

Riker Parcel

Transportation Impact Analysis



Prepared for:
Neal Communities
5800 Lakewood Ranch Boulevard
Sarasota, Florida 34240

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Riker Parcel Transportation Impact Analysis

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Professional Engineer's Certification

I hereby certify that I am a Licensed Professional Engineer in the State of Florida practicing with Stantec Consulting Services Inc. and that I have supervised the preparation of and approve the evaluations, findings, opinions, conclusions, and technical advice hereby reported for:

PROJECT: Riker Parcel
Transportation Impact Analysis
215611778

LOCATION: Northeast corner of the future Pope Road/44th Avenue East
intersection in Manatee County, Florida

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Introduction

The purpose of this study is to determine the transportation impacts of the proposed Riker Parcel residential development located at the northeast corner of the future Pope Road/44th Avenue E intersection in Manatee County, Florida. The project location is shown in Figure 1.



Source: Google 2013

Figure 1: Project Location

The property is currently vacant. The petitioner proposes to construct 120 single-family dwelling units. The development will create one new connection to 44th Avenue E. As part of the project, 44th Avenue E will be extended from its current terminus (located at Future Pope Road) to the project access point. Please refer to the site plan attached in Appendix A, which shows the alignment of 44th Avenue E as well as the site access point. The analysis will evaluate a build-out year of 2016, which represents the maximum time frame a Certificate of Level of Service (CLOS) can grant concurrency approval. Prior to undertaking the study, a methodology statement was submitted to Manatee County and approved on October 10, 2013. A copy of the proposed methodology is attached in Appendix B.

Trip Generation

Traffic volumes generated by the development were estimated using the Institute of Transportation Engineers (ITE), *Trip Generation Manual – the 9th Edition (2012)*. Land Use 210 (Single-Family Detached Housing) was used to estimate the AM and PM peak-hour trip generation potential. The estimated external trips generated by the development are 94 AM peak-hour two-way trip ends (24 entering; 70 exiting) and 124 PM peak-hour two-way trip ends (78 entering; 46 exiting). The trip generation results are summarized in Table 1 and Table 2.

Table 1: AM Peak-Hour Trip Generation

ITE Land Use Category	Units	Development Size	AM Peak Trip Rate/ Equation	AM Enter Split	AM Exit Split	AM Peak Total Trips		
						Total	Enter	Exit
Single Family Housing - 210	Per Unit	120	$T = .70(x) + 9.74$	25%	75%	94	24	70

Table 2: PM Peak-Hour Trip Generation

ITE Land Use Category	Units	Development Size	PM Peak Trip Rate/ Equation	PM Enter Split	PM Exit Split	PM Peak Total Trips		
						Total	Enter	Exit
Single Family Housing - 210	Per Unit	120	$\ln(T) = .90\ln(x) + .51$	63%	37%	124	78	46

Project Traffic Distribution/Assignment

The traffic generated by the proposed project was distributed and assigned to the adjacent roadway network using existing travel patterns. The existing AM and PM peak-hour peak-season traffic volumes, shown in Figure 2, were used to help distribute project traffic. The project traffic distribution and assignment is shown in Figure 3.

