



MEMORANDUM

SRF Project No. 19777

To: Craig Britton, PE, Office Manager, VP
Justin Sebens, PE, Senior Project Manager
From: Ashley Stueve, PE, Engineer III
Date: March 9, 2026
Subject: School Sisters of Notre Dame Traffic Study Update; Mankato, Minnesota

Introduction

SRF has completed a traffic study update for the proposed School Sisters of Notre Dame residential development in the City of Mankato, Minnesota. The proposed development is generally located east of 4th Street and north of Thompson Ravine Road (see Figure 1) and was originally analyzed as part of the *School Sisters of Notre Dame Proposed Residential Development Traffic Impact Study* completed by Bolton & Menk in November 2023. Since completion of the 2023 study, development assumptions and site access conditions have changed, therefore, an updated traffic study is required. The main objectives of the study are to evaluate existing operations within the study area, identify any transportation impacts associated with the proposed development, and recommend improvements to address any issues, if necessary. The following information provides the assumptions, analysis, and study recommendations offered for consideration.

Previous Study

The *School Sisters of Notre Dame Proposed Residential Development Traffic Impact Study* was prepared by Bolton & Menk in November 2023 (hereafter referred to as the *School Sisters 2023 Study*). The study evaluated a proposed development consisting of 18 senior adult housing units, 10 single-family detached housing units, 250 multifamily housing units, and an event center. The primary objectives of the study were to collect traffic data at nine (9) study intersections, evaluate opening-year (2028) traffic operations, and identify any potential transportation infrastructure improvements. For the purpose of this study, Thompson Ravine Road access is expected to be used primarily for emergency purposes due to several geometric and safety constraints. These constraints include steep roadway grades exceeding 10 percent in some locations, a narrow access roadway approximately 22 feet wide, limited sight distance, insufficient vehicle stacking distance at the intersection, inadequate curb radii, and steep side slopes. Based on discussions with Widseth (Civil and Site Design Engineer), improvements necessary to address these constraints are considered infeasible. Therefore, public access from Thompson Ravine Road was not assumed in this study update.



Project Location

School Sisters of Notre Dame Traffic Study Update
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Figure 1

Existing Conditions

Existing conditions were reviewed to establish a baseline to identify any future impacts associated with the proposed development. The evaluation of existing conditions includes a review of traffic volumes, roadway characteristics, and an intersection capacity analysis, which are summarized in the following sections.

Data Collection

Weekday a.m. and p.m. peak-period vehicular turning movement data collected by Bolton & Menk in April 2023 were utilized in this study at the following study intersections:

- Victory Drive and Thompson Ravine Road
- May Street and 5th Street
- May Street and Broad Street
- May Street and 2nd Street
- 4th Street and Mabel Street
- Broad Street and Mabel Street
- North Riverfront Drive and Good Counsel Drive
- 4th Street and Good Counsel Drive

It should be noted that the Bolton & Menk traffic counts were collected while area schools were in session. Intersections along Good Counsel Road, which is the primary roadway providing access to and from Loyola Catholic School, were analyzed using the school dismissal peak hour (2:30 p.m. to 3:30 p.m.), while the remaining study intersections were analyzed using the p.m. peak hour (4:30 p.m. to 5:30 p.m.). Existing year 2026 peak-period volumes were developed using turning movement data from the *School Sisters 2023 Study*, along with background traffic growth in the study area and additional enrollment-related traffic at the adjacent Loyola Catholic School between the 2022–2023 and 2025–2026 school years, which were added and distributed throughout the study area.

Roadway Characteristics

A field assessment was completed to identify various roadway characteristics within the transportation system study area, such as functional classification, general configuration, and posted speed limit. A summary of these roadway characteristics are shown in Table 1. Note that these are general characteristics and that there are some deviations within the area or segments of the roadways. For example, Good Counsel Drive transitions from an unposted speed limit roadway to a posted 20 mph speed limit upon entering the school campus.

Table 1: Existing Roadway Characteristics

Roadway	Functional Classification ¹	General Configuration	Posted Speed Limit (mph)
Victory Drive	Minor Arterial	4-lane divided roadway	40
Thompson Ravine Road	Minor Collector	2-lane undivided roadway	Unposted ²
May Street	Local Roadway	2-lane undivided	Unposted ²
5th Street	Local Roadway	2-lane undivided	Unposted ²
Broad Street	Local Roadway	2-lane divided	Unposted ²
2nd Street	Local Roadway	2-lane undivided	Unposted ²
4th Street	Local Roadway	2-lane (one way) undivided roadway	30
Mable Street	Local Roadway	2-lane undivided	Unposted ²
North Riverfront Drive	Minor Arterial	4-lane divided/ 4-lane undivided ³	30/ 35 ⁴
Good Counsel Drive	Local Roadway	2-lane undivided	Unposted ² / 20 ⁵

From a traffic control perspective, the Victory Drive and Thompson Ravine Road/Raintree Road intersection is signalized. All other study intersections are unsignalized with side-street stop control. Existing geometrics, traffic control, and traffic volumes in the study area are shown in Figure 2.

Intersection Capacity Analysis

An intersection capacity analysis was completed using Synchro/SimTraffic software to establish a baseline condition to which future traffic operations could be compared. Capacity analysis results identify a Level of Service (LOS) which indicates how well an intersection is operating. Intersections are graded from LOS A through LOS F. The LOS results are based on average delay per vehicle, which corresponds to the delay threshold values shown in Table 2. LOS A indicates the best traffic operation, while LOS F indicates an intersection where demand exceeds capacity. Overall intersection LOS A through LOS D is generally considered acceptable based on MnDOT guidelines.

¹ Functional Classification based on *MNDOT's Transportation Management System*.

² Speed Limit Assumed to be 30-mph.

³ North Riverfront Drive transitions from a 4-lane divided roadway to a 4-lane undivided roadway south of Ruby Street.

⁴ North Riverfront Drive transitions from a 35-mph speed limit to a 30-mph speed limit south of May Street.

⁵ Good Counsel Drive transitions from an unposted speed limit to a 20-mph speed limit upon entering the school campus.

