

September 19th, 2025

To: Shawn Meschke, PE – APX Construction Group

From: Katie Schmidt, PE - SSTS LLC (MN PE #47147)

Re: Traffic Study – Mankato Apartments (901 S Victory Dr) Traffic Study, Mankato, MN

SSTS, LLC has performed a traffic analysis for the Mankato Apartment Development located at 901 S Victory Dr, referred to as the Proposed Project. This development encompasses approximately 4.5 acres situated on the south side of Stadium Rd (CSAH 60) and east of S Victory Dr. The current land uses consist of a small engine repair shop and vacant land that will be redeveloped.

The Proposed Project consists of 72 apartment units distributed between two three-story buildings, along with a 150-stall surface parking lot. Access to the project is proposed via the existing driveway on S Victory Dr. Traffic will not be permitted to cut through to the eastern property. **Figure 1** illustrates the location and layout of the Proposed Project.

This study aims to assess the traffic impacts generated by the Proposed Project on the operations and safety of the adjacent roadway network and the proposed access driveway. Two existing intersections were analyzed: the Stadium Rd/S Victory Dr roundabout and the side-street stop-controlled intersection at S Victory Dr/Stadium Ln. Additionally, the proposed intersection of S Victory Dr and the Access Driveway was evaluated under Build conditions. Study years include Year 2025 (existing conditions) and Year 2027 without and with the Proposed Project. The following items will be reviewed to provide informed recommendations for safely accommodating traffic:

- Existing Conditions – Geometry and traffic volumes.
- Safety – Review of crash history.
- Future Conditions – Details on background growth and site-generated traffic. Descriptions of 2027 No-Build and 2027 Build Scenarios.
- Traffic Operations Analysis – Summary of Year 2025 Existing Conditions, and Year 2027 No-Build and Build Conditions.

EXISTING CONDITIONS

The existing conditions of the study area roadways and intersections are noted in **Table 1** and on **Figure 2**. Average Daily Traffic (ADT) volumes noted on Figure 2 are from MnDOT's traffic mapping application ([MnDOT ADT Map](#)).

Table 1. Study Roadway Characteristics

Roadway	Ownership	Functional Class*	Typical Section	Posted Speed
Stadium Rd (CSAH 60)	Blue Earth County	Minor Arterial	2-Lanes w/Turn Lanes (W of Victory Rd) 3-Lanes W/CLTL (E of Victory Rd)	40 mph
S Victory Dr	City of Mankato (S of Stadium Rd) Blue Earth County (N of Stadium Rd)	Major Collector	2-Lanes	45 mph
Stadium Ln	City of Mankato	Local	2-Lanes	30 mph

* Based on Enterprise MnDOT Mapping Application (EMMA) - [EMMA Link](#)

AM and PM peak hour turning movement counts were conducted at the two existing study area intersections (Stadium Rd/S Victory Dr roundabout and S Victory Dr/Stadium Ln side-street stop-controlled intersection) on Wednesday, September 10th, 2025. The AM peak traffic hour was found to occur from 7:15 to 8:15 AM, and the PM peak traffic hour was found to occur from 4:30 to 5:30 PM.

Figure 3 shows the existing traffic volumes at the study area intersections. Traffic volumes were balanced through the intersections as needed. Detailed traffic counts are included in Appendix A.

CRASH HISTORY REVIEW

Historical crash data from MnDOT's Crash Mapping Analysis Tool (MnCMAT) for the existing study area intersections was reviewed for 5 years (2020-2024) to note any existing safety concerns and to determine if the addition of site-generated traffic could exacerbate existing safety issues. Intersection Crash Rate (CR), MnDOT's Average Crash Rate for similar intersections, and Intersection Critical Crash Rate were reviewed. The Intersection Crash Rate is defined by the number of crashes occurring per million entering vehicles (MEV). MnDOT's Average Crash Rate is from published system-wide average crash rates for similar intersections. The Intersection Critical Crash Rate is used to determine if an intersection has a crash rate higher than similar facilities by a statistically significant amount. The critical rate is calculated by adjusting the system-wide average crash rate based on the amount of exposure and a statistical constant indicating the level of confidence. If the actual crash rate at a specific location exceeds the critical crash rate, it suggests that deficiencies in the intersection design or other factors may be contributing to the crashes. In such cases, further engineering investigation is recommended.

Table 2 summarizes the intersection crash data for the studied intersections and compares the overall crash rates to the critical crash rates. Based on the crash history at these intersections, there are no existing safety concerns, as the crash rates are lower than the critical crash rates.

Table 2. Intersection Crash Summary

Study Intersection and Control	Years of Data	Total Crashes	Crash Types	F&A Crashes*	Entering ADT	Intersection CR (per MEV)		
						CR	MnDOT Ave. CR	Critical CR
Stadium Rd & S Victory Dr Roundabout	5	5	Single Vehicle - 4 Rear End - 1	0	15,737	0.17	0.97	1.46
S Victory Dr & Stadium Ln Side-Street Stop	5	1	Rear End - 1	0	1,557	0.35	0.15	0.90

* F & A crashes are fatalities and serious injury crashes.

2027 NO-BUILD SCENARIO

Year 2027 was studied to correspond to the year after build-out of the Proposed Project, and No-Build and Build Scenarios were determined. The No-Build Scenario considers the traffic and geometric conditions that would be present at the time of completion of the Proposed Project, without the inclusion of the Proposed Project. The Build Scenario includes the volumes and geometric conditions with the Proposed Project.