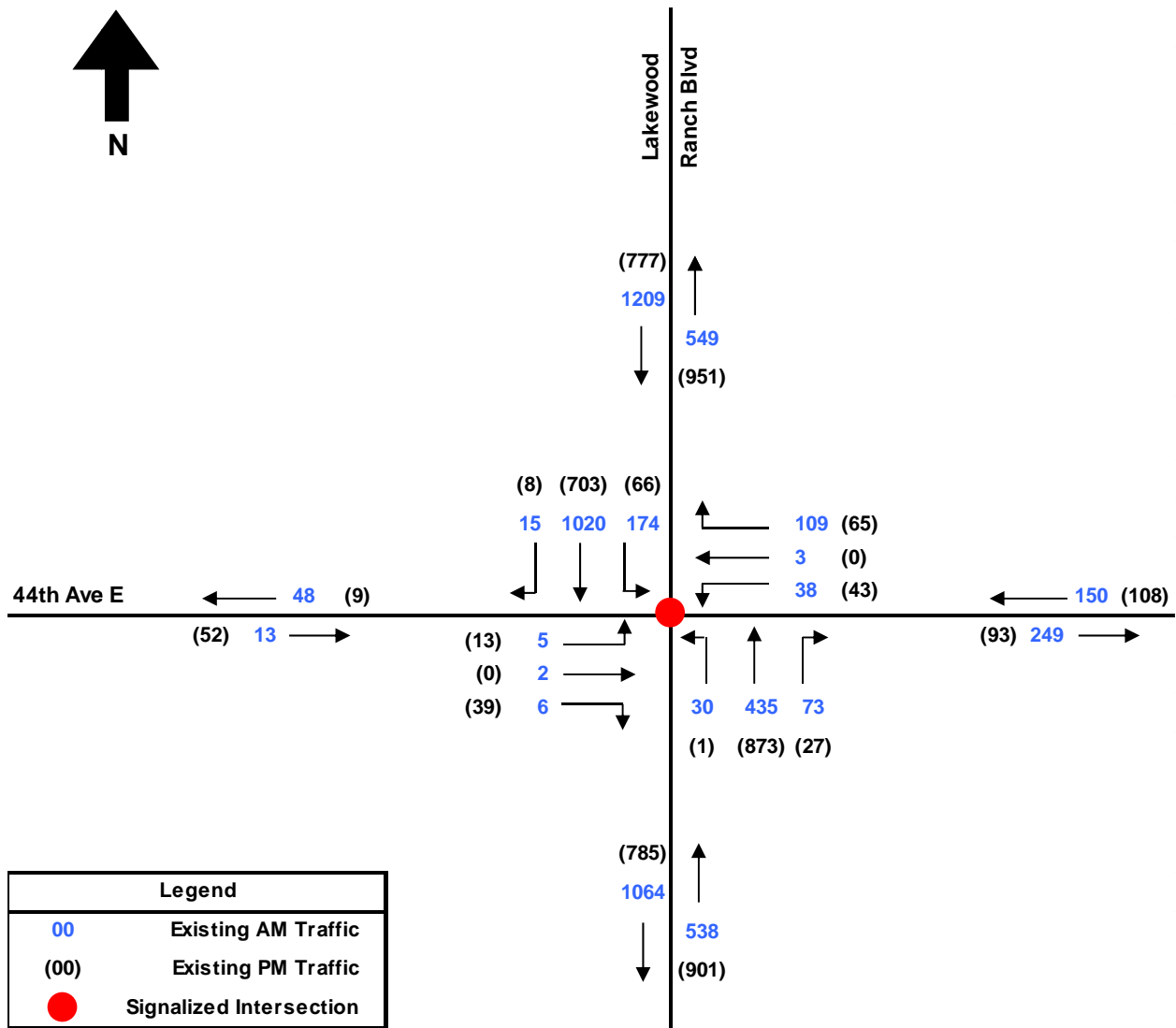


Figure 2: Existing AM and PM Peak-Hour Peak-Season Traffic

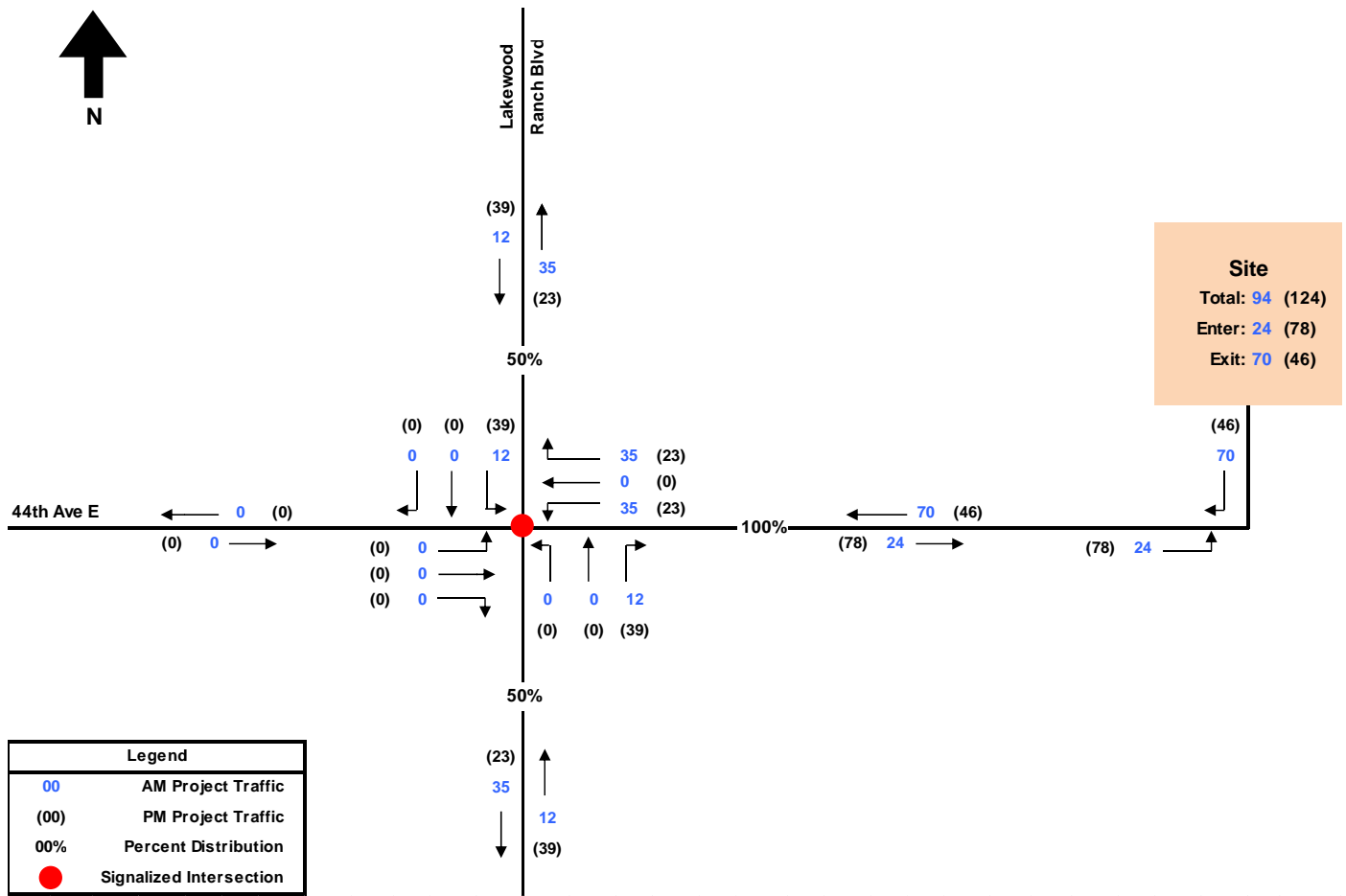


Figure 3: Project Traffic Distribution and Assignment

Study Area

The extent of the roadway network to be studied was based upon the Manatee County Transportation Planning Division's *Traffic Impact Analysis Requirements and Procedures*. Significantly impacted segments are defined as roadway segments in which project traffic is expected to consume at least five percent of the peak-hour two-way level-of-service standard volume or any roadway segment to which the development has direct access or which the development accesses via local and private roads.

The results of the study area determination are provided in Table 3. Per Manatee County's criteria, no regulated roadway segments exceed five percent of the adopted two-way peak-hour service volume. Only the segment of 44th Avenue E from Lakewood Ranch Boulevard to the Site was evaluated as part of this analysis. In addition, a detailed intersection analysis was performed at the Lakewood Ranch Boulevard/44th Avenue E intersection for both the AM and PM peak hours.

Table 3: Study Area Determination

Road Name and Segment	Adopted LOS			Percent Project Traffic	New Project Traffic		Significant Impact? (>5%)	Direct Access?
	LOS Standard	Number of Lanes	Service Volume ¹		Trips	% Impact		
Lakewood Ranch Blvd to Terminus (Site)	D	4	2,630	100%	124	4.7%	No	Yes
Lakewood Ranch Boulevard								
SR 70 to 44th Ave E	D	4	3,220	50%	62	1.9%	No	No
44th Ave E to SR 64	D	4	3,220	50%	62	1.9%	No	No

1. Service volume obtained from Table 4 of the 2012 FDOT Generalized Level-of-Service tables with a non-state roadway adjustment.