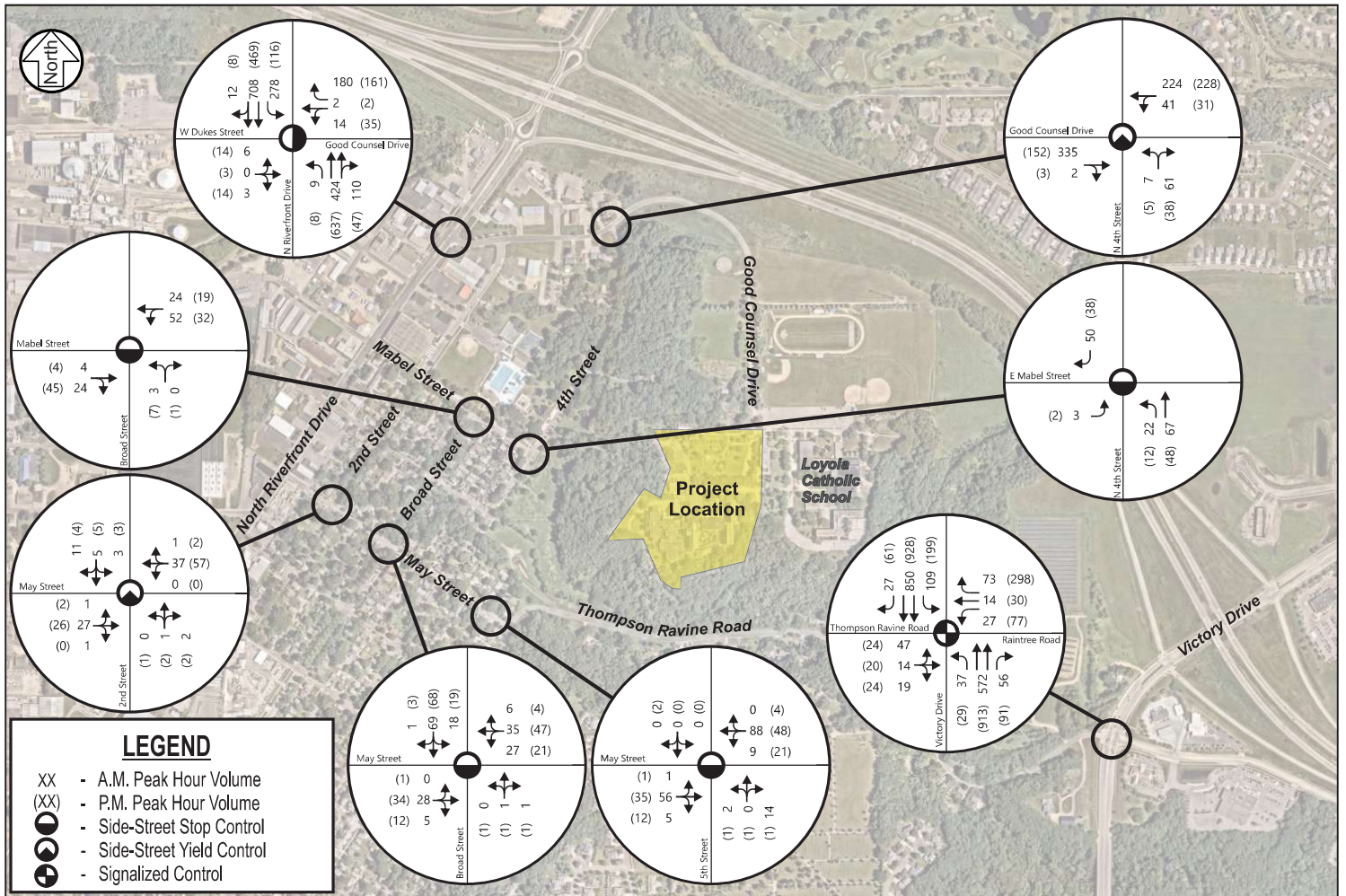


Table 2: Level of Service Criteria for Signalized and Unsignalized Intersections

LOS Designation	Signalized Intersection Average Delay/Vehicle (seconds)	Unsignalized Intersection Average Delay/Vehicle (seconds)
A	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

For signalized, all-way stop, and roundabout controlled intersections, the overall intersection control delay dictates the LOS. At side-street stop-controlled intersections, the LOS is determined based on the worst side-street movement (or shared movement) or major-street left-turn delay and no overall LOS is provided.

Results of the existing capacity analysis summary, shown in Table 3, indicate that all study intersections currently operate at an acceptable overall LOS C or better during the weekday a.m., and p.m. peak hours with the existing traffic control and geometric layout. No significant side-street stop delay or queuing issues were observed.

Table 3: Existing Intersection Capacity Analysis Summary

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
North Riverfront Drive & Good Counsel Drive ⁶	C	22 sec.	C	16 sec.
4th Street & Good Counsel Drive ⁷	A	3 sec.	A	1 sec.
Broad Street & Mabel Street ⁶	A	2 sec.	A	4 sec.
4th Street & Mabel Street ⁶	A	6 sec.	A	6 sec.
2nd Street & May Street ⁷	A	2 sec.	A	2 sec.
Broad Street & May Street ⁶	A	6 sec.	A	6 sec.
5th Street & May Street ⁶	A	3 sec.	A	3 sec.
Thompson Ravine Road & Emergency Access ⁸	A	1 sec.	A	1 sec.
Victory Drive & Thompson Ravine Road/Raintree Road ⁹	A	8 sec.	B	13 sec.

⁶ Indicates an unsignalized intersection with a side-street stop control, where the worst side-street movement LOS and delay are shown.

⁷ Indicates an unsignalized intersection with a yield control, where the worst side-street movement LOS and delay are shown.

⁸ Indicates an uncontrolled intersection, where the worst side-street movement LOS and delay are shown.

⁹ Indicates a signalized controlled intersection, where the overall LOS and delay are shown.

Traffic Forecasts

The year 2030 build traffic forecasts account for general background growth, increased enrollment at Loyola Catholic School, and traffic generated by the proposed development. The following sections outline the traffic forecast development process and assumptions, as well as the proposed development trip generation.

Background Traffic Growth

To account for general background growth in the area, an annual growth rate of one (1) percent was applied to the existing peak hour mainline through movements along North Riverfront Drive and Victory Drive to develop future background forecasts. This growth rate was developed using a combination of historical average daily traffic (ADT) volumes from surrounding roadways as published by MnDOT, traffic forecasts from the *MAPO 2050 Metropolitan Transportation Plan*, and engineering judgment. Note that no background growth was applied to the remaining intersections/movements due to limited availability for future development.

Loyola Catholic High School

Loyola Catholic School is a private school serving students from preschool through grade 12 and is located immediately east of the proposed development. Based on enrollment data provided by the school, 541 students were enrolled during the 2022–2023 school year, which corresponds to the period when traffic counts were collected as part of the *School Sisters 2023 Study*. Trips associated with this enrollment level were already using the adjacent roadway network at the time of data collection and were therefore not included in the trip generation estimates. For the 2025–2026 school year, enrollment has increased to 585 students. The increase in enrollment between the 2022–2023 count year and the 2025–2026 school year was accounted for and included in the existing conditions analysis. Additionally, the school is projecting approximately 600 students by the 2030 build year. To account for additional trips associated with the increase in enrollment to the 2030 build year, trip generation estimates were developed using the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 12th Edition, and distributed to the adjacent roadway network. Results of the trip generation analysis indicate that the increased school enrollment trips are expected to generate approximately 45 a.m. peak-hour trips, 30 p.m. peak-hour trips, and 103 daily trips between the 2022–2023 and 2029–2030 school years.

Proposed Development

As previously noted, the proposed development is generally located east of 4th Street and north of Thompson Ravine Road in Mankato, Minnesota. The proposed development consists of 118 multifamily housing units, 51 assisted living beds, 20,000 square feet of office space, a 3,850-square-foot karate/dance studio, a chapel and gym with a capacity of up to 350 people, and a 4,210-square-foot conference room available for outside rental. The development is anticipated to be fully constructed and operational by 2030. A preliminary site plan, shown in Figure 3, was used as the basis for the traffic analysis. Primary access to the site will be provided via Good Counsel Road, with emergency access provided from Thompson Ravine Road.