To account for general background traffic growth in the area, an annual traffic growth rate was calculated based on historical AADT trends in the area from MnDOT's Traffic Mapping Application. An annual traffic growth rate of 2.35% was calculated and applied to the existing 2025 traffic volumes to estimate the 2027 No-Build traffic volumes shown on **Figure 4**.

2027 BUILD SCENARIO

The 2027 Build Scenario includes traffic from the Proposed Project. The volume of vehicle trips generated by the Proposed Project has been estimated for the weekday AM and PM peak traffic hours and on a daily basis using the data and methodology described in the Institute of Transportation Engineers' (ITE) **Trip Generation Manual**¹, which is a standard industry reference used by public a

¹ **Trip Generation Manual**, Institute of Transportation Engineers (ITE), 12th Edition

agencies to estimate trips generated by specific land uses. **Table 3** summarizes the trip generation estimates. ITE's Low Rise Multifamily land use corresponds to the proposed three-level apartment buildings.

Table 3. Trip Generation

Land Use	ITE Land Use Code	Size	Trips Generated:				
			AM Peak		PM Peak		Weekday ADT
			Enter	Exit	Enter	Exit	
Multifamily Housing (Low-Rise)	220	72 units	7	23	23	14	447
Totals			7	23	23	14	447
			30		37		

The Proposed Project is estimated to generate the following:

- 30 new trips (7 entering and 23 exiting) during the morning traffic peak hour,
- 37 new trips (23 entering and 14 exiting) during the evening traffic peak hour, and
- 447 daily trips.

The primary travel pattern for residents of the Proposed Project is assumed to/from Minnesota State University via Stadium Rd, accounting for 70% of site-generated traffic. Additionally, it is estimated that 15% of the site-generated traffic is to/from the north on Victory Dr, 5% to/from the south on Victory Dr, and 10% to/from the east on Stadium Rd. **Figure 5** illustrates the distribution percentages of site-generated traffic and the resulting trip assignment at each intersection. The Build traffic volumes, shown on **Figure 6**, are formed when the No-Build traffic volumes are combined with the trip assignment traffic volumes.

Turning volumes at the S Victory Dr and the Access Driveway do not warrant turn lanes per industry references (NCHRP Reports) and the intersection was modeled with shared single lane approaches.

TRAFFIC OPERATIONS ANALYSIS

The operating conditions of intersections are assessed by comparing their capacity to the actual traffic volume. The industry standards for evaluating capacity are outlined in the **Highway Capacity Manual**². These conditions are described in terms of driver delay, which is represented by a Level of Service (LOS) grade, where "A" indicates the best conditions and "F" signifies the worst. Generally, LOS "D" marks the threshold for acceptable operations. **Table 4** provides a summary of the LOS and delay criteria for unsignalized intersections and roundabouts.

Table 4. Level of Service Criteria – Unsignalized Intersections & Roundabouts

LOS	A	B	C	D	E	F
Delay	0-10 seconds	>10-15 seconds	>15-25 seconds	>25-35 seconds	>35-50 seconds	>50 seconds
Description	 <i>Free-flow operation</i>	 <i>Unimpeded operation</i>	 <i>Stable operation</i>	 <i>Less stable & more delay</i>	 <i>Unstable & high delay</i>	 <i>Congested & back-ups</i>

Another component of operational analyses is a study of queuing. An intersection can operate with an acceptable LOS, but if queues from the intersection extend back to block adjacent intersections, entrances to turn lanes, or access driveways, unsafe conditions could result. This study reports the industry design standard 95th Percentile Queue Length.

This study utilized the Synchro/SimTraffic software package (12th Edition) for the side-street stop control operational analyses and RODEL Roundabout Analysis Software for the roundabout operational

² **Highway Capacity Manual (HCM)**, Transportation Research Board, 7th Edition

analyses. LOS D was considered the threshold for acceptable operations. LOS, delay, and queues are reported for each intersection.

Intersection operational analysis results for Existing Conditions, 2027 No-Build Conditions, and 2027 Build Conditions are reported in **Table 5** and **Table 6** for the AM and PM peak hours, respectively.

Table 5. Operational Analysis Results – AM Peak Hour

Intersection	Lane	2025 Existing AM Peak Hour		2027 No-Build AM Peak Hour		2027 Build AM Peak Hour	
		Delay	Queue (')	Delay	Queue (')	Delay	Queue (')
Stadium Rd & Victory Dr (Roundabout)	EB	A 3.8	49	A 3.9	53	A 3.9	54
	WB	A 6.0	48	A 6.2	53	A 6.4	55
	NB	A 5.1	24	A 5.2	27	A 5.4	30
	SB	A 4.2	9	A 4.3	10	A 4.3	10
	Overall	A 4.5		A 4.6		A 4.7	
Victory Dr & Stadium Ln (Side-Street Stop)	EB LTR	B 10.5	3	B 10.7	3	B 10.7	3
	WB LTR	A 9.4	0	A 9.5	0	A 9.5	0
	NB LT	A 7.4	0	A 7.4	0	A 7.4	0
	NB R	A 0.0	0	A 0.0	0	A 0.0	0
	SB LT	A 7.7	0	A 7.7	0	A 7.7	0
	SB R	A 0.0	0	A 0.0	0	A 0.0	0
	Overall	A 0.7		A 0.7		A 0.7	
Victory Dr & Access (Side-Street Stop)	WB LR	NA	NA	NA	NA	A 9.8	3
	NB TR					A 0.0	0
	SB LT					A 7.8	0
	Overall					A 0.8	

