500	1.9%
	Rte. 626 (Andora Dr)	Rte. 627 (Gordon Rd)	40,000	76,300	3.5%

FIGURE 6, SHEET 1 OF 3: 2040 PEAK HOUR VOLUMES FOR EXISTING INTERSECTIONS

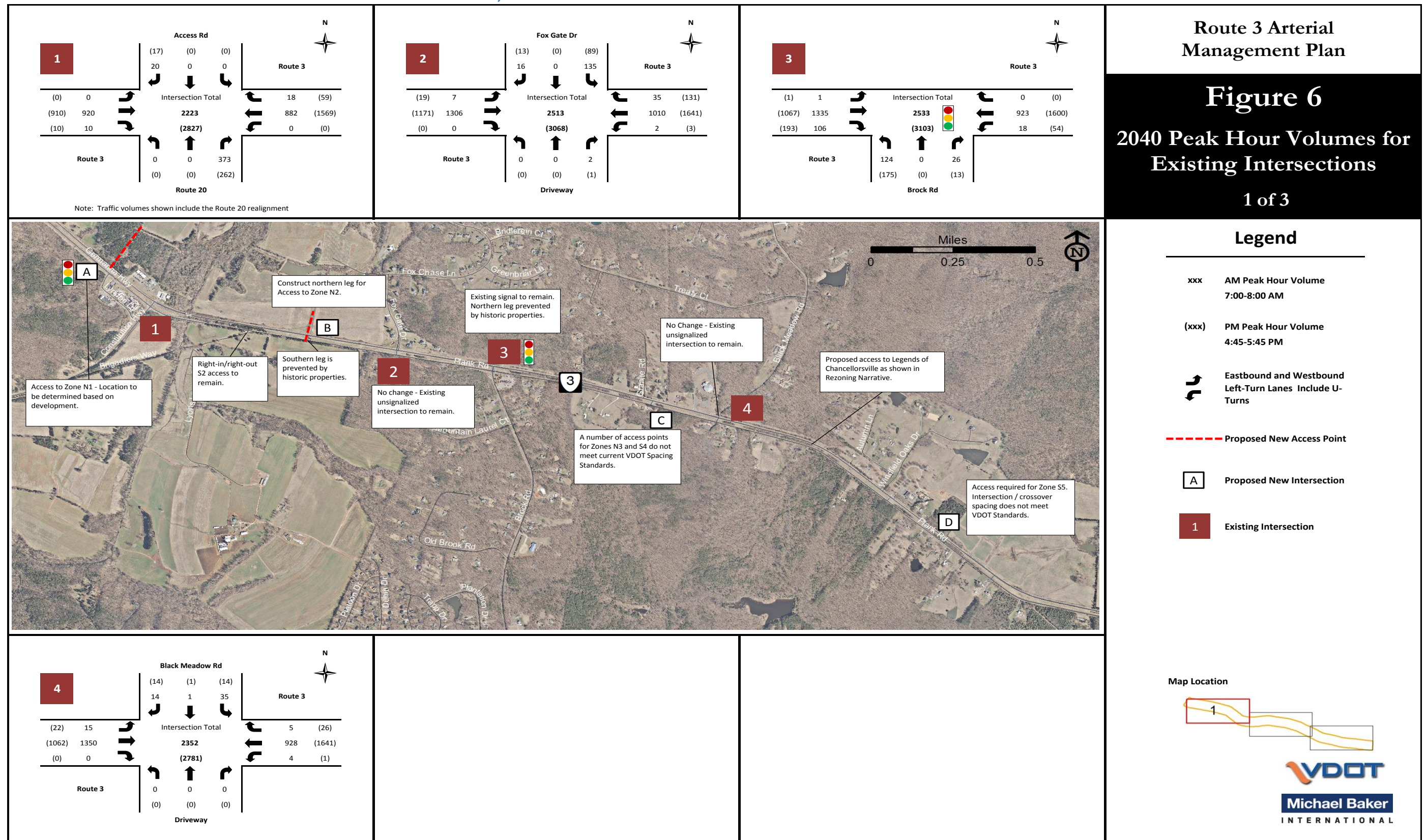


FIGURE 6, SHEET 2 OF 3: 2040 PEAK HOUR VOLUMES FOR EXISTING INTERSECTIONS

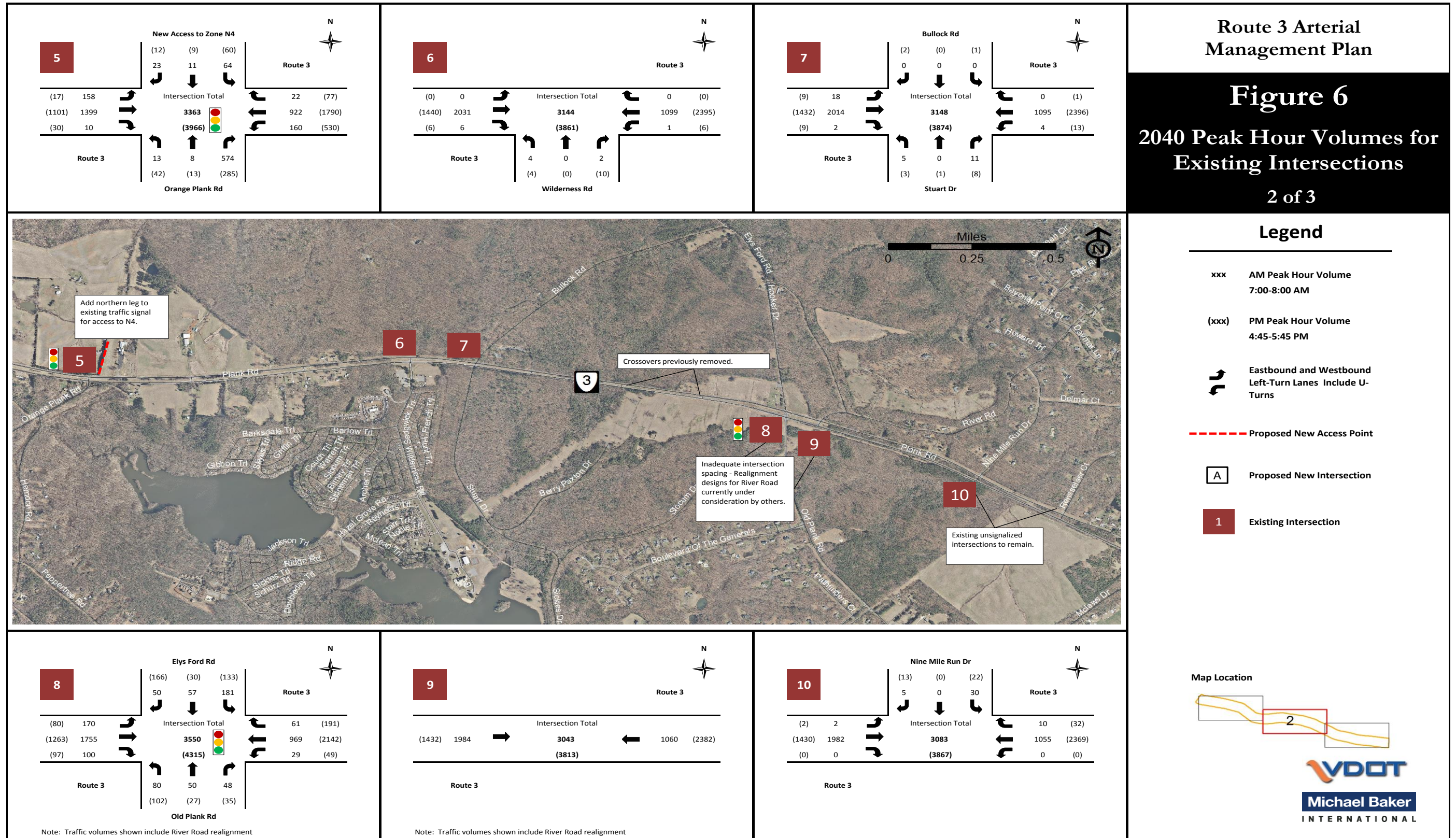


FIGURE 6, SHEET 3 OF 3: 2040 PEAK HOUR VOLUMES FOR EXISTING INTERSECTIONS

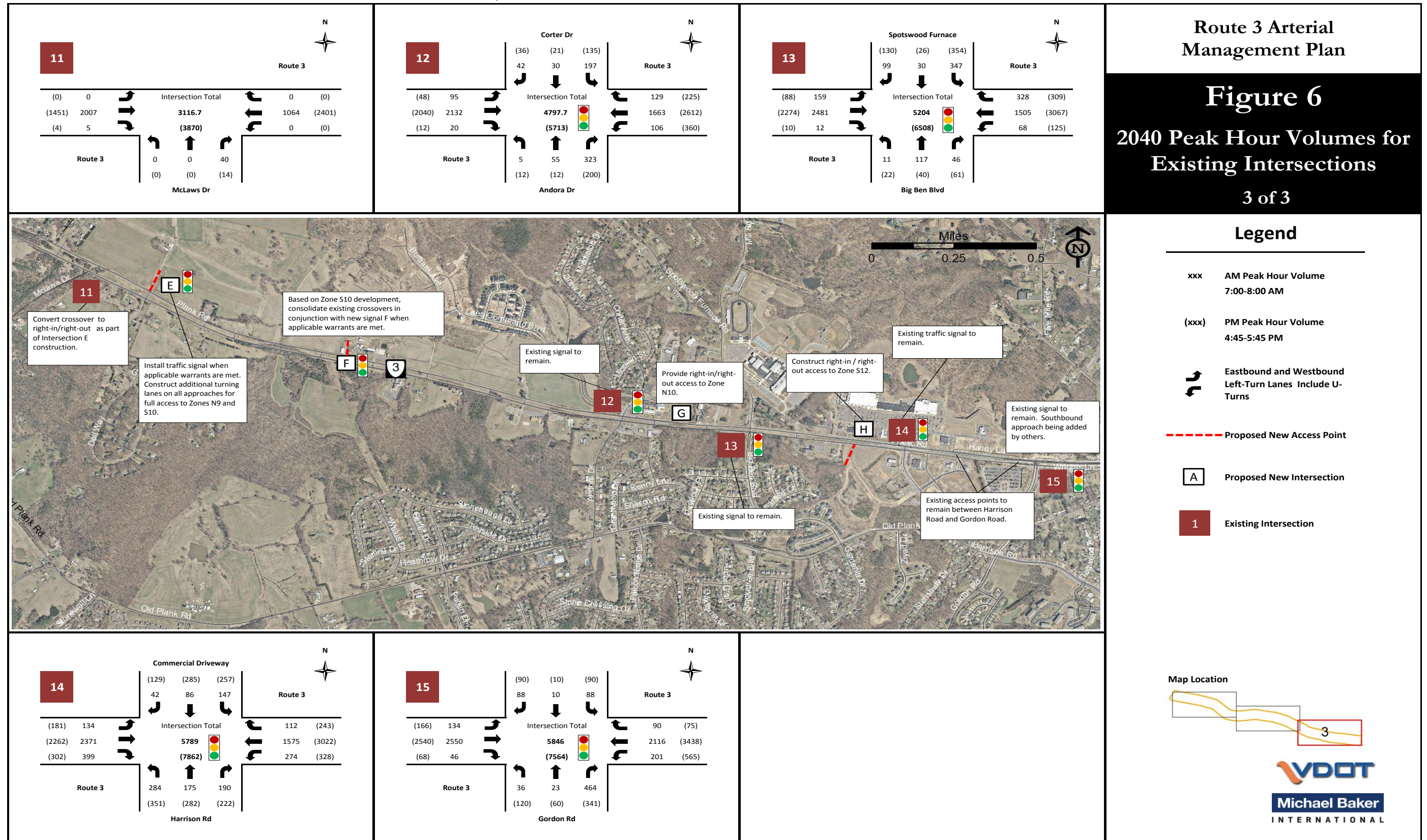


FIGURE 7, SHEET 1 OF 3: 2040 PEAK HOUR VOLUMES FOR PROPOSED NEW INTERSECTIONS

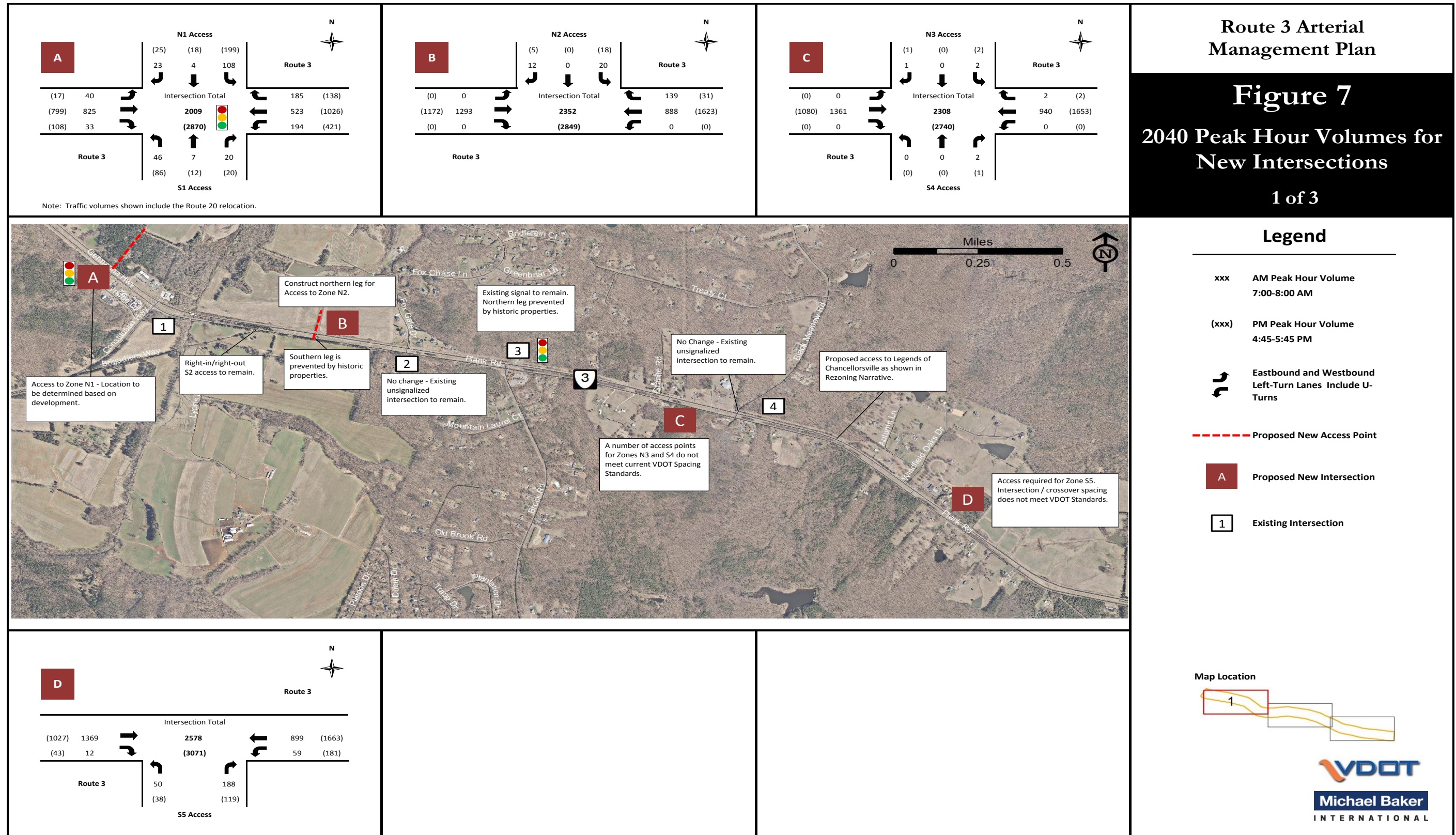


FIGURE 7, SHEET 2 OF 3: 2040 PEAK HOUR VOLUMES FOR PROPOSED NEW INTERSECTIONS

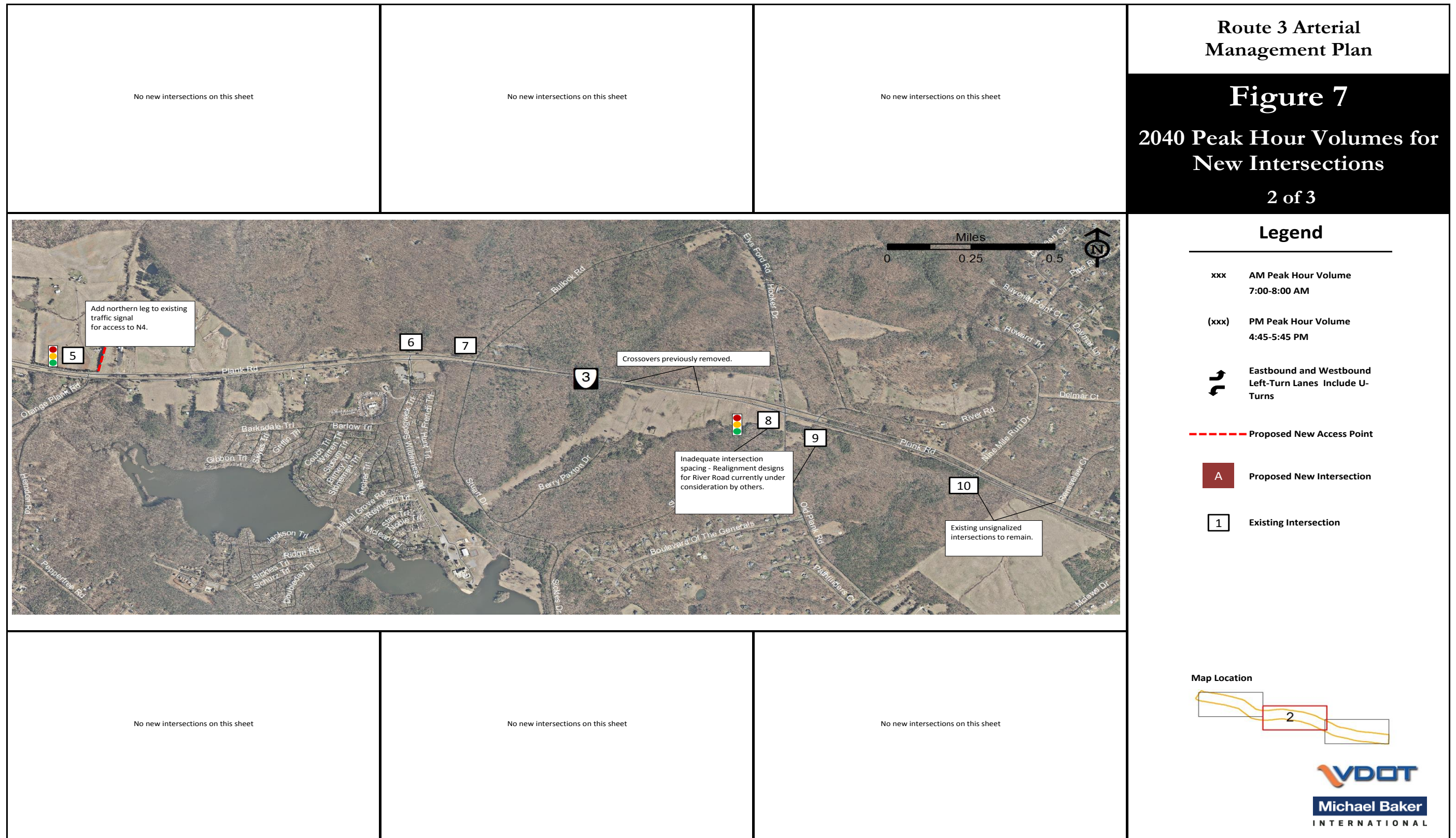
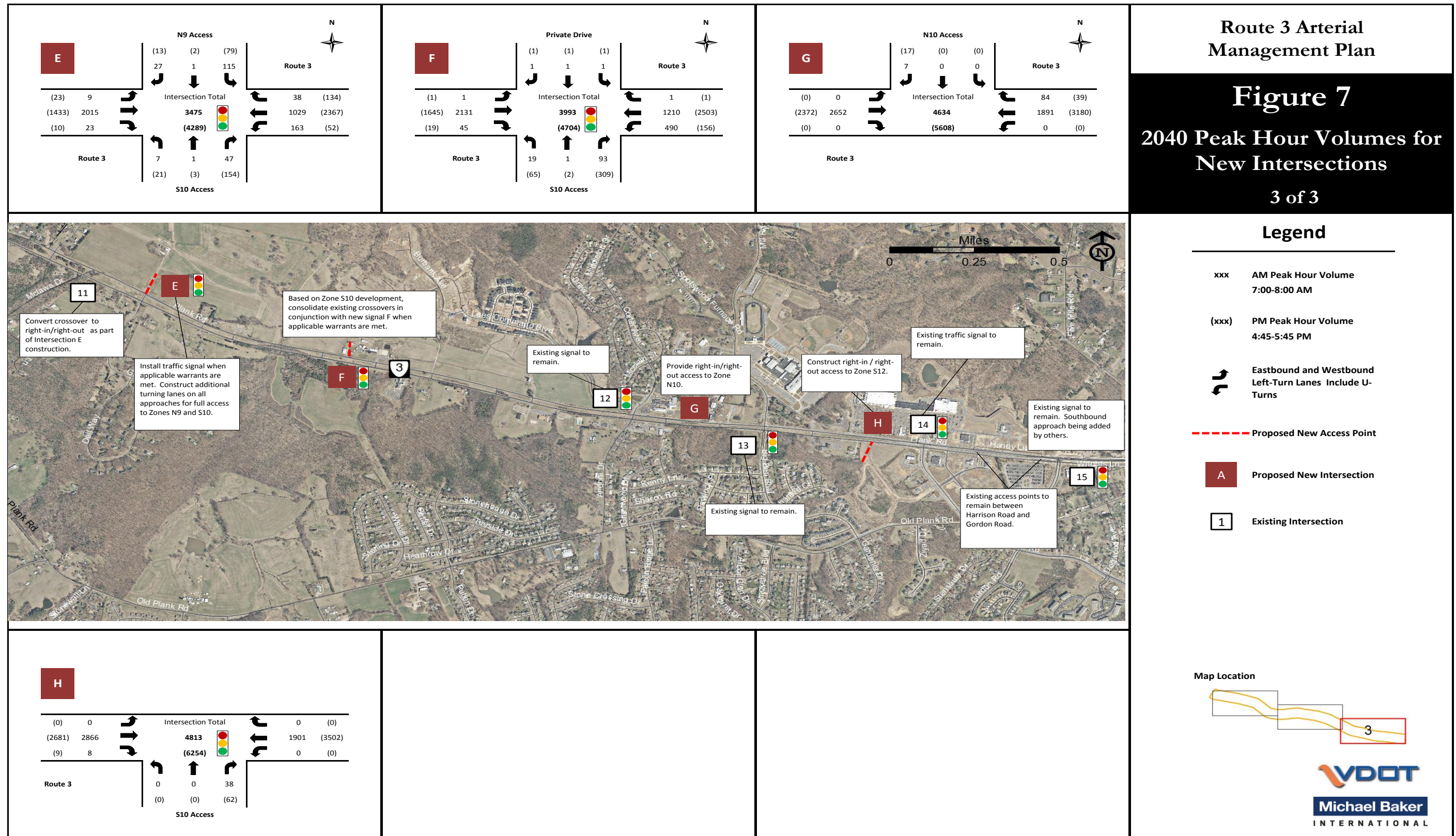


FIGURE 7, SHEET 3 OF 3: 2040 PEAK HOUR VOLUMES FOR PROPOSED NEW INTERSECTIONS



3.3 MINIMALLY MANAGED CONDITION OPERATIONS AND DEFICIENCIES

The following section will detail the deficiencies along the Route 3 corridor and will include existing geometric deficiencies as well as operational deficiencies based on the 2040 traffic volumes calculated in the previous section. The locations are discussed starting on the western end of the corridor at Route 20 and continuing east to Gordon Road. The deficiencies along the Route 3 corridor are shown in Figure 8. In the figure, study (existing) intersections