DRMP

TRAFFIC IMPACT ANALYSIS

FOR

NORTH POINTE

LOCATED

IN

ALBEMARLE COUNTY, VIRGINIA

Prepared For:

Southern Classic, Inc.
126 Garrett Street, Suite D
Charlottesville, VA 22902



AUGUST 2025

DRMP Project No. 21803

Prepared By: MM

Reviewed By: GV

DRMP

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License 0407007139

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TRAFFIC IMPACT ANALYSIS

NORTH POINTE

Albemarle County, Virginia

1. INTRODUCTION

This report summarizes the findings of an updated Chapter 527 Traffic Impact Analysis (TIA) for the proposed North Pointe mixed-use community in Albemarle County, Virginia. A TIA was previously conducted for this development by DRMP in April 2024. This update is prepared to address comments issued by the Virginia Department of Transportation (VDOT) on the April 2024 TIA, and includes updated Sidra roundabout analysis and signal warrant analysis.

Refer to Appendix A for TIA scoping documentation, comment memos, and responses to the comments. The purpose of this study is to determine the potential impacts to the surrounding transportation system created by traffic generated by the proposed development, as well as recommend improvements to mitigate the impacts.

1.1. Executive Summary

The proposed development is located on the east side of US 29 north of Proffit Road/Airport Road in Albemarle County, Virginia. The development plan includes:

- 269 single-family homes
- 850 townhomes
- 479 apartments
- 500-student elementary school
- 125-room hotel
- 30,000 square feet (s.f.) general office
- 6,000 s.f. of fast-food restaurants with drive-through
- 10,000 s.f. of high-turnover sit-down restaurants
- 4,000 s.f./12 fueling position (f.p.) convenience store with gas station
- 60,000 s.f. mini-warehouse
- 71,000 s.f. retail
- 60,000 s.f. supermarket

Full build out is anticipated by 2034. The proposed access plan includes two directional crossover driveways on US 29 aligning with Northside Drive and Airport Acres Road and a connection to Leake Square.

Based on the TIA scoping meeting with the County and VDOT on January 13, 2022, the weekday AM and PM peak hours were studied for the following intersections:

- US 29 at Proffit Road / Airport Road
- US 29 NB at South Site Driveway
- US 29 SB at Airport Acres Road
- US29 NB at North Site Driveway
- US 29 SB at Northside Drive
- US 29 SB at Median Break north of Cypress Drive
- US 29 at Lewis and Clark Drive
- Proffit Road at Worth Crossing / Leake Square
- Airport Road at Innovation Drive / Berkmar Drive

Per scoping coordination with the County and VDOT, the following scenarios were analyzed:

- Existing 2023 traffic conditions
- No-build 2034 traffic conditions
- Build 2034 traffic conditions
- Build 2040 traffic conditions – For planning purposes only

The following roadway improvements are currently planned to be constructed by others (see North Fork proffers in Appendix D of this report):

US 29 at Lewis and Clark Drive:

- Construct a second left turn lane on the northbound approach of US 29 to provide dual left turn lanes. (North Fork)
- Construct a second left turn lane on the eastbound approach of Lewis and Clark Drive to provide dual left turn lanes. (North Fork)

Airport Road at Innovation Drive/Berkmar Drive Extension:

- Extend Berkmar Drive to become the south leg of the intersection and construct a two-lane roundabout at Airport Road (Albemarle County Berkmar Drive Ext project)

The following roadway improvements are recommended to be constructed by the developer **if not constructed by others.* Additional analysis may be needed to determine the appropriate stage of build out at which each improvement is needed. Refer to Appendix P for plans showing the daily development trip thresholds at which improvements are proposed to be completed.

US 29:

- Construct a third through lane northbound between Airport Road/Proffit Road and the Airport Acres Road median break/South Site Driveway. **This improvement*

was previously identified to be constructed by the North Fork development; however, current North Fork proffers indicate monetary contributions to the County CIP fund to improve US 29.

US 29 at Airport Road/Proffit Road:

- Restripe/widen the southbound approach of US 29 to provide dual left turn lanes. The turn lanes should each provide a minimum of 275 ft of storage.
- Construct a second receiving lane eastbound on Proffit Road.
- Construct an exclusive right turn lane on the westbound approach of Proffit Road. The turn lane should provide a minimum of 100 ft of storage.
- Convert the existing exclusive right turn lane on the northbound approach of US 29 to a shared through-right turn lane. **This improvement was previously identified to be constructed by the North Fork development; however, current North Fork proffers indicate monetary contributions to the County CIP fund to improve US 29.*

US 29 NB at South Site Driveway:

- Construct a third through lane northbound on US 29.
- Restripe existing pavement to provide dual right turn lanes on the westbound approach of the South Site Driveway.
- Signalize intersection when warranted and approved by VDOT.

US 29 NB at North Site Driveway:

- Construct a third through lane northbound on US 29 and carry an appropriate distance north of the intersection before tapering back to two through lanes northbound.
- Restripe existing pavement to provide dual right turn lanes on the westbound approach of the North Site Driveway.
- Signalize intersection when warranted and approved by VDOT.

US 29 SB at Northside Drive:

- Signalize intersection when warranted and approved by VDOT.

US 29 SB at Median Break:

- Construct/restripe a second left turn lane to provide dual u-turn lanes on the northbound approach of US 29. Each lane should provide a minimum of 200 ft of storage.
- Signalize intersection when warranted and approved by VDOT.

Proffit Road at Worth Crossing/Leake Square:

- Construct a single-lane roundabout with an eastbound right turn slip lane. The roundabout geometry should accommodate large vehicles (wb-62).

1.2. Site Location and Study Area

The proposed mixed-use community is located in the northeast quadrant of the US 29 at Proffit Road/Airport Road intersection in Albemarle County. Based on the TIA scoping meeting with the County and VDOT on January 13, 2022, the study area consists of the following intersections:

- US 29 at Proffit Road / Airport Road
- US 29 at Airport Acres Road / Site Driveway
- US29 at Northside Drive / Site Driveway
- US 29 at Median Break north of Cypress Drive
- US 29 at Lewis and Clark Drive
- Proffit Road at Worth Crossing / Leake Square
- Airport Road at Innovation Drive / Berkmar Drive

Figure 1 illustrates the site location and study intersections.

1.3. Existing Land Uses

The subject property is currently zoned Planned Development – Mixed Commercial (PDMC), and the proposed zoning is Neighborhood Model District (NMD). The surrounding area consists of primarily undeveloped land with some residential and commercial to the west and south.

1.4. Proposed Land Uses and Access

The development plan includes:

- 269 single-family homes
- 850 townhomes
- 479 apartments
- 500-student elementary school
- 125-room hotel
- 30,000 square feet (s.f.) general office
- 6,000 s.f. of fast-food restaurants with drive-through
- 10,000 s.f. of high-turnover sit-down restaurants
- 4,000 s.f./12 fueling position (f.p.) convenience store with gas station
- 60,000 s.f. mini-warehouse
- 71,000 s.f. retail
- 60,000 s.f. supermarket

Full build out is anticipated by 2034. The proposed access plan includes two directional crossover driveways on US 29 aligning with Northside Drive and Airport Acres Road and a connection to Leake Square. Figure 2 shows the conceptual site plan.

1.5. Existing Roadway Network

US 29 (Seminole Trail) is a four-lane divided Principal Arterial with a posted speed limit of 45 mph south of Airport Acres Road and 55 mph north of Airport Acres Road and an average daily traffic (ADT) volume of approximately 39,000 vehicles per day (vpd).

Route 649 (Proffit Road / Airport Road) is a four-lane divided Minor Arterial with an ADT volume of approximately 8,700 vpd and posted speed limit of 45 mph west of US 29. Route 649 is a two-lane Major Collector with an ADT volume of approximately 8,000 vpd and a posted speed limit of 35 mph east of US 29.

Lewis and Clark Drive is a four-lane divided Major Collector with an ADT volume of approximately 3,000 vpd and a posted speed limit of 35 mph.

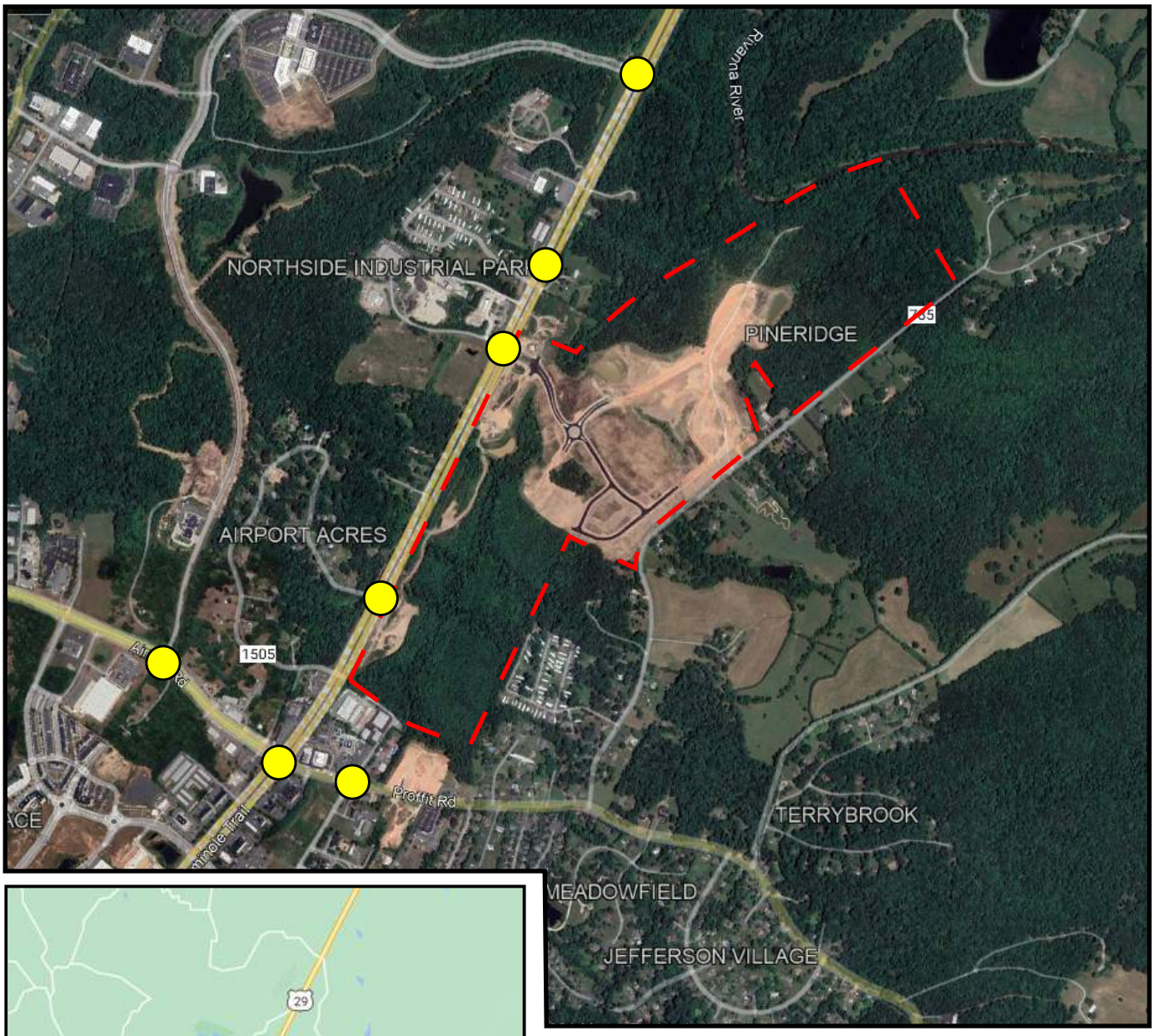
Route 1722 (Worth Crossing) is a local roadway with an ADT volume of approximately 1,900 vpd and a posted speed limit of 35 mph.

Innovation Drive is a two-lane local roadway with an ADT volume of approximately 1,400 vpd and a posted speed limit of 35 mph.

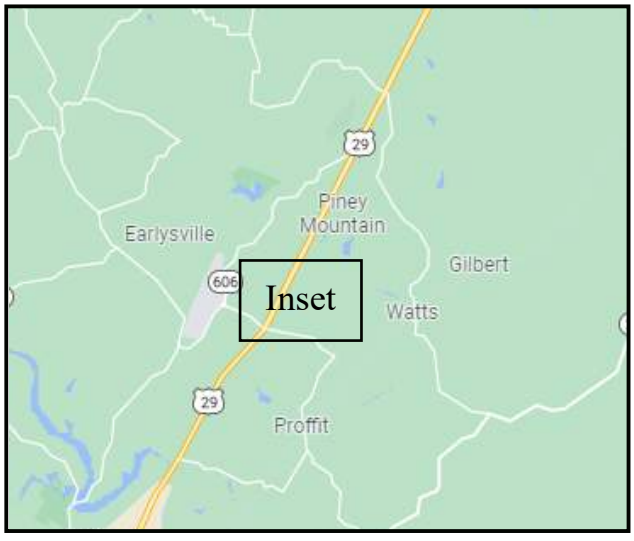
Northside Drive is a local roadway with an ADT volume of approximately 600 vpd and an unposted speed limit.

Airport Acres Road is a local roadway with an ADT volume of approximately 210 vpd and a posted speed limit of 25 mph.

Figure 3 shows the existing lane configurations.



Inset



Overview

LEGEND

N

Study Intersection

Site Boundary

DRMP	North Pointe Albemarle County, Virginia	Site Location and Study Intersections Scale: Not to Scale | Figure 1

EXISTING
162 SINGLE
FAMILY

STEEP ROCK DRIVE

PRITCHETT LANE

160 CONDOS

EXISTING
106 SINGLE
FAMILY

EXISTING
279 APTS

96 CONDOS

500 STUDENT
ELEMENTARY SCHOOL

147 CONDOS

PROFFIT ROAD

EXISTING
200 APTS

350 CONDOS

SEMINOLE TRAIL

APPROX. 105 CONDOS

NORTH POINTE

CONCEPTUAL EXHIBIT

RIVANNA DISTRICT
ALBEMARLE COUNTY, VIRGINIA

GREAT EASTERN MANAGEMENT
2519 HYDRAULIC ROAD
CHARLOTTESVILLE, VA 22901
DAVID MITCHELL, E.I.T.
PHONE: (434) 296-4109
FAX: (434) 963-2670
E-MAIL: david@southern-classic.com

TOWNES SITE ENGINEERING
C/O BRIAN C. MITCHELL, P.E.
1 PARK WEST CIRCLE, SUITE 108
MIDLOTHIAN, VA 23114
PHONE: (804) 748-9011
FAX: (804) 748-2590
E-MAIL: BMITCHELL@CCTOWNES.COM

AREA TO BE REZONED TO PD-MC
WITH SUP FOR RESIDENTIAL USES

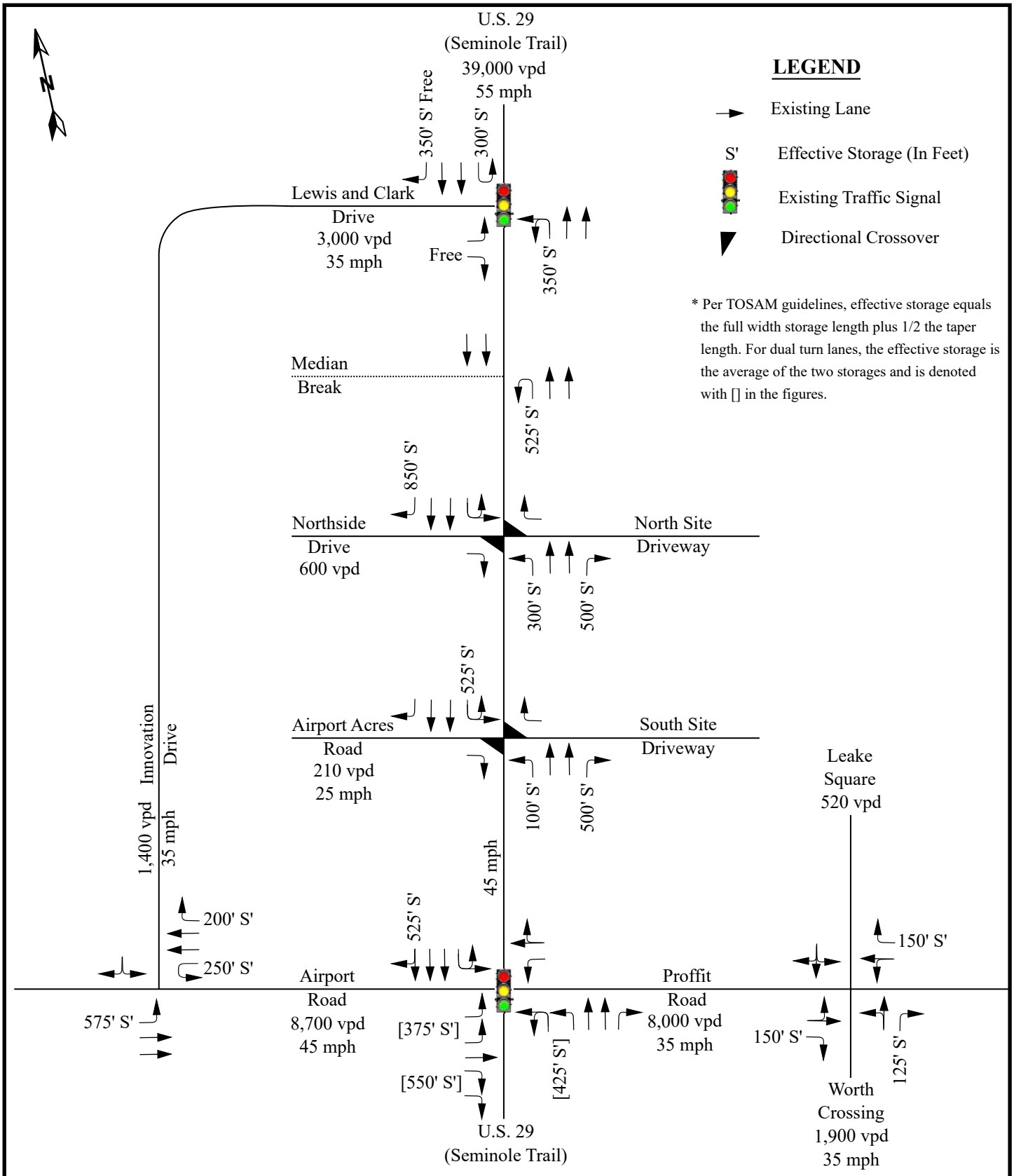
GRAPHIC SCALE

500 0 250 500 1000

1 inch = 500 ft.

GREAT EASTERN MANAGEMENT COMPANY

Townes SITE ENGINEERING



DRMP	North Pointe Albemarle County, Virginia	Existing Lane Configurations Scale: Not to Scale | Figure 3

2. TRAFFIC ANALYSIS PROCEDURE

The traffic capacity analysis was performed using Synchro 11 and Sidra Intersection 9. Both models are comprehensive software packages that allows the user to determine the level-of-service (LOS) for the study intersections based on the control delay thresholds specified in the Highway Capacity Manual (HCM) 6th Edition. LOS is a qualitative measure of traffic operation that ranges from LOS A, which represents free-flow conditions, to LOS F, which represents congestion and long delays.

For signalized intersections, Synchro calculates the average control delay and queue length for each lane group, and the LOS for the overall intersection. For unsignalized intersections, Synchro calculates the average control delay and queue length for stop-controlled movements but does not provide an overall LOS for the intersection. Table 1 shows the control delay thresholds for unsignalized and signalized movements.

Table 1: Highway Capacity Manual – Levels-of-Service and Delay

UNSIGNALIZED INTERSECTION		SIGNALIZED INTERSECTION	
LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)
A	0-10	A	0-10
B	10-15	B	10-20
C	15-25	C	20-35
D	25-35	D	35-55
E	35-50	E	55-80
F	>50	F	>80

LOS D is typically an acceptable overall LOS for signalized intersections, and it is common for left-turn and minor street movements to experience LOS E or F at signalized and unsignalized intersections.