Table 6. Operational Analysis Results – PM Peak Hour

Intersection	Lane	2025 Existing PM Peak Hour		2027 No-Build PM Peak Hour		2027 Build PM Peak Hour	
		Delay	Queue (')	Delay	Queue (')	Delay	Queue (')
Stadium Rd & Victory Dr (Roundabout)	EB	A 4.0	59	A 4.2	65	A 4.2	67
	WB	A 7.9	103	A 8.6	119	A 8.8	122
	NB	A 5.0	19	A 5.2	21	A 5.3	23
	SB	A 5.7	30	A 6.0	33	A 6.1	35
	Overall	A 5.5		A 5.8		A 5.9	
Victory Dr & Stadium Ln (Side-Street Stop)	EB LTR	B 11.1	3	B 11.3	3	B 11.3	3
	WB LTR	A 9.7	0	A 9.7	0	A 9.7	0
	NB LT	A 7.6	0	A 7.6	0	A 7.6	0
	NB R	A 0.0	0	A 0.0	0	A 0.0	0
	SB LT	A 7.5	0	A 7.6	0	A 7.6	0
	SB R	A 0.0	0	A 0.0	0	A 0.0	0
	Overall	A 0.7		A 1.0		A 1.0	
Victory Dr & Access (Side-Street Stop)	WB LR	NA	NA	NA	NA	A 9.5	3
	NB TR					A 0.0	0
	SB LT					A 7.7	3
	Overall					A 0.7	

The following summarizes the operational results for each study year:

- 2025 Existing Conditions - The two study area intersections function acceptably under existing conditions. LOS is B or better for all approach lanes. Queuing is safely managed by the current roadway geometry.
- 2027 No-Build Conditions - The two study area intersections also operate acceptably under 2027 No-Build conditions. The growth in background traffic slightly increases delays and queuing. LOS remains B or better for all approach lanes. Queuing continues to be safely managed by the current roadway geometry.
- 2027 Build Conditions - The intersections and proposed access within the study area function acceptably under 2027 Build conditions with the Proposed Project. The addition of site-generated traffic causes slight increases in delay and queuing. LOS remains B or better for all approach lanes. Queuing is safely accommodated by the existing roadway geometry. Mainline turn lanes at the access are not necessary on Victory Dr based on operations.

SUMMARY

- ★ The number of new vehicle trips estimated to be generated by the Proposed Project is 30 trips during the morning peak hour (7 entering and 23 exiting), 37 trips during the evening peak hour (23 entering and 14 exiting), and 447 trips daily. This volume is low, resulting in roughly one new trip every two minutes during peak hours.
- ★ The operational analyses show acceptable conditions in the study area for both existing and 2027 No-Build scenarios. The crash history review revealed no safety issues.
- ★ The operation analyses for 2027 Build conditions with the Proposed Project indicate acceptable study area operations. The Victory Dr and Access intersection functions acceptably with single-lane approaches.