are represented by numbers and the recommended access points along the corridor are represented using letters. Future delay and level of service (LOS) for the 2040 Minimally Managed condition can be seen in Figure 9 for the study intersections and Figure 10 shows the delay and LOS for new access locations.

Route 3 (Plank Road) & Route 20 (Constitution Hwy)
[Intersection 1]

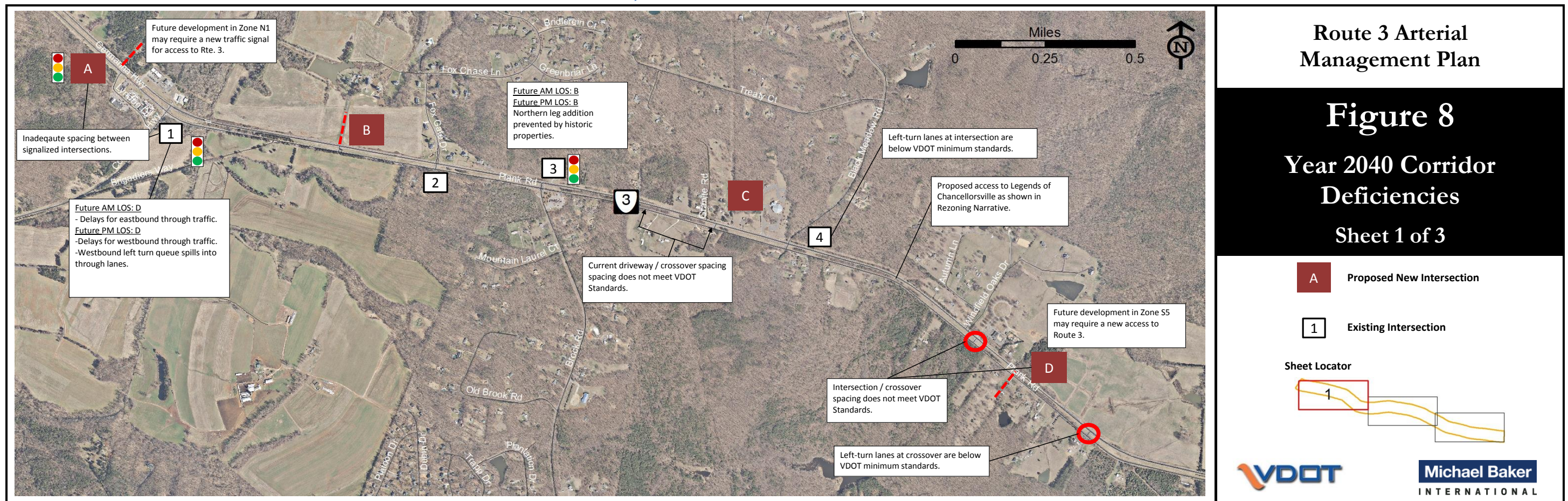
The intersection of Route 3 (Plank Road) & Route 20 (Constitution Hwy.) is projected to operate with a LOS D for both the AM and PM peak hours based on the Year 2040 analysis. The AM peak would experience delay for all eastbound

movements while the PM peak would experience delay for the westbound through traffic. Contributing to that delay in the PM peak is the queue from the westbound left-turn lane that encroaches into the through lanes. Future development of the parcels northwest of the intersection could necessitate a new traffic signal. That new signal would not be able to meet VDOT spacing standards.

Route 3 (Plank Road) & Route 613 (Brock Road)
[Intersection 3]

Development of the north leg at the intersection of Route 3 (Plank Road) & Route 613 (Brock Road) is restricted by historic properties. This location is expected to operate with a LOS B for both the AM and PM peak hours.