Proposed Development Trip Generation

To account for traffic impacts associated with the proposed development, a trip generation estimate was developed for the weekday a.m. and p.m. peak hours and on a daily basis. The estimates, shown in Table 4, were developed using the *ITE Trip Generation Manual, 12th Edition*.

Table 4: Proposed Development Trip Generation Estimate

Land Use Type (ITE Code)	Size	A.M. Peak Hour		P.M. Peak Hour		Daily Trips
		In	Out	In	Out	
221 - Multifamily Housing (Mid-Rise)	118 DU	10	35	29	16	526
254 – Assisted Living	51 Beds	6	4	5	7	211
712 – Small Office Building	20,000 SF	27	6	15	28	288
494 – Boutique Fitness Studio	3,850 SF	23	22	25	6	158
Total		66	67	74	57	1,183

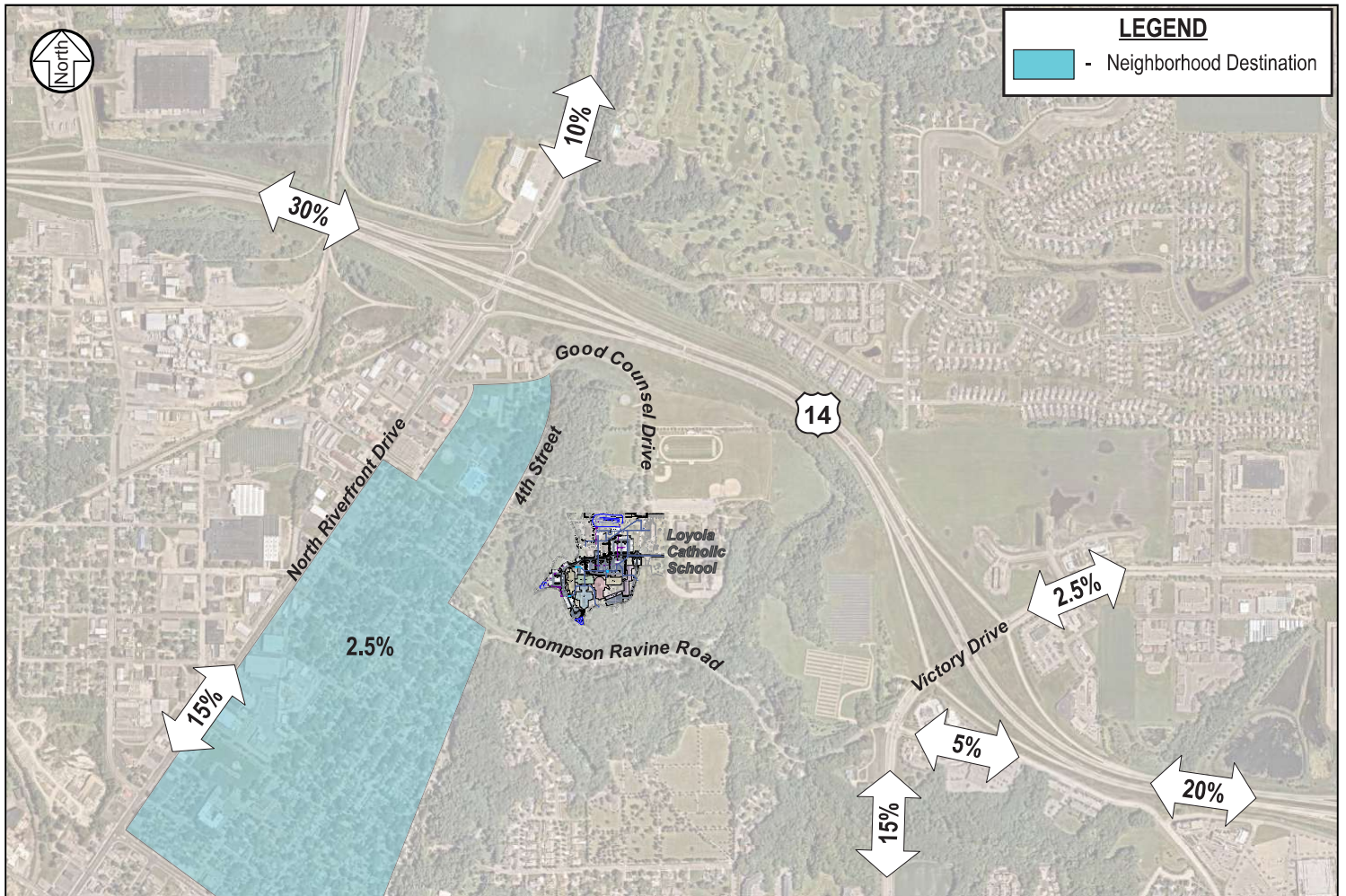
Results of the trip generation estimate indicate that the proposed development is expected to generate approximately 133 a.m. peak hour, 131 p.m. peak hour, and 1,183 daily trips. The trips generated were distributed throughout the area based on the directional distribution shown in Figure 4, which was developed based on existing travel patterns and engineering judgement.

Special Event Consideration

The proposed development includes a chapel and gym with a 350-person capacity, expected to host approximately 10 events per year, and a 4,210-square-foot conference room available for outside rental. Given the limited number of events and the likelihood that they will occur outside peak traffic hours, trips associated with these uses were not included in the trip generation estimates.

Traffic Forecast Summary

Based on the traffic forecast approach described in this study, peak-hour traffic forecasts were developed for the year 2030 build conditions. The forecasts include general area background growth, increased school enrollment trips, and traffic generated by the proposed development, which is shown in Figure 5.