Figure 1. Project Location and Site Layout

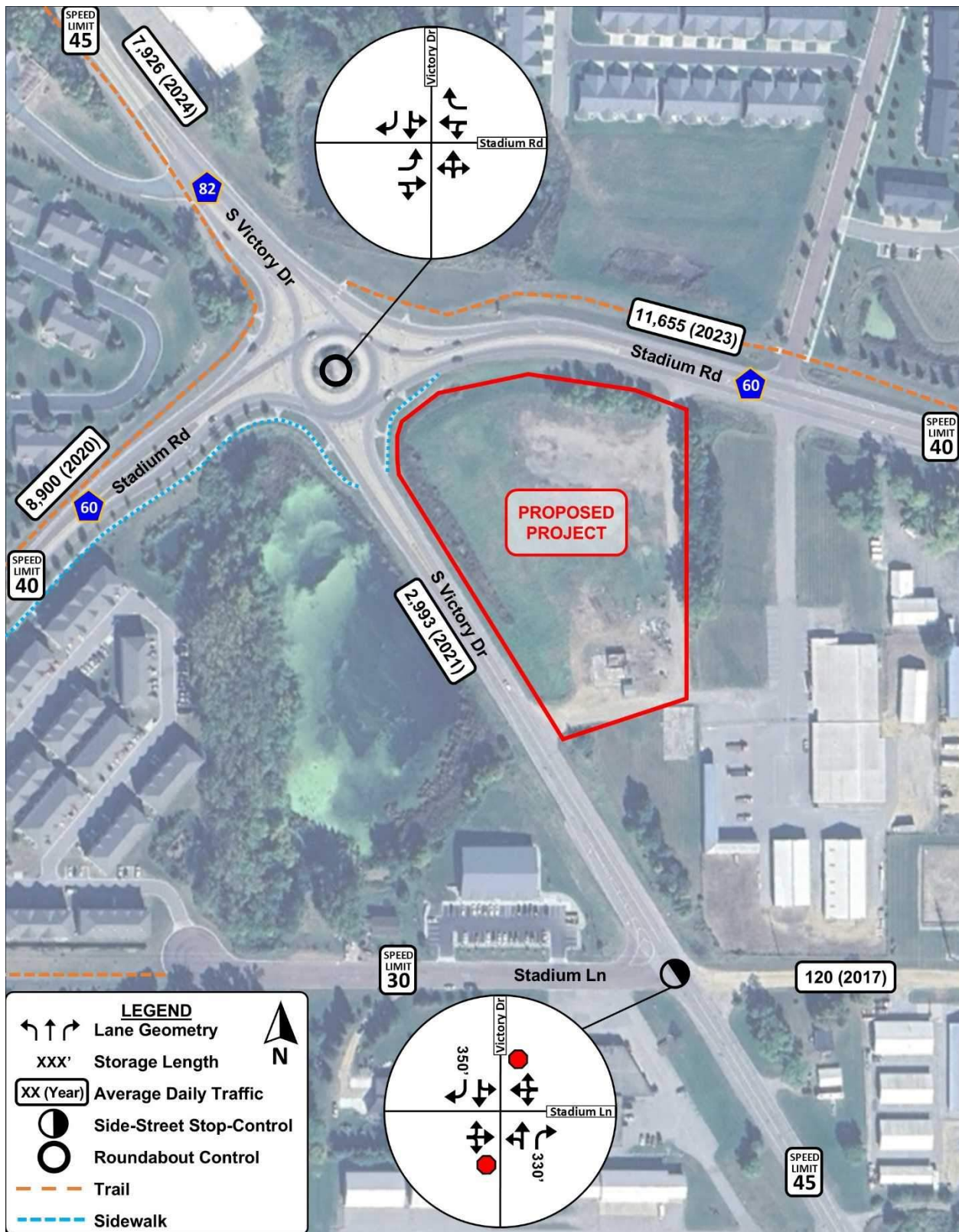


Figure 2. Existing Conditions