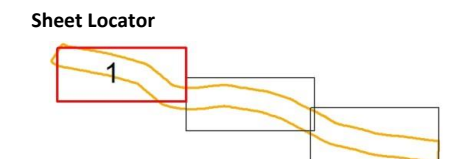
FIGURE 8, SHEET 1 OF 3: YEAR 2040 CORRIDOR DEFICIENCIES



Route 3 Arterial Management Plan

Figure 8
Year 2040 Corridor Deficiencies
Sheet 1 of 3

- A** Proposed New Intersection
- 1** Existing Intersection



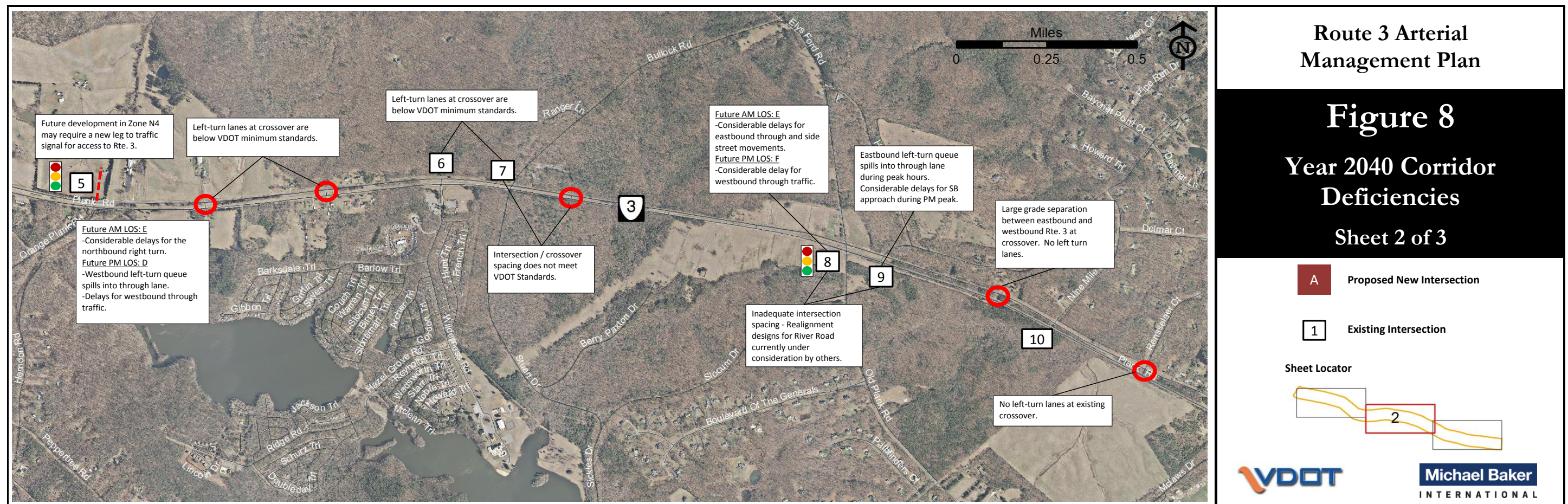
*Locations between Route 613 (Brock Road) & Route 621 (Orange Plank Road)
[Intersection 3] & [Intersection 5]*

Between Brock Road and Black Meadow Drive there is one crossover and numerous driveways. The VDOT Road Design Manual states the minimum spacing for full median crossovers on a principal arterial with a 55 mph speed limit is 1,320 feet. The spacing between Black Meadow Drive and the adjacent crossovers does not meet the standard. At the intersection of Route 3 and Black Meadow Drive, the dedicated left turn lanes do not meet VDOT minimum standards of at least 200' of storage and a 200' taper. The two crossovers immediately west of Orange Plank Road have dedicated left-turn lanes but they do not meet VDOT minimum standards. Future development in Zones N4 and S5 may require the installation of a traffic signal between the aforementioned crossovers. The distance between the existing crossovers and the traffic signal would not meet the minimum VDOT spacing distance.

*Route 3 (Plank Road) & Route 621 (Orange Plank Road)
[Intersection 5]*

For the intersection of Route 3 (Plank Road) & Route 621 (Orange Plank Road), the installation of a north leg is anticipated with development in Zone N4. The Year 2040 analysis shows that this location is projected to operate at a LOS E during the AM peak hour and a LOS D during the PM peak hour. During the AM peak there is considerable delay for all northbound movements due to the high right turn volume. The westbound left-turn lane queue spills into the through lane and there is considerable delay for the westbound approach during the PM peak.

FIGURE 8. SHEET 2 OF 3: YEAR 2040 CORRIDOR DEFICIENCIES



Locations between Route 621 (Orange Plank Road) & Route 610 (Elys Ford Rd) / Route 610 (Old Plank Rd) [Intersection 5] & [Intersection 8]

The two crossovers east of Orange Plank Road meet spacing standards but the left-turn lanes at these crossovers do not meet VDOT minimum standards. The intersection at Wilderness Road does not meet minimum spacing distance from the intersection at Bullock Road / Stuart Drive. There are dedicated left-turn / U-turn lanes at Wilderness Road but the taper for the westbound lane is below standard and both the storage and taper lengths for the eastbound left-turn lane are below standard. Similarly, the National Parks Service (NPS) entrance on Route 3 and Bullock Road / Stuart Drive does not meet the VDOT minimum spacing requirement. Although the crossover at the NPS entrance has dedicated left-turn lanes, the storage and tapers for those lanes does not meet current VDOT minimums.

Intersections of Route 3 (Plank Road) & Route 610 (Elys Ford Road) / Route 610 (Old Plank Road) and Route 3 (Plank road) & Route 618 (River road) [Intersection 8] & [Intersection 9]

The high traffic volumes and short spacing between these two intersections presents a difficult operational environment. During both peak hours, the eastbound left turn from Route 3 onto River Road queues into the through lane affecting the operation of the signal at intersection with Elys Ford Road. During the AM peak hour the signal operates at LOS E and LOS F during the PM peak hour. The AM peak has delays for the eastbound through movement and all side street movements. The PM peak has considerable delays for the westbound through movement. These delays prevent movement from River Road, where there are also substantial delays during the PM peak, onto Route 3.

Locations between Nine Mile Run Drive & Mclaws Drive [Intersection 10] & [Intersection 11]

The distance from Nine Mile Run Drive and the crossover to the west does not meet spacing standards. That crossover also has a large grade separation between eastbound and westbound Route 3 and no dedicated left-turn lanes. The intersection of Rensselaer Court falls just short of spacing standards from Wesley Drive and does not have dedicated left-turn lanes at the crossover. The intersection spacing between Wesley Drive and McLaws Drive does not meet minimum VDOT spacing standards.

Locations between McLaws Drive & Route 626 (Andora Drive) / Route 760 (Corter Avenue) [Intersection 11] & [Intersection 12]

Between the intersections of Route 3 with McLaws Drive and Andora Drive there are seven crossovers and an unsignalized intersection at Glade Drive. The McLaws Drive intersection lacks dedicated left turn lanes and the channelized right turn from eastbound Route 3 has a short taper requiring vehicles to slow down prior to entering the lane. The intersection spacing between McLaws and Glade Drive does not meet VDOT standards. At the intersection with Glade Drive there are dedicated lanes for right and left turns but only the eastbound left-turn lane meets VDOT standards. Future development on the north side of Route 3 would likely warrant a traffic signal at the intersection of Route 3 and Glade Drive. The spacing to the two crossovers east of Glade Drive do not meet spacing requirements and neither has dedicated left-turn lanes. Approximately 1,450 feet east is another crossover but it does not have dedicated left turn lanes. The last four crossovers before Andora Drive do not meet minimum spacing standards. The majority of these do not have dedicated turn lanes. The crossovers in front of Lick Run Community Center and Fredericksburg Seventh-Day Adventist Church have dedicated turn lanes for the westbound left turns but they do not meet VDOT minimums lengths. These two crossovers and the crossover immediately east of Glade Drive currently provide access to destinations along Route 3 while the remaining crossovers do not provide any additional access beyond that.

Route 3 (Plank Road) & Route 626 (Andora Drive) / Route 760 (Corter Avenue) [Intersection 12]

The intersection of Route 3 and Andora Drive / Corter Avenue is the dividing point between the urban and rural classifications of the corridor. The LOS at this location degrades from an existing LOS D in the AM peak hour and LOS C in the PM peak hour to a LOS F for both peak hours in 2040. In the 2040 AM analysis, results show the westbound left-turn queue encroaching into the through lane and considerable delays for the eastbound through movement. The analysis also shows delays for all northbound and southbound movements. The PM peak hour analysis shows the westbound left-turn queues extending into the through lane as well as lengthy delays for the eastbound and westbound through movements.

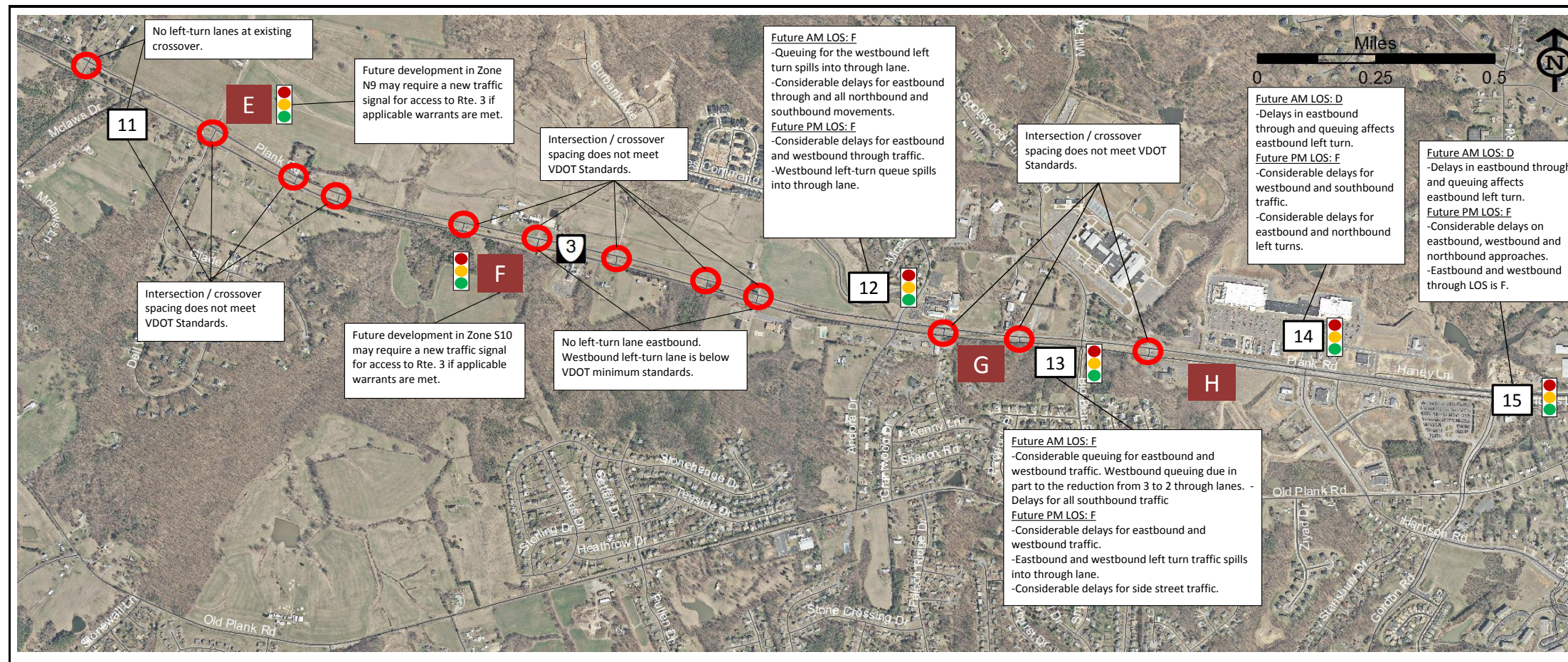
Route 3 (Plank Road) & Route 620 W. (Spotswood Furnace Drive) / Route 1942 (Big Ben Boulevard) [Intersection 13]

The intersection of Route 3 & Big Ben Blvd / Spotswood Furnace Drive currently operates with a LOS E during the AM peak hour and LOS D during the PM peak hour. The 2040 analysis results show a degradation in LOS for both peak hours to LOS F. This is a result of significant congestion in the eastbound and westbound through movements. This issue is exacerbated in the westbound direction by a reduction from three through lanes to two through lanes on Route 3. The westbound queue length affects the through traffic all the way back to the intersection with Harrison Road. During the AM peak hour, there are significant delays for the southbound traffic due to the left turn volume. In addition to the delays on the mainline through movements during the AM peak hour, queuing from the eastbound left turn lane encroaches into the through lane.

Locations between Route 626 (Andora Drive) / Route 760 (Corter Avenue) & Route 620 (Harrison Road) [Intersection 12] & [Intersection 14]

There are three crossovers between Andora Drive and Harrison Road along Route 3 and none of them currently meets VDOT spacing standards. Only two of the three have dedicated left-turn lanes but these are only in the westbound direction. These left-turn lanes do not meet the VDOT minimum of 200' of storage and a 200' taper. This poses a safety and operational hazard as turning vehicles at this location do not have enough storage or do not have enough room to decelerate outside of the through lane. As a result there can be an increase in rear-end accidents and reduced traffic flow in the through lanes.

FIGURE 8, SHEET 3 OF 3: YEAR 2040 CORRIDOR DEFICIENCIES



Route 3 Arterial Management Plan

Figure 8

Year 2040 Corridor Deficiencies

Sheet 3 of 3

A Proposed New Intersection

1 Existing Intersection

Sheet Locator

*Route 3 (Plank Road) & Route 620 (Harrison Road)
[Intersection 14]*

The intersection of Route 3 and Harrison Road currently operates with LOS C during both the AM and PM peaks. The projected increase in traffic is expected to degrade the operations at this location to a LOS D and LOS F during the AM and PM peak hours, respectively. During the AM peak hour there are considerable delays for the eastbound through traffic that block the eastbound left turn lane. The PM peak hour shows considerable delays for all westbound and southbound movements as well as the eastbound and northbound left turns.

*Route 3 (Plank Road) & Route 627 (Gordon Road)
[Intersection 15]*

The intersection of Route 3 with Gordon Road is presently a three-legged intersection that will become a four-legged intersection following completion of commercial development on the north side of Route 3. Since the fourth leg has yet to be completed, it was not included in the existing conditions analysis but was included in analyses for the future conditions. Presently the intersection operates at a LOS C during both the AM and PM peak hours; however, with the inclusion of the fourth leg, the LOS will degrade to LOS E in the AM peak hour and LOS F in the PM peak hour. The through movements along Route 3 show a significant increase in delay compared to the existing conditions. This contributes to operational problems for left turns from Route 3. There is also extensive queuing for the northbound movement due to the large volume of traffic leaving the park and ride lot.