3. 2023 EXISTING PEAK HOUR CONDITIONS

Existing lane configurations and turn lane storage lengths were collected in the field by DRMP. Traffic signal timing information was provided by VDOT and is included in Appendix B. The following AM peak hour (7:00 to 9:00 AM) and PM peak hour (4:00 to 6:00 PM) turning movement counts were conducted by Quality Counts and obtained from the North Fork Residential Rezoning TIA by Timmons Group, dated December 2021:

- US 29 at Airport Road / Proffit Road
- US 29 at Lewis and Clark Drive
- Airport Drive at Innovation Drive

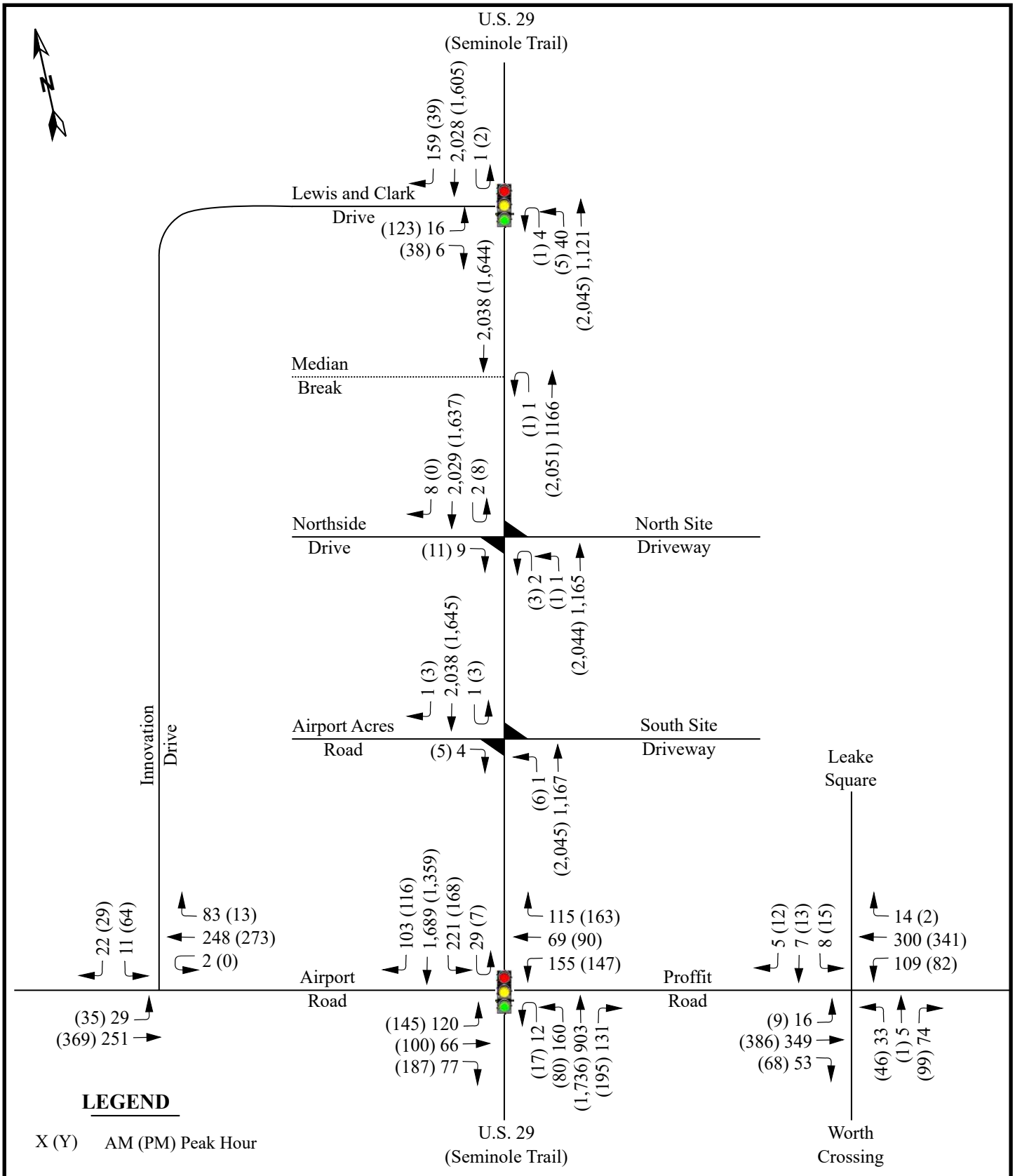
The AM and PM peak hour turning movement counts for the following intersections were conducted by Burns Services, Inc. during the week of January 24, 2022:

- US 29 at Airport Acres Road
- US 29 at Northside Drive
- Proffit Road at Worth Crossing / Leake Square

Based on scoping coordination with the County and VDOT, count volumes were grown by an annual rate of 1.0% to estimate the existing condition (2023) volumes. Figure 4 shows the 2023 AM and PM peak hour volumes at the study intersections. Count data are provided in Appendix C.

3.1. Analysis of 2023 Existing Peak Hour Traffic Conditions

The existing (2023) weekday AM and PM peak hour traffic volumes at the study intersections were analyzed to determine the current LOS under existing roadway conditions. The results of the analysis are presented in Section 8 of this report.



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North Pointe
Albemarle County, Virginia

Existing (2023) Peak Hour Traffic Volumes

Scale: Not to Scale | Figure 4

4. 2034/2040 NO-BUILD PEAK HOUR CONDITIONS

In order to account for growth of traffic and subsequent traffic conditions at a future year, no-build traffic projections are needed. No-build traffic is the component of traffic due to the growth of the community and surrounding area that is anticipated to occur regardless of whether the proposed development is constructed. No-build traffic is comprised of background traffic growth within the study area and additional traffic created as a result of adjacent approved developments.

4.1. Background Traffic Growth

Based on historical ADT's and discussions with the County and VDOT, an annual background growth rate of 1.0% was applied to existing traffic volumes to estimate future projected traffic volumes. This growth rate is also consistent with the growth rate used in the North Fork Residential Rezoning TIA. Projected (2034) and projected (2040) peak hour traffic volumes are shown in Figure 5 and Figure 6, respectively.

4.2. Approved Development Traffic

Based on scoping discussions with the County and VDOT, there are three approved developments in the vicinity of the site that were included in the analysis.

North Fork is a proposed mixed-use community located in the southwest quadrant of the US 29 at Lewis and Clark Drive. Timmons Group performed a TIA for this community in December 2021 and Figures 7 and 8 show the North Fork site trips based on that TIA. Refer to Appendix D for copies of the site trip figures from the North Fork TIA.

Maplewood townhomes are located in the southwest quadrant of the Proffit Road at Worth Crossing / Leake Square intersection. A TIA was not required, so the trip potential of the townhomes was estimated based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual – 11th Edition.* Table 2, on the following page, shows the ITE trip generation calculation for the Maplewood townhomes.

Table 2: Maplewood – ITE Trip Generation – 11th Edition

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Multifamily Housing – Mid-Rise (221)	102 units	464	9	29	24	16

The Maplewood townhomes site trip distribution and assignment are shown in Figure 9 and Figure 10, respectively.

3223 Proffit Road is a proposed residential community located in the northeast quadrant of the Proffit Road at Worth Crossing / Leake Square intersection. The development plan includes up to 80 residential units, with 54 single-family attached townhomes in Block A. It was assumed that the remainder of the residential units are single-family detached units to be conservative. A TIA was not required, so the trip potential of the community was estimated based on the ITE *Trip Generation Manual – 11th Edition.* Table 3 shows the ITE trip generation calculation for the Maplewood townhomes.

Table 3: 3223 Proffit Road – ITE Trip Generation – 11th Edition

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single-Family – Detached Housing (210)	26 lots	292	6	16	18	10
Single-Family – Attached Housing (215)	54 units	390	8	18	18	13
Total	**80 units**	**682**	**14**	**34**	**36**	**23**

The 3223 Proffit Road site trip distribution is shown in Figure 11 and the trip assignment is shown in Figure 12.

The total approved development trips are shown in Figure 13.

4.3. Berkmar Drive Extension Traffic Diversions

Berkmar Drive is planned to be extended from Timberwood Boulevard to Airport Road. The anticipated 2034 diverted traffic volumes with the extension in place were estimated based on information contained within the March 2018 Berkmar Drive Extension Traffic Report. Refer to Figure 14 for the 2034 diverted traffic volumes.

4.4. 2034/2040 No-Build Peak Hour Traffic Volumes

The no-build (2034 and 2040) peak hour traffic volumes were estimated by adding the total approved development trips (Figure 13) and the anticipated diverted traffic volumes with the Berkmar Drive Extension (Figure 14) to the projected (2034 and 2040) peak hour traffic volumes (Figure 5 and Figure 6). Refer to Figure 15 for the no-build (2034) peak hour traffic volumes. No-build (2040) peak hour traffic volumes are shown in Figure 16.

4.5. Analysis of No-Build Peak Hour Traffic Conditions

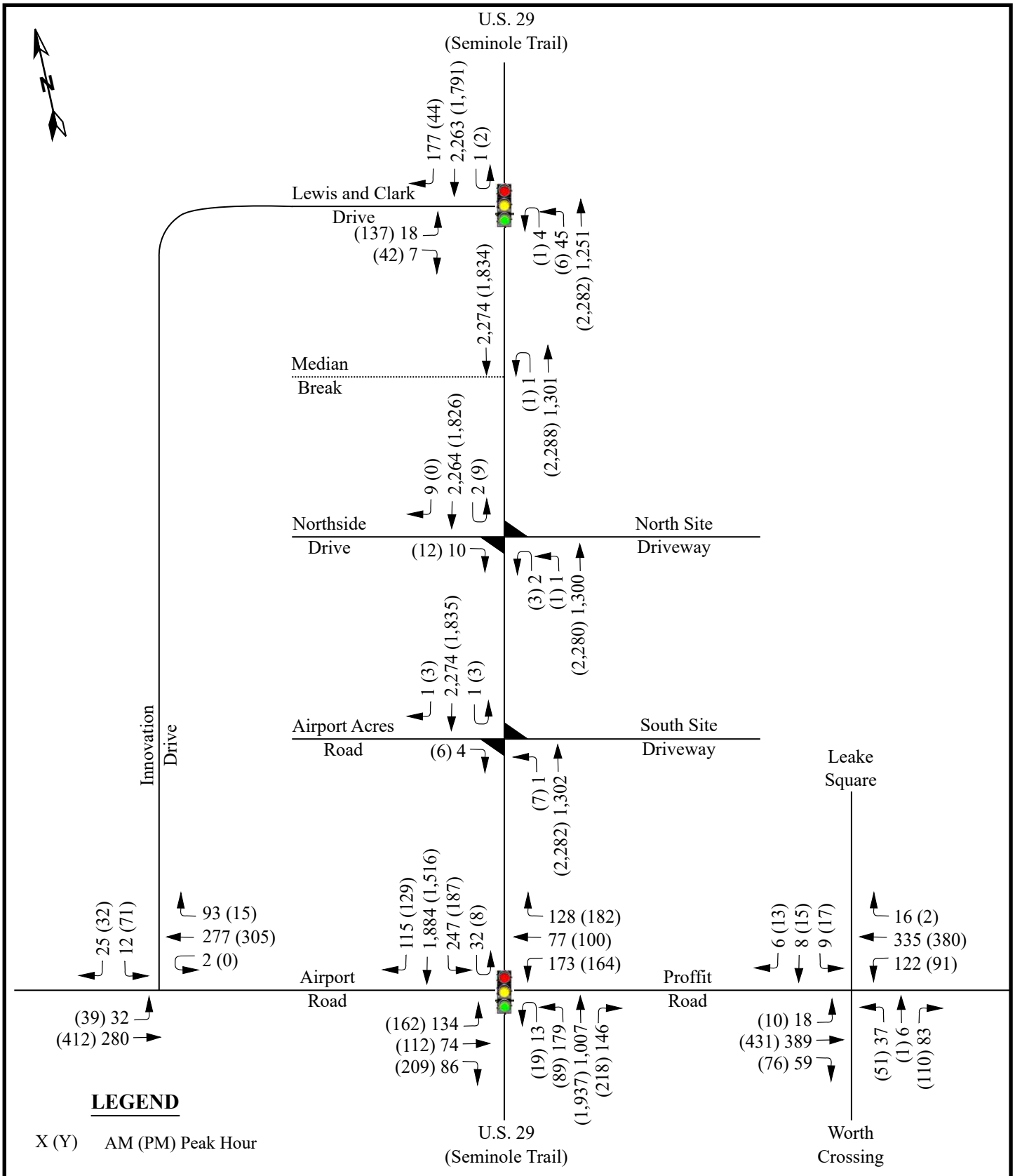
No-build (2034 and 2040) conditions were analyzed with the following improvements anticipated to be constructed by approved developments in place:

- Construct a second left turn lane with approximately 500 ft of storage on the northbound approach of US 29 at Lewis and Clark Drive. (North Fork)
- Construct a second left turn lane with approximately 200 ft of storage and a 200 ft taper on the eastbound approach of Lewis and Clark Drive at US 29. (North Fork)
- Berkmar Drive Extension and construction of roundabout at the intersection of Airport Road and Innovation Drive/Berkmar Drive Extension. (County)

In addition to the above improvements, the following improvements were also analyzed under no-build conditions. It is possible that these improvements may be made by the County with CIP funds. However, if these improvements are not constructed by the County or others, they may be the responsibility of this development.

- Convert the existing exclusive right turn lane on the northbound approach of US 29 to a shared through-right turn lane.
- Construct a third through lane northbound on US 29 between Airport Road/Proffit Road and the Airport Acres Road median crossover.

Refer to Appendix D for more information on improvements by approved developments. The results of the no-build (2034 and 2040) traffic conditions analyses are presented in Section 8 of this report.

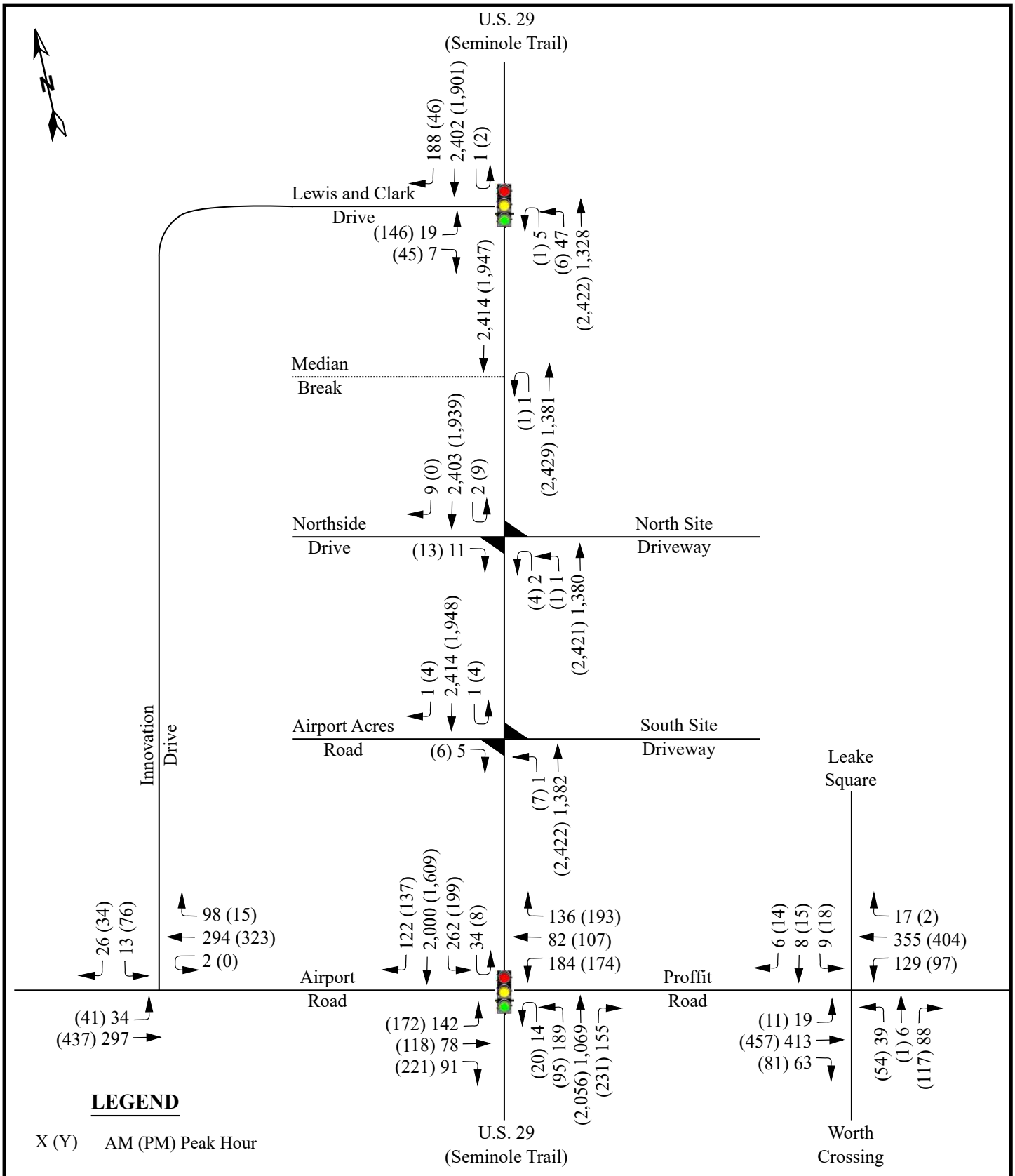


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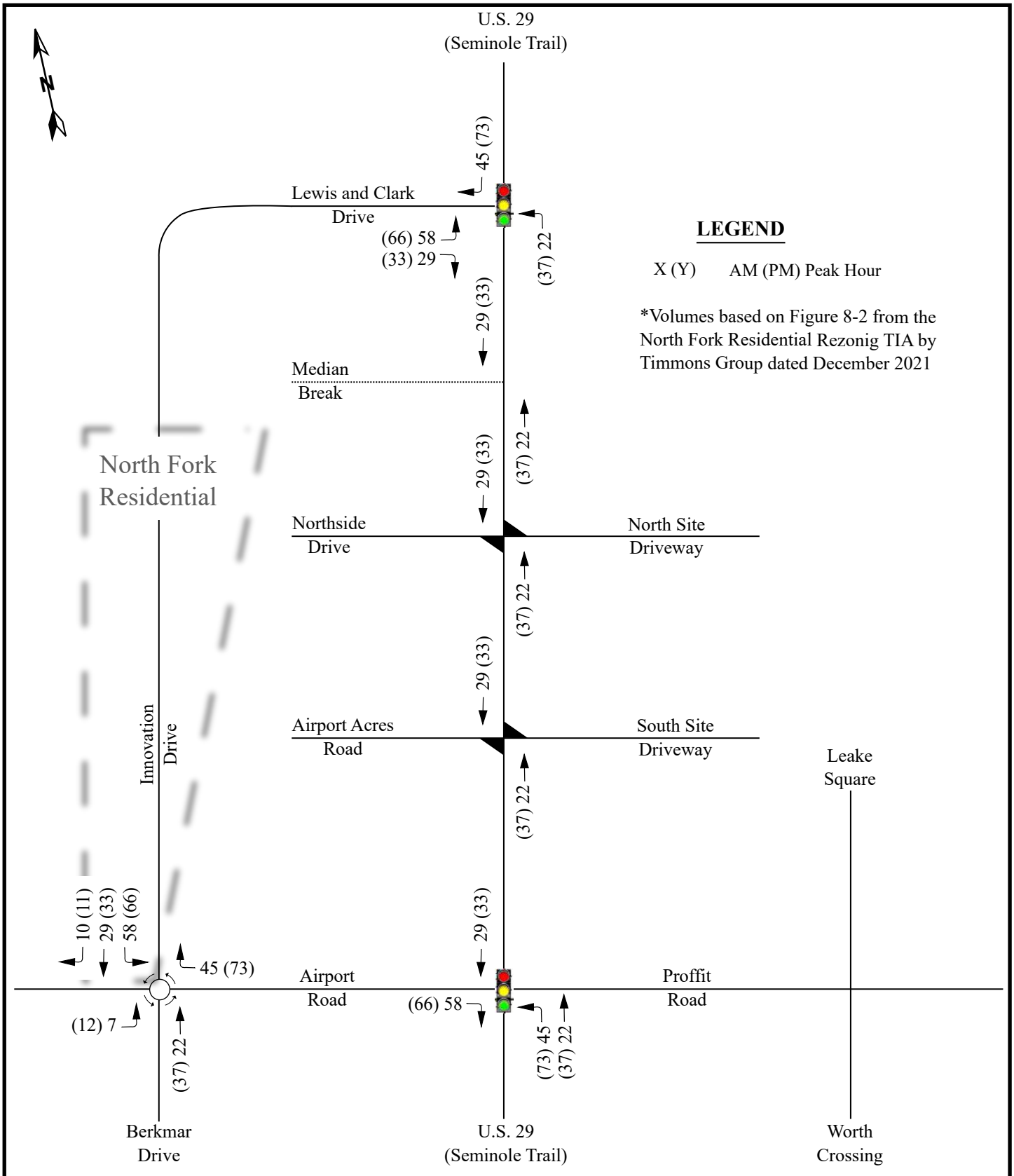
North Pointe
Albemarle County, Virginia