2013 Existing Traffic Conditions

Vehicle turning movement counts were conducted at the study area intersection on Wednesday, October 9, 2013. The turning movement counts were taken during the AM peak period (7:00 AM to 9:00 AM) and PM peak period (4:00 PM to 6:00 PM) to quantify existing AM and PM peak-hour conditions. The turning movement counts at the intersection were then adjusted by the FDOT peak-season conversion factor of 1.16. The existing AM and PM peak-hour peak-season traffic volumes are shown in Figure 2. The peak-season factors, turning movement counts, existing lane geometry, and signal timing information are attached in Appendix C.

ROADWAY ANALYSIS

The directional service volumes were taken from the FDOT's 2012 Generalized Service Volume Tables. Existing segment volumes were obtained from the peak-season volumes entering/exiting the intersections during the peak-hour. The results of the 2013 existing level-of-service analysis are summarized in Table 4 and indicate that the segment within the study area currently operates within Manatee County's adopted level-of-service standards.

Table 4: 2013 Existing Segment Conditions

Road Name and Segment	Direction	Adopted LOS			2013 Existing Volume	Exceeds LOS?
		LOS Standard	Number of Lanes / Direction	Service Volume ¹		
44th Avenue East						
Lakewood Ranch Blvd to Terminus (Site)	EB	D	2	1,465	93	No
Terminus (Site) to Lakewood Ranch Blvd	WB				108	

1. Service volume obtained from Table 7 of the 2012 FDOT Generalized Level-of-Service tables with a non-state roadway adjustment.

INTERSECTION ANALYSIS

The intersection analysis was performed using the Synchro Software. As part of the analysis, existing lane geometry was used at the study intersections. Manatee County has adopted an overall intersection level-of-service standard of D with each intersection movement having a volume to capacity ratio (v/c ratio) less than 1.0. The results of the Synchro intersection analysis are summarized in Table 5 and indicate that the study area intersection currently operates within Manatee County's adopted level-of-service standards for both the AM and PM peak hours.

Table 5: 2013 Existing Intersection Conditions

Intersection	Type	Time Period	Overall Intersection LOS		Delay (sec/veh)	Max v/c Ratio	Approach LOS			
			Standard	Existing			EB	WB	NB	SB
Lakewood Ranch Blvd & 44th Ave E	Signalized	AM	D	B	10.5	0.50	B	B	B	A
		PM	D	B	11.0	0.42	A	A	B	A

The intersection volume tables are provided in Appendix D. The 2013 existing Synchro intersection worksheets are provided in Appendix E and electronic versions of the files are attached on the accompanying CD.

2016 Background Traffic Conditions

The background traffic conditions were analyzed for 2016. The background traffic conditions consist of the existing peak-hour peak-season traffic volumes, an annual background growth rate, and reserved traffic.

Based on conversations with County staff, a 1.00% annual growth rate was used to forecast future AM and PM background traffic. In addition, 33% of the reserved traffic on Lakewood Ranch Boulevard (1,280 PM peak-hour trips) was used for the PM peak-hour analysis and for the AM peak-hour intersection analysis, 40% of the PM peak-hour reserved traffic (510 AM peak-hour trips) was used.

The reserved traffic was directionally distributed based on existing travel patterns approaching the Lakewood Ranch Boulevard/44th Avenue E intersection. During the AM peak-hour, the 510 reserved trips were distributed 30% northbound (153 trips) and 70% southbound (357 trips). During the PM peak-hour, the 1,280 PM peak-hour trips were distributed 55% northbound (704 trips) and 45% southbound (576 trips). The northbound and southbound approach volumes were then converted to turning movements based on the percentage of existing turning vehicles. For the eastbound and westbound approaches, reserved traffic was added so that the approach and departure volumes north and south of the intersection were equal.

The 2016 AM and PM peak-hour background traffic volumes are shown in Figure 4 as well as in Appendix D.