FIGURE 9, SHEET 1 OF 3: 2040 PEAK HOUR LOS FOR EXISTING INTERSECTIONS – MINIMALLY MANAGED CONDITION

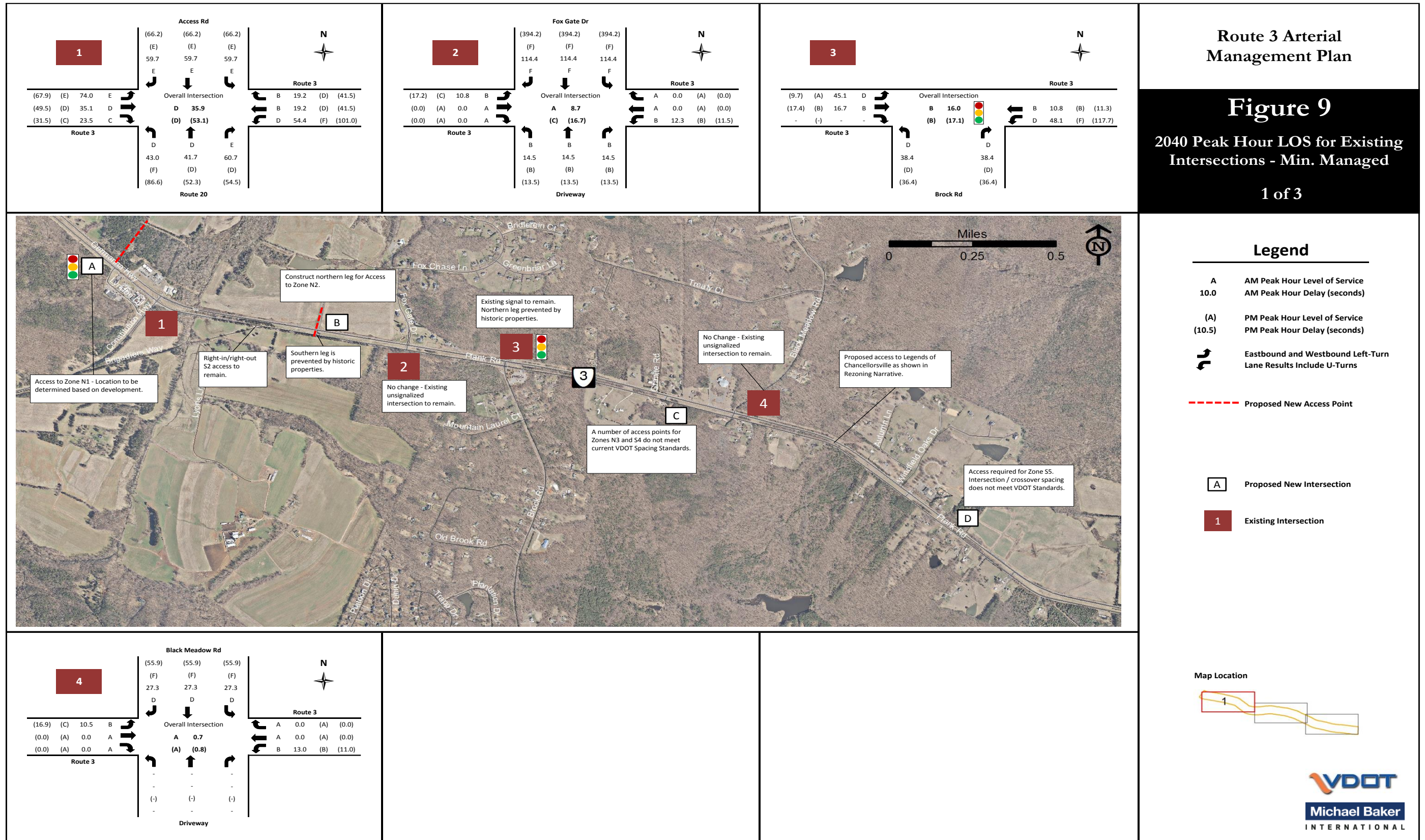


FIGURE 9, SHEET 2 OF 3: 2040 PEAK HOUR LOS FOR EXISTING INTERSECTIONS -- MINIMALLY MANAGED CONDITION

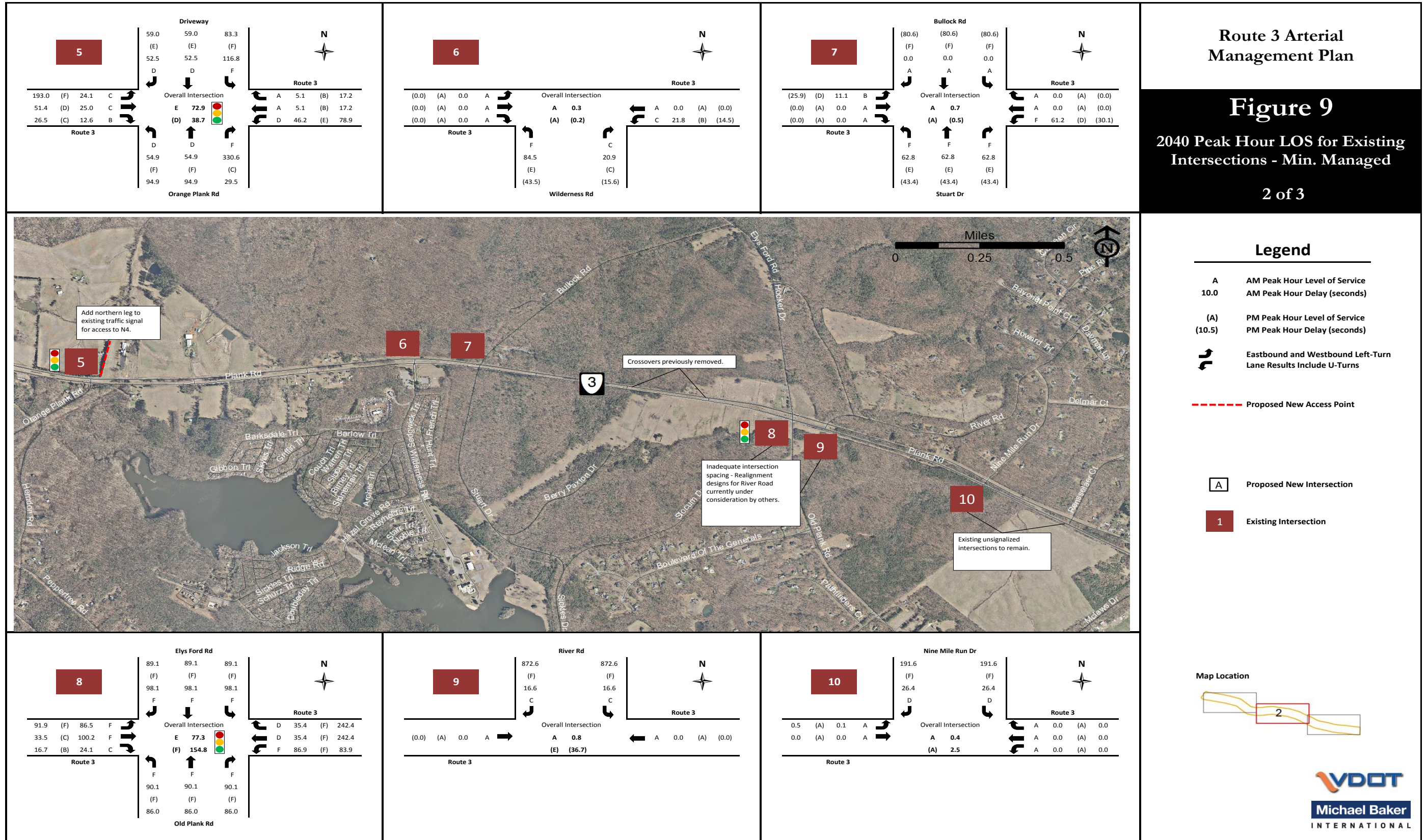


FIGURE 9, SHEET 3 OF 3: 2040 PEAK HOUR LOS FOR EXISTING INTERSECTIONS -- MINIMALLY MANAGED CONDITION

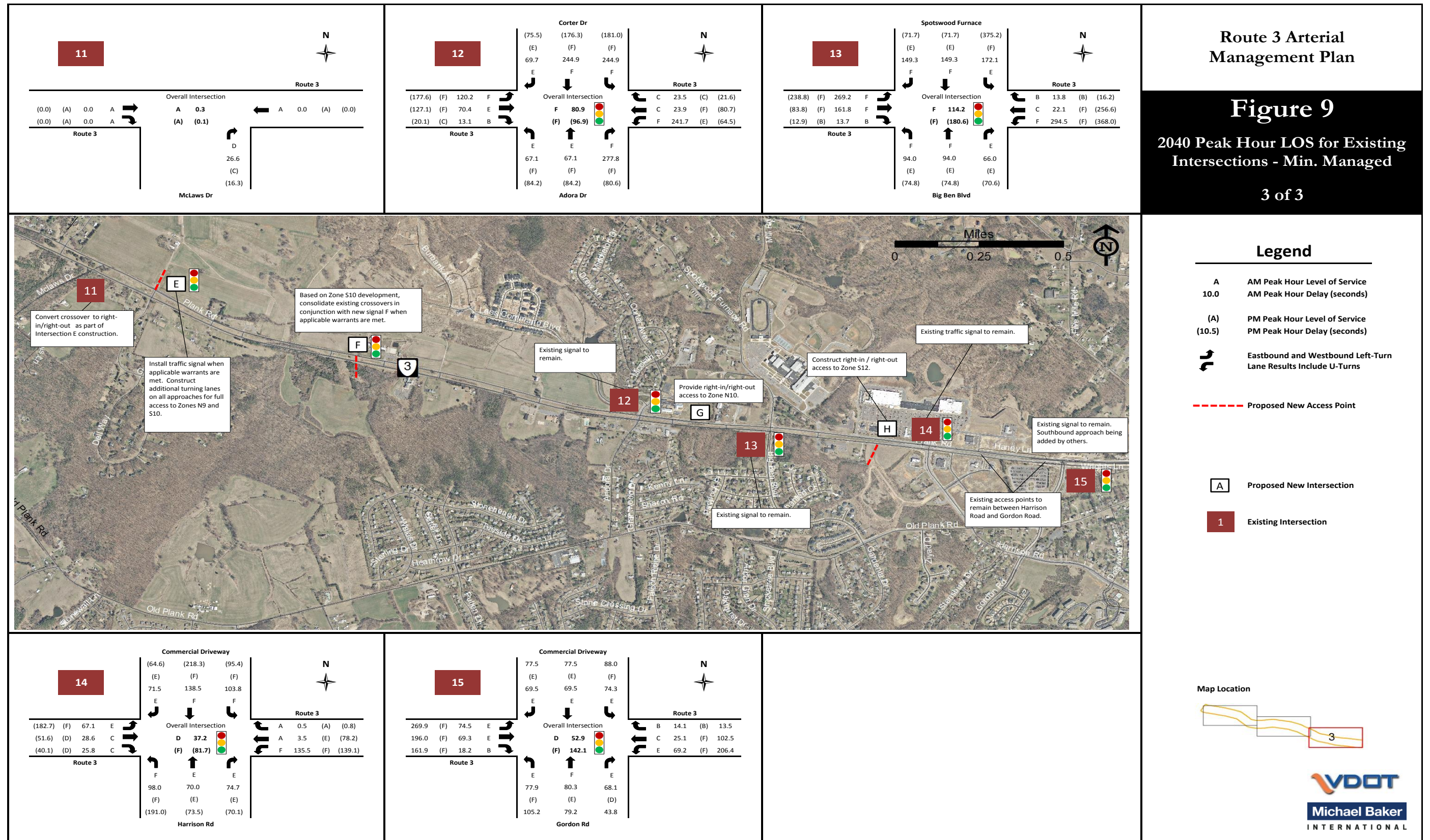


FIGURE 10, SHEET 1 OF 3: 2040 PEAK HOUR LOS FOR PROPOSED NEW INTERSECTIONS – MINIMALLY MANAGED CONDITION

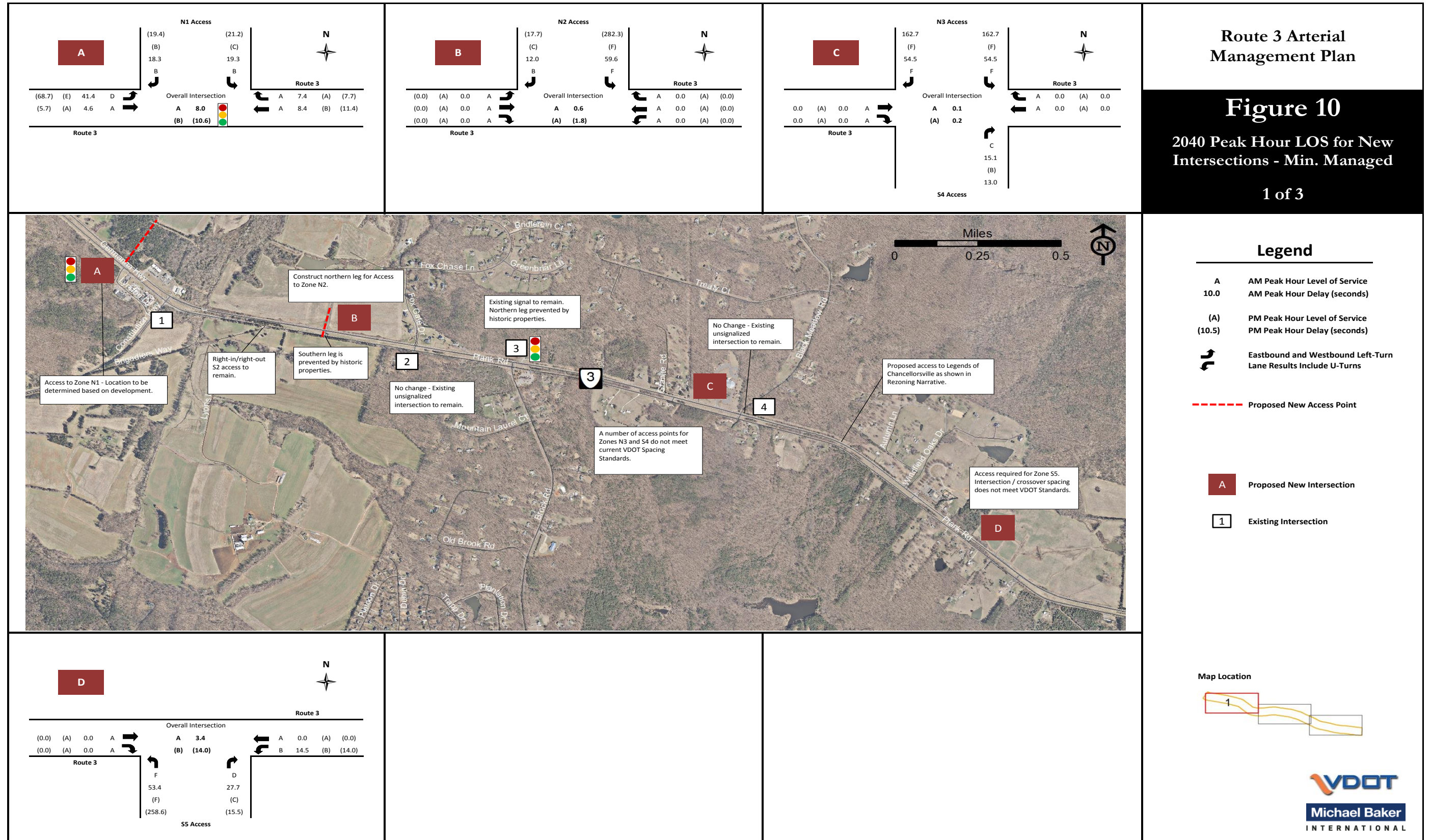


FIGURE 10. SHEET 2 OF 3: 2040 PEAK HOUR LOS FOR PROPOSED NEW INTERSECTIONS – MINIMALLY MANAGED CONDITION

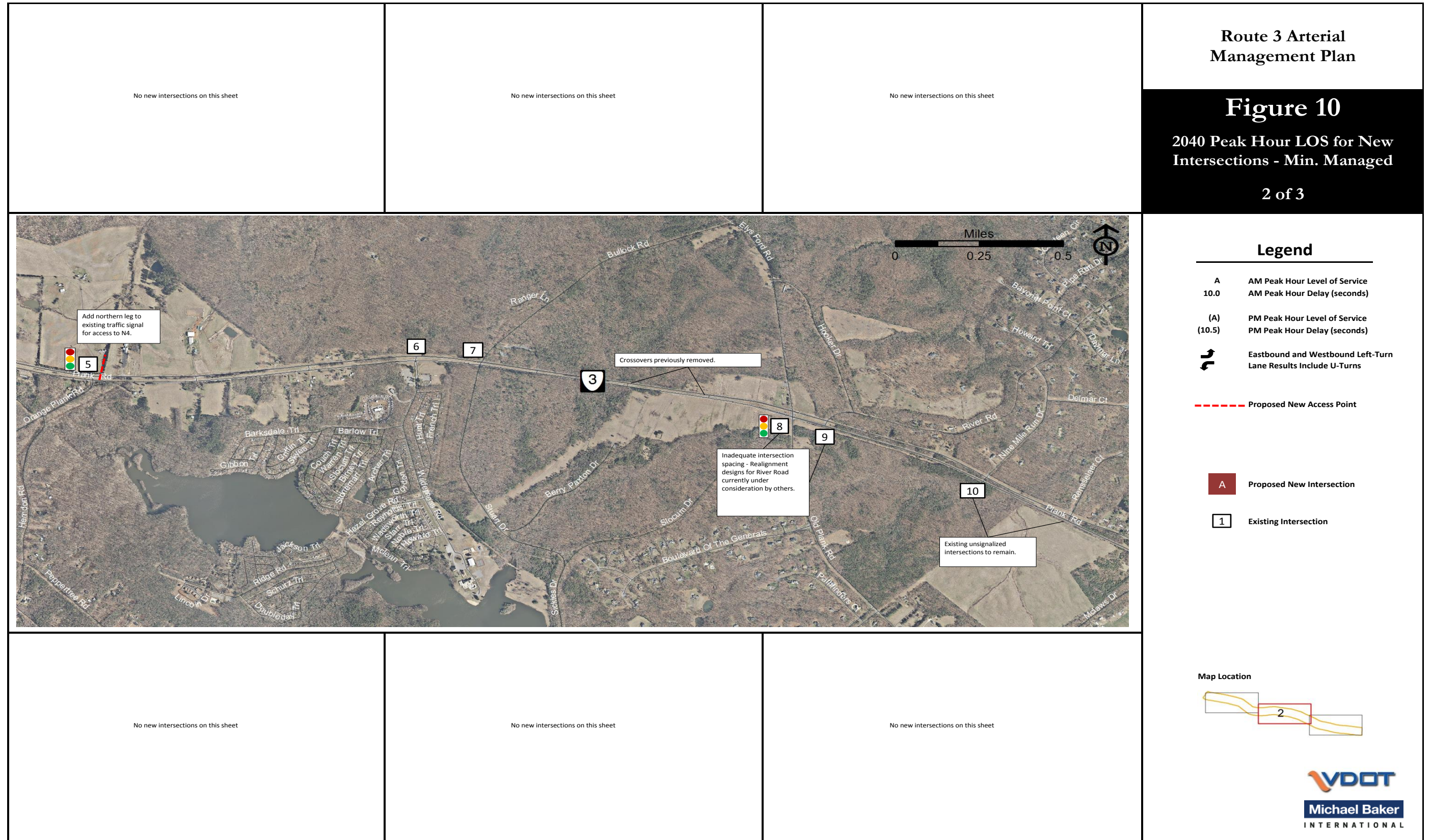
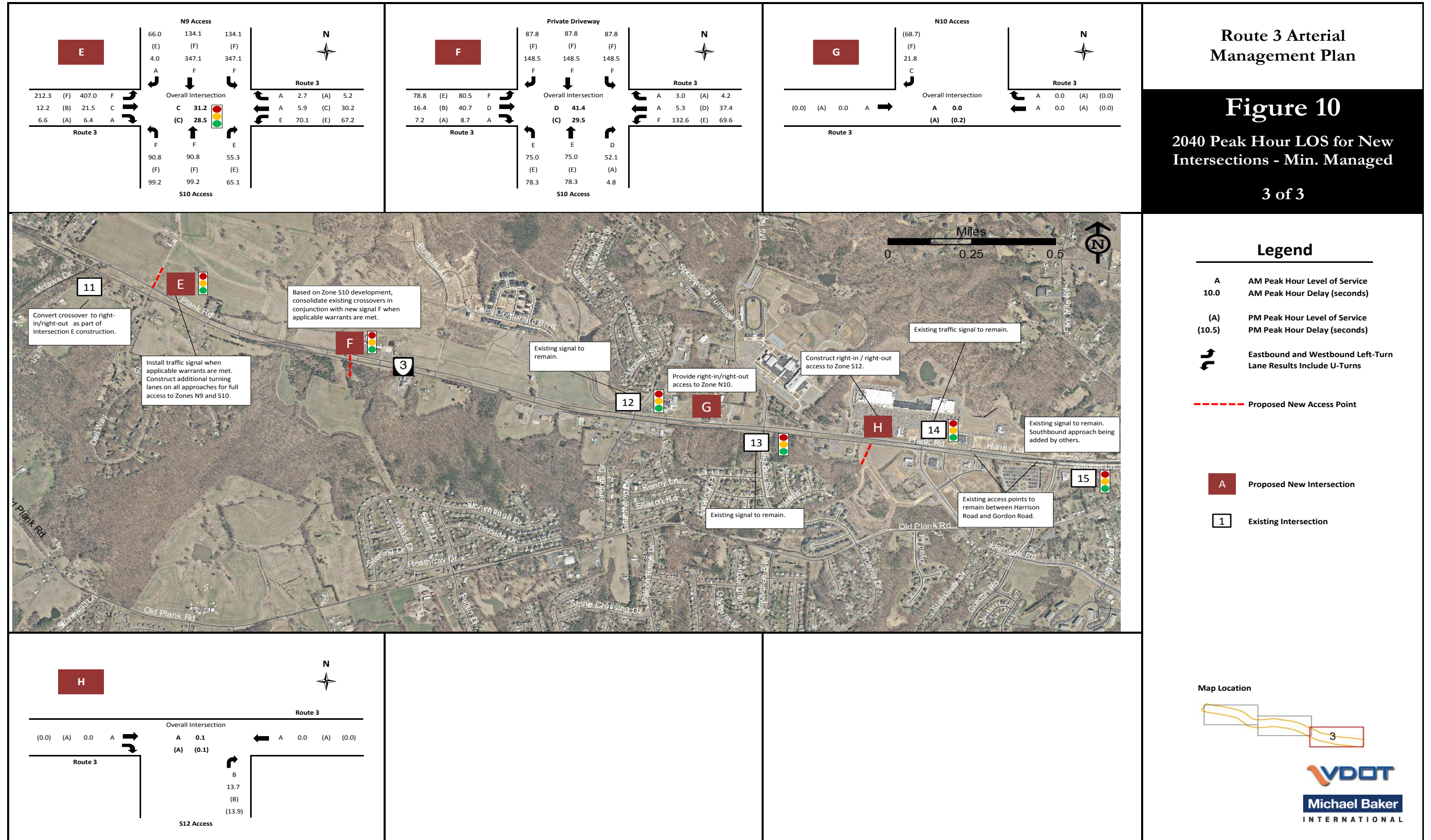


FIGURE 10, SHEET 3 OF 3: 2040 PEAK HOUR LOS FOR PROPOSED NEW INTERSECTIONS – MINIMALLY MANAGED CONDITION



CHAPTER 4: RECOMMENDATIONS

4.1 TOOLBOX OF RECOMMENDATIONS

Future traffic volumes and operating conditions show that Route 3 needs improvements to ensure capacity and safety within the corridor. While most of these improvements may be driven by development, other improvements such as crossover closings may be implemented immediately. Based on capacity analyses of current and future conditions and a review of current corridor infrastructure, a “toolbox” of improvements were developed for the Route 3 study area. These include:

- REMOVE EXISTING CROSSOVER (BASED ON INADEQUATE SPACING/GRADE/ETC.)
- UPGRADE EXISTING CROSSOVER TO MEET VDOT STANDARDS
- CONVERT EXISTING CROSSOVER TO DIRECTIONAL MEDIAN TO ALLOW ONLY CERTAIN MOVEMENTS
- UPGRADE/MODIFY TRAFFIC SIGNAL TO ACCOMMODATE INCREASED TRAFFIC VOLUME
- INSTALL NEW TRAFFIC SIGNAL BASED ON INCREASED TRAFFIC FROM DEVELOPMENT
- CONSOLIDATE EXISTING ACCESS POINTS BASED ON VDOT ACCESS MANAGEMENT STANDARDS
- PROVIDE INTERPARCEL CONNECTIONS IN LIEU OF MULTIPLE ACCESS POINTS TO ROUTE 3

A small number of the recommendations for the Route 3 corridor include the installation of a traffic signal at high volume intersections. Below is a list of alternative intersection designs that are included in the VDOT AMP toolbox but were not selected for the ultimate intersection recommendations due to the high traffic volumes, 55 mph speed limit, grade changes (hills), and limited Right-of-Way along the Route 3 corridor. Some of the alternative designs may be suitable for intersections (based on traffic volumes) prior to the installation of a signal, but would have to be studied thoroughly to determine the safety impacts at each location.

- ROUNDABOUT
- CONTINUOUS FLOW INTERSECTION (CFI)
- DISPLACED LEFT-TURN INTERSECTION
- MEDIAN U-TURN INTERSECTION
- RESTRICTED CROSSING U-TURN INTERSECTION
- GRADE SEPARATION
- OFFSET T-INTERSECTION