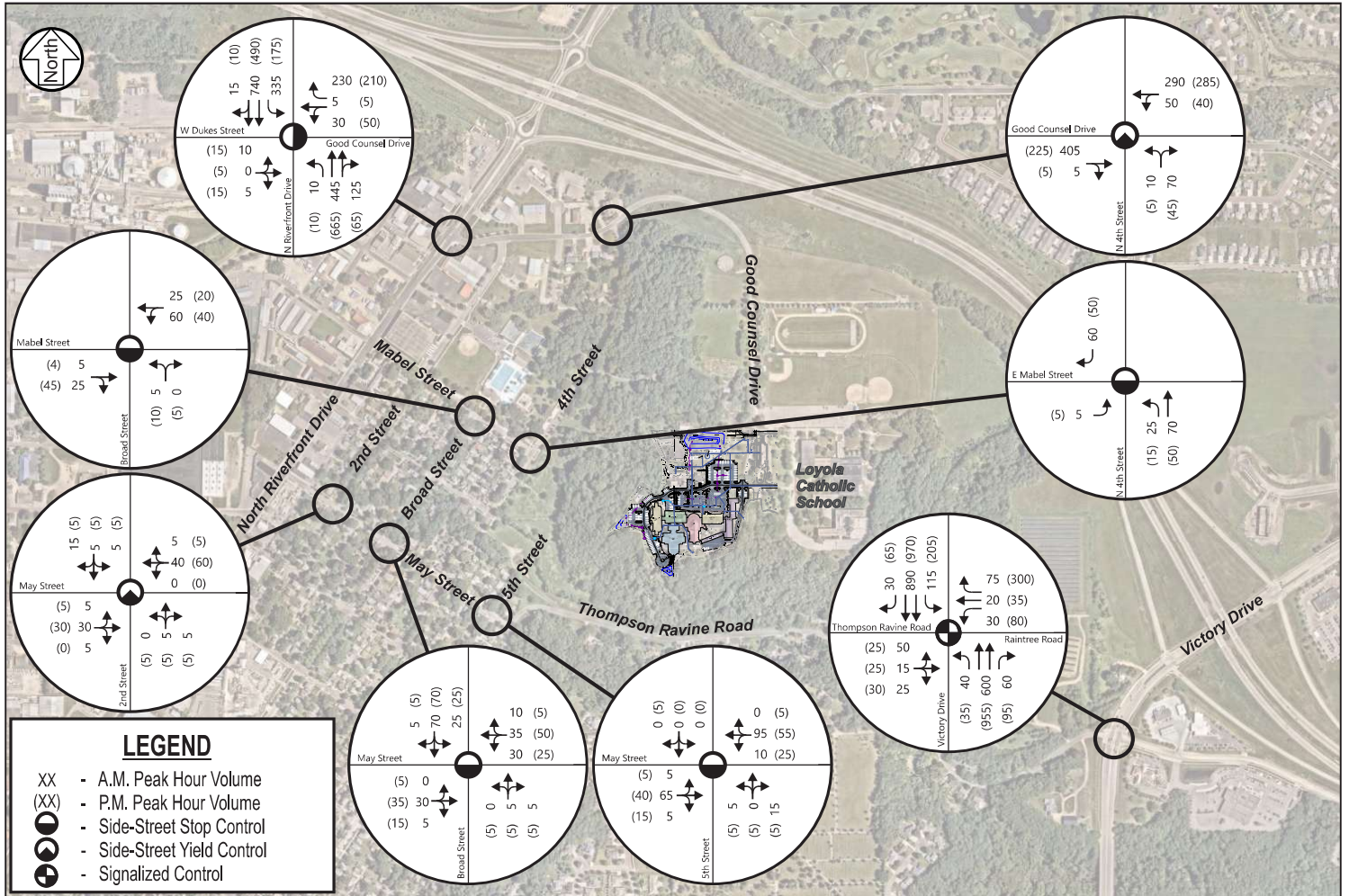


Directional Distribution

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Figure 4



Year 2030 Build Conditions

To determine how the study intersections and site access locations will operate under year 2030 build conditions, an intersection capacity analysis was completed using Synchro/SimTraffic software. The analysis assumes the expected increase enrollment at the Loyola Catholic School and the completion of the proposed development. Results of the analysis, summarized in Table 5, indicate that the North Riverfront Drive and Good Counsel Drive intersection is expected to operate at an overall LOS D and E during the weekday a.m. and p.m. peak hours, respectively. All remaining study intersections are expected to operate at an overall LOS B or better during the weekday a.m. and p.m. peak hours. Delays and queueing are expected to worsen compared to existing conditions as area development occurs (i.e. from background growth, adjacent school, and the proposed development).

Table 5: Year 2030 Build Intersection Capacity Analysis Summary

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
North Riverfront Drive & Good Counsel Drive ¹⁰	D	31 sec.	E	40 sec.
4th Street & Good Counsel Drive ¹¹	A	3 sec	A	2 sec.
Broad Street & Mabel Street ¹⁰	A	2 sec.	A	4 sec.
4th Street & Mabel Street ¹⁰	A	6 sec.	A	6 sec.
2nd Street & May Street ¹¹	A	2 sec.	A	2 sec.
Broad Street & May Street ¹⁰	A	6 sec.	A	6 sec.
5th Street & May Street ¹⁰	A	3 sec.	A	3 sec.
Thompson Ravine Road & Emergency Access ¹²	A	1 sec.	A	1 sec.
Victory Drive & Thompson Ravine Road/Raintree Road ¹³	A	9 sec.	B	14 sec.

¹⁰ Indicates an unsignalized intersection with a side-street stop control, where the worst side-street movement LOS and delay are shown.

¹¹ Indicates an unsignalized intersection with a yield control, where the worst side-street movement LOS and delay are shown.

¹² Indicates an uncontrolled intersection, where the worst side-street movement LOS and delay are shown.

¹³ Indicates a signalized controlled intersection, where the overall LOS and delay are shown.

The following information summarizes the operational and/or safety issues that warrant consideration as traffic volumes increase:

North Riverfront Drive and Good Counsel Drive

- Under 2030 build conditions, the North Riverfront Drive and Good Counsel Drive intersection is expected to operate at a LOS E during the p.m. peak hour, with an average delay of approximately 40 seconds for the westbound left-turn/through movement. Despite delays reaching 40 seconds, 95th-percentile queues are not expected to exceed five (5) vehicles and are not anticipated to extend to adjacent neighborhood intersections or block the westbound left-turn/through lane. Table 6 shows the westbound 95th-percentile and average queues expected under 2030 build conditions.

Table 6: North Riverfront and Good Counsel Drive Westbound Queuing Analysis

Westbound Movement	Storage Length Capacity	AM Peak Hour		PM Peak Hour	
		Average Queue	95th Percentile Queue	Average Queue	95th Percentile Queue
Left-Turn/ Through Movement	150 feet	27 feet	66 feet	45 feet	109 feet
Right-Turn Movement	-	55 feet	88 feet	52 feet	86 feet

Warrant Analysis

A warrants analysis was performed at the North Riverfront Drive and Good Counsel Drive Intersection for the applicable control alternatives as outlined in the *Minnesota Manual on Uniform Traffic Control Devices* (MN MUTCD), 11th Edition that went into effect on January 18, 2026. Analysis of signal warrants 1-3 and the Multiway Stop Applications (MWSA) Condition C was performed for existing year 2026, year 2030 no build and year 2030 build traffic volumes. Signal warrants 4-9 were investigated and determined to not be applicable to the subject intersection.

For the analysis, the northbound and southbound approaches were treated as the major approaches, which is consistent with the existing side street stop control on the eastbound and westbound legs of the intersection. The number of lanes assumed for each approach in the warrants analysis follows guidance from the MnDOT ICE Manual (2025). Right-turning vehicles on westbound Good Counsel Drive were evaluated under two scenarios, assuming either 0 percent or 50 percent of the westbound right-turn volumes, to allow for comparison given the high proportion of traffic destined northbound on North Riverfront Drive. The 70 percent traffic volume factor was not applied because the proposed conditions do not meet the required criteria, which include a mainline roadway speed limit above 40 mph or a population under 10,000. The assumed lane geometry and approach speeds used in the warrants analysis are summarized in Table 7, and the results of the warrant analysis for 0 percent and 50 percent of the westbound right-turn volumes are shown in Tables 8 and 9, respectively.