Projected 2034 Volumes
(Growth Only)

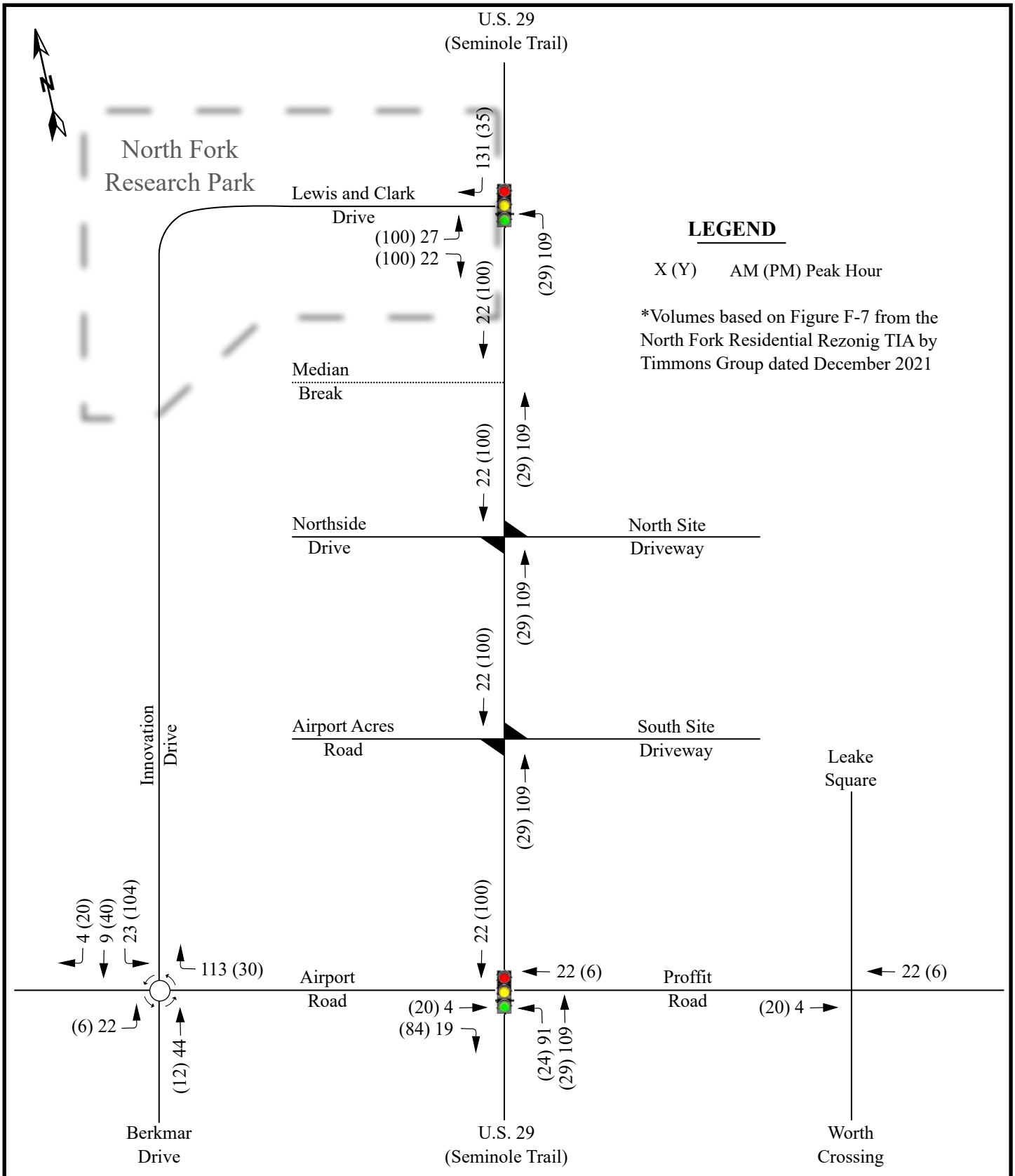
Scale: Not to Scale | Figure 5



DRMP	North Pointe Albemarle County, Virginia	Projected 2040 Volumes (Growth Only)
		Scale: Not to Scale / Figure 6



DRMP	North Pointe Albemarle County, Virginia	North Fork Residential Trips Scale: Not to Scale | Figure 7

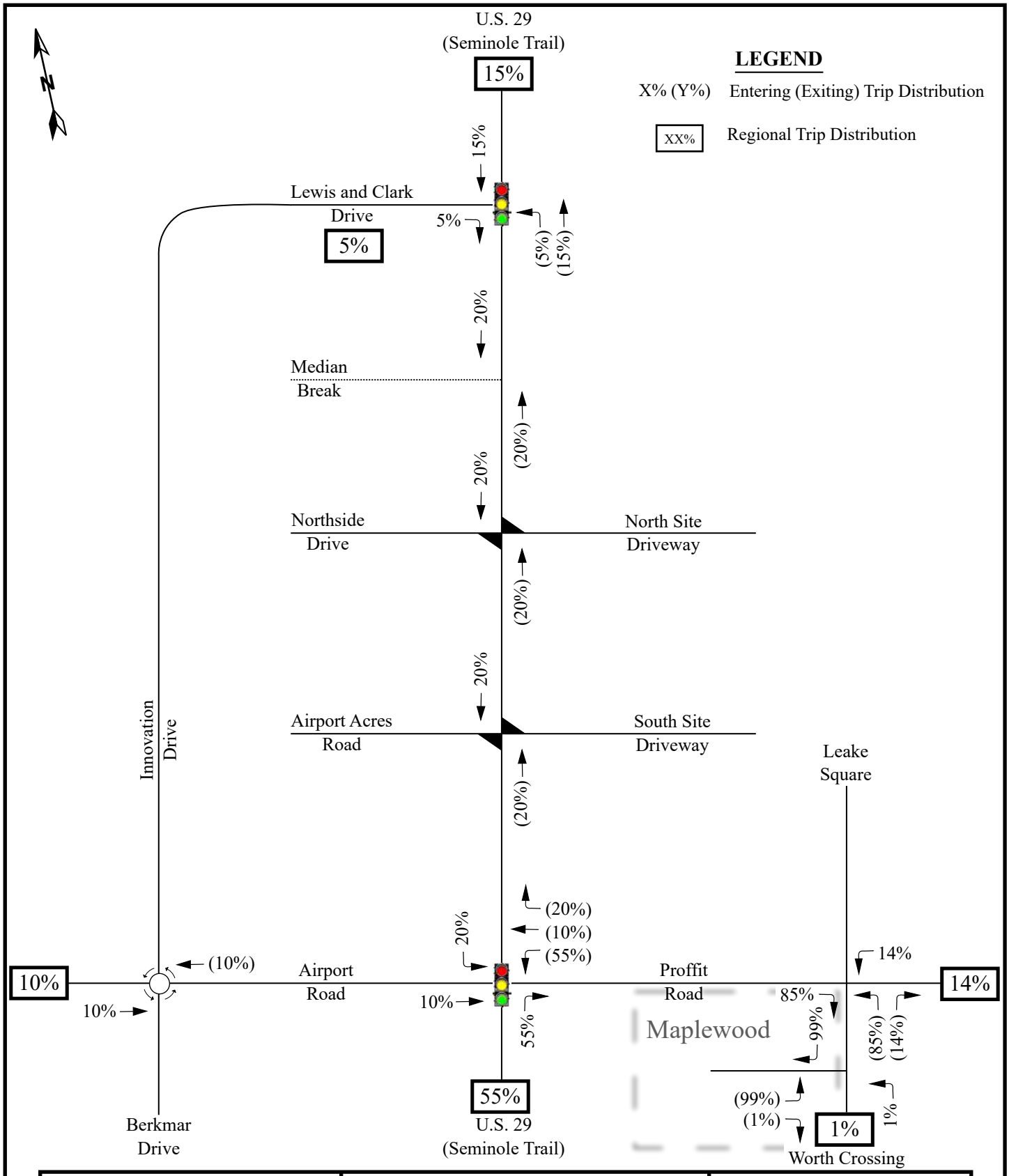


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North Pointe
Albemarle County, Virginia

North Fork Research Park Trips

Scale: Not to Scale | Figure 8

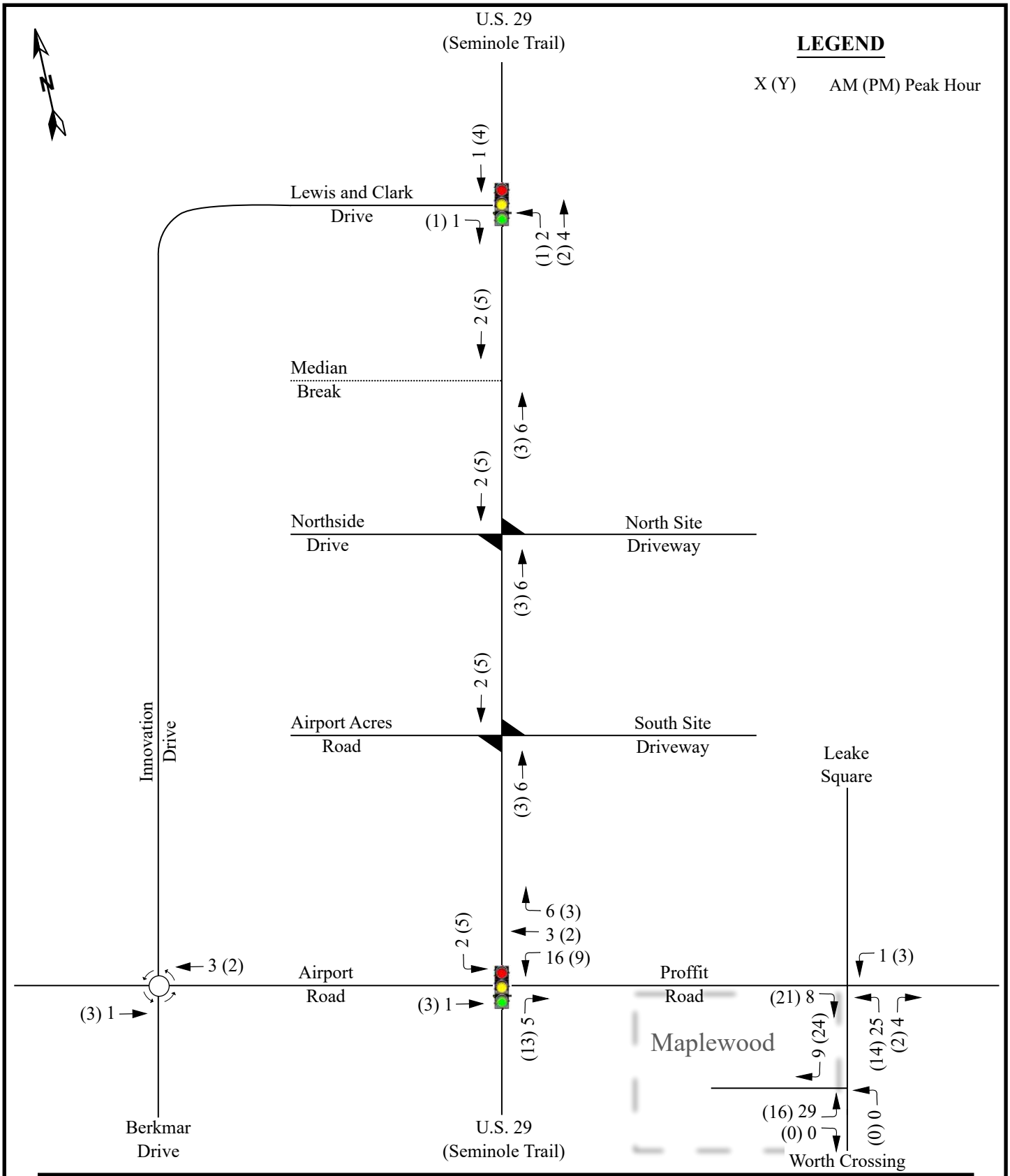


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North Pointe
Albemarle County, Virginia

Maplewood Site Trip Distribution

Scale: Not to Scale | Figure 9

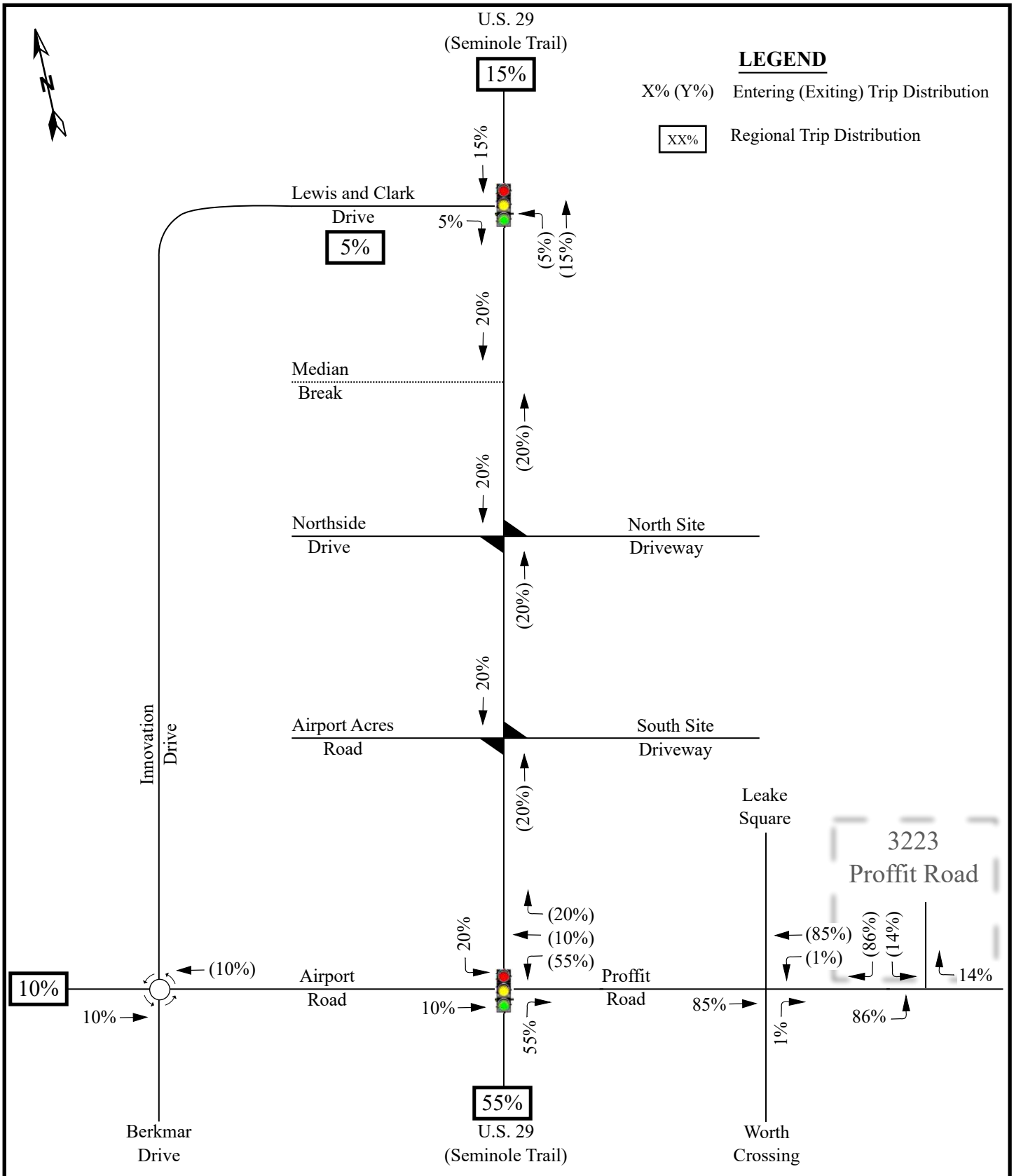


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North Pointe
Albemarle County, Virginia