Potential “toolbox” options for future consideration that would need to be coordinated between Spotsylvania County and the National Park Service include:

- CONSTRUCTION OF PARK AND RIDE FACILITY

- INSTALLATION OF BIKE LANES ON EXISTING ROADWAYS
- PEDESTRIAN FACILITIES
- CONSTRUCTION OF SHARED USE PATHS

4.2 ROUTE 3 STUDY CORRIDOR RECOMMENDATIONS

By analyzing the future volumes from planned and potential developments along the corridor, recommendations can be derived from the list above. Again, most of the following recommendations are development driven and are anticipated to be funded primarily by the developing party. Input from the National Park Service should be solicited in situations where recommendations may impact NPS property. Additionally, the recommendations included in this Route 3 Arterial Management Plan are based on a particular set of land use assumptions and some of the recommendations may not be applicable if development occurs differently than assumed. Public and elected officials, project committees, other stakeholders, and citizens within the study area were engaged throughout the entire project process in order to help identify preferable recommendations.

Route 3 (Plank Road) & Route 20 (Constitution Hwy) [Intersection 1]

Orange County recently adopted the Germanna-Wilderness Area Plan into their Comprehensive Plan which includes the potential relocation of the Route 3 and Route 20 intersection further to the west. This would present an ideal location for the entrance to development within Zone N1, which is northwest of the current intersection of Route 3 and Route 20. This improvement is included in the analyses due to the potential development, however it should be noted that this recommendation is not part of this Route 3 Arterial Management Plan. The relocated intersection, including a northern leg for future development, would operate at a LOS C during both the 2040 AM and PM peak hours. The Route 3 & Route 20 intersection would be converted to right-in / right-out intersection.

Route 3 (Plank Road) & Zone N2 Access [Intersection B]

It is not anticipated that traffic generated by development within Zone N2 would be great enough to warrant a new traffic signal. The recommendation would be to convert the existing median crossover approximately 0.5 miles east of the intersection of Route 3 & Route 20 to only allow southbound lefts onto Route 3. This along with interparcel connections within Zone N2 will help regulate access and traffic flow along Route 3. The existing unsignalized intersection at Fox Gate Drive would provide for eastbound U-turns in lieu of a direct left-turn from eastbound Route

3 into the future development in Zone N2. Given the presence of historic property, no development can take place on the south side of Route 3 at this location.