Table 7: Warrant Analysis Assumptions

Approach	Geometry	Speed Limit
Northbound North Riverfront Drive	Two or more approach lanes	35 mph
Southbound North Riverfront Drive	Two or more approach lanes	35 mph
Eastbound Good Counsel Drive	One approach Lane	30 mph
Westbound Good Counsel Drive	One approach Lane	30 mph

Table 8: Warrant Analysis – 0 Percent of Westbound Right Turn Volumes Included

MN MUTCD	Hours Required	Existing Year 2026 Volumes		Year 2030 No Build Volumes		Year 2030 Build Volumes	
		Hours Met	Warrant Met	Hours Met	Warrant Met	Hours Met	Warrant Met
Multiway Stop Applications Condition C Warrant	8	0	Not Met	0	Not Met	0	Not Met
Warrant 1A: Minimum Vehicular Volume	8	0	Not Met	0	Not Met	0	Not Met
Warrant 1B: Interruption of Continuous Traffic	8	0	Not Met	0	Not Met	0	Not Met
Warrant 1C: Combination of Warrants	8	0	Not Met	0	Not Met	0	Not Met
Warrant 2: Four-Hour Vehicular Volume	4	0	Not Met	0	Not Met	0	Not Met
Warrant 3B: Peak Hour Volume	1	0	Not Met	0	Not Met	0	Not Met

Table 9: Warrant Analysis – 50 Percent of Westbound Right Turn Volumes Included

MN MUTCD	Hours Required	Existing Year 2026 Volumes		Year 2030 No Build Volumes		Year 2030 Build Volumes	
		Hours Met	Warrant Met	Hours Met	Warrant Met	Hours Met	Warrant Met
Multiway Stop Applications Condition C Warrant	8	0	Not Met	0	Not Met	0	Not Met
Warrant 1A: Minimum Vehicular Volume	8	0	Not Met	0	Not Met	1	Not Met
Warrant 1B: Interruption of Continuous Traffic	8	6	Not Met	7	Not Met	9	Met
Warrant 1C: Combination of Warrants	8	1	Not Met	1	Not Met	4	Not Met
Warrant 2: Four-Hour Vehicular Volume	4	3	Not Met	4	Met	6	Met
Warrant 3B: Peak Hour Volume	1	0	Not Met	0	Not Met	0	Not Met

The results of the warrant analysis indicate that the intersection meets Warrant 2 under the 2030 no build conditions and meets Warrants 1B and 2 under the 2030 build conditions when 50 percent of the westbound right-turn volumes are included in the analysis. No warrants are met when 0 percent of the westbound right-turn volumes are included in the analysis. Based on these results, a signal would be warranted under the 2030 no build conditions when 50 percent of the right-turn volumes are included. However, a signal is not recommended at the subject intersection because it would be inconsistent with the existing traffic control along the corridor, and other viable unsignalized mitigation measures are available.

Potential Alternatives for Consideration:

Three (3) alternatives were identified for consideration at the North Riverfront Drive and Good Counsel Drive intersection: maintaining the existing geometry and traffic control, implementing a three-quarter access, and constructing a roundabout.

Maintaining Existing Geometry/Traffic Control (i.e. No Build)

- While changes to access or traffic control could improve safety and operations, they could also result in significant costs and unwanted trip rerouting. It should be noted that the anticipated LOS E condition during the p.m. peak hour is expected to occur only for a brief period.
 - **Advantages:** While the westbound left-turn/through lane is projected to operate at a LOS E during the p.m. peak, all other movements are expected to operate at acceptable levels under the year 2030 build conditions. Delays are anticipated to affect approximately 30 to 50 westbound left-turn and through vehicles during the peak hours. Additionally, queues are expected to be minimal and not impact the right-turn lane, which carries the highest volume of movements on the westbound leg of the intersection.
 - **Disadvantages:** The westbound left-turn/through lane is projected to operate at a LOS E during the p.m. peak hour and maintaining the existing geometry and traffic control would not improve this condition. If the delay for this movement becomes excessive, drivers may make more aggressive movements during unsafe gaps or choose to reroute to alternative intersections or residential streets, potentially degrading safety and operations elsewhere.

Three-Quarter Access

- If the North Riverfront Drive and Good Counsel Drive intersection were restricted to three-quarter access, which would prohibit eastbound and westbound left-turn and through movements, approximately 30 to 50 westbound left-turn and through movements are expected to reroute to adjacent intersections in the 2030 build conditions. Additionally, a yield-controlled channelized right-turn lane on the minor approaches could be considered to improve right-turn operations and reduce delay.
 - **Advantages:** While a three-quarter access configuration would result in a less direct route for some users, it would reduce conflict points and improve overall safety and operations at the North Riverfront Drive and Good Counsel Drive intersection. With fewer conflicting movements and yield-controlled right turns on the minor approaches, the westbound approach is expected to operate at LOS A during both the a.m. and p.m. peak hours, compared to the existing geometry, which operates at LOS D and LOS E during the a.m. and p.m. peak hours, respectively.
 - **Disadvantages:** The three-quarter access configuration would restrict left-turn and through movements from the minor approach, requiring those trips to use alternative routes and potentially increasing out-of-direction travel.

Roundabout

- A hybrid (two-lane northbound/southbound and one-lane eastbound/westbound) multilane roundabout could be considered at the North Riverfront Drive and Good Counsel Drive intersection to improve safety and operations.
 - **Advantages:** Installing a roundabout would provide acceptable operations and improve safety at the intersection by reducing conflict points and lowering the potential for severe crashes. It would also improve traffic flow by allowing continuous movement through the intersection and reduce the delay for all approaches. Additionally, it is not expected to reroute any additional trips through residential streets.
 - **Disadvantages:** Constructing a hybrid roundabout would be a high-cost improvement that may not be feasible in the area. Because of the multilane north and south approaches, RRFB crossings would be required, further increasing costs. Roundabouts may also require additional right-of-way and modifications to nearby driveways.

Site Plan Review

A review of the proposed site plan was completed to identify any issues and recommend potential improvements with regard to internal roadways, access, traffic controls, sight distance, and circulation. The following information should be considered when designing internal traffic controls and access roadways:

- Incorporate traffic controls, signing, and striping based on guidelines established in the Manual on Uniform Traffic Control Devices (MUTCD).
- Special consideration should be made to limit any sight distance impacts from future structures, landscaping, and signing.

In general, all internal intersections are expected to operate adequately with side-street stop control. As development occurs, internal intersections should be reviewed to determine if a higher level of traffic control (i.e. an all-way stop) should be considered. In addition, special consideration should be made to limit any sight distance impacts from future landscaping and signing at all internal and external intersections within the study area.