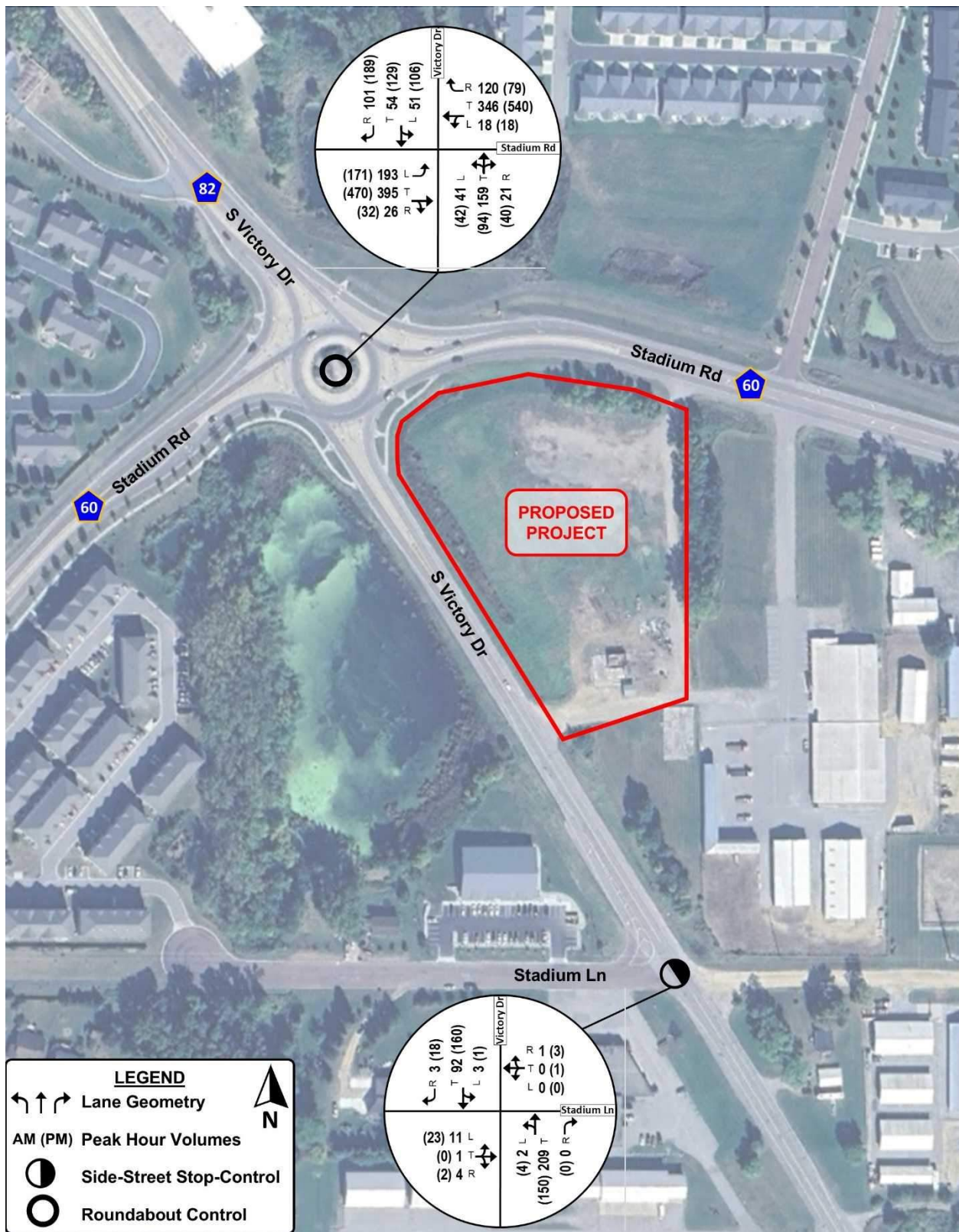


Figure 3. Existing 2025 Traffic Volumes



Figure 4. 2027 No-Build Traffic Volumes

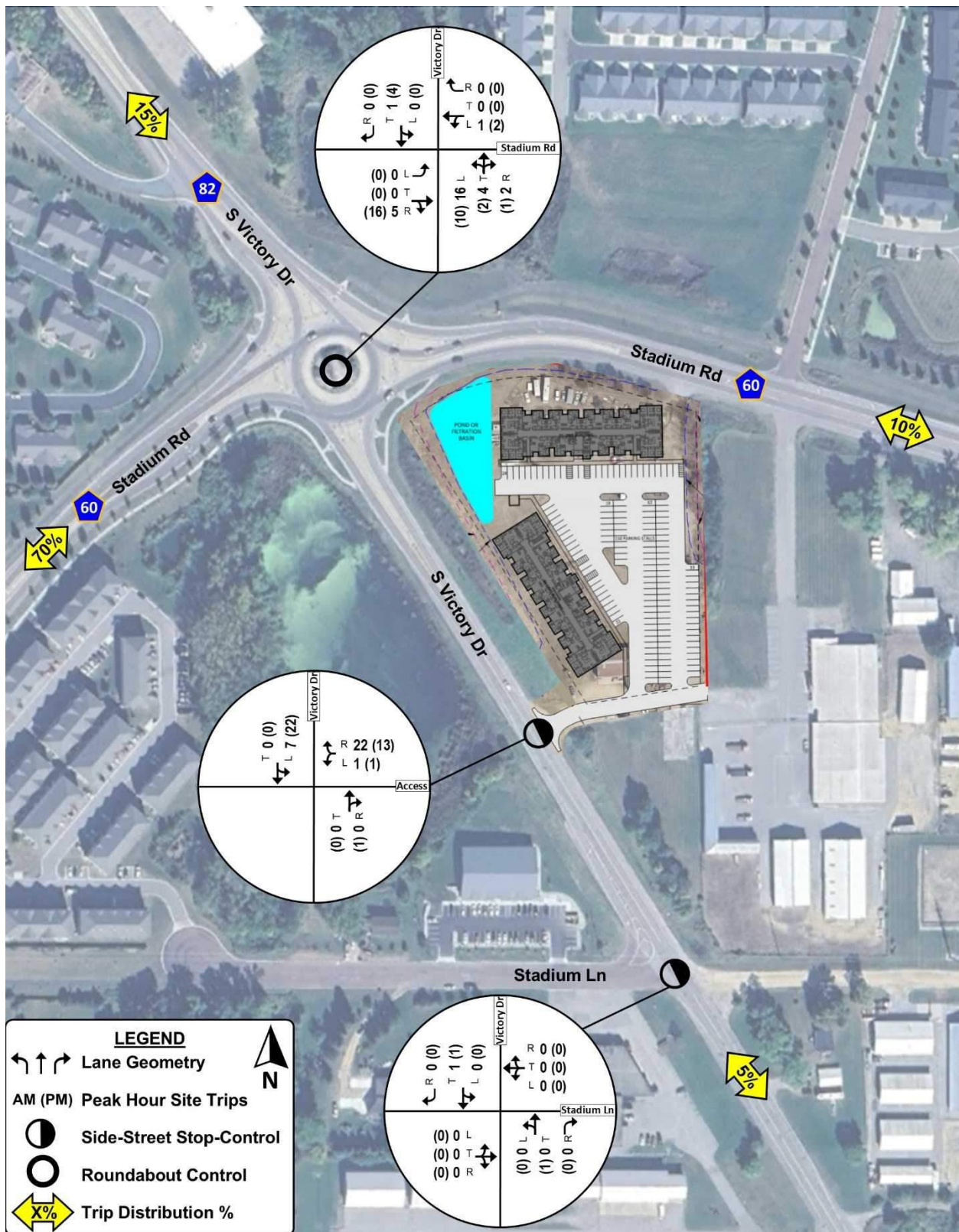