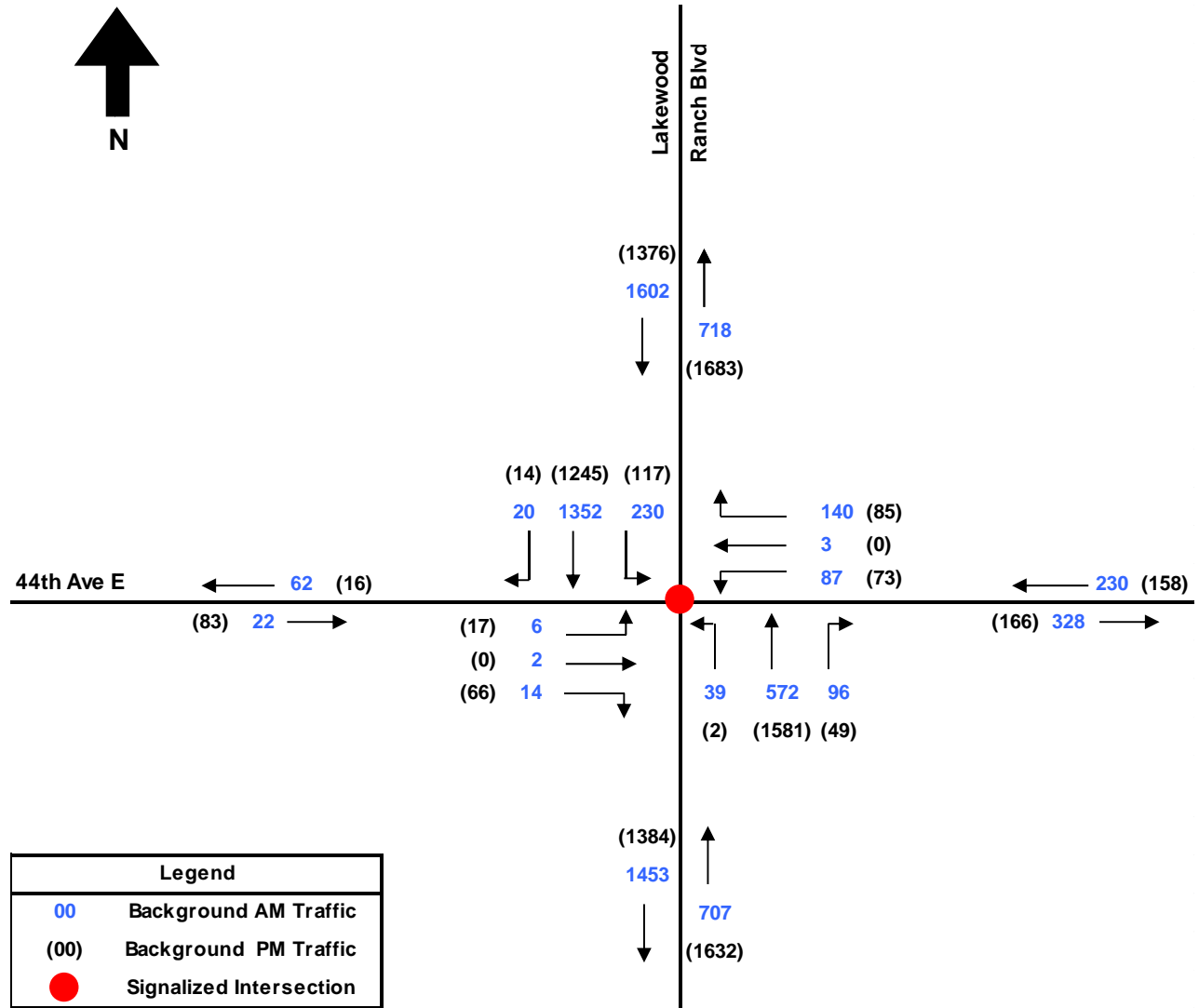


Figure 4: 2016 AM and PM Peak-Hour Background Traffic

ROADWAY ANALYSIS

The results of the 2016 background traffic level-of-service analysis are summarized in Table 6 and indicate that the segment within the study area is anticipated to continue to operate within Manatee County’s adopted level-of-service standards.