Neighborhood Traffic Impacts

As mentioned previously, the primary access to the development is via Good Counsel Drive. Depending on users' origins and destinations, a minimal amount of trips are expected to utilize residential streets in the neighborhood immediately west of the proposed development. Based on current development assumptions and anticipated routing, approximately 120 additional daily trips (from the proposed development) are expected to travel along 4th Street under 2030 conditions. This equates to approximately 10

to 15 vehicles during the peak hours (i.e., approximately 1 vehicle every 4 to 6 minutes), in addition to the existing traffic volumes of approximately 110 and 80 vehicles in the a.m. and p.m. peak hour, respectively, on 4th Street.

While these trips are minimal and are not expected to significantly affect traffic conditions within the residential neighborhood, mitigation measures could be considered if safety or operational issues arise. Mitigation measures include signage (e.g., "No Through Traffic") and/or restricting the westbound left-turn movement to limit use of the residential streets. Note that if trips are diverted from 4th Street, they would likely use the North Riverfront Drive and Good Counsel Drive intersection. Although the additional trips are minor, approximately 10 to 15 vehicles per peak hour, the intersection is already expected to operate at LOS E during the p.m. peak hour under 2030 build conditions, so these trips may contribute to increased delay or result in rerouting to nearby intersections.



Summary and Conclusion

SRF completed an updated transportation study for the proposed School Sisters of Notre Dame residential development, generally located east of 4th Street and north of Thompson Ravine Road in Mankato, Minnesota. The proposed development consists of 118 multifamily housing units, 51 assisted living beds, 20,000 square feet of office space, a 3,850-square-foot fitness studio, a chapel and gym with a capacity of up to 350 people, and a 4,210-square-foot conference room available for outside rental. The development is anticipated to be fully constructed and operational by 2030. The purpose of this study was to evaluate existing and future traffic conditions, assess operational and safety impacts associated with the proposed development, and identify potential improvements needed to maintain acceptable operations within the study area. Key findings of the study are summarized below.

1. Existing Conditions

- a. All study intersections currently operate at an acceptable overall LOS C or better during the a.m. and p.m. peak hours and, no significant operational or queueing issues were observed.

2. Traffic Forecasts

- a. **Background Growth:** An annual growth rate of 1 percent was applied to peak hour through traffic volumes along North Riverfront Drive and Victory Drive to account for general background growth in the area. No background growth was applied to other intersections due to limited potential for additional development.
- b. **Loyola Catholic School Enrollment:** Based on data provided from the school, enrollment is projected to increase from 541 students in 2022–2023 to approximately 600 students by 2030. This increase was included in the traffic forecast and is expected to generate an additional 45 a.m. peak-hour trips, 30 p.m. peak-hour trips, and 103 daily trips by year 2030.
- c. **Proposed Development:** The proposed development is expected to generate approximately 133 a.m. peak-hour trips, 131 p.m. peak-hour trips, and 1,183 daily trips.

3. Year 2030 Build Conditions

- a. With background growth, increased enrollment at the Loyola Catholic School and the completion of the proposed development, the North Riverfront Drive and Good Counsel Drive intersection is projected to operate at a LOS E during the p.m. peak hour, while all remaining study intersections are expected to continue operating at an overall LOS B or better during the weekday a.m. and p.m. peak hours.

4. Alternative of Consideration at the North Riverfront Drive and Counsel Drive Intersection

a. Maintaining Existing Geometry and Traffic Control

- i. **Advantages:** All lanes except the westbound left-turn/through lane are expected to operate at acceptable levels. Delays affect approximately 30–50 vehicles during the peak hours, and queues are minimal.
- ii. **Disadvantages:** The westbound left-turn/through lane is projected to operate at a LOS E during the p.m. peak hour. Drivers may make aggressive movements or reroute to residential streets, potentially increasing safety and operational concerns.

b. Three-Quarter Access

- i. **Advantages:** Restricting eastbound and westbound left-turn/through movements reduces conflict points and improves safety. The intersection is expected to operate at acceptable levels of service.
- ii. **Disadvantages:** Restricting left-turn and through movements from the minor approach would require those trips to use alternative routes and potentially increase out-of-direction travel.

c. Roundabout

- i. **Advantages:** A hybrid (2x1) roundabout would provide acceptable operations, reduce conflict points, lower potential for severe crashes, improve continuous traffic flow, and is not expected to reroute trips through residential streets.
- ii. **Disadvantages:** Constructing a multilane roundabout would be a high-cost improvement. RRFB crossings would be required on the north and south legs, and additional right-of-way and driveway modifications may be necessary.

5. Neighborhood Traffic Impacts

- a. Development-related trips using residential streets are expected to be minimal, approximately 120 daily trips along 4th Street (10 to 15 vehicles per peak hour). While minor, these trips could be mitigated by signage or restricting westbound left-turn movements if operational or safety issues arise.

Appendix

- Year 2026 Existing Conditions Operations
- Year 2030 Build Operations
- Year 2026 Existing Conditions Warrant Analysis (0% WBR Volumes)
- Year 2030 No Build Warrant Analysis (0% WBR Volumes)
- Year 2030 Build Warrant Analysis (0% WBR Volumes)
- Year 2026 Existing Conditions Warrant Analysis (50% WBR Volumes)
- Year 2030 No Build Warrant Analysis (50% WBR Volumes)
- Year 2030 Build Warrant Analysis (50% WBR Volumes)

Year 2026 Existing Conditions Operations

10: N Riverfront Drive & W Dukes Street/Good Counsel Drive Performance by lane

Lane	EB	WB	WB	NB	NB	NB	SB	SB	SB	All
Movements Served	LTR	LT	R	L	T	TR	L	T	TR	
Denied Del/Veh (s)										0.5
Total Del/Veh (s)	22.0	12.5	3.8	3.5	0.5	0.8	6.6	0.8	0.4	2.3

20: N 4th Street & Good Counsel Drive Performance by lane

Lane	EB	WB	NB	All
Movements Served	TR	LT	LR	
Denied Del/Veh (s)				0.1
Total Del/Veh (s)	0.4	1.1	2.9	0.9

30: N Broad Street & E Mabel Street Performance by lane

Lane	EB	WB	NB	All
Movements Served	TR	LT	LR	
Denied Del/Veh (s)				0.1
Total Del/Veh (s)	0.1	1.3	1.8	1.0

40: N 4th Street & E Mabel Street Performance by lane

Lane	EB	NB	NB	SB	All
Movements Served	L	L	T	R	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	2.7	4.6	6.0	0.2	4.0

50: N 2nd Street & May Street Performance by lane

Lane	EB	WB	NB	SB	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	0.1	2.0	0.9	1.4	1.3

60: N Broad Street & May Street Performance by lane

Lane	EB	WB	NB	SB	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.0
Total Del/Veh (s)	5.5	4.3	0.2	0.6	3.0

70: N 5th Street & May Street Performance by lane

Lane	EB	WB	NB	All
Movements Served	LTR	LTR	LTR	
Denied Del/Veh (s)				0.1
Total Del/Veh (s)	1.1	0.6	2.9	1.0

80: Thompson Ravine Road & Emergency Access Performance by lane

Lane	EB	WB	All
Movements Served	LT	TR	
Denied Del/Veh (s)			0.1
Total Del/Veh (s)	0.1	0.6	0.3