Figure 5. Trip Distribution and Assignment

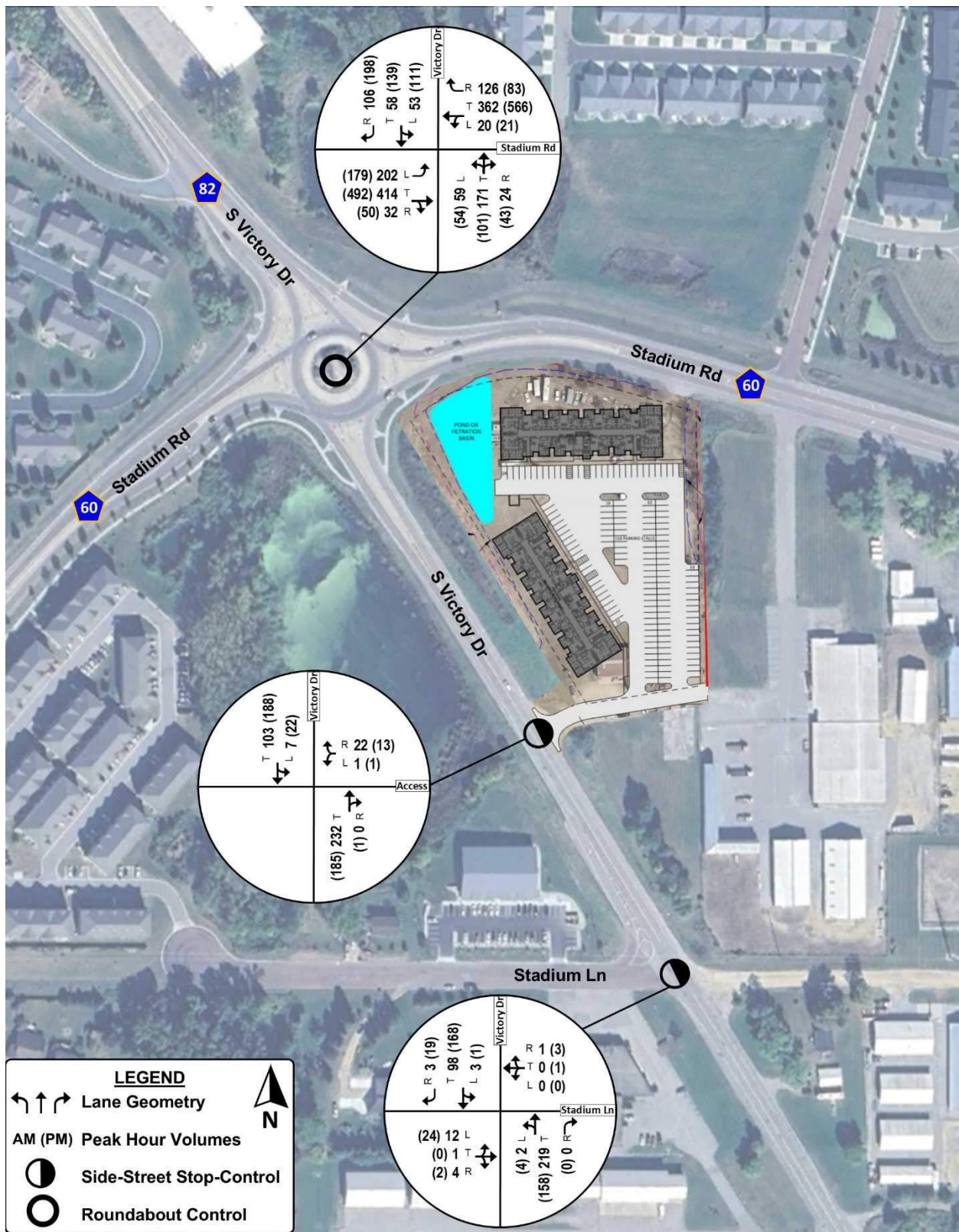
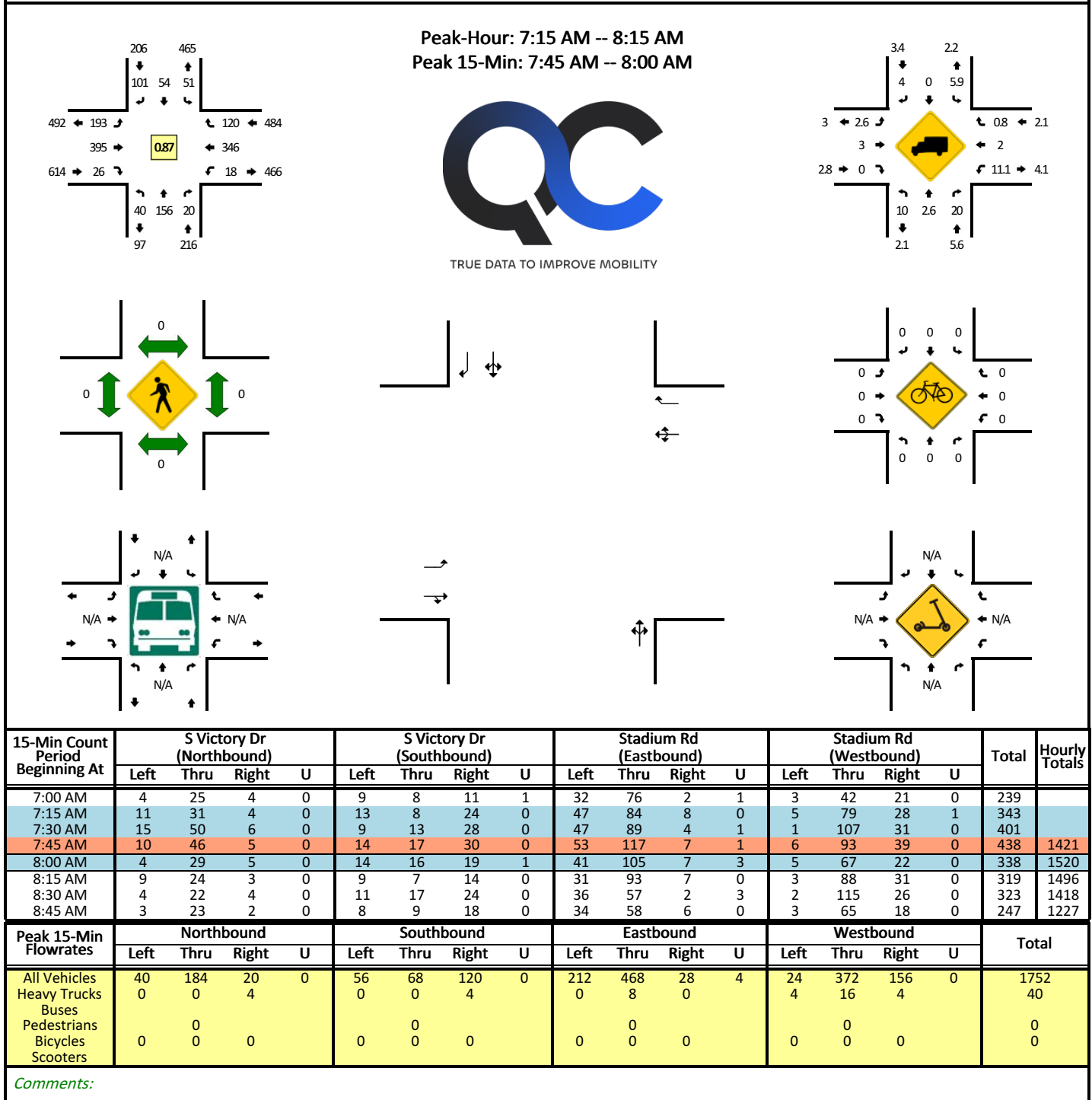