Table 6: 2016 Background Traffic Segment Conditions

Road Name and Segment	Direction	Adopted LOS			2013 Existing Volume	Bkgd Growth ¹	Reserved Traffic	2016 Bkgd Volume	Exceeds LOS?
		LOS Standard	Number of Lanes / Direction	Service Volume					
44th Avenue East									
Lakewood Ranch Blvd to Terminus (Site)	EB	D	2	1,465	93	3	70	166	No
Terminus (Site) to Lakewood Ranch Blvd	WB				108	3	47	158	

1. A 1.00% annual background growth rate was used to forecast future traffic volumes.

INTERSECTION ANALYSIS

The intersection analysis was again performed using Synchro. The 2016 background traffic analysis used the same geometry as the existing analysis. The results of the Synchro intersection analysis are summarized in Table 7 and indicate that the study area intersection is anticipated to operate within Manatee County's adopted level-of-service standards for both the AM and PM peak hours.

Table 7: 2016 Background Traffic Intersection Conditions

Intersection	Type	Time Period	Overall Intersection LOS		Delay (sec/veh)	Max v/c Ratio	Approach LOS			
			Standard	Background			EB	WB	NB	SB
Lakewood Ranch Blvd & 44th Ave E	Signalized	AM	D	B	15.8	0.77	A	B	B	B
		PM	D	B	17.7	0.86	A	B	C	B

2016 Total Traffic Conditions

The total traffic conditions were analyzed for 2016. The total traffic conditions consist of the existing peak-hour peak-season traffic volumes, an annual background growth rate, reserved traffic, and project traffic. The 2016 AM and PM peak-hour total traffic volumes are shown in Figure 5.