Maplewood Site Trip Assignment

Scale: Not to Scale | Figure 10

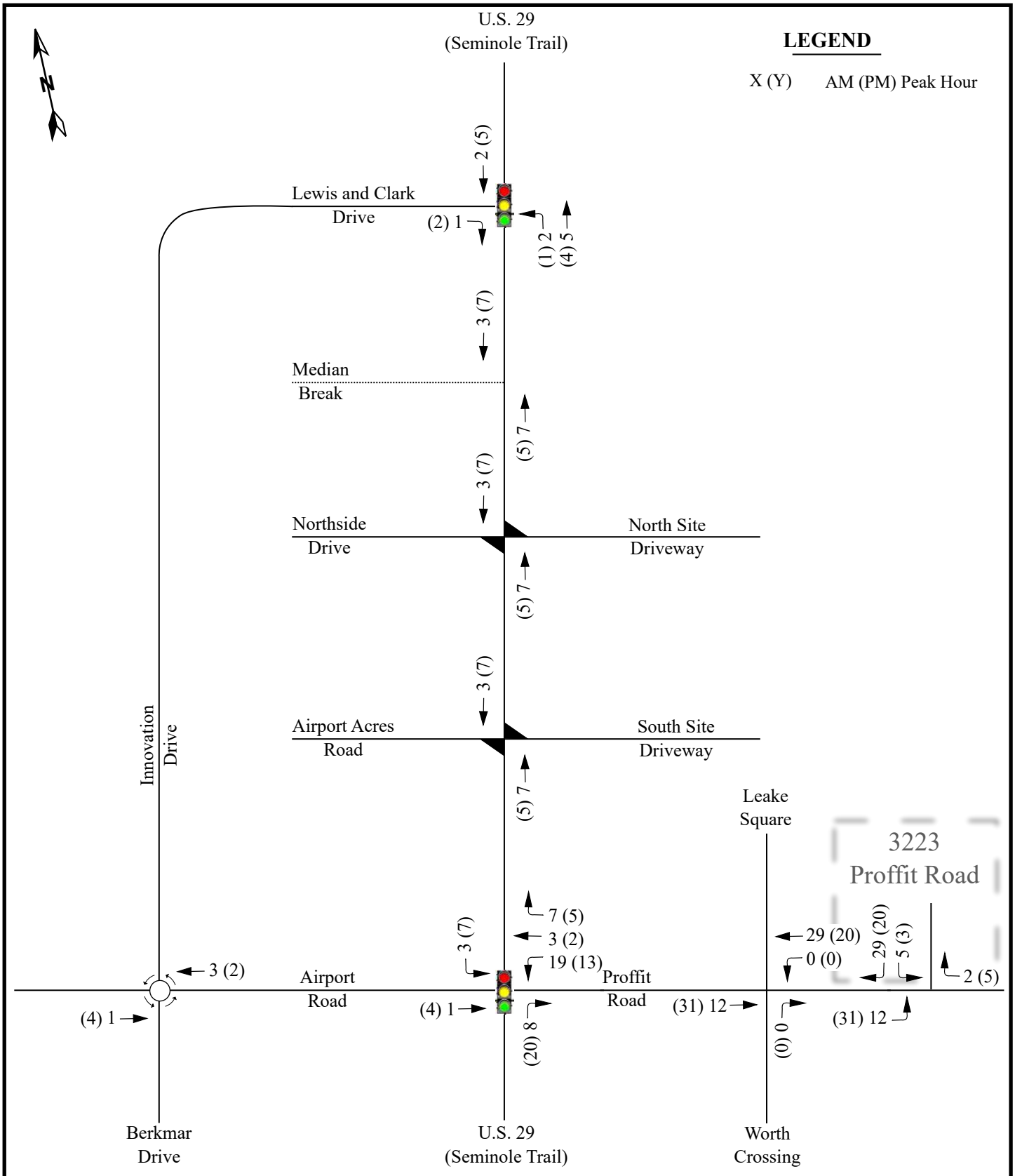


DRMP

North Pointe
Albemarle County, Virginia

3223 Proffit Road Site
Trip Distribution

Scale: Not to Scale | Figure 11

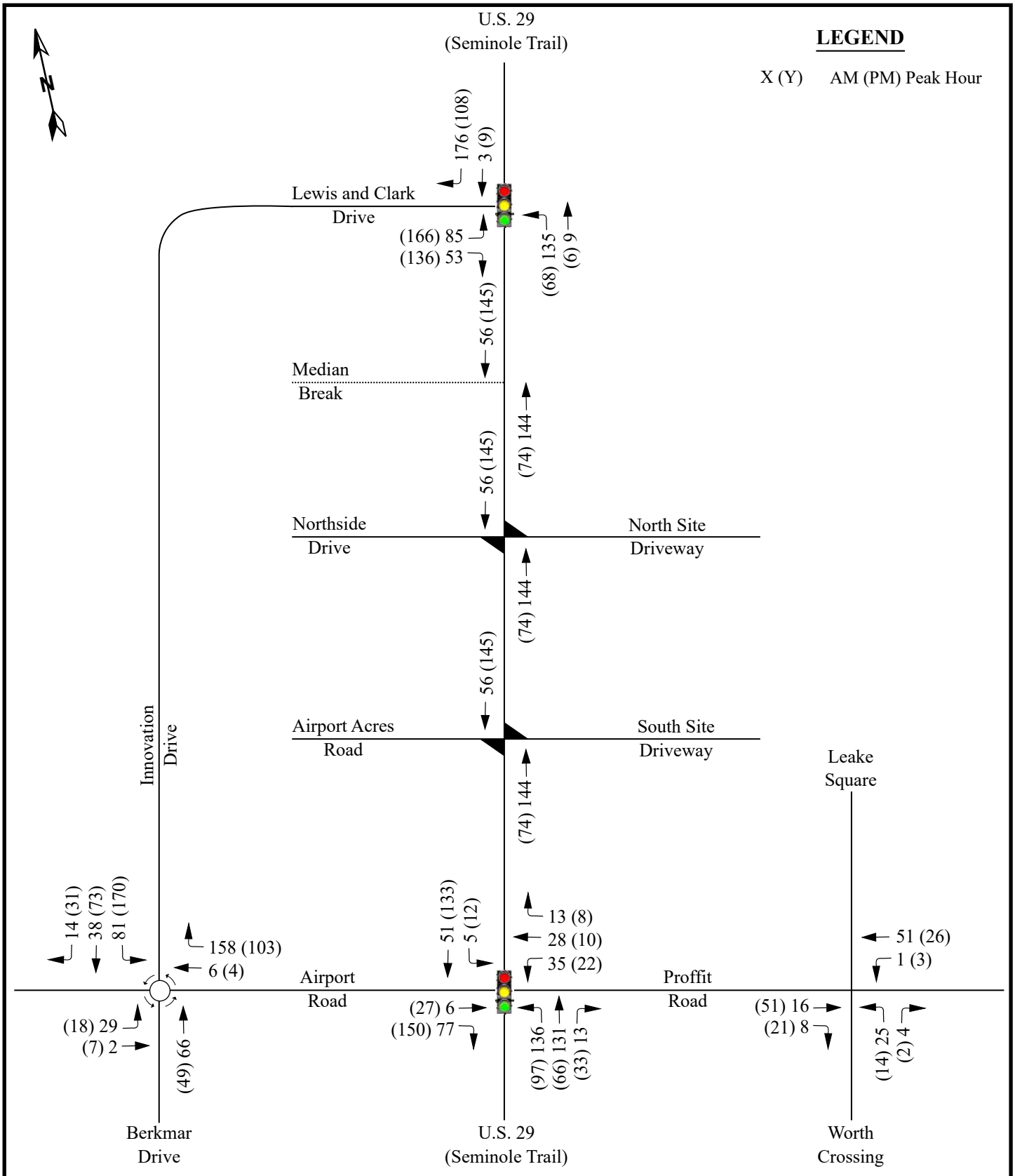


DRMP

North Pointe
Albemarle County, Virginia

3223 Proffit Road Site
Trip Assignment

Scale: Not to Scale | Figure 12

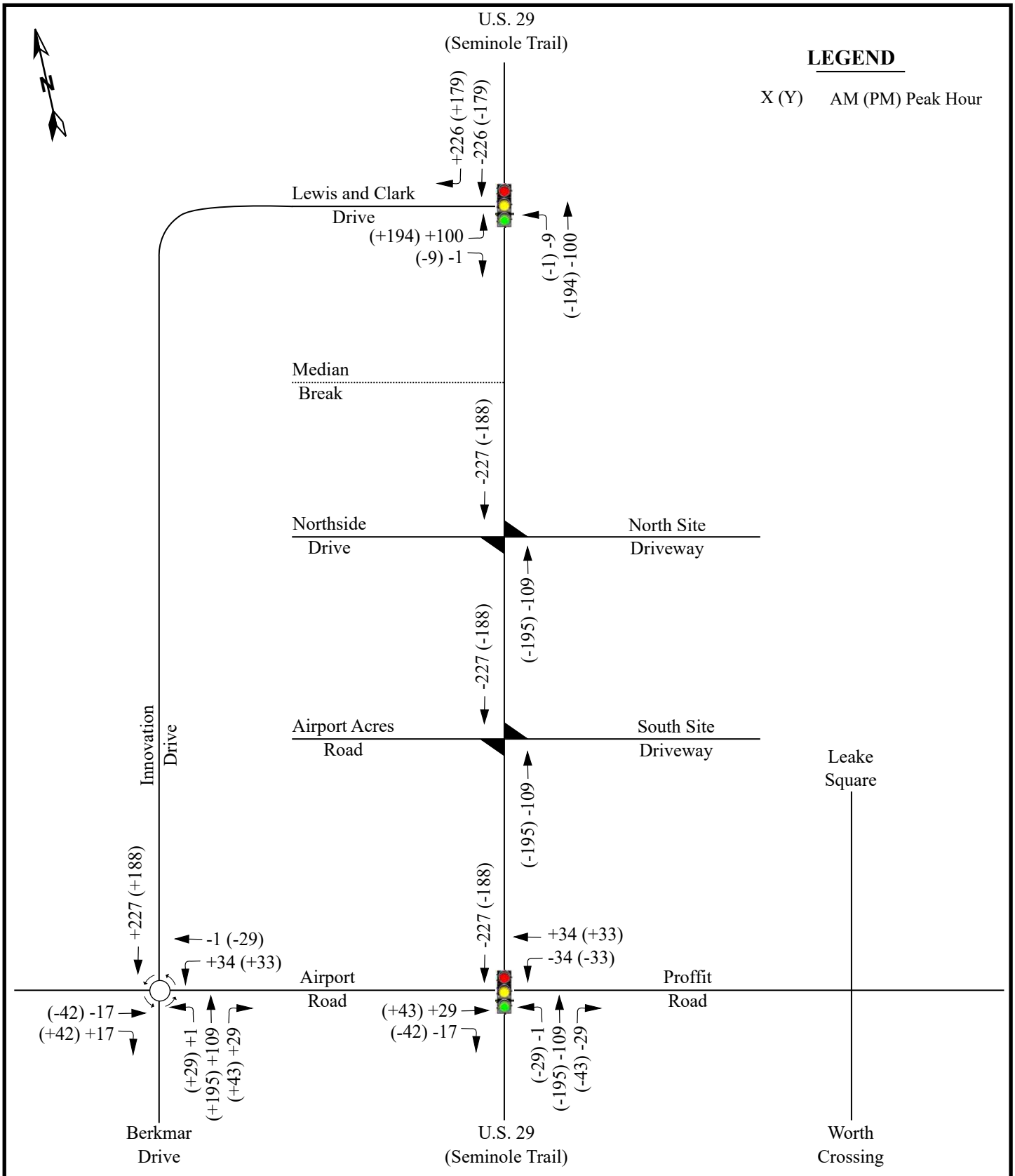


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North Pointe
Albemarle County, Virginia

Total Adjacent Development Trips

Scale: Not to Scale | Figure 13

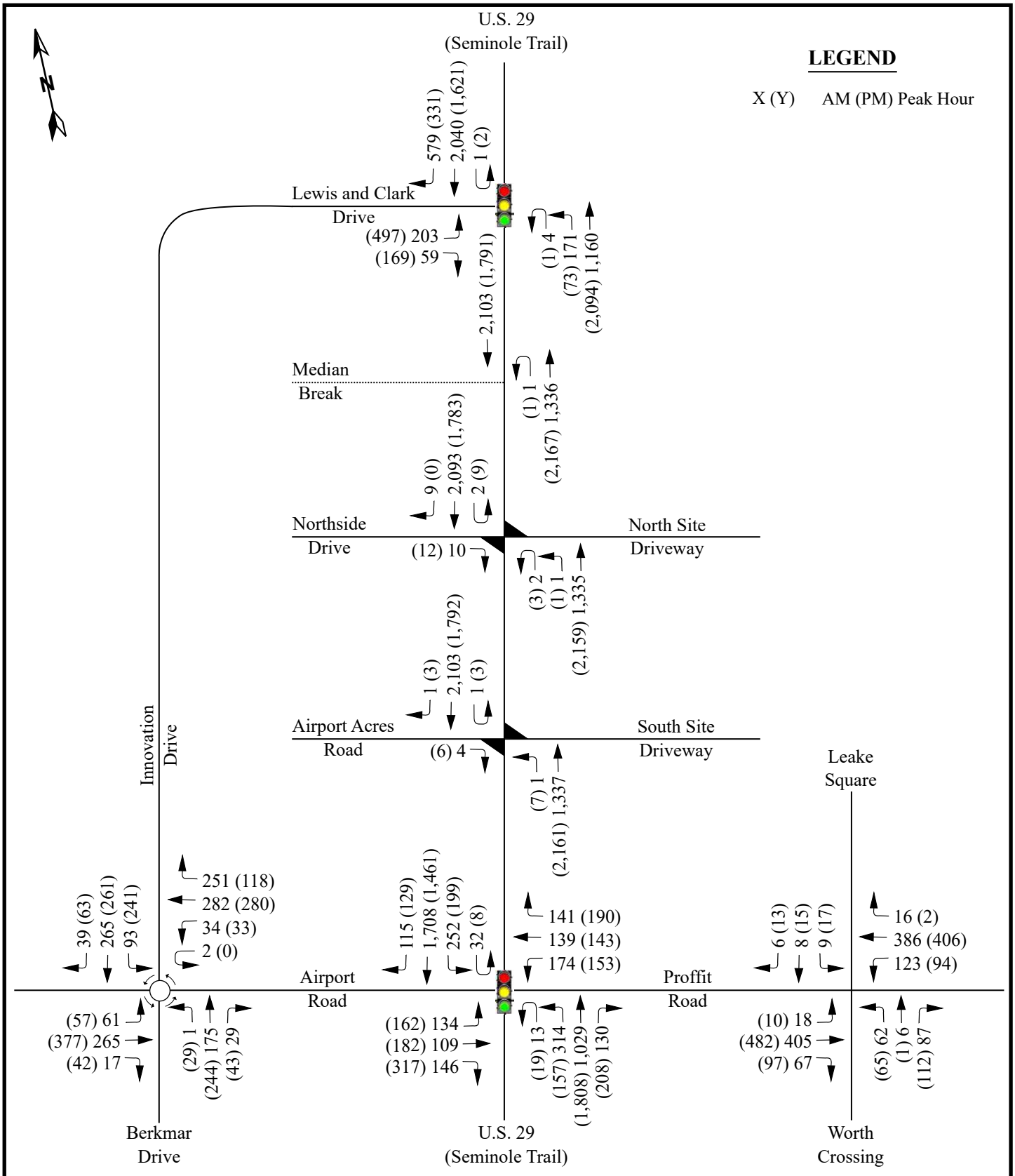


DRMP

North Pointe
Albemarle County, Virginia

Berkmar Drive Extension
Diverted Volumes (2034)

Scale: Not to Scale | Figure 14

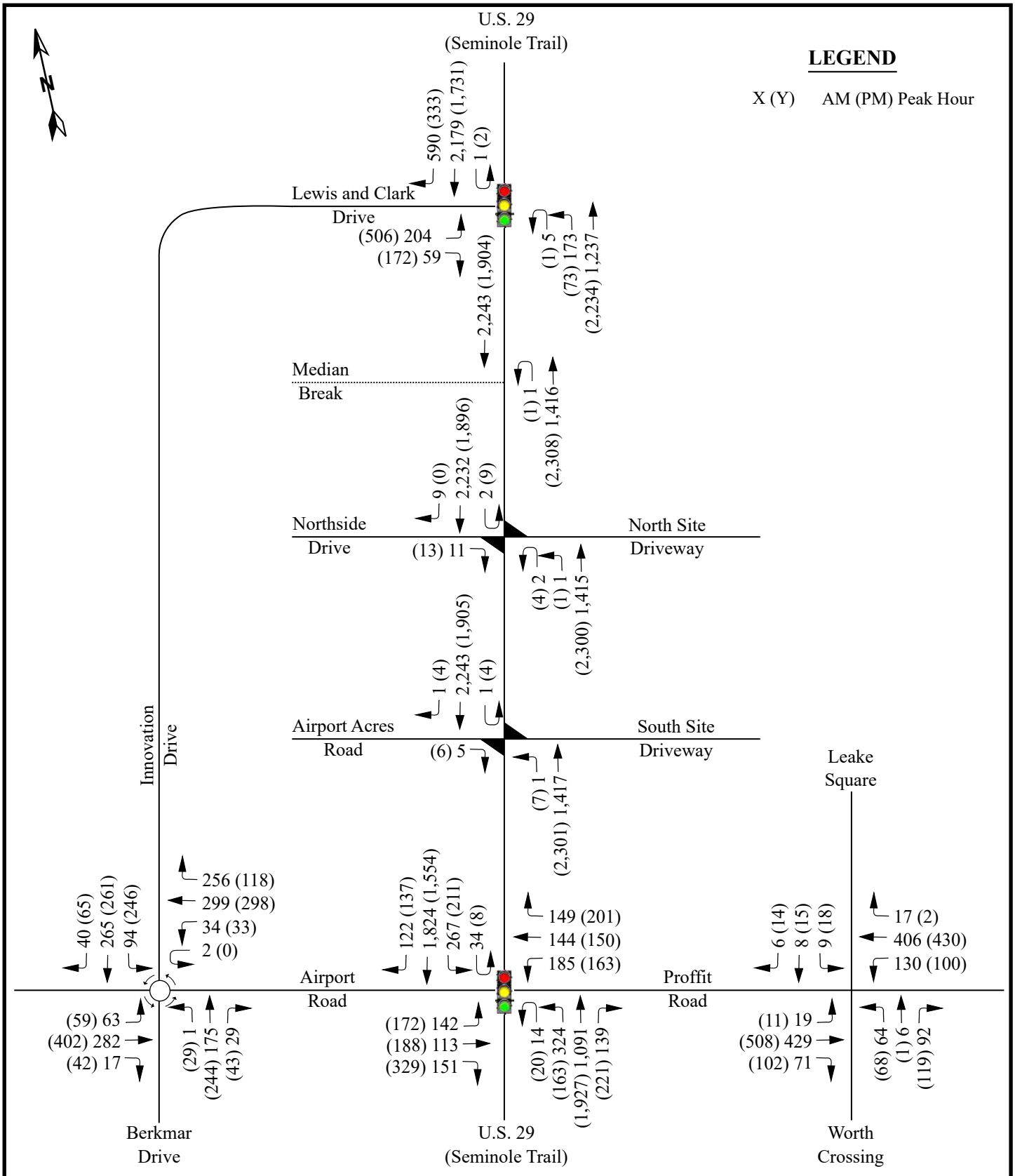


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North Pointe
Albemarle County, Virginia

No-Build (2034) Peak Hour Traffic Volumes

Scale: Not to Scale | Figure 15



DRMP

North Pointe
Albemarle County, Virginia

No-Build (2040) Peak Hour Traffic Volumes

Scale: Not to Scale | Figure 16

5. SITE TRIP GENERATION AND DISTRIBUTION

5.1. Trip Generation

Table 4, on the following page, shows the estimated trip generation potential of the proposed development based on the ITE *Trip Generation Manual*, 11th Edition. Trips are generated for each land use according to VDOT trip generation methodology. VDOT internal capture methodology indicates that for a development with residential uses and a mix of non-residential uses, the smaller of 15% of residential trips or 15% of non-residential trips should be considered as internal capture trips. Therefore for this site, 15% of residential trips are assigned as internal capture. Internal capture trips were balanced, as it is likely that these trips would enter and exit within the same hour.

Retail and restaurant uses generate pass-by trips. Pass-by trips are made by the traffic already using the adjacent roadway, that enters and exits the site as an intermediate stop on their way to another destination. Pass-by percentages are applied to site trips after adjustments for internal capture. Table 4 shows the ITE pass-by rates that were applied in this study. Pass-by trips were balanced, as it is likely that these trips would enter and exit within the same hour.

Table 4: ITE Trip Generation – Weekday – 11th Edition

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single-Family Detached Housing (210)	269 lots	2,508	46	137	159	93
Multifamily Housing (Low-Rise) (220)	850 townhomes	5,730	82	258	273	161
Multifamily Housing (Mid-Rise) (221)	479 apartments	2,176	46	153	114	73
Elementary School (520)	500 students	1,136	200	170	37	43
Hotel (310)	125 rooms	1,000	31	24	33	32
General Office (710)	30,000 s.f.	408	52	7	10	51
Fast-Food Restaurant with Drive-Through Window (934)	6,000 s.f.	2,806	137	131	103	95
High-Turnover Sit-Down Restaurant (932)	10,000 s.f.	1,072	53	43	55	36
Convenience Store/Gas Station (945)	12 f.p. 4,000 s.f.	2,802	113	113	109	109
Mini-Warehouse (151)	60,000 s.f.	88	3	2	4	5
Shopping Plaza (821)	71,000 s.f	4,794	76	47	181	187
Supermarket (850)	60,000 s.f.	5,544	101	71	256	255
Total Trips		**30,064**	**940**	**1,156**	**1,334**	**1,140**
Internal Capture – 15% Residential		-1,562	-54	-54	-65	-65
Total External Trips		28,502	886	1,102	1,269	1,075
ITE Pass-By: Fast-Food – 50% AM / 55% PM High-Turnover Sit-Down – 43% Convenience/Gas Station – 76% AM / 75% PM Shopping Plaza – 40% Supermarket – 24%		 -1,474 -460 -2,116 -1,918 -1,330	 -67 -21 -86 -25 -21	 -67 -21 -86 -25 -21	 -54 -20 -82 -74 -61	 -54 -20 -82 -74 -61
New Trips Added to Roadway Network		**21,204**	**666**	**882**	**978**	**784**

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5.2. Site Trip Distribution and Assignment

The site trip distributions for the proposed development were estimated based on a review of existing traffic patterns, surrounding land uses, engineering judgment, and discussions with the County and VDOT.

The following distribution was applied to the residential trips (Refer to Figure 17 for the residential trip distribution and Figure 18 for the residential site trip assignment.):

- 35% to / from the south on US 29
- 30% to / from the north on US 29
- 15% to / from the east on Proffit Road
- 10% to / from the west on Airport Road
- 10% to / from the west on Lewis and Clark Drive

The following distribution was applied to the primary commercial trips (Refer to Figure 19 for the primary commercial trip distribution and Figure 20 for the primary site trip assignment.):

- 30% to / from the north on US 29
- 30% to / from the south on US 29
- 15% to / from the east on Proffit Road
- 15% to / from the west on Airport Road
- 10% to / from the west on Lewis and Clark Drive

The commercial pass-by trip distribution is based on existing traffic patterns on US 29 and Proffit Road, with consideration given to driver convenience and proximity to similar developments. (Refer to Figure 21 for the pass-by trip distribution and Figure 22 for the pass-by trip assignment.)