90: Victory Drive & Thompson Ravine Road/Raintree Road Performance by lane

Lane	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Movements Served	LTR	L	T	R	L	T	T	R	L	T	T	R
Denied Del/Veh (s)												
Total Del/Veh (s)	42.6	45.9	51.6	4.6	8.7	7.2	7.4	1.3	8.9	4.8	4.2	0.5

90: Victory Drive & Thompson Ravine Road/Raintree Road Performance by lane

Lane	All
Movements Served	
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	8.2

Total Network Performance

Denied Del/Veh (s)	0.6
Total Del/Veh (s)	6.3

Intersection: 10: N Riverfront Drive & W Dukes Street/Good Counsel Drive

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	LT	R	L	TR	L
Maximum Queue (ft)	31	53	71	33	39	142
Average Queue (ft)	9	13	45	5	4	53
95th Queue (ft)	31	38	68	22	22	105
Link Distance (ft)	326	394			306	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			80	75		250
Storage Blk Time (%)		0	0			0
Queuing Penalty (veh)		0	0			0

Intersection: 20: N 4th Street & Good Counsel Drive

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	74	56
Average Queue (ft)	10	20
95th Queue (ft)	43	49
Link Distance (ft)	1044	760
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 30: N Broad Street & E Mabel Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	30	30
Average Queue (ft)	2	2
95th Queue (ft)	14	15
Link Distance (ft)	344	926
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: N 4th Street & E Mabel Street

Movement	EB	NB	NB
Directions Served	L	L	T
Maximum Queue (ft)	27	44	67
Average Queue (ft)	2	18	31
95th Queue (ft)	14	44	54
Link Distance (ft)	344	632	632
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 50: N 2nd Street & May Street

Movement	SB
Directions Served	LTR
Maximum Queue (ft)	18
Average Queue (ft)	1
95th Queue (ft)	8
Link Distance (ft)	470
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 60: N Broad Street & May Street

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	56	62	4
Average Queue (ft)	20	32	0
95th Queue (ft)	48	54	3
Link Distance (ft)	341	726	926
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 70: N 5th Street & May Street

Movement	WB	NB
Directions Served	LTR	LTR
Maximum Queue (ft)	18	36
Average Queue (ft)	1	12
95th Queue (ft)	8	37
Link Distance (ft)	103	399
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 80: Thompson Ravine Road & Emergency Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 90: Victory Drive & Thompson Ravine Road/Raintree Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	124	69	61	55	39	170	140	28	102	161	131	6
Average Queue (ft)	57	23	12	21	13	70	35	4	33	60	35	1
95th Queue (ft)	109	58	41	41	33	144	98	15	68	129	90	4
Link Distance (ft)	1490		1014			1186	1186			1190	1190	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		200		435	175			275	275			300
Storage Blk Time (%)						0						
Queuing Penalty (veh)						0						

Network Summary

Network wide Queuing Penalty: 0

10: N Riverfront Drive & W Dukes Street/Good Counsel Drive Performance by lane

Lane	EB	WB	WB	NB	NB	NB	SB	SB	SB	All
Movements Served	LTR	LT	R	L	T	TR	L	T	TR	
Denied Del/Veh (s)										0.3
Total Del/Veh (s)	16.2	11.1	4.7	2.8	0.3	0.5	5.6	0.4	0.3	2.0

20: N 4th Street & Good Counsel Drive Performance by lane

Lane	EB	WB	NB	All
Movements Served	TR	LT	LR	
Denied Del/Veh (s)				0.1
Total Del/Veh (s)	0.3	0.9	1.1	0.7

30: N Broad Street & E Mabel Street Performance by lane

Lane	EB	WB	NB	All
Movements Served	TR	LT	LR	
Denied Del/Veh (s)				0.1
Total Del/Veh (s)	0.3	1.3	3.8	1.0

40: N 4th Street & E Mabel Street Performance by lane

Lane	EB	NB	NB	SB	All
Movements Served	L	L	T	R	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	1.1	4.3	5.8	0.1	3.1

50: N 2nd Street & May Street Performance by lane

Lane	EB	WB	NB	SB	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	0.1	1.8	1.7	2.1	1.4

60: N Broad Street & May Street Performance by lane

Lane	EB	WB	NB	SB	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	5.1	6.0	0.3	0.8	3.4

70: N 5th Street & May Street Performance by lane

Lane	EB	WB	NB	SB	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	1.5	0.7	3.0	2.7	1.1

80: Thompson Ravine Road & Emergency Access Performance by lane

Lane	EB	WB	All
Movements Served	LT	TR	
Denied Del/Veh (s)			0.1
Total Del/Veh (s)	0.1	0.8	0.5

90: Victory Drive & Thompson Ravine Road/Raintree Road Performance by lane

Lane	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Movements Served	LTR	L	T	R	L	T	T	R	L	T	T	R
Denied Del/Veh (s)												
Total Del/Veh (s)	35.8	51.8	46.6	14.3	10.6	13.9	11.6	2.2	19.4	7.0	5.5	0.8

90: Victory Drive & Thompson Ravine Road/Raintree Road Performance by lane

Lane	All
Movements Served	
Denied Del/Veh (s)	1.0
Total Del/Veh (s)	13.0

Total Network Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	10.1

Intersection: 10: N Riverfront Drive & W Dukes Street/Good Counsel Drive

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	LT	R	L	TR	L
Maximum Queue (ft)	61	62	94	28	7	78
Average Queue (ft)	23	24	47	3	0	28
95th Queue (ft)	52	52	77	17	5	61
Link Distance (ft)	326	394			306	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			80	75		250
Storage Blk Time (%)		0	0			
Queuing Penalty (veh)		0	0			

Intersection: 20: N 4th Street & Good Counsel Drive

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	45	34
Average Queue (ft)	7	7
95th Queue (ft)	30	29
Link Distance (ft)	1044	760
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 30: N Broad Street & E Mabel Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	30	31
Average Queue (ft)	2	8
95th Queue (ft)	15	30
Link Distance (ft)	344	926
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: N 4th Street & E Mabel Street

Movement	EB	NB	NB
Directions Served	L	L	T
Maximum Queue (ft)	16	31	49
Average Queue (ft)	1	10	25
95th Queue (ft)	9	34	48
Link Distance (ft)	344	632	632
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 50: N 2nd Street & May Street

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	6	18
Average Queue (ft)	0	1
95th Queue (ft)	4	11
Link Distance (ft)	455	470
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 60: N Broad Street & May Street

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	54	54	18
Average Queue (ft)	27	29	1
95th Queue (ft)	52	53	8
Link Distance (ft)	341	726	926
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 70: N 5th Street & May Street

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	12	31	18
Average Queue (ft)	0	3	1
95th Queue (ft)	6	19	10
Link Distance (ft)	103	399	183
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 80: Thompson Ravine Road & Emergency Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 90: Victory Drive & Thompson Ravine Road/Raintree Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	127	146	75	200	94	309	259	53	163	186	146	18
Average Queue (ft)	53	70	25	83	16	150	98	10	69	82	51	2
95th Queue (ft)	108	126	61	155	57	260	204	32	129	154	116	9
Link Distance (ft)	1490		1014			1186	1186			1190	1190	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		200		435	175			275	275			300
Storage Blk Time (%)						5	0					
Queuing Penalty (veh)						1	0					