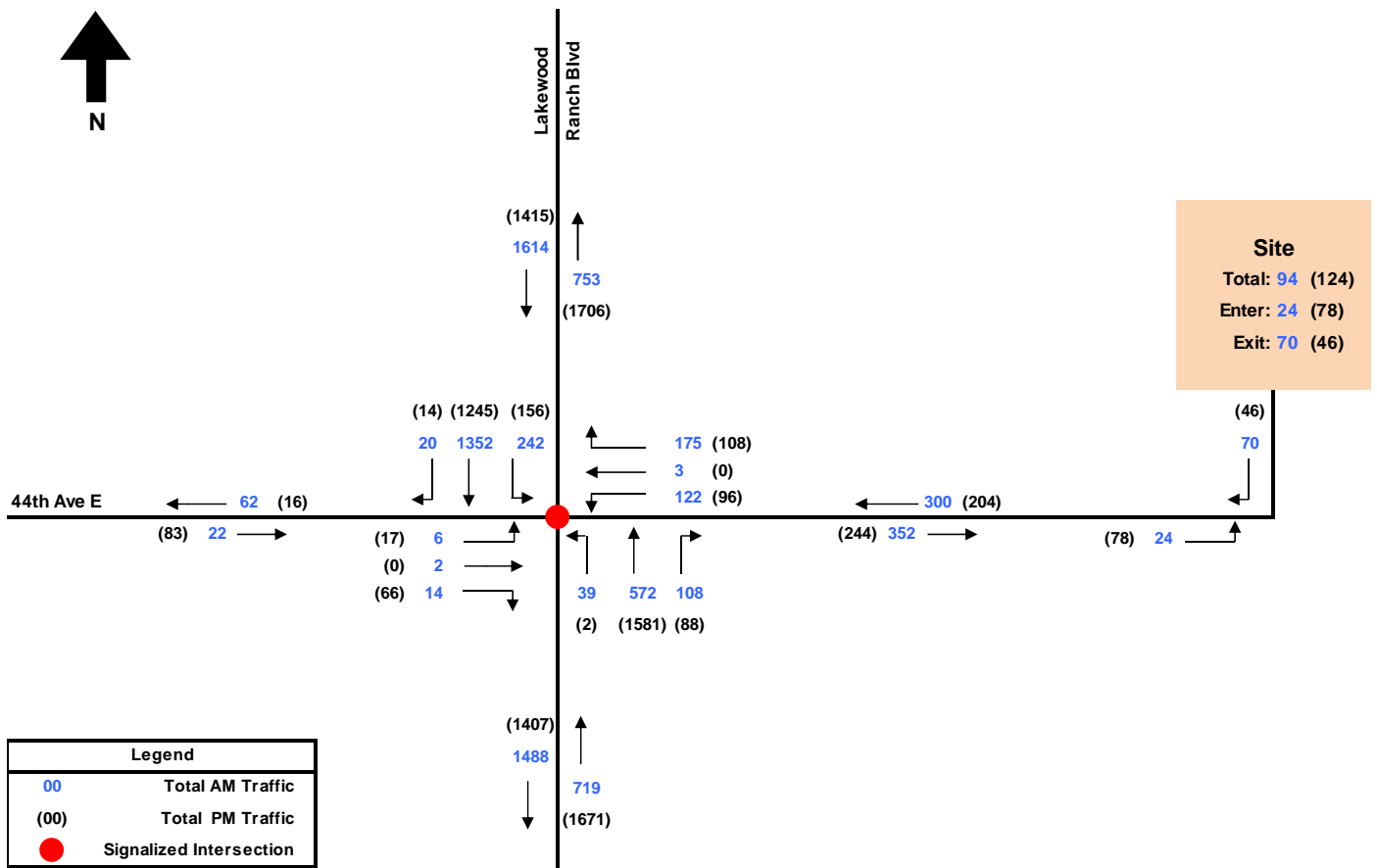


Figure 5: 2016 AM and PM Peak-Hour Total Traffic

ROADWAY ANALYSIS

The results of the 2016 total traffic level-of-service analysis are summarized in Table 8 and indicate that that the segment within the study area is anticipated to continue to operate within Manatee County’s adopted level-of-service standards. No roadway improvements are required in conjunction with this project.

Table 8: 2016 Total Traffic Segment Conditions

Road Name and Segment	Direction	Adopted LOS			2016 Bkgd Volume	Project Traffic	2016 Total Volume	Exceeds LOS?
		LOS Standard	Number of Lanes / Direction	Service Volume				
44th Avenue East								
Lakewood Ranch Blvd to Terminus (Site)	EB	D	2	1,465	166	78	244	No
Terminus (Site) to Lakewood Ranch Blvd	WB				158	46	204	No

INTERSECTION ANALYSIS

The intersection analysis was again performed using Synchro. The 2016 total traffic intersection analysis used the same geometry as the existing traffic analysis. The results of the Synchro intersection analysis are summarized in Table 9 and indicate that the study area intersection is anticipated to operate within Manatee County's adopted level-of-service standards for both the AM and PM peak hours with the addition of project traffic. No intersection improvements are required in conjunction with this project.

Table 9: 2016 Total Traffic Intersection Conditions

Intersection	Type	Time Period	Overall Intersection LOS		Delay (sec/veh)	Max v/c Ratio	Approach LOS			
			Standard	Total			EB	WB	NB	SB
Lakewood Ranch Blvd & 44th Ave E	Signalized	AM	D	B	16.9	0.77	A	B	B	B
		PM	D	B	18.5	0.86	A	B	C	B

The intersection volume tables are provided in Appendix D. The 2016 total traffic Synchro intersection worksheets are provided in Appendix G and electronic versions of the files are attached on the accompanying CD.

SITE ACCESS ANALYSIS

The development will utilize one new connection to 44th Avenue E; please refer to the attached site plan in Appendix A. 44th Avenue E terminates at the site access point, therefore a westbound right turn lane is not warranted as part of this development because it is not a permitted movement. Because 44th Avenue E terminates at the site access point, the eastbound left turn movement is a free-flow movement with no opposing traffic. Additionally, there is no eastbound through traffic for the left turn traffic to impede. Therefore, an eastbound left turn lane is not warranted as part of this development.

Conclusion

The Riker Parcel consists of 120 single-family dwelling units and is estimated to generate 94 AM peak-hour two-way trip ends (24 entering; 70 exiting) and 124 PM peak-hour trip ends (78 entering; 46 exiting). As the capacity analysis documented in this report indicates, the study area roadway segment and intersection are currently operating at acceptable level-of-service standards and are anticipated to continue to operate at acceptable level-of-service standards with the addition of the project traffic. In addition to the off-site concurrency analysis, the site access was reviewed and indicates that neither right turn lanes nor left turn lanes are warranted at either site access point.