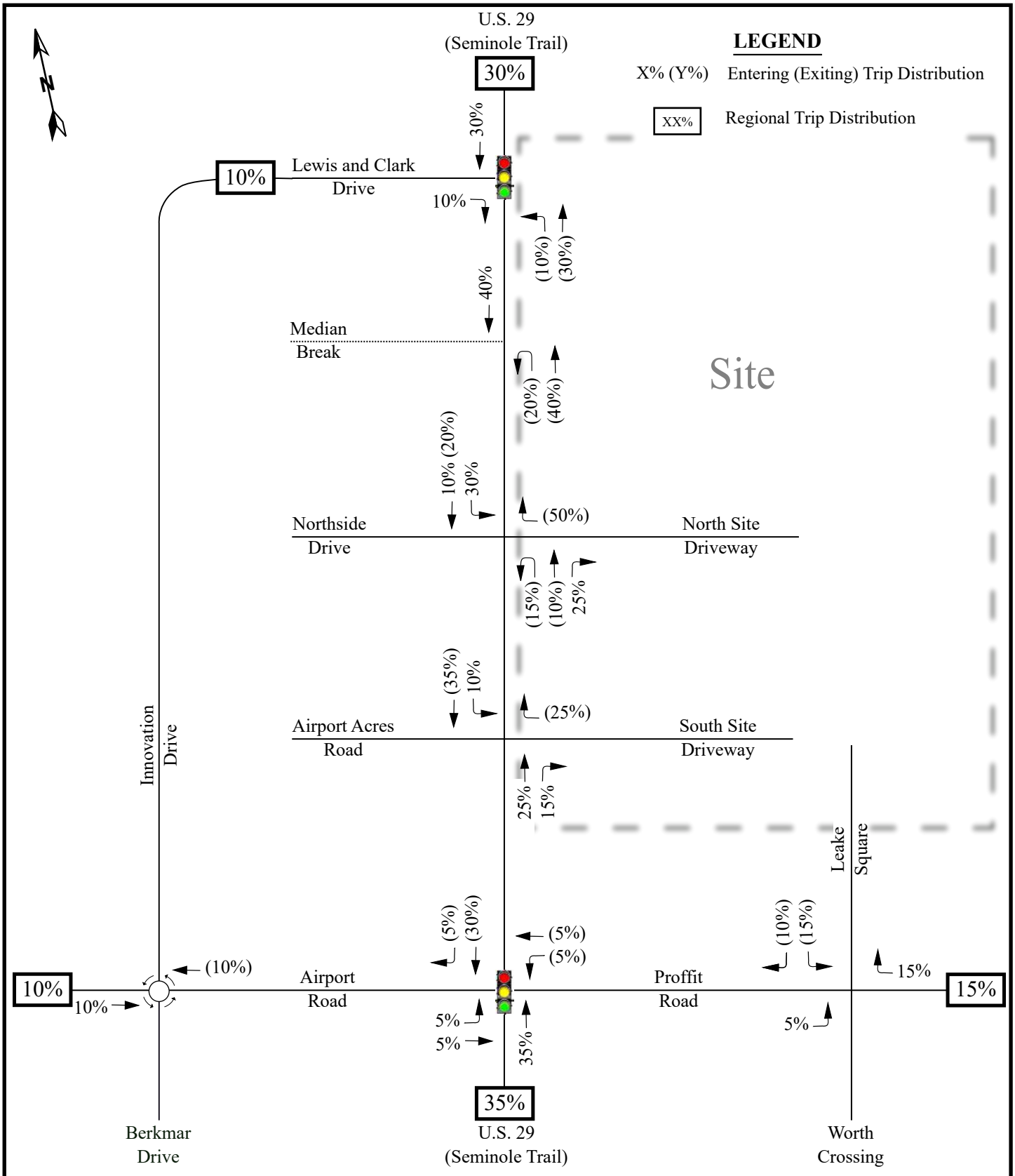
AM Peak Hour

- 45% from northbound US 29
- 45% from southbound US 29
- 5% from eastbound Proffit Road
- 5% from westbound Proffit Road

PM Peak Hour

- 60% from northbound US 29
- 30% from southbound US 29
- 5% from eastbound Proffit Road
- 5% from westbound Proffit Road

Total site trips are shown in Figure 23.

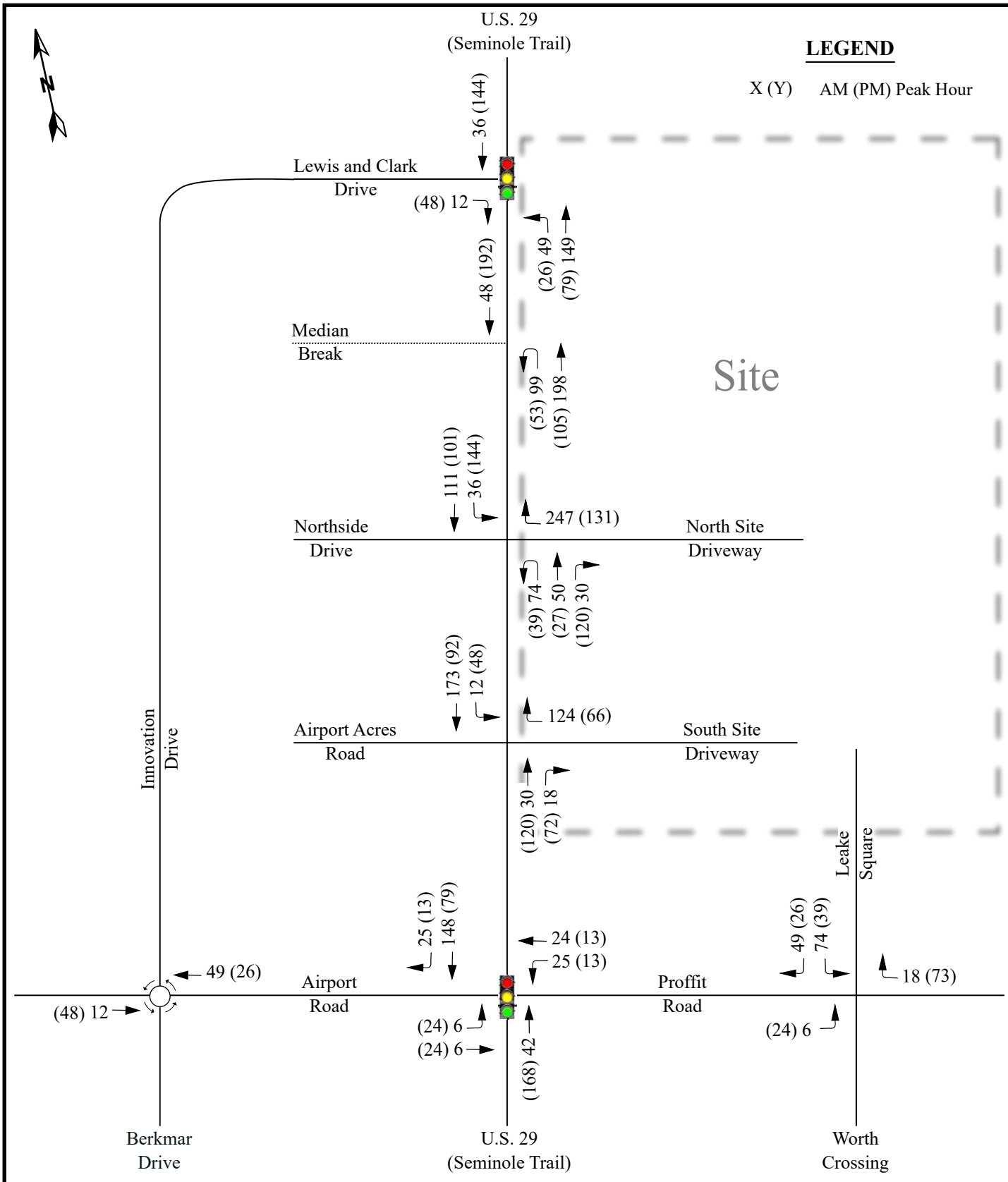


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North Pointe
Albemarle County, Virginia

Residential Site Trip Distribution

Scale: Not to Scale | Figure 17

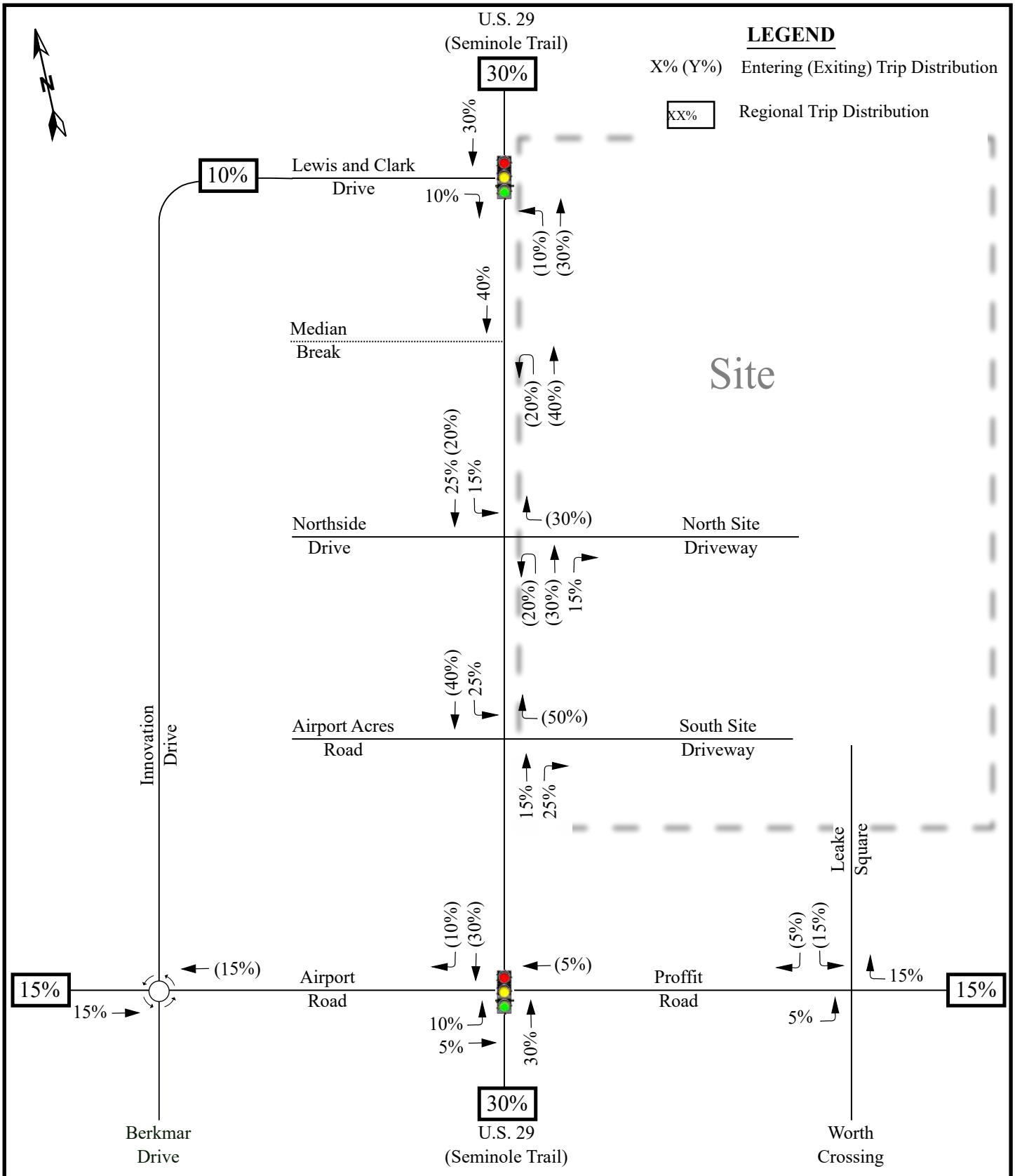


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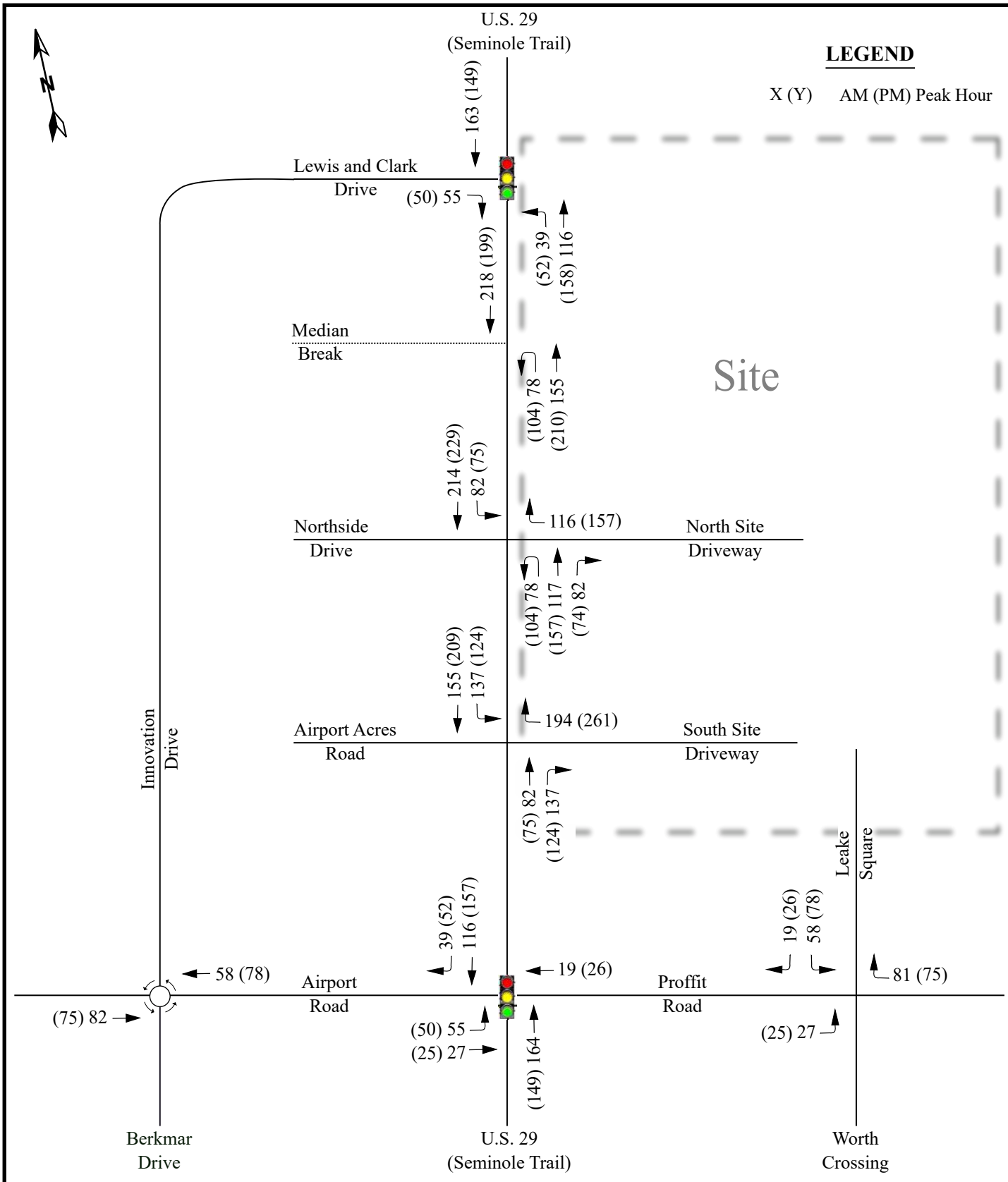
North Pointe
Albemarle County, Virginia

Residential
Site Trip Assignment

Scale: Not to Scale | Figure 18



DRMP	North Pointe Albemarle County, Virginia	Non-Residential Site Trip Distribution
		Scale: Not to Scale / Figure 19