*Route 3 (Plank Road) & Fox Gate drive
[Intersection 2]*

Additional development in Zone N2 is not anticipated to impact the intersection of Route 3 & Fox Gate Drive such that modifications or improvements would be required.

*Route 3 (Plank Road) & Route 613 (Brock Road)
[Intersection 3]*

There are no recommendations for the existing signal at Route 3 (Plank Road) & Route 613 (Brock Road). The projected 2040 LOS for the intersection is B for both the AM and PM peak hours. Development for the northern leg is prevented by historic properties.

*Locations between Route 613 (Brock Road) & Rte. 621 (Orange Plank Road)
[Intersection 3] & [Intersection 5]*

There is one crossover between Brock Road and Black Meadow Road as well as numerous driveways along eastbound and westbound Route 3. When development occurs in Zones N3 and / or S4 it would be recommended to consolidate access points to meet VDOT standards. The existing crossover would present a suitable location for a directional median to allow southbound lefts and a right-in / right-out access for eastbound Route 3 vehicles. Effects of future traffic are anticipated to be minimal at the intersection of Route 3 and Black Meadow Road and no improvements are recommended for this location.

There is a planned unsignalized access point leading to the proposed Legends of Chancellorsville residential development approximately 0.25 miles east of the intersection of Route 3 and Black Meadow Drive. As shown in the Legends of Chancellorsville Rezoning Narrative (April 2014), this access point will most likely include a crossover that allows full access to the development to the north. Further east on Route 3, it is recommended that the crossover in front of Laurel Hill Memorial Park be converted into a directional median to allow eastbound left turns. The dedicated left turn lanes at the crossover 0.5 miles west of Orange Plank Road are recommended to be upgraded to meet the minimum VDOT standards of 200' of storage and a 200' taper. In order to provide access to any potential development in Zone S5, a new access point is recommended between the two aforementioned crossovers. Based on projected

volumes, the new "T" intersection is expected to operate at a LOS A in the AM peak hour and LOS B in the PM peak hour.

*Route 3 (Plank Road) & Route 621 (Orange Plank Road)
[Intersection 5]*

The future development in Zone N4 would add a northern leg to the signal at this location, however historic preservation of this property would make the addition of this northern leg unnecessary. For the northbound approach, it is recommended that it be reconstructed to include a through-left lane and dual right turn lanes due to the large number of right turns during the AM (574 vehicles) and PM (285 vehicle) peak hours. The high volume of westbound left turns projected at this location would warrant dual left turn lanes based on the VDOT Road Design manual, however due to the historic properties that are adjacent to the receiving lanes on Orange Plank Road, this is most likely not an option. The existing left-turn lane should be extended to accommodate the future volumes. It is also recommended that the eastbound left-turn lane be upgraded based on development in Zone N4 as it does not currently meet VDOT standards.

*Locations between Rte. 621 (Orange Plank Road) & Route 610 (Old Plank Road)
[Intersection 5] & [Intersection 8]*

For the two existing crossovers east of Orange Plank Road and the unsignalized intersection at Wilderness Road & Bullock Road / Stuart Drive, it is recommended to improve the existing left-turn lanes to meet the VDOT minimum standards of 200' of storage and 200' taper. It is also recommended that the National Park Service entrance be converted to a right-in / right-out and the median crossover at this location be converted to a directional median for eastbound left turns into the National Park Service property.

*Intersection of Route 3 (Plank Road) & Route 610 (Elys Ford Road) / Route 610 (Old Plank Road) and
Intersection of Route 3 (Plank Road) & Route 618 (River Road)
[Intersection 8] & [Intersection 9]*

The spacing between these locations is below what is required by the VDOT Road Design Manual. Although not recommended as part of this study, there are realignment designs under consideration for the River Road intersection which will include modifications to the traffic signal at Elys Ford Road / Old Plank Road. For the purpose of this study, the southbound and northbound approaches at this intersection included dedicated left-turn lanes and shared through-right lanes. It is recommended that the westbound approach be reconstructed to include a dedicated right turn lane and both the eastbound and westbound left-turn lanes be improved to accommodate future traffic volumes.

Based on these improvements, the future operations of the intersection are projected to be LOS D in both the AM and PM peak hours.

*Locations between Route 618 (River Road) & Mclaws Drive
[Intersection 9] & [Intersection 11]*

The intersections with Route 3 at Nine Mile Run Drive, Rensselaer Court, Heritage Avenue and Wesley Drive are not expected to experience much of an operational deterioration based on future volumes, although the increase of traffic on Route 3 will reduce available gaps for side street traffic. It is recommended that the crossover west of Nine Mile Run Drive be removed due the grade separation between eastbound and westbound Route 3. It is also recommended that the three aforementioned unsignalized intersections be upgraded with dedicated left-turn lanes along Route 3 that meet VDOT standards.

*Route 3 (Plank Road) & Mclaws Drive
[Intersection 11]*

The unsignalized intersection at McLaws Drive does not meet spacing standards between Wesley Drive and Glade Drive. In an effort to reduce the number of median crossings and improve safety, it is recommended that the intersection of Route 3 with McLaws Drive be reconfigured as a right-in / right-out. Because the land directly across Route 3 from McLaws Drive is designated as historic, there’s minimal need to cross Route 3 at this location. Vehicles wishing to travel west on Route 3 from McLaws Drive will be able to U-turn at the Glade Road intersection.

*Route 3 (Plank Road) & Glade Drive
[Intersection E]*

It is recommended that a traffic signal be installed at Glade Drive to accommodate increased traffic from future development in Zones N9 and S10. It is also recommended that interparcel connections be constructed in these zones as development occurs to replace multiple access points along Route 3. While this will help improve the operations along Route 3, there will be a significant amount of traffic at the signal. The 2040 analysis of this intersection that includes the traffic signal results in a LOS C in the AM peak hour and LOS C in the PM peak hour.

*Route 3 (Plank Road) & Zone S10 Access
[Intersection F]*

It is recommended that a signalized intersection to allow access to Zone S10 be constructed approximately 0.8 miles east of the Mclaws Drive intersection. It is also recommended that interparcel connections be constructed in Zone S10 as development occurs to replace multiple access points along Route 3. The north leg of the proposed intersection

would allow access to the private driveway on the north side of Route 3. The 2040 analysis results shown that this new intersection is expected to operate at LOS D for both the AM and PM peak hours.

*Locations between Glade Drive & Route 626 (Andora Drive) / Route 760 (Corter Avenue)
[Intersection E] & [Intersection 12]*

A review of the crossovers between Glade Drive and Andora Drive reveals that spacing was not currently to standard and that multiple crossovers didn’t provide direct access to parcels along Route 3. It is recommended that five of the seven crossovers between Glade Drive and Andora Drive be closed. The two crossovers to remain open are the locations in front of Lick Run Community Center and Fredericksburg Seventh-Day Adventist Church. Additionally, those two crossovers should be improved by providing left-turn lanes that meet the VDOT minimum 200’ of storage and 200’ taper. These actions will increase safety, preserve access in this area of the corridor and bring this section up to VDOT Standards.

Route 3 Widening

Presently Route 3 is a four lane divide highway east of the intersection of Route 3 and Big Ben Road / Spotswood Furnace Road. By 2040 the expected through traffic will be such that two lanes in either direction will not be able to support the increased volume. The goal of this study was to preserve the existing roadway without widening Route 3; however, projected volumes dictate that the corridor will not be able to function without widening Route 3 to three through lanes in each direction and tie into the existing four lane typical section just west of the intersection of Route 3 and Andora Drive / Corter Avenue. Without the widening, the operations of Route 3 west of the intersection with Andora Drive will degrade significantly and suffer from increased delays associated with the lack of through capacity. An analysis to determine the threshold at which this portion of Route 3 would need widening determined that approximately 300-400 cars would need to be removed from each direction of travel during each peak hour to achieve a future LOS D at the intersections of Route 3 with Andora Drive / Corter Avenue and Spotswood Furnace Drive / Big Ben Boulevard. Assuming the full future build-out of development discussed previously is still in place, the Route 3 widening would need to occur between 2025 and 2030. It is important to note that the full development along Route 3 may not occur in this time frame which would extend the date that the widening of Route 3 would be needed.

*Route 3 (Plank Road) & Route 626 (Andora Drive) / Route 760 (Corter Avenue)
[Intersection 12]*

This location is expected to operate with a LOS F for both peak hours without any improvements. In addition to widening Route 3 to three through lanes in each direction, it is recommended that a second left-turn lane be

constructed and right-turn overlaps be added for the westbound and northbound approaches. The results of the analysis that included these improvements show the intersection operating at a future LOS D in the AM peak hour and LOS C in the PM peak hour.

Route 3 (Plank Road) & Route 620 West (Spotswood Furnace Drive) / Route 1942 (Big Ben Boulevard) [Intersection 13]

This location, along with the other intersections east of Andora Drive, is expected to benefit greatly from the recommended Route 3 widening. Without the widening, the delays caused by the westbound through traffic will cause the westbound queue to extend through the Gordon Road intersection during both the AM and PM peak hours. To reduce overall delay at the intersection, in addition to the Route 3 widening, it is recommended that the southbound approach be reconfigured to include a left-turn, a through-left lane, and right-turn lane to decrease the delay caused by the high volume of left turns during the AM (347) and PM (354) peak hours. It may not be feasible to widen the side streets for two receiving lanes so it is recommended that the eastbound and westbound left turn lanes be extended to account for future queues. With the high volume of westbound right turns, the analysis included a right turn overlap for that movement. With these improvements, the future LOS for the intersection is expected to be LOS D in both the AM and PM peak hours.

Locations between Route 626 (Andora Drive) & Route 620 (Harrison Road) [Intersection 12] & [Intersection 14]

To meet VDOT spacing standards, it is recommended to remove the two crossovers between Andora Drive and Big Ben Boulevard. As development occurs, it is recommended that a new access point to Route 3 be constructed to allow right-in / right out access from Zone N10. In order to reduce the number of access points along Route 3, Zone N10 should include interparcel connections to connect Corter Avenue and Spotswood Furnace Road, which flank either side of the zone.

Route 3 (Plank Road) & Route 620 (Harrison Road) / Entrance to Harrison Crossing [Intersection 14]

There’s little at the intersection of Route 3 & Harrison Road that can be done given its current configuration. It is recommended that the southbound approach be reconfigured to include a through-right lane in place of the existing dedicated right-turn lane. The analysis also included adding right turn overlaps for the eastbound, westbound and

northbound movements. These recommendations are expected to improve the LOS for the PM peak hour from a LOS F to a LOS E, while the AM peak hour would remain at a LOS D.

Route 3 (Plank Road) & Route 627 (Gordon Road) / Commercial Entrance [Intersection 15]

As discussed previously, the parcel on the north side at this location is currently under construction and will add the north leg to this intersection that will include a through-right lane and left-turn lane. It is recommended to construct a second left turn lane for both eastbound and westbound directions and that the storage for the left-turn lanes be extended to accommodate future volumes. With these improvements the intersection is projected to operate at LOS D in the AM peak hour and LOS E in the PM peak hour.

4.3 OPINION OF COSTS

Opinion of costs were developed for each recommendation type at each location using the VDOT Statewide Planning Level Cost Estimate tool developed by the Transportation and Mobility Planning Division in conjunction with input from VDOT staff in the Fredericksburg District. Table 13 shows the unit cost in 2016 dollars for each recommendation type which includes estimates for preliminary engineering as well as construction contingencies. Table 14 shows the total cost of recommendations at each by location. The costs shown in the Table are not attributable to any certain entity although it is anticipated that any recommendations associated with future development would be funded by the development party.

TABLE 13: UNIT COSTS FOR ROUTE 3 RECOMMENDATIONS

<i>Item</i>	<i>Unit</i>	<i>Low</i>	<i>High</i>
Crossover (New or Modify)	EA	\$200,000	\$310,000
Add or Extend Left-Turn Lane	EA	\$260,000	\$350,000
Right-in / Right-out	EA	\$365,000	\$470,000
Provide traffic signal at unsignalized intersection	EA	\$350,000	\$450,000
Close Arterial Access	EA	\$100,000	\$100,000
Close Crossover	EA	\$100,000	\$100,000
1 lane rural section	Per Mi	\$480,000	\$740,000
Interparcel Connections (2 Lane Urban Section)	Per Mi	\$4,430,000	\$6,640,000

TABLE 14: ROUTE 3 SUMMARY OF RECOMMENDATIONS AND OPINION OF COST

	Location	# of Improvements	Low	High	Responsible Entity
1, A	Route 3 (Plank Road) & Route 20 (Constitution Hwy)	Orange County Project			N/A
B	Route 3 (Plank Road) & Zone N2 Access				
	Crossover (New or Modification)	1	\$200,000	\$310,000	Private Developer
	Total		\$200,000	\$310,000	
D	Locations between Route 613 (Brock Road) & Rte. 621 (Orange Plank Road)				
	Crossover (New or Modify)	2	\$400,000	\$620,000	Private Developer
	Turn Lane (New or Improved)	2	\$520,000	\$700,000	Private Developer
	Right-in / Right-out	1	\$365,000	\$470,000	Private Developer
	Provide traffic signal at unsignalized intersection	1	\$350,000	\$450,000	Private Developer
	Total		\$1,635,000	\$2,240,000	
5	Route 3 (Plank Road) & Route 621 (Orange Plank Road)				
	Turn Lane (New or Improved)	3	\$780,000	\$1,050,000	VDOT / Spotsy Co.
	Total		\$780,000	\$1,050,000	
6, 7	Locations between Rte. 621 (Orange Plank Road) & Route 610 (Old Plank Road)				
	Crossover (New or Modify)	1	\$200,000	\$310,000	VDOT / Spotsy Co.
	Turn Lane (New or Improved)	7	\$1,820,000	\$2,450,000	VDOT / Spotsy Co.
	Total		\$2,020,000	\$2,760,000	
8, 9	Intersection of Route 3 (Plank Road) & Route 610 (Elys Ford Road) / Route 610 (Old Plank Road)				
	Turn Lane (New or Improved)	5	\$1,300,000	\$1,750,000	VDOT / Spotsy Co.
	Additional Improvements by Others				Private Developer
	Total		\$1,300,000	\$1,750,000	
10	Locations between Route 618 (River Road) & McLaws Drive				
	Turn Lane (New or Improved)	6	\$1,560,000	\$2,100,000	VDOT / Spotsy Co.
	Close Crossover	1	\$100,000	\$100,000	VDOT / Spotsy Co.
	Total		\$1,660,000	\$2,200,000	
11	Route 3 (Plank Road) & Mclaws Drive				
	Turn Lane (New or Improved)	1	\$365,000	\$470,000	VDOT / Spotsy Co.
	Close Crossover	1	\$100,000	\$100,000	VDOT / Spotsy Co.
	Total		\$465,000	\$570,000	
E	Route 3 (Plank Road) & Glade Drive				
	Provide traffic signal at unsignalized intersection	1	\$350,000	\$450,000	Private Developer
	Close Crossover	2	\$200,000	\$200,000	Private Developer
	Turn Lane (New or Improved)	1	\$365,000	\$470,000	VDOT / Spotsy Co.
	Total		\$915,000	\$1,120,000	