Figure 6. 2027 Build Traffic Volumes

Appendix A – Turning Movement Counts

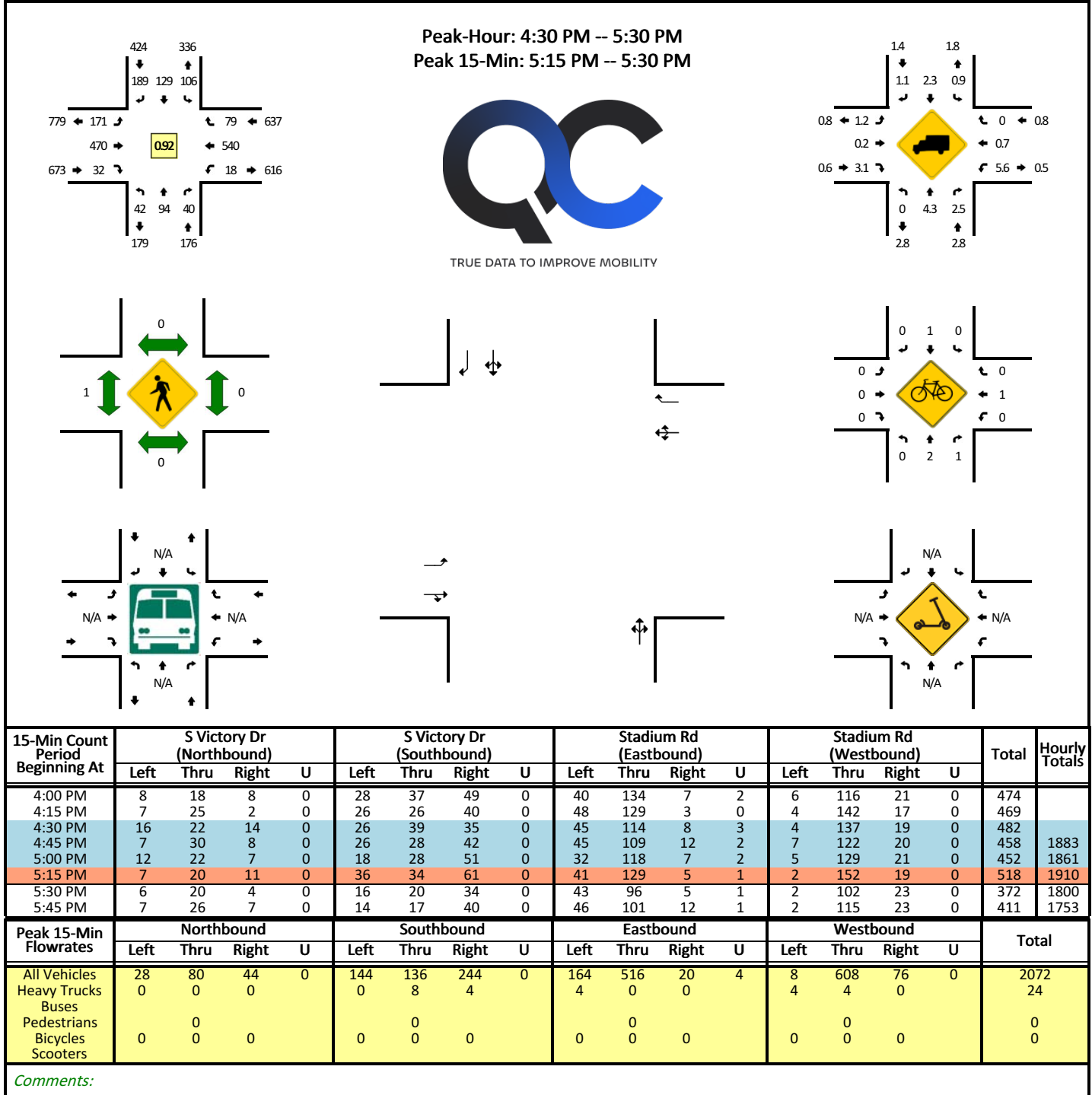
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CITY/STATE: Mankato, MN