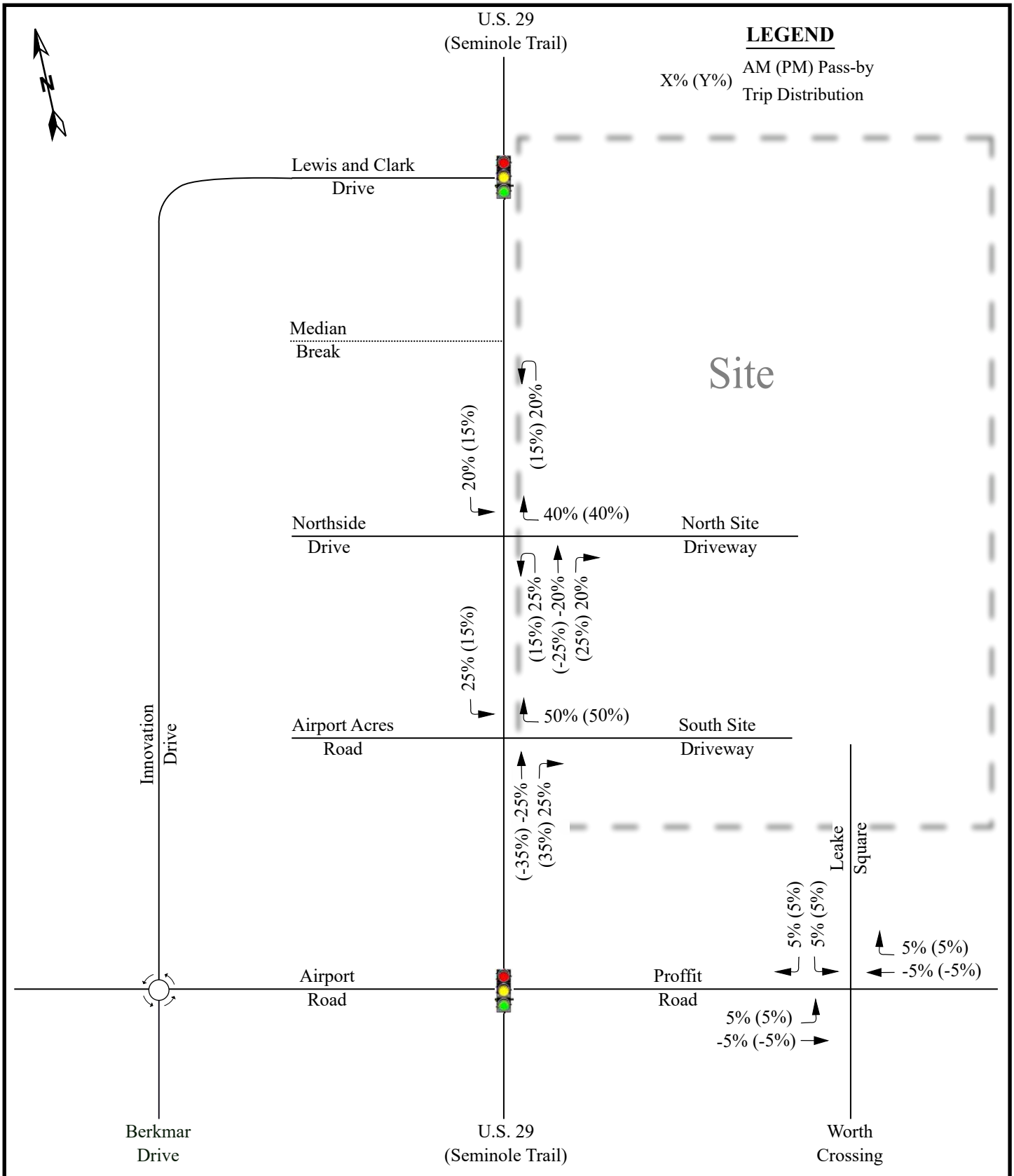


DRMP

North Pointe
Albemarle County, Virginia

Non-Residential
Site Trip Assignment

Scale: Not to Scale | Figure 20

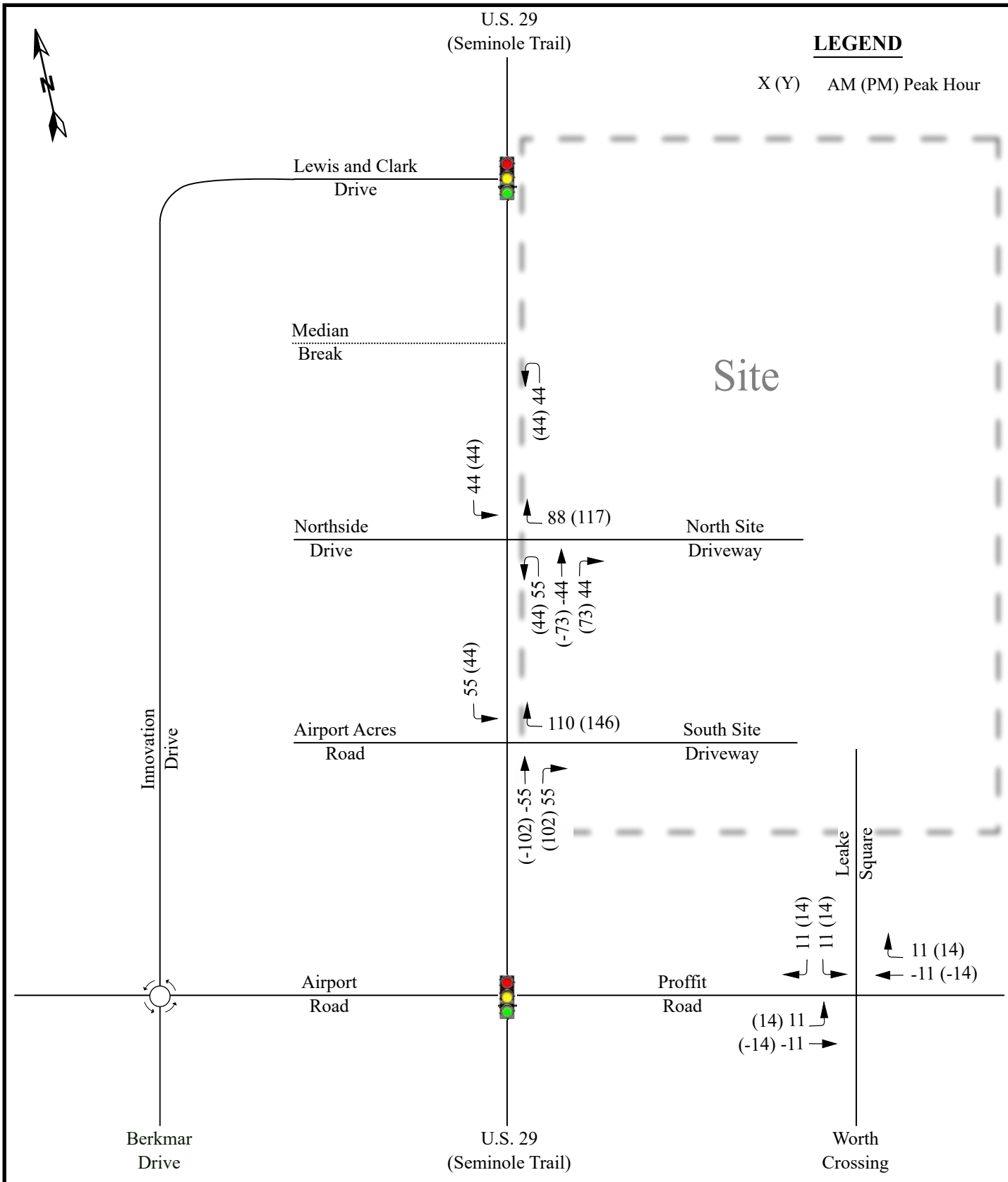


DRMP

North Pointe
Albemarle County, Virginia

Pass-By
Site Trip Distribution

Scale: Not to Scale | Figure 21

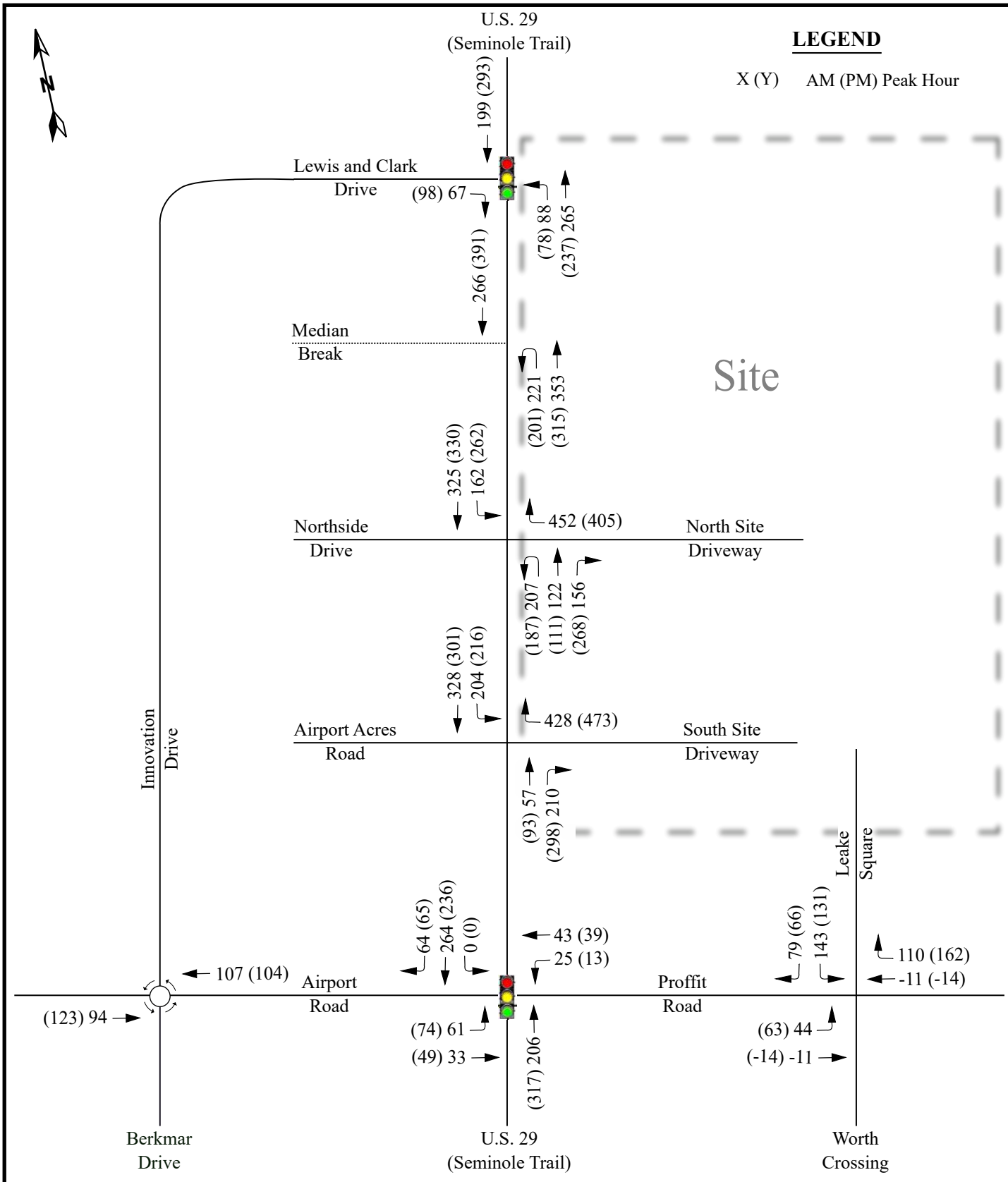


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North Pointe
Albemarle County, Virginia

Pass-By
Site Trip Assignment

Scale: Not to Scale | Figure 22



DRMP

North Pointe
Albemarle County, Virginia

Total Site Trips

Scale: Not to Scale | Figure 23

6. BUILD (2034/2040) TRAFFIC CONDITIONS

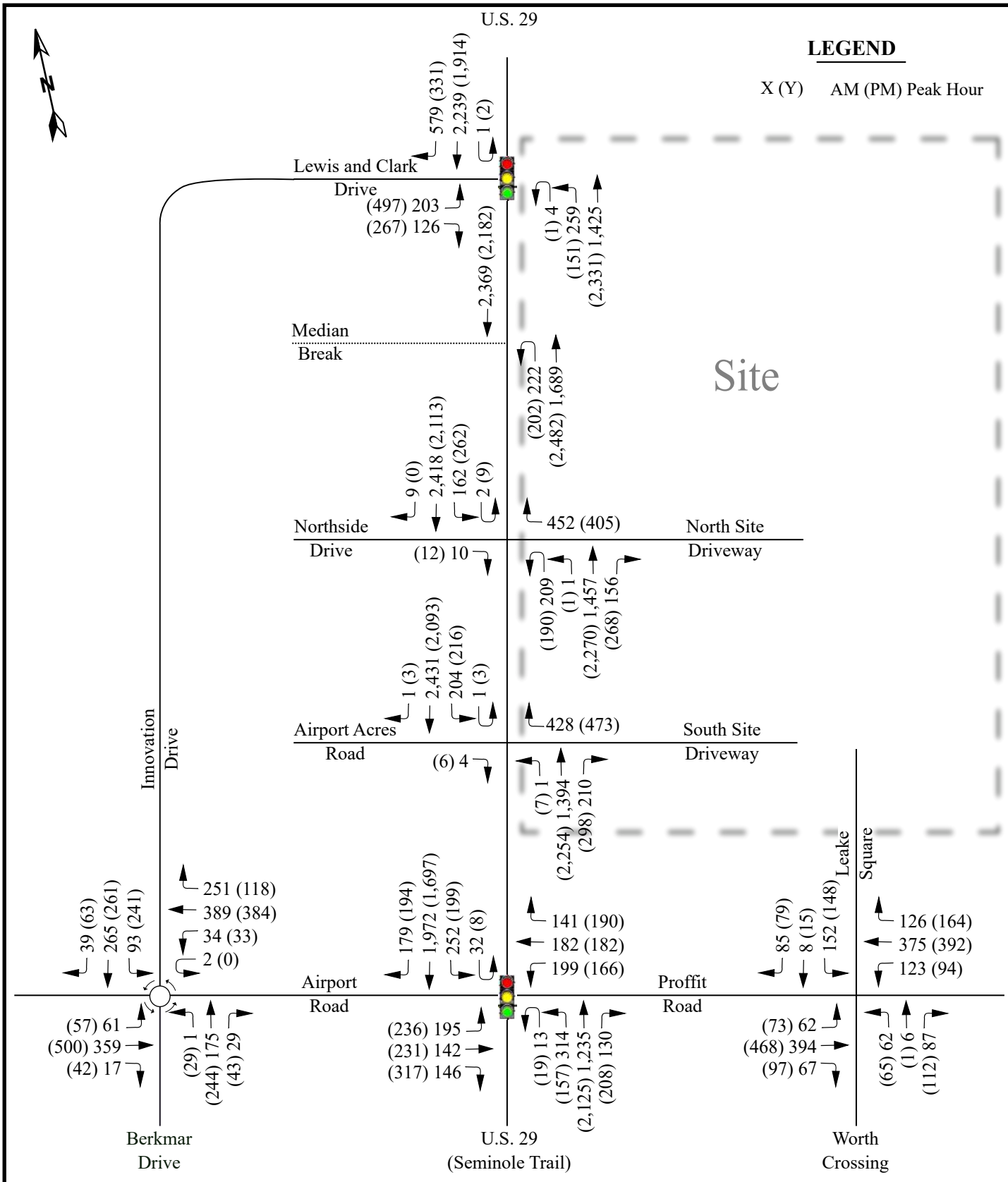
6.1. Build (2034/2040) Peak Hour Traffic Volumes

To estimate traffic conditions with the site fully built out, the total site trips were added to the no-build (2034 and 2040) traffic volumes to determine the build (2034 and 2040) traffic volumes. Build (2034) peak hour traffic volumes are shown in Figure 24. Build (2040) peak hour traffic volumes are shown in Figure 25.

6.2. Analysis of Build Peak Hour Traffic Conditions

Build (2034) traffic volumes were analyzed with the recommended lane configurations and traffic control, and the results are presented in Section 8 of this report. This is the basis for the recommendations in this study.

Build (2040) traffic volumes were analyzed with the recommended lane configurations and traffic control, and the results are presented in Section 8 of this report for planning purposes only.

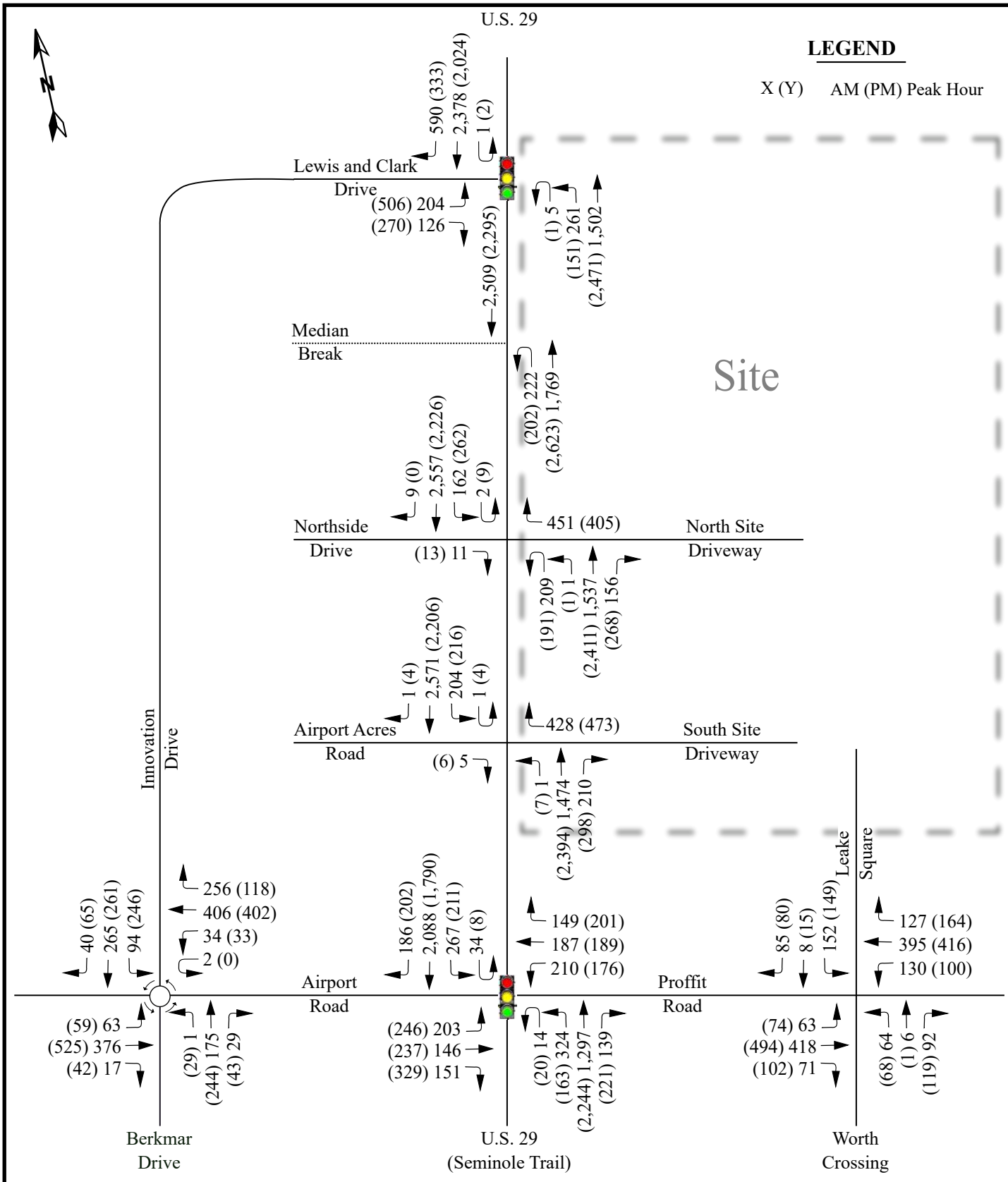


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North Pointe
Albemarle County, Virginia

Build (2034) Peak Hour Traffic Volumes

Scale: Not to Scale | Figure 24



DRMP

North Pointe
Albemarle County, Virginia

Build (2040) Peak Hour Traffic Volumes

Scale: Not to Scale | Figure 25

7. CAPACITY ANALYSIS

7.1. US 29 at Airport Road/Proffit Road

The signalized intersection of US 29 at Airport Road / Proffit Road was analyzed under all traffic conditions. Table 5 on the following page provides a summary of the capacity analysis results. Synchro reports are provided in Appendix E. SimTraffic queuing reports are provided in Appendix N.

Capacity analysis indicates the intersection currently operates at an overall LOS D during the AM peak hour and LOS E during the PM peak hour. No-build conditions were analyzed with the following improvements:

- *Convert the existing right turn lane on the northbound approach of US 29 to a shared through-right turn lane.
- *Provide a new northbound receiving lane on US 29 that extends north to the Airport Acres Road median break/South Site Driveway.
- Berkmar Drive Extension project.

*These improvements were previously identified to be provided by the North Fork development; however, current North Fork proffers indicate monetary contributions to the County CIP fund for improvements to US 29. If these improvements are not constructed by others, then they may be the responsibility of this development. To be consistent with previous TIA submittals, these improvements are shown under no-build conditions.

Under no-build conditions, the intersection is expected to operate at an overall LOS F during the AM peak hour and LOS E during the PM peak hour.

Build with improvements conditions were analyzed with the following improvements:

- Restripe/widen the southbound approach of US 29 to provide dual left turn lanes.
- Construct a second receiving lane eastbound on Proffit Road.
- Construct an exclusive right turn lane on the westbound approach of Proffit Road.
- Signal timing modifications.

Analysis results indicate the intersection is expected to operate at an overall LOS E during both peak hours under build (2034) conditions with the improvements listed above. Overall intersection delay is projected to be less than under no-build conditions.

Table 5: Analysis Summary of US 29 at Airport Road/Proffit Road

ANALYSIS SCENARIO	LANE GROUP	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)	Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)
Existing (2023)	EBL	E	58.7	85	D (51.0)	E	71.2	119	E (77.1)
	EBT	F	97.0	122		E	63.4	163	
	EBR	D	45.0	0		D	49.8	77	
	WBL	F	151.0	315		F	104.7	275	
	WBT/R	F	223.6	309		F	149.4	399	
	NBL	E	76.6	136		E	66.6	79	
	NBT	C	27.3	63		F	116.2	1141	
	NBR	D	12.6	12		B	13.2	49	
	SBL	F	128.0	396		F	136.1	331	
	SBT/R	C	24.2	460		C	23.0	389	
No-Build (2034)	EBL	E	62.0	99	F (115.8)	E	79.2	138	E (73.5)
	EBT	F	150.9	215		F	164.2	350	
	EBR	D	43.9	21		E	55.2	156	
	WBL	F	336.8	348		F	110.7	284	
	WBT/R	F	723.9	520		F	329.3	588	
	NBL	F	321.7	286		F	158.0	174	
	NBT/R	C	23.8	283		D	41.7	705	
	SBL	F	165.6	453		F	194.4	398	
	SBT/R	C	22.8	457		C	24.0	428	
Build (2034)	EBL	F	116.9	163	F (141.9)	F	166.3	220	F (102.9)
	EBT	F	263.7	284		F	280.3	457	
	EBR	D	43.9	21		E	55.2	156	
	WBL	F	472.5	397		F	134.3	312	
	WBT/R	F	989.2	614		F	416.3	680	
	NBL	F	321.7	286		F	158.0	174	
	NBT/R	C	25.6	354		F	81.7	967	
	SBL	F	165.6	453		F	194.4	398	
	SBT/R	C	28.5	614		C	28.0	564	
Build (2034) w/ Improvements	EBL	F	82.8	152	E (73.3)	F	124.6	208	E (70.2)
	EBT	F	354.7	296		F	189.4	432	
	EBR	D	44.7	16		D	53.3	155	
	WBL	F	128.3	329		F	94.2	288	
	WBT	F	139.8	313		E	61.4	263	
	WBR	D	47.5	0		D	49.2	98	
	NBL	F	321.7	286		F	233.0	186	
	NBT/R	C	28.4	386		E	67.6	942	
	SBL	D	52.6	159		F	154.3	196	
	SBT/R	D	40.3	732		C	31.4	594	
Build (2040)*	EBL	F	128.7	172	F (152.1)	F	182.5	229	F (118.5)
	EBT	F	281.4	295		F	296.9	471	
	EBR	D	43.9	22		E	56.4	165	
	WBL	F	517.6	419		F	153.1	337	
	WBT/R	F	1043.2	638		F	451.4	714	
	NBL	F	344.3	297		F	171.3	181	
	NBT/R	C	26.5	381		F	106.9	1057	
	SBL	F	192.4	484		F	221.4	424	
	SBT/R	C	33.1	693		C	29.9	617	
Build (2040)* w/ Improvements	EBL	F	90.9	160	F (82.2)	F	136.3	218	F (82.9)
	EBT	F	376.1	307		F	210.0	446	
	EBR	D	44.8	18		D	54.5	163	
	WBL	F	146.7	350		F	104.7	313	
	WBT	F	148.5	322		E	63.4	277	
	WBR	D	47.5	0		D	49.7	109	
	NBL	F	344.3	297		F	251.5	193	
	NBT/R	C	29.8	416		F	90.6	1032	
	SBL	D	53.5	168		F	176.3	209	
	SBT/R	D	53.8	807		C	33.9	650	

*This scenario is for planning purposes only
+ Synchro 95th percentile queue length

7.2. US 29 NB at South Site Driveway

The intersection of US 29 NB at South Site Driveway was analyzed under all traffic conditions. Table 6 provides a summary of the capacity analysis results. Synchro reports are provided in Appendix F. SimTraffic queuing reports are provided in Appendix N.