Network Summary

Network wide Queuing Penalty: 2

Year 2030 Build Operations

10: N Riverfront Drive & W Dukes Street/Good Counsel Drive Performance by lane

Lane	EB	WB	WB	NB	NB	NB	SB	SB	SB	All
Movements Served	LTR	LT	R	L	T	TR	L	T	TR	
Denied Del/Veh (s)										0.6
Total Del/Veh (s)	27.9	31.3	4.6	3.7	0.6	0.9	9.2	1.1	0.4	3.7

20: N 4th Street & Good Counsel Drive Performance by lane

Lane	EB	WB	NB	All
Movements Served	TR	LT	LR	
Denied Del/Veh (s)				0.1
Total Del/Veh (s)	0.5	1.5	2.9	1.1

30: N Broad Street & E Mabel Street Performance by lane

Lane	EB	WB	NB	All
Movements Served	TR	LT	LR	
Denied Del/Veh (s)				0.1
Total Del/Veh (s)	0.1	1.4	1.6	1.1

40: N 4th Street & E Mabel Street Performance by lane

Lane	EB	NB	NB	SB	All
Movements Served	L	L	T	R	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	2.3	4.6	6.1	0.2	3.8

50: N 2nd Street & May Street Performance by lane

Lane	EB	WB	NB	SB	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	0.1	2.1	1.2	1.7	1.3

60: N Broad Street & May Street Performance by lane

Lane	EB	WB	NB	SB	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.0
Total Del/Veh (s)	6.0	3.9	0.0	0.7	2.8

70: N 5th Street & May Street Performance by lane

Lane	EB	WB	NB	All
Movements Served	LTR	LTR	LTR	
Denied Del/Veh (s)				0.1
Total Del/Veh (s)	1.2	0.6	2.5	1.0

80: Thompson Ravine Road & Emergency Access Performance by lane

Lane	EB	WB	All
Movements Served	LT	TR	
Denied Del/Veh (s)			0.1
Total Del/Veh (s)	0.1	0.5	0.3

90: Victory Drive & Thompson Ravine Road/Raintree Road Performance by lane

Lane	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Movements Served	LTR	L	T	R	L	T	T	R	L	T	T	R
Denied Del/Veh (s)												
Total Del/Veh (s)	44.1	50.9	49.5	4.8	8.5	8.2	7.7	1.2	9.0	5.1	4.3	0.5

90: Victory Drive & Thompson Ravine Road/Raintree Road Performance by lane

Lane	All
Movements Served	
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	8.6

Total Network Performance

Denied Del/Veh (s)	0.6
Total Del/Veh (s)	7.2

Intersection: 10: N Riverfront Drive & W Dukes Street/Good Counsel Drive

Movement	EB	WB	WB	NB	NB	NB	B2	SB	SB	SB
Directions Served	LTR	LT	R	L	T	TR	T	L	T	TR
Maximum Queue (ft)	43	78	108	28	4	51	6	179	2	9
Average Queue (ft)	8	27	55	4	0	6	0	73	0	0
95th Queue (ft)	31	66	88	20	4	26	4	144	2	7
Link Distance (ft)	326	394			306	306	426		763	763
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			80	75				250		
Storage Blk Time (%)		2	1					0		
Queuing Penalty (veh)		5	0					1		

Intersection: 20: N 4th Street & Good Counsel Drive

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	71	61
Average Queue (ft)	17	24
95th Queue (ft)	53	51
Link Distance (ft)	1044	760
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 30: N Broad Street & E Mabel Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	30	30
Average Queue (ft)	3	2
95th Queue (ft)	17	16
Link Distance (ft)	344	926
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: N 4th Street & E Mabel Street

Movement	EB	NB	NB
Directions Served	L	L	T
Maximum Queue (ft)	27	38	63
Average Queue (ft)	2	19	33
95th Queue (ft)	14	44	53
Link Distance (ft)	344	632	632
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 50: N 2nd Street & May Street

Movement	EB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	6	24
Average Queue (ft)	0	2
95th Queue (ft)	4	13
Link Distance (ft)	350	470
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 60: N Broad Street & May Street

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	57	60	18
Average Queue (ft)	23	31	1
95th Queue (ft)	51	52	8
Link Distance (ft)	341	726	926
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 70: N 5th Street & May Street

Movement	WB	NB
Directions Served	LTR	LTR
Maximum Queue (ft)	17	31
Average Queue (ft)	0	12
95th Queue (ft)	4	36
Link Distance (ft)	103	399
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 80: Thompson Ravine Road & Emergency Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 90: Victory Drive & Thompson Ravine Road/Raintree Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	165	62	54	48	41	196	134	18	87	166	126	19
Average Queue (ft)	64	21	11	24	14	76	37	4	32	62	33	1
95th Queue (ft)	122	53	38	45	32	156	104	12	66	129	92	9
Link Distance (ft)	1490		1014			1186	1186			1190	1190	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		200		435	175			275	275			300
Storage Blk Time (%)						0						
Queuing Penalty (veh)						0						

Network Summary

Network wide Queuing Penalty: 6

10: N Riverfront Drive & W Dukes Street/Good Counsel Drive Performance by lane

Lane	EB	WB	WB	NB	NB	NB	SB	SB	SB	All
Movements Served	LTR	LT	R	L	T	TR	L	T	TR	
Denied Del/Veh (s)										0.4
Total Del/Veh (s)	30.6	40.3	5.2	2.4	0.4	0.8	7.6	0.6	0.3	4.2

20: N 4th Street & Good Counsel Drive Performance by lane

Lane	EB	WB	NB	All
Movements Served	TR	LT	LR	
Denied Del/Veh (s)				0.1
Total Del/Veh (s)	0.3	1.0	1.7	0.8

30: N Broad Street & E Mabel Street Performance by lane

Lane	EB	WB	NB	All
Movements Served	TR	LT	LR	
Denied Del/Veh (s)				0.1
Total Del/Veh (s)	0.2	1.4	4.0	1.1

40: N 4th Street & E Mabel Street Performance by lane

Lane	EB	NB	NB	SB	All
Movements Served	L	L	T	R	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	1.3	4.5	5.8	0.1	3.5

50: N 2nd Street & May Street Performance by lane

Lane	EB	WB	NB	SB	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	0.1	1.8	1.5	2.0	1.3

60: N Broad Street & May Street Performance by lane

Lane	EB	WB	NB	SB	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.0
Total Del/Veh (s)	5.3	5.7	0.5	0.7	3.3

70: N 5th Street & May Street Performance by lane

Lane	EB	WB	NB	SB	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	1.6	0.8	3.2	2.5	1.3

80: Thompson Ravine Road & Emergency Access Performance by lane

Lane	EB	WB	All
Movements Served	LT	TR	
Denied Del/Veh (s)			0.0
Total Del/Veh (s)	0.1	0.8	0.5

90: Victory Drive & Thompson Ravine Road/Raintree