	Location	# of Improvements	Low	High	Responsible Entity
F	Locations between Glade Drive & Route 626 (Andora Drive) / Route 760 (Corter Avenue)				
	Turn Lane (New or Improved)	4	\$1,040,000	\$1,400,000	VDOT / Spotsy Co.
	Right-in / Right-out	1	\$365,000	\$470,000	Private Developer
	Provide traffic signal at unsignalized intersection	1	\$350,000	\$450,000	Private Developer
	Close Crossover	5	\$500,000	\$500,000	Developer/VDOT/Spotsy
	Total		\$2,255,000	\$2,820,000	
	Route 3 Widening				
	1 lane rural section (Eastbound)	0.86	\$412,800	\$636,400	VDOT / Spotsy Co.
	1 lane rural section (Westbound)	0.71	\$340,800	\$525,400	VDOT / Spotsy Co.
	Total		\$753,600	\$1,161,800	
12	Route 3 (Plank Road) & Route 626 (Andora Drive) / Route 760 (Corter Avenue)				
	Turn Lane (New or Improved)	1	\$260,000	\$350,000	Private Developer
	Total		\$260,000	\$1,511,800	
13	Route 3 (Plank Road) & Route 620 West (Spotswood Furnace Drive) / Route 1942 (Big Ben Boulevard)				
	Turn Lane (New or Improved)	3	\$780,000	\$1,050,000	Private Developer
	Total		\$780,000	\$2,561,800	
G	Locations between Route 626 (Andora Drive) & Route 620 (Harrison Road)				
	Crossover (New or Modify)	1	\$200,000	\$310,000	VDOT / Spotsy Co.
	Right-in / Right-out	2	\$730,000	\$940,000	Private Developer
	Close Crossover	2	\$200,000	\$200,000	VDOT / Spotsy Co.
	Total		\$1,130,000	\$1,450,000	
14	Route 3 (Plank Road) & Route 620 (Harrison Road) / Entrance to Harrison Crossing				
	Minimal Cost				VDOT / Spotsy Co.
15	Route 3 (Plank Road) & Route 627 (Gordon Road) / Commercial Entrance				
	Turn Lane (New or Improved)	2	\$520,000	\$700,000	VDOT / Spotsy Co.
	Total		\$520,000	\$700,000	