Table 6: Analysis Summary of US 29 NB at South Site Driveway

ANALYSIS SCENARIO	LANE GROUP	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)	Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)
Existing (2023)	EBL/T WBR NBT NBR	B A - -	14.9 0.0 - -	0 0 - -	N/A	D A - -	26.2 0.0 - -	2.5 0 - -	N/A
No-Build (2034)	EBL/T WBR NBT NBR	C A - -	16.6 0.0 - -	0 0 - -	N/A	D A - -	28.6 0.0 - -	2.5 0 - -	N/A
Build (2034)	EBL/T WBR NBT NBR	- F - -	- 197.2 - -	- 555 - -	N/A	- F - -	- 842.8 - -	- 1097 - -	N/A
Build (2034) w/ Improvements	EBL/T WBR NBT NBR	B B A A	17.3 19.1 9.5 6.9	128 147 193 27	B (11.8)	C C B A	28.5 34.4 11.6 6.6	161 194 390 30	B (15.6)
Build (2040)*	EBL/T WBR NBT NBR	- F - -	- 238.0 - -	- 610 - -	N/A	- F - -	- 992.1 - -	- 1150 - -	N/A
Build (2040)* w/ Improvements	EBL/T WBR NBT NBR	B C A A	18.2 20.2 9.6 6.8	128 148 208 27	B (12.1)	C D B A	29.2 35.5 12.5 6.5	162 194 438 30	B (16.3)

*This scenario is for planning purposes only
+ Synchro 95th percentile queue length
1. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections

Capacity analysis indicates the southbound u-turn movement (analyzed as eastbound left/through) currently operates at LOS B during the AM peak hour and LOS D during the PM peak hour. Under no-build (2034) conditions, the southbound u-turn movement is expected to operate at LOS C during the AM peak hour and LOS D during the PM peak hour.

Under build (2034) conditions, this intersection is projected to meet MUTCD traffic signal warrants. Unsignalized, the South Site Driveway and southbound left-/u-turn movement are anticipated to operate with long delays and excessive queuing during the peak hours.

Build with improvements conditions were analyzed with the following improvements:

- Provide a third though lane northbound on US 29, beginning at the South Site Driveway and extending an appropriate distance beyond the North Site Driveway, before transitioning back to two northbound through lanes.
- Provide dual right turn lanes on the westbound approach of South Site Driveway.
- Install a traffic signal when warranted and approved by VDOT.

With the above improvements in place, this intersection is anticipated to operate at an overall LOS B during both peak hours.

7.3. US 29 SB at Airport Acres Road

The intersection of US 29 SB at Airport Acres Road was analyzed under all traffic conditions. Table 7 provides a summary of the capacity analysis results. Synchro reports are provided in Appendix G. SimTraffic queuing reports are provided in Appendix N.

Table 7: Analysis Summary of US 29 at Airport Acres Road

ANALYSIS SCENARIO	LANE GROUP	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)	Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)
Existing (2023)	WBL/T EBR SBT SBR	F C - -	133.9 23.0 - -	2.5 2.5 - -	N/A	E C - -	49.6 17.4 - -	5 2.5 - -	N/A
No-Build (2034)	WBL/T EBR SBT SBR	F C - -	149.4 24.1 - -	2.5 2.5 - -	N/A	F C - -	62.4 19.0 - -	7.5 2.5 - -	N/A
Build (2034)	WBL/T EBR SBT SBR	F D - -	282.8 30.2 - -	5 2.5 - -	N/A	F C - -	102.6 23.0 - -	12.5 2.5 - -	N/A
Build (2040)*	WBL/T EBR SBT SBR	F D - -	365.4 33.9 - -	7.5 2.5 - -	N/A	F C - -	125.1 24.8 - -	15 2.5 - -	N/A

*This scenario is for planning purposes only
+ Synchro 95th percentile queue length
1. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections

Capacity analysis indicates the eastbound approach of Airport Acres Road currently operates at LOS C during the AM and PM peak hours. The northbound left-/u-turn movement (analyzed as westbound left/through) operates at LOS F during the AM peak hour and LOS E during the PM peak hour. Under future no-build and build conditions, the eastbound approach of Airport Acres Road is expected to operate at LOS D or better, while the northbound left- and u-turn movement is expected to operate at LOS F. Queue lengths on Airport Acres Road and for the northbound left-/u-turn movement are expected to be minimal.

7.4. US 29 NB at North Site Driveway

The intersection of US 29 NB at North Site Driveway was analyzed under all traffic conditions. Table 8 provides a summary of the capacity analysis results. Synchro reports are provided in Appendix H. SimTraffic queuing reports are provided in Appendix N.

Table 8: Analysis Summary of US 29 NB at North Site Driveway

ANALYSIS SCENARIO	LANE GROUP	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)	Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)
Existing (2023)	EBL/T WBR NBT NBR	C A - -	15.2 0 - -	0 0 - -	N/A	D A - -	26.7 0 - -	5 0 - -	N/A
No-Build (2034)	EBL/T WBR NBT NBR	C A - -	16.6 0 - -	0 0 - -	N/A	D A - -	29.4 0 - -	5 0 - -	N/A
Build (2034)	EBL/T WBR NBT NBR	- F - -	- 261.2 - -	- 670 - -	N/A	- F - -	- 679.8 - -	- 885 - -	N/A
Build (2034) w/ Improvements	EBL/T WBR NBT NBR	B C B A	17.1 20.1 10.0 6.9	100 156 215 25	B (12.4)	D C B A	35.1 34.3 10.2 5.8	215 171 354 41	B (14.9)
Build (2040)*	EBL/T WBR NBT NBR	- F - -	- 308.2 - -	- 725 - -	N/A	- F - -	- 818.7 - -	- 943 - -	N/A
Build (2040)* w/ Improvements	EBL/T WBR NBT NBR	B C B A	18.0 21.1 10.3 6.9	100 156 232 25	B (12.7)	D D B A	36.9 36.1 10.7 5.7	215 171 398 41	B (15.5)

*This scenario is for planning purposes only
+ Synchro 95th percentile queue length
1. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections

Capacity analysis indicates the southbound left-/u-turn movements (analyzed as eastbound left/through) currently operate at LOS D or better. These movements are very low volume and queues are minimal. Similar operational conditions are anticipated under no-build conditions.

Under build (2034) conditions, this intersection is projected to meet MUTCD traffic signal warrants. Unsignalized, the North Site Driveway and southbound left turn movement are anticipated to operate with long delays and excessive queuing during the peak hours.

Build conditions were analyzed with the following improvements:

- Provide a third though lane northbound on US 29. The through lane should extend an appropriate distance beyond the intersection before transitioning back to two northbound through lanes.
- Provide dual right turn lanes on the westbound approach of North Site Driveway.
- Install a traffic signal when warranted and approved by VDOT.

With the above improvements in place, this intersection is anticipated to operate at an overall LOS B during both peak hours.

7.5. US 29 SB at Northside Drive

The intersection of US 29 SB at Northside Drive was analyzed under all traffic conditions. Table 9 provides a summary of the capacity analysis results. Synchro reports are provided in Appendix I. SimTraffic queuing reports are provided in Appendix N.

Table 9: Analysis Summary of US 29 SB at Northside Drive

ANALYSIS SCENARIO	LANE GROUP	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)	Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)
Existing (2023)	WBL/T EBR SBT SBR	F D - -	53.2 29.2 - -	2.5 5 - -	N/A	D C - -	33.8 17.6 - -	2.5 2.5 - -	N/A
No-Build (2034)	WBL/T EBR SBT SBR	F D - -	54.5 29.8 - -	2.5 5 - -	N/A	E C - -	40.7 19.3 - -	2.5 2.5 - -	N/A
Build (2034)	WBL/T EBR SBT SBR	F E - -	644.8 39.2 - -	498 7.5 - -	N/A	F C - -	252.2 23.9 - -	313 5 - -	N/A
Build (2034) w/ Improvements	WBL/T EBR SBT SBR	E C D A	70.5 32.1 37.5 2.9	223 1 898 0	D (40.0)	D C B A	48.3 32.8 11.5 0	197 5 520 0	B (14.6)
Build (2040)*	WBL/T EBR SBT SBR	F E - -	824.5 44.9 - -	538 10 - -	N/A	F D - -	328.4 26.0 - -	350 5 - -	N/A
Build (2040)* w/ Improvements	WBL/T EBR SBT SBR	E C E A	70.5 32.1 59.0 2.9	223 2 982 0	E (59.6)	D C B A	52.1 34.1 13.5 0	199 6 612 0	B (16.6)

*This scenario is for planning purposes only
+ Synchro 95th percentile queue length
1. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections

Capacity analysis indicates the eastbound approach of Northside Drive currently operates at LOS D or better during the AM and PM peak hours. The northbound left-/u-turn movements (analyzed as westbound left/through) currently operate at LOS F during the AM peak hour and LOS D during the PM peak hour. The movements are very low volume and queues are short. Similar operational conditions are anticipated under no-build conditions.

Under build (2034) conditions, this intersection is projected to meet MUTCD traffic signal warrants. Unsignalized, the Northside Drive approach and northbound left-/u-turn

movements are anticipated to operate with long delays and excessive queuing during the peak hours.

Build with improvements conditions were analyzed with the following improvements:

- Install a traffic signal when warranted and approved by VDOT.

Analysis results with the above improvements in place indicate the intersection is expected to operate at an overall LOS D during the AM peak hour and LOS B during the PM peak hour under build (2034) conditions.

Under build (2040) conditions with improvements, the intersection is anticipated to operate at an overall LOS E during the AM peak hour and LOS B during the PM peak hour.

7.6. US 29 SB at Median Break

The intersection of US 29 SB at Median Break was analyzed under build traffic conditions. Table 10 provides a summary of the capacity analysis results. Synchro reports are provided in Appendix J. SimTraffic queuing reports are provided in Appendix N.

Table 10: Analysis Summary of US 29 SB at Median Break

ANALYSIS SCENARIO	LANE GROUP	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)	Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)
Build (2034)	WBL SBT	F -	327.8 -	405 -	N/A	F -	187.5 -	295 -	N/A
Build (2034) w/ Improvements	WBL SBT	D C	36.4 29.7	90 869	C (30.2)	D B	38.7 11.6	89 567	B (13.9)
Build (2040)*	WBL SBT	F -	414.8 -	448 -	N/A	F -	237.6 -	328 -	N/A
Build (2040)* w/ Improvements	WBL SBT	D D	36.6 48.5	92 953	D (47.5)	D B	40.5 14.6	91 729	B (16.7)

*This scenario is for planning purposes only
+ Synchro 95th percentile queue length
1. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections

Under build (2034) conditions, this intersection is projected to meet MUTCD traffic signal warrants. Unsignalized, the northbound u-turn movement (analyzed as westbound left turn) is anticipated to operate with long delays and excessive queuing during the peak hours.

Build with improvements conditions were analyzed with the following improvements:

- Provide dual left turn lanes on the northbound approach of US 29.
- Install a traffic signal when warranted and approved by VDOT.

Although the northbound u-turn volumes are under the typical thresholds for dual turn lanes, dual u-turn lanes are considered in this case to reduce delay incurred by US 29 southbound. Analysis results with the above improvements in place indicate the intersection is expected to operate at an overall LOS C during the AM peak hour and LOS B during the PM peak hour under build (2034) conditions.

7.7. US 29 at Lewis and Clark Drive

The intersection of US 29 at Lewis and Clark Drive was analyzed under all traffic conditions. Table 11 provides a summary of the capacity analysis results. Synchro reports are provided in Appendix K. SimTraffic queuing reports are provided in Appendix N.

Table 11: Analysis Summary of US 29 at Lewis and Clark Drive

ANALYSIS SCENARIO	LANE GROUP	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)	Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)
Existing (2023)	EBL	F	82.6	43	B (11.6)	F	80.5	202	B (15.6)
	EBR	A	0	0		A	0	0	
	NBL	E	73.9	90		F	113.1	24	
	NBT	A	4.3	262		B	15.1	951	
	SBU	E	75.6	8		F	83.4	12	
	SBT	B	14.7	957		B	11.7	585	
	SBR	A	0.1	0		A	0	0	
No-Build (2034)	EBL	F	185.6	218	C (25.5)	F	175.6	451	C (33.6)
	EBR	A	0.1	0		A	0.1	0	
	NBL	F	83.4	153		F	87.1	78	
	NBT	A	6.3	276		B	19.0	1012	
	SBU	E	75.6	8		F	83.4	12	
	SBT	C	23.4	973		B	16.7	595	
	SBR	A	0.7	0		A	0.3	0	
Build (2034)	EBL	F	185.6	218	D (36.8)	F	175.6	451	D (42.3)
	EBR	A	0.1	0		A	0.2	0	
	NBL	F	179.6	265		F	263.4	189	
	NBT	A	7.5	390		C	27.2	1473	
	SBU	E	75.6	8		F	83.4	12	
	SBT	D	36.7	1391		C	21.6	848	
	SBR	A	0.7	0		A	0.3	0	
Build (2040)*	EBL	F	187.5	219	D (45.3)	F	184.8	462	D (48.6)
	EBR	A	0.1	0		A	0.2	0	
	NBL	F	185.6	270		F	263.4	189	
	NBT	A	8.0	432		D	38.7	1632	
	SBU	E	75.6	8		F	83.4	12	
	SBT	D	54.4	1547		C	24.6	973	
	SBR	A	0.8	0		A	0.3	0	

*This scenario is for planning purposes only
+ Synchro 95th percentile queue length

Capacity analysis indicates the intersection currently operates at an overall LOS B during both peak hours. The northbound and eastbound left turn movements operate at LOS E/LOS F during the peak hours.

Future conditions were analyzed with the following improvements:

- Construct a second left turn lane on the northbound approach of US 29 to provide dual left turn lanes. (North Fork)
- Construct a second left turn lane on the eastbound approach of Lewis and Clark Drive to provide dual left turn lanes. (North Fork)

7.8. Proffit Road at Worth Crossing/Leake Square

The intersection of Proffit Road at Worth Crossing / Leake Square was analyzed under all traffic conditions. Table 12 provides a summary of the capacity analysis results. Synchro and Sidra reports are provided in Appendix L. SimTraffic queuing reports are provided in Appendix N.

Table 12: Analysis Summary of Proffit Road at Worth Crossing/Leake Square

ANALYSIS SCENARIO	LANE GROUP	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)	Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)
Existing (2023)	EBL/T EBR WBL/T WBR NBL/T NBR SBL/T/R	A - A - E B D	8.2 - 8.6 - 39.9 11.9 28.9	2.5 - 10 - 32.5 12.5 12.5	N/A	A - A - D B C	8.3 - 8.4 - 28.0 11.6 22.5	0 - 5 - 22.5 15 15	N/A
No-Build (2034)	EBL/T EBR WBL/T WBR NBL/T NBR SBL/T/R	A - A - F B D	8.3 - 8.7 - 61.6 12.0 31.4	2.5 - 10 - 67.5 12.5 12.5	N/A	A - A - F B C	8.5 - 8.7 - 52.7 13.0 32.9	0 - 7.5 - 57.5 20 25	N/A
Build (2034)	EBL/T EBR WBL/T WBR NBL/T NBR SBL/T/R	A - A - F B F	8.8 - 8.6 - 162 11.9 531.9	5 - 10 - 120 12.5 532.5	N/A	A - A - F B F	8.9 - 8.7 - 158.1 12.8 527.8	5 - 7.5 - 112.5 17.5 507.5	N/A
Build (2034) w/ Improvements	NB WB SB EB	A B A A	8.7 11.1 9.7 7.2	41.9 145.2 63.1 78.9	A (9.3)	A B A A	9.2 10.9 8.8 7.6	47.3 140.5 55.8 92.2	A (9.2)
Build (2040)*	EBL/T EBR WBL/T WBR NBL/T NBR SBL/T/R	A - A - F B F	8.8 - 8.8 - 222.5 12.2 669.7	5 - 10 - 140 15 577.5	N/A	A - A - F B F	9.0 - 8.8 - 223.2 13.3 680.4	7.5 - 7.5 - 135 20 557.5	N/A
Build (2040)* w/ Improvements	NB WB SB EB	A B B A	9.3 11.9 10.3 7.6	46.1 159.4 66.9 85.8	A (9.9)	A B A A	10.0 11.7 9.4 8.0	53.1 154.8 59.8 100.0	A (9.8)

*This scenario is for planning purposes only
+ Synchro/Sidra 95th percentile queue length
1. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections

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Capacity analysis indicates the northbound and southbound left turn movements from the minor street approaches of Worth Crossing and Leake Square, respectively, currently operate at LOS E or better during the peak hours. The eastbound and westbound major-street left turn movements on Proffit Road operate at LOS A.

Under no-build and build (2034) conditions, the northbound approach of Worth Crossing and the southbound approach of Leake Square are anticipated to operate at LOS F during both peak hours.

Build with improvements conditions were analyzed with the following improvements (a conceptual drawing is provided in Appendix L):

- Construct a single-lane roundabout with an eastbound right turn slip lane. The roundabout geometry should accommodate large vehicles (wb-62).

As a roundabout, Sidra analysis indicates the intersection is expected to operate at an overall LOS A during the peak hours under build (2034 and 2040) conditions. All approaches are anticipated to operate at LOS B or better and with significantly shorter delays and queue lengths when compared to unimproved conditions.

7.9. Airport Road at Innovation Drive/Berkmar Drive

The intersection of Airport Road at Innovation Drive / Berkmar Drive was analyzed under all traffic conditions. Table 13 provides a summary of the capacity analysis results. Synchro and Sidra reports are provided in Appendix M. SimTraffic queuing reports are provided in Appendix N.

Table 13: Analysis Summary of Airport Road at Innovation Drive/Berkmar Drive

ANALYSIS SCENARIO	LANE GROUP	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)	Lane LOS	Lane Delay (sec)	Lane Queue + (ft)	Overall LOS (delay)
Existing (2023)	EBL EBT WBU WBT WBR SBL/R	A - A - - B	8.2 - 8.9 - - 10.6	2.5 - 0 - - 5	N/A	A - A - - B	8.2 - 0 - - 14.8	2.5 - 0 - - 22.5	N/A
No-Build (2034)	NB WB SB EB	A A A A	7.0 5.1 6.7 5.1	29.9 40.6 48.1 29.4	A (5.8)	B A A A	11.9 5.5 8.8 7.0	79.9 38.5 86.3 53.0	A (8.1)
Build (2034)	NB WB SB EB	A A A A	7.6 5.5 7.2 5.7	32.0 48.4 49.9 39.5	A (6.2)	B A A A	14.2 6.1 9.9 8.1	94.3 49.9 109.4 71.5	A (9.0)
Build (2040)*	NB WB SB EB	A A A A	7.8 5.8 7.5 5.8	32.6 53.0 51.3 41.9	A (6.4)	B A B A	14.9 6.2 10.2 8.4	98.4 52.1 115.5 76.5	A (9.3)

*This scenario is for planning purposes only
+ Synchro/Sidra 95th percentile queue length
1. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections

Capacity analysis indicates the minor street approach of Innovation Drive currently operates at LOS B during the AM and PM peak hours, while the eastbound left turn movement and westbound u-turn movement on Airport Road operate at LOS A.

Under all future conditions, the intersection was analyzed with a hybrid roundabout that is planned to be constructed by the County as part of the extension of Berkmar Drive.

Analysis results indicate the roundabout is anticipated to operate at an overall LOS A under all future analysis conditions.

8. SIGNAL WARRANT ANALYSIS

Traffic signal warrants were evaluated for the following intersections:

- US 29 NB at South Site Driveway
- US 29 NB at North Site Driveway
- US 29 SB at Northside Drive
- US 29 SB at Median Break

The traffic signal warrants are published by the Federal Highway Administration (FHWA) in the Manual on Uniform Traffic Control Devices (MUTCD). The following four traffic signal warrants that are based on traffic volumes were evaluated:

- Warrant 1A – Eight-Hour Vehicular Volume – Minimum Vehicular Volume
- Warrant 1B – Eight-Hour Vehicular Volume – Interruption of Continuous Traffic
- Warrant 1C – Eight-Hour Vehicular Volume – Combination Warrant
- Warrant 2 – Four-Hour Vehicular Volume

Warrant 3 – Peak-Hour Vehicular Volume – was not evaluated as this site does not meet the requirements of MUTCD 4C.04.

Tube counts were conducted along US 29 by Quality Counts on October 5-6, 2022. The tube count data was used for the signal warrant analyses and is included in Appendix B.

The proposed development trips were assigned to each of the study intersections based on the average of the ITE hourly distribution data for each land use. The hourly site traffic assignment was combined with the hourly no-build 2034 traffic volumes to determine the hourly build 2034 traffic volumes. The build 2034 hourly traffic volumes were compared to the MUTCD traffic signal warrant thresholds to establish if signal warrant criteria may be met.

US 29 is posted 55 mph at the locations of the four intersections that were evaluated for signal warrants. Refer to the following tables for the projected build 2034 hourly traffic volumes at the intersections and a summary of the traffic signal warrants based on both low-speed and high-speed thresholds. Traffic volume development and detailed MUTCD signal warrant summaries are included in Appendix O.

Table 14: Signal Warrant – US 29 NB at South Site Driveway – Low-Speed

START TIME	VOLUMES		WARRANTS				
	MINOR STREET (vph)	MINOR STREET (vph)	1A	1B	COMBINATION		2
					1A	1B	
6:00 AM	753	144	N	N	N	Y	N
7:00 AM	1,418	336	Y	Y	Y	Y	Y
8:00 AM	1,424	310	Y	Y	Y	Y	Y
9:00 AM	1,169	262	Y	Y	Y	Y	Y
10:00 AM	1,113	306	Y	Y	Y	Y	Y
11:00 AM	1,378	397	Y	Y	Y	Y	Y
12:00 PM	1,636	488	Y	Y	Y	Y	Y
1:00 PM	1,560	432	Y	Y	Y	Y	Y
2:00 PM	1,782	455	Y	Y	Y	Y	Y
3:00 PM	2,023	432	Y	Y	Y	Y	Y
4:00 PM	2,306	465	Y	Y	Y	Y	Y
5:00 PM	2,471	481	Y	Y	Y	Y	Y
6:00 PM	2,016	429	Y	Y	Y	Y	Y
7:00 PM	1,526	343	Y	Y	Y	Y	Y
Hours Required			**8**	**8**	**8**	**8**	**4**
Total Hours Met			**13**	**13**	**13**	**14**	**13**
Warrant Met?			**Y**	**Y**	**Y**	**Y**	**Y**

Table 15: Signal Warrant – US 29 NB at South Site Driveway – High-Speed

START TIME	VOLUMES		WARRANTS				
	MINOR STREET (vph)	MINOR STREET (vph)	1A	1B	COMBINATION		2
					1A	1B	
6:00 AM	753	144	Y	Y	Y	Y	Y
7:00 AM	1,418	336	Y	Y	Y	Y	Y
8:00 AM	1,424	310	Y	Y	Y	Y	Y
9:00 AM	1,169	262	Y	Y	Y	Y	Y
10:00 AM	1,113	306	Y	Y	Y	Y	Y
11:00 AM	1,378	397	Y	Y	Y	Y	Y
12:00 PM	1,636	488	Y	Y	Y	Y	Y
1:00 PM	1,560	432	Y	Y	Y	Y	Y
2:00 PM	1,782	455	Y	Y	Y	Y	Y
3:00 PM	2,023	432	Y	Y	Y	Y	Y
4:00 PM	2,306	465	Y	Y	Y	Y	Y
5:00 PM	2,471	481	Y	Y	Y	Y	Y
6:00 PM	2,016	429	Y	Y	Y	Y	Y
7:00 PM	1,526	343	Y	Y	Y	Y	Y
Hours Required			**8**	**8**	**8**	**8**	**4**
Total Hours Met			**14**	**14**	**14**	**14**	**14**
Warrant Met?			**Y**	**Y**	**Y**	**Y**	**Y**

Table 16: Signal Warrant – US 29 NB at North Site Driveway – Low-Speed

START TIME	VOLUMES		WARRANTS				
	MINOR STREET (vph)	MINOR STREET (vph)	1A	1B	COMBINATION		2
					1A	1B	
6:00 AM	771	197	N	N	Y	Y	N
7:00 AM	1454	395	Y	Y	Y	Y	Y
8:00 AM	1449	347	Y	Y	Y	Y	Y
9:00 AM	1178	258	Y	Y	Y	Y	Y
10:00 AM	1120	279	Y	Y	Y	Y	Y
11:00 AM	1382	337	Y	Y	Y	Y	Y
12:00 PM	1649	398	Y	Y	Y	Y	Y
1:00 PM	1573	362	Y	Y	Y	Y	Y
2:00 PM	1799	379	Y	Y	Y	Y	Y
3:00 PM	2025	368	Y	Y	Y	Y	Y
4:00 PM	2294	400	Y	Y	Y	Y	Y
5:00 PM	2452	429	Y	Y	Y	Y	Y
6:00 PM	2007	382	Y	Y	Y	Y	Y
7:00 PM	1520	301	Y	Y	Y	Y	Y
Hours Required			**8**	**8**	**8**	**8**	**4**
Total Hours Met			**13**	**13**	**14**	**14**	**13**
Warrant Met?			**Y**	**Y**	**Y**	**Y**	**Y**

Table 17: Signal Warrant – US 29 NB at North Site Driveway – High-Speed

START TIME	VOLUMES		WARRANTS				
	MINOR STREET (vph)	MINOR STREET (vph)	1A	1B	COMBINATION		2
					1A	1B	
6:00 AM	771	197	Y	Y	Y	Y	Y
7:00 AM	1454	395	Y	Y	Y	Y	Y
8:00 AM	1449	347	Y	Y	Y	Y	Y
9:00 AM	1178	258	Y	Y	Y	Y	Y
10:00 AM	1120	279	Y	Y	Y	Y	Y
11:00 AM	1382	337	Y	Y	Y	Y	Y
12:00 PM	1649	398	Y	Y	Y	Y	Y
1:00 PM	1573	362	Y	Y	Y	Y	Y
2:00 PM	1799	379	Y	Y	Y	Y	Y
3:00 PM	2025	368	Y	Y	Y	Y	Y
4:00 PM	2294	400	Y	Y	Y	Y	Y
5:00 PM	2452	429	Y	Y	Y	Y	Y
6:00 PM	2007	382	Y	Y	Y	Y	Y
7:00 PM	1520	301	Y	Y	Y	Y	Y
Hours Required			**8**	**8**	**8**	**8**	**4**
Total Hours Met			**14**	**14**	**14**	**14**	**14**
Warrant Met?			**Y**	**Y**	**Y**	**Y**	**Y**

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Table 18: Signal Warrant – US 29 SB at Northside Drive – Low-Speed

START TIME	VOLUMES		WARRANTS				
	MINOR STREET (vph)	MINOR STREET (vph)	1A	1B	COMBINATION		2
					1A	1B	
6:00 AM	1,356	75	N	Y	N	Y	N
7:00 AM	1,708	168	Y	Y	Y	Y	Y
8:00 AM	1,753	153	Y	Y	Y	Y	Y
9:00 AM	1,534	125	N	Y	Y	Y	Y
10:00 AM	1,457	143	N	Y	Y	Y	Y
11:00 AM	1,554	182	Y	Y	Y	Y	Y
12:00 PM	1,622	222	Y	Y	Y	Y	Y
1:00 PM	1,584	198	Y	Y	Y	Y	Y
2:00 PM	1,642	208	Y	Y	Y	Y	Y
3:00 PM	1,773	198	Y	Y	Y	Y	Y
4:00 PM	1,852	184	Y	Y	Y	Y	Y
5:00 PM	1,922	193	Y	Y	Y	Y	Y
6:00 PM	1,399	172	Y	Y	Y	Y	Y
7:00 PM	992	137	N	Y	Y	Y	N
Hours Required			**8**	**8**	**8**	**8**	**4**
Total Hours Met			**10**	**14**	**13**	**14**	**12**
Warrant Met?			**Y**	**Y**	**Y**	**Y**	**Y**

Table 19: Signal Warrant – US 29 SB at Northside Drive – High-Speed

START TIME	VOLUMES		WARRANTS				
	MINOR STREET (vph)	MINOR STREET (vph)	1A	1B	COMBINATION		2
					1A	1B	
6:00 AM	1,356	75	N	Y	N	Y	N
7:00 AM	1,708	168	Y	Y	Y	Y	Y
8:00 AM	1,753	153	Y	Y	Y	Y	Y
9:00 AM	1,534	125	N	Y	Y	Y	Y
10:00 AM	1,457	143	N	Y	Y	Y	Y
11:00 AM	1,554	182	Y	Y	Y	Y	Y
12:00 PM	1,622	222	Y	Y	Y	Y	Y
1:00 PM	1,584	198	Y	Y	Y	Y	Y
2:00 PM	1,642	208	Y	Y	Y	Y	Y
3:00 PM	1,773	198	Y	Y	Y	Y	Y
4:00 PM	1,852	184	Y	Y	Y	Y	Y
5:00 PM	1,922	193	Y	Y	Y	Y	Y
6:00 PM	1,399	172	Y	Y	Y	Y	Y
7:00 PM	992	137	N	Y	Y	Y	N
Hours Required			**8**	**8**	**8**	**8**	**4**
Total Hours Met			**10**	**14**	**13**	**14**	**12**
Warrant Met?			**Y**	**Y**	**Y**	**Y**	**Y**

Table 20: Signal Warrant – US 29 SB at Median Break – Low-Speed

START TIME	VOLUMES		WARRANTS				
	MINOR STREET (vph)	MINOR STREET (vph)	1A	1B	COMBINATION		2
					1A	1B	
6:00 AM	1,314	88	N	N	N	Y	N
7:00 AM	1,634	185	N	Y	Y	Y	Y
8:00 AM	1,706	165	N	Y	Y	Y	Y
9:00 AM	1,516	129	N	Y	N	Y	Y
10:00 AM	1,443	144	N	Y	N	Y	Y
11:00 AM	1,553	179	N	Y	Y	Y	Y
12:00 PM	1,619	216	Y	Y	Y	Y	Y
1:00 PM	1,580	194	N	Y	Y	Y	Y
2:00 PM	1,643	204	Y	Y	Y	Y	Y
3:00 PM	1,796	196	N	Y	Y	Y	Y
4:00 PM	1,906	197	N	Y	Y	Y	Y
5:00 PM	1,985	209	Y	Y	Y	Y	Y
6:00 PM	1,448	186	N	Y	Y	Y	Y
7:00 PM	1,032	148	N	Y	N	Y	N
Hours Required			**8**	**8**	**8**	**8**	**4**
Total Hours Met			**3**	**13**	**10**	**14**	**12**
Warrant Met?			**N**	**Y**	**Y**	**Y**	**Y**

Table 21: Signal Warrant – US 29 SB at Median Break – High-Speed

START TIME	VOLUMES		WARRANTS				
	MINOR STREET (vph)	MINOR STREET (vph)	1A	1B	COMBINATION		2
					1A	1B	
6:00 AM	1,314	88	N	Y	N	Y	Y
7:00 AM	1,634	185	Y	Y	Y	Y	Y
8:00 AM	1,706	165	Y	Y	Y	Y	Y
9:00 AM	1,516	129	N	Y	Y	Y	Y
10:00 AM	1,443	144	Y	Y	Y	Y	Y
11:00 AM	1,553	179	Y	Y	Y	Y	Y
12:00 PM	1,619	216	Y	Y	Y	Y	Y
1:00 PM	1,580	194	Y	Y	Y	Y	Y
2:00 PM	1,643	204	Y	Y	Y	Y	Y
3:00 PM	1,796	196	Y	Y	Y	Y	Y
4:00 PM	1,906	197	Y	Y	Y	Y	Y
5:00 PM	1,985	209	Y	Y	Y	Y	Y
6:00 PM	1,448	186	Y	Y	Y	Y	Y
7:00 PM	1,032	148	Y	Y	Y	Y	Y
Hours Required			**8**	**8**	**8**	**8**	**4**
Total Hours Met			**12**	**14**	**13**	**14**	**14**
Warrant Met?			**Y**	**Y**	**Y**	**Y**	**Y**

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Based on MUTCD's low-speed and high-speed (greater than 40 mph) thresholds, traffic signals are expected to be warranted at each of the evaluated intersections at or prior to full build out of the proposed development. It is recommended that additional signal warrant studies be performed for these intersections as the development builds out to establish the appropriate timeframe in which signal warrants may be met.

9. RECOMMENDATIONS

The following roadway improvements are currently planned to be constructed by others (see North Fork proffers in Appendix D of this report):

US 29 at Lewis and Clark Drive:

- Construct a second left turn lane on the northbound approach of US 29 to provide dual left turn lanes. (North Fork)
- Construct a second left turn lane on the eastbound approach of Lewis and Clark Drive to provide dual left turn lanes. (North Fork)

Airport Road at Innovation Drive/Berkmar Drive Extension:

- Extend Berkmar Drive to become the south leg of the intersection and construct a two-lane roundabout at Airport Road (Albemarle County Berkmar Drive Ext project)

The following roadway improvements are recommended to be constructed by the developer **if not constructed by others.* Additional analysis may be needed to determine the appropriate stage of build out at which each improvement is needed. Refer to Appendix P for plans showing the daily development trip thresholds at which improvements are proposed to be completed.

US 29:

- Construct a third through lane northbound between Airport Road/Proffit Road and the Airport Acres Road median break/South Site Driveway. **This improvement was previously identified to be constructed by the North Fork development; however, current North Fork proffers indicate monetary contributions to the County CIP fund to improve US 29.*

US 29 at Airport Road/Proffit Road:

- Restripe/widen the southbound approach of US 29 to provide dual left turn lanes. The turn lanes should each provide a minimum of 275 ft of storage.
- Construct a second receiving lane eastbound on Proffit Road.
- Construct an exclusive right turn lane on the westbound approach of Proffit Road. The turn lane should provide a minimum of 100 ft of storage.
- Convert the existing exclusive right turn lane on the northbound approach of US 29 to a shared through-right turn lane. **This improvement was previously identified to be constructed by the North Fork development; however, current North Fork proffers indicate monetary contributions to the County CIP fund to improve US 29.*

US 29 NB at South Site Driveway:

- Construct a third through lane northbound on US 29.
- Restripe existing pavement to provide dual right turn lanes on the westbound approach of the South Site Driveway.
- Signalize intersection when warranted and approved by VDOT.

US 29 NB at North Site Driveway:

- Construct a third through lane northbound on US 29 and carry an appropriate distance north of the intersection before tapering back to two through lanes northbound.
- Restripe existing pavement to provide dual right turn lanes on the westbound approach of the North Site Driveway.
- Signalize intersection when warranted and approved by VDOT.

US 29 SB at Northside Drive:

- Signalize intersection when warranted and approved by VDOT.

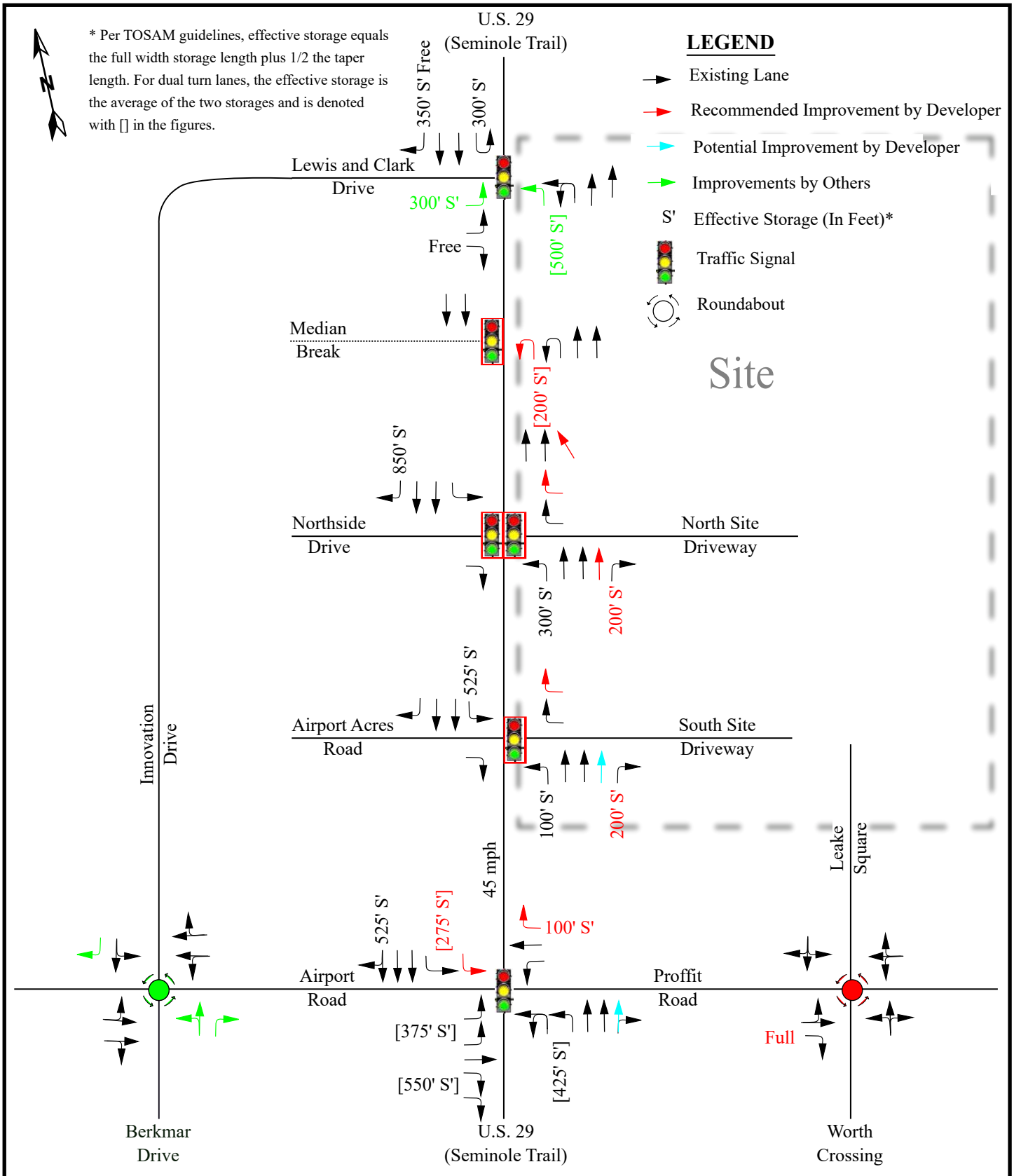
US 29 SB at Median Break:

- Construct/restripe a second left turn lane to provide dual u-turn lanes on the northbound approach of US 29. Each lane should provide a minimum of 200 ft of storage.
- Signalize intersection when warranted and approved by VDOT.

Proffit Road at Worth Crossing/Leake Square:

- Construct a single-lane roundabout with an eastbound right turn slip lane. The roundabout geometry should accommodate large vehicles (wb-62).

Figure 26 shows the recommended lane configurations and traffic control at the study intersections.



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Recommended Lane Configurations

Scale: Not to Scale | Figure 26