QC JOB #: 17227201
DATE: Wed, Sep 10 2025



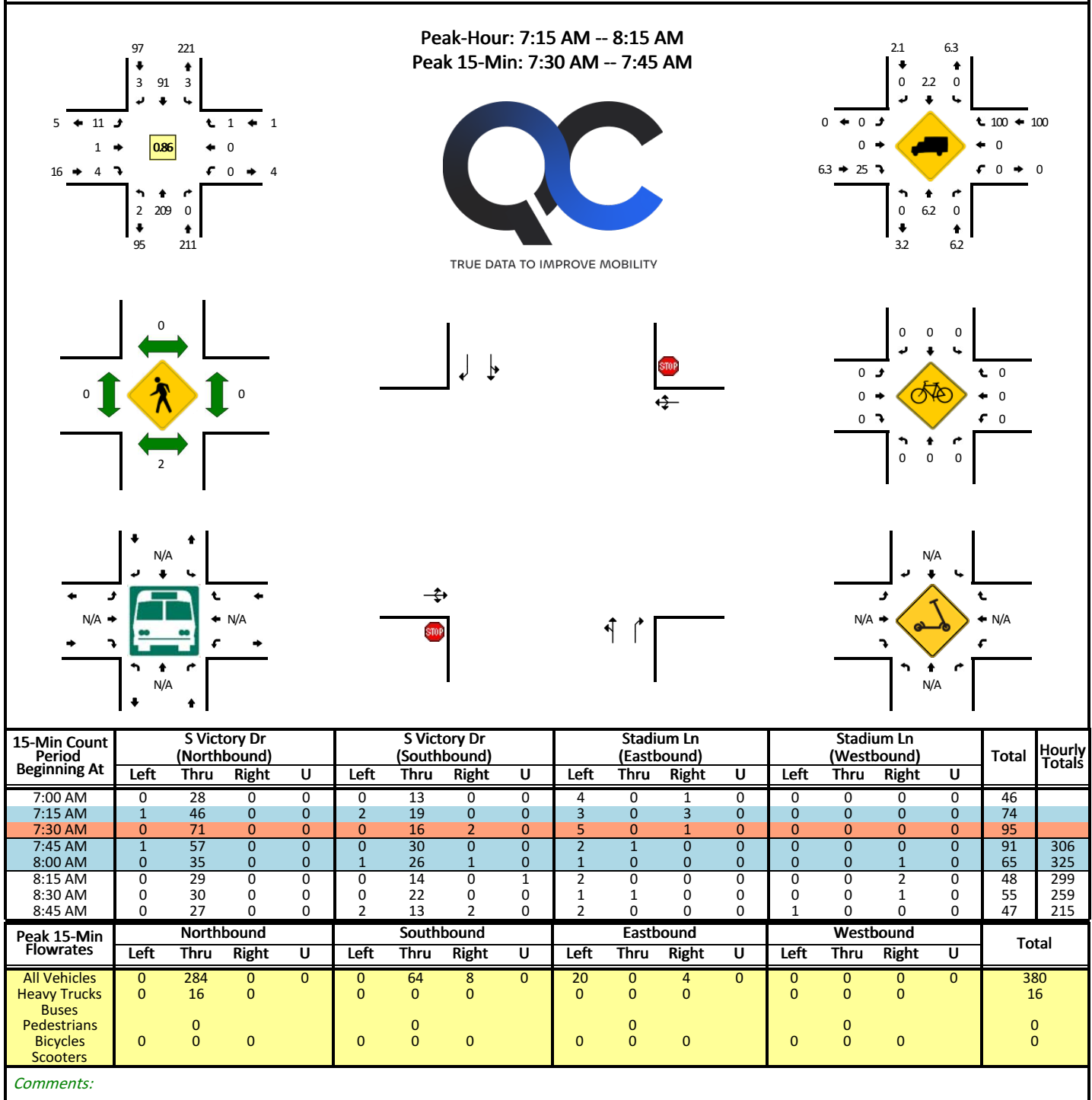
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CITY/STATE: Mankato, MN

QC JOB #: 17227202
DATE: Wed, Sep 10 2025



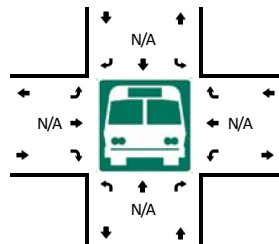
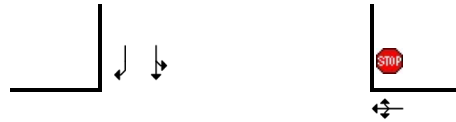
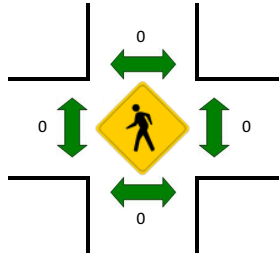
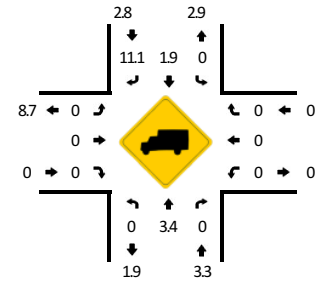
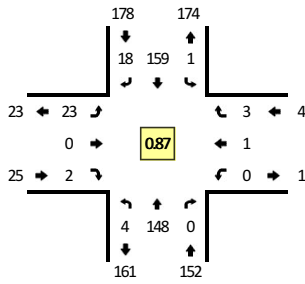
LOCATION: S Victory Dr -- Stadium Ln
CITY/STATE: Mankato, MN

QC JOB #: 17227203
DATE: Wed, Sep 10 2025



LOCATION: S Victory Dr -- Stadium Ln**CITY/STATE:** Mankato, MN**QC JOB #:** 17227204**DATE:** Wed, Sep 10 2025

Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM



15-Min Count Period Beginning At	S Victory Dr (Northbound)				S Victory Dr (Southbound)				Stadium Ln (Eastbound)				Stadium Ln (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	31	0	0	1	48	3	0	3	0	1	0	0	0	0	0	87	
4:15 PM	0	29	0	0	1	29	3	0	5	0	2	0	0	0	1	0	70	
4:30 PM	1	44	0	0	0	46	6	0	4	0	0	0	0	0	2	0	103	
4:45 PM	0	40	0	0	1	38	6	0	5	0	2	0	0	0	0	0	92	352
5:00 PM	2	33	0	0	0	37	4	0	7	0	0	0	0	1	0	0	84	349
5:15 PM	1	31	0	0	0	38	2	0	7	0	0	0	0	0	1	0	80	359
5:30 PM	0	29	0	0	0	27	3	0	3	0	0	0	1	0	1	0	64	320
5:45 PM	1	35	0	0	0	31	0	0	2	0	1	0	0	0	1	0	71	299
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	176	0	0	0	184	24	0	16	0	0	0	0	0	8	0	412	
Heavy Trucks	0	12	0	0	0	4	4	0	0	0	0	0	0	0	0	0	20	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scooters																		

Comments:

Report generated on 9/17/2025 8:29 AM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212