FIGURE 11, SHEET 1 OF 3: 2040 PEAK HOUR LOS FOR EXISTING INTERSECTIONS – RECOMMENDATION BUILD CONDITION

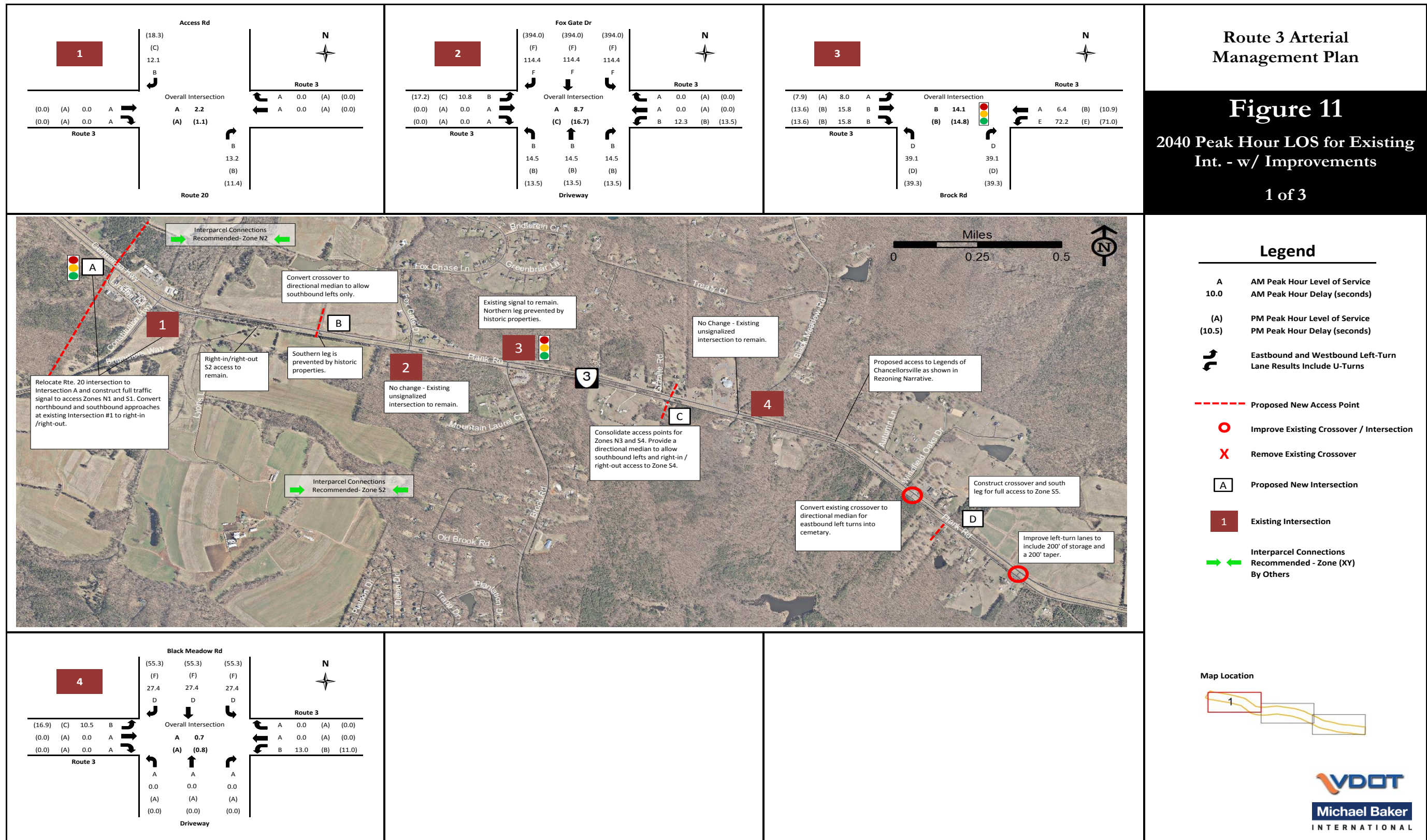


FIGURE 11, SHEET 2 OF 3: 2040 PEAK HOUR LOS FOR EXISTING INTERSECTIONS – RECOMMENDATION BUILD CONDITION

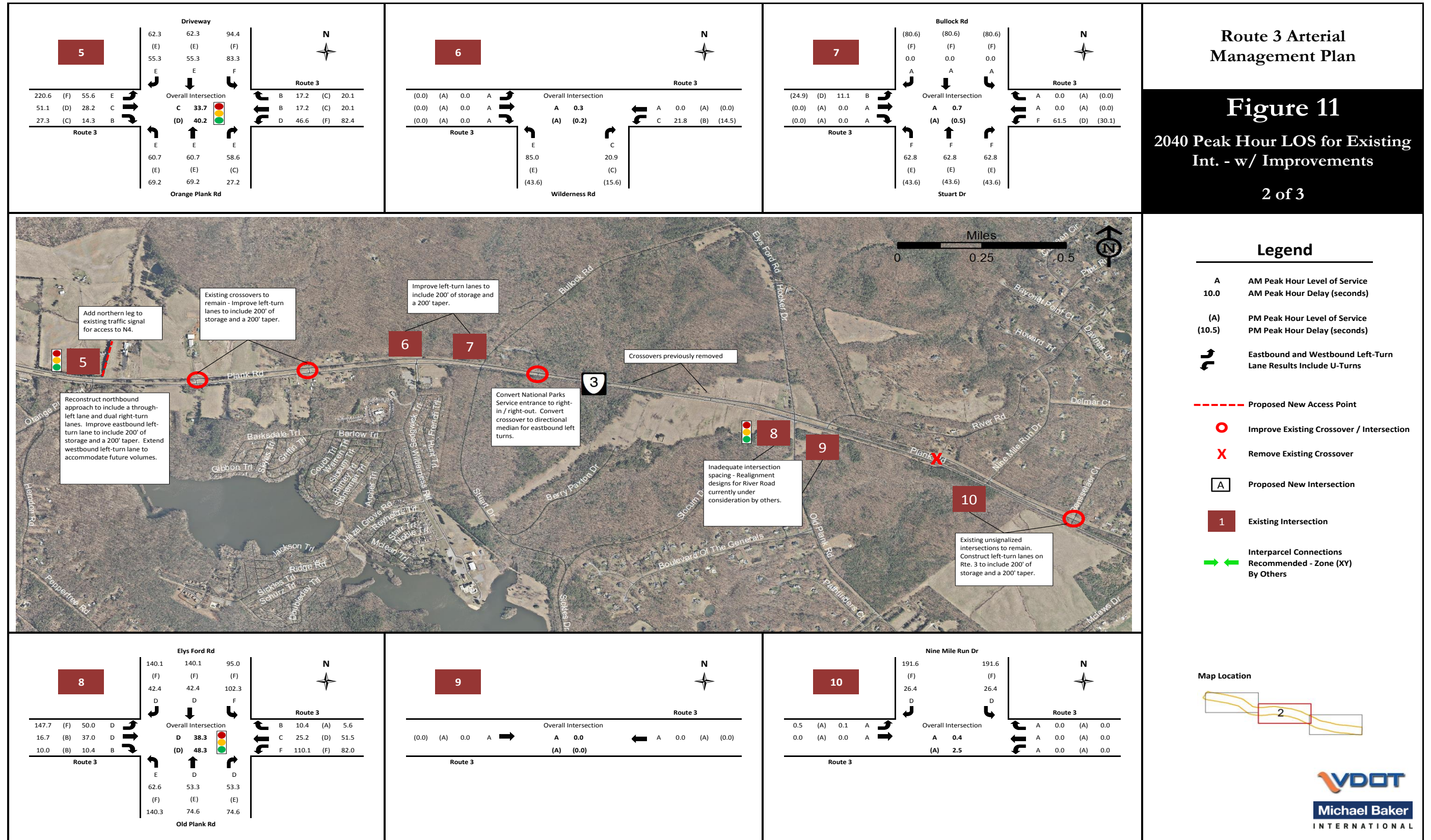


FIGURE 11, SHEET 3 OF 3: 2040 PEAK HOUR LOS FOR EXISTING INTERSECTIONS – RECOMMENDATION BUILD CONDITION

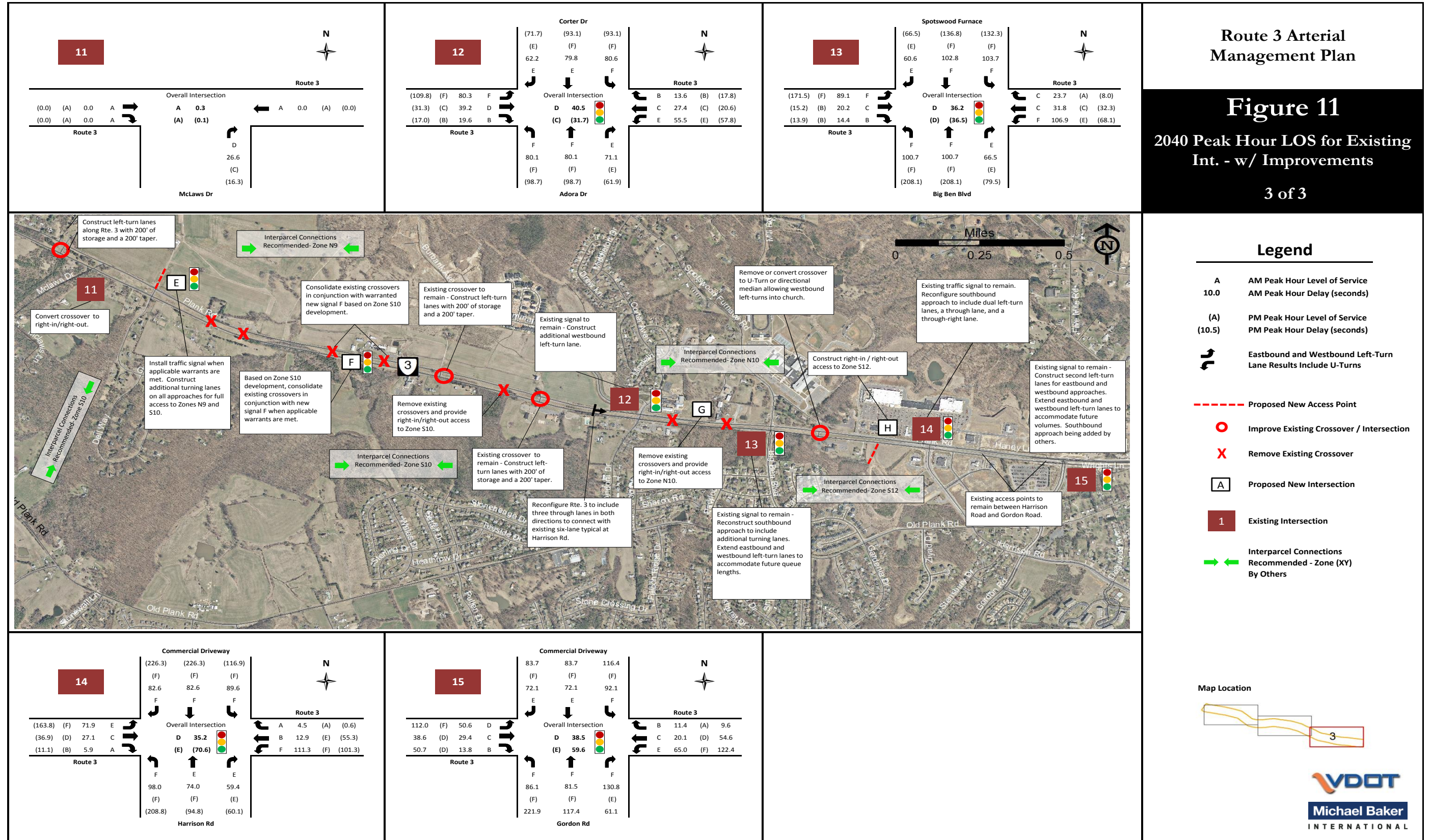


FIGURE 12, SHEET 1 OF 3: 2040 PEAK HOUR LOS FOR PROPOSED NEW INTERSECTIONS – RECOMMENDATION BUILD CONDITION

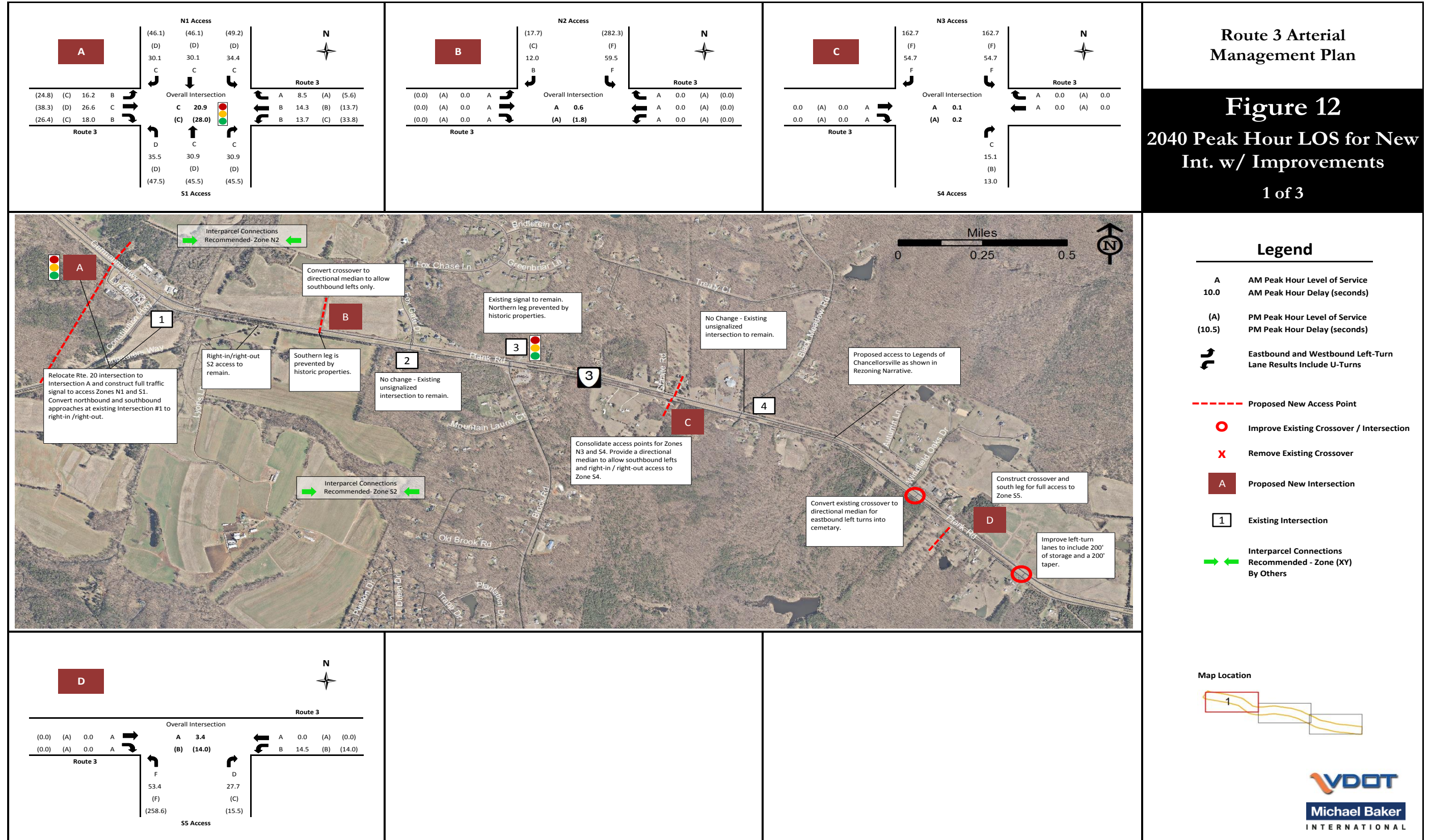


FIGURE 12, SHEET 2 OF 3: 2040 PEAK HOUR LOS FOR PROPOSED NEW INTERSECTIONS – RECOMMENDATION BUILD CONDITION

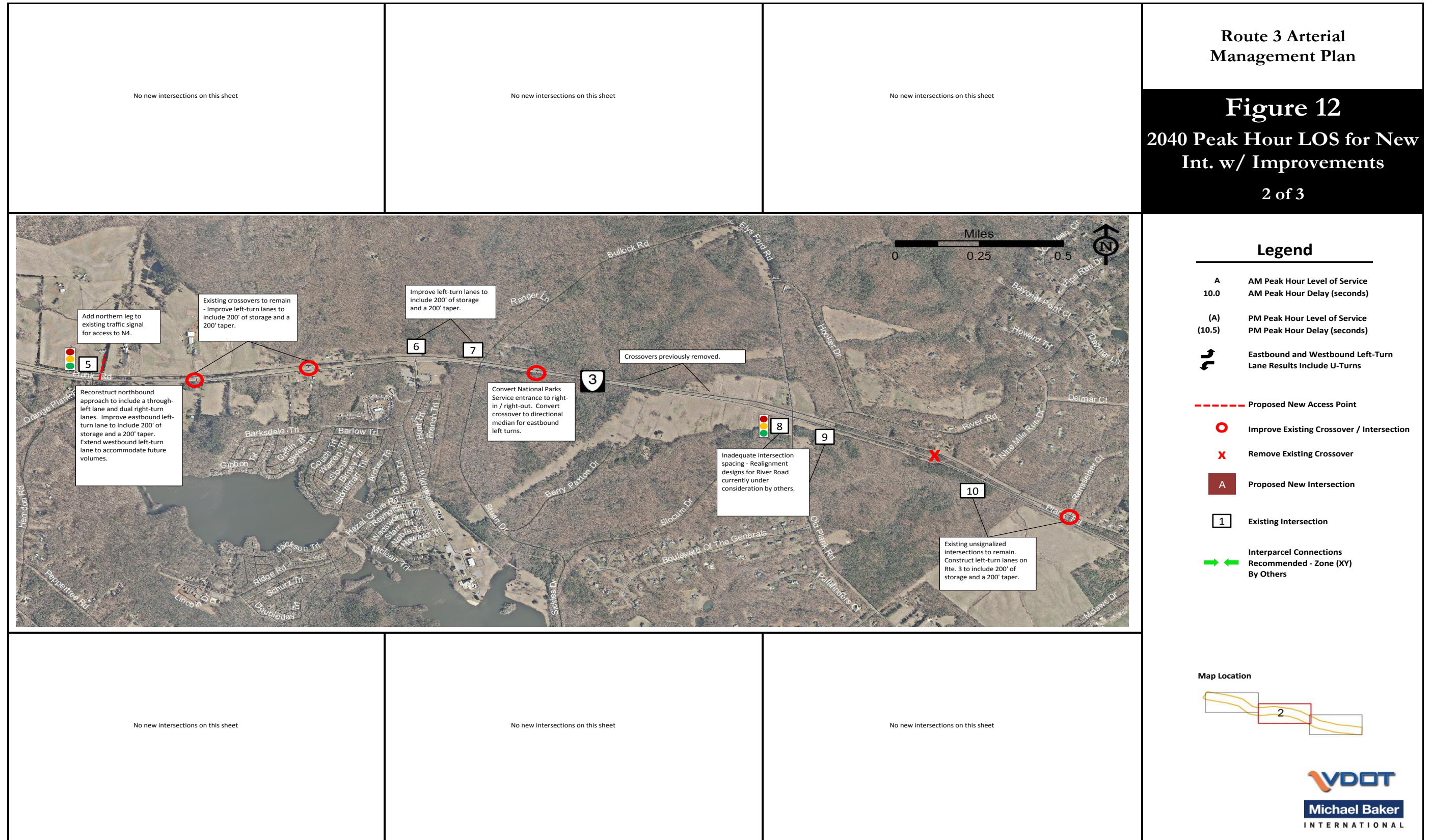
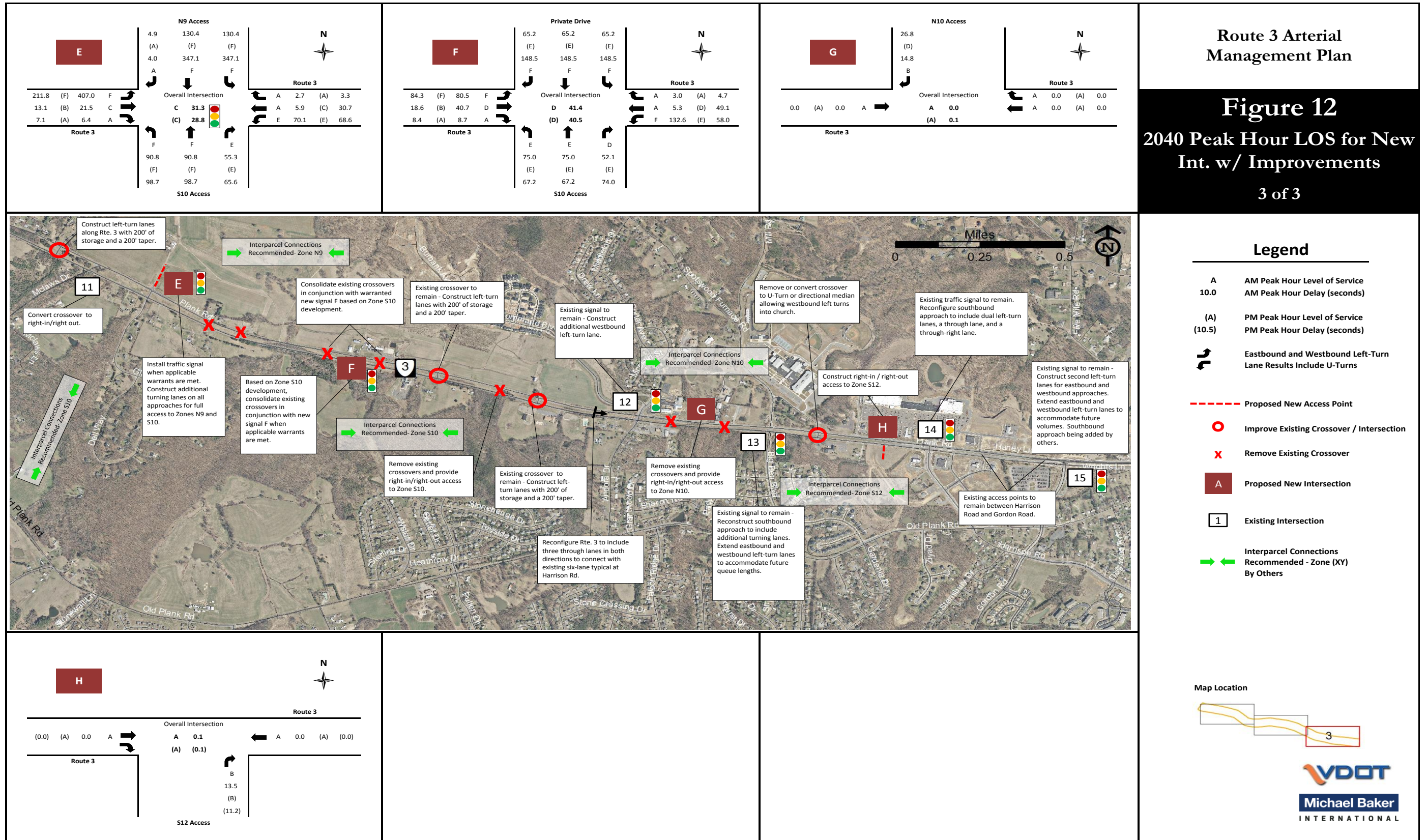


FIGURE 12, SHEET 3 OF 3: 2040 PEAK HOUR LOS FOR PROPOSED NEW INTERSECTIONS – RECOMMENDATION BUILD CONDITION



4.4 CONCLUSION AND NEXT STEPS

Route 3, west of I-95, between Gordon Road and Route 20 is predominately a four-lane divided road that has experienced significant growth within the urbanized eastern end of the study area and is expected to see continuous growth to the west. Future development projects along Route 3 combined with aggressive land development in Orange County will serve as a catalyst for more expansion and thus more traffic along the corridor. To accommodate new land development along the arterial, access to new sites must be strategically planned in advance to minimize the congestion and safety impacts that frequently accompany “strip development”. The recommendations in this report serve as an access management plan to preserve the capacity and efficiency of the Route 3 corridor. The next step would include Spotsylvania County approving this Arterial Management Plan for incorporation into the County Comprehensive Plan. The adoption into the Comprehensive Plan, along with coordination with the National Park Service and other preservation groups would allow Spotsylvania County more control over roadway improvements along Route 3 in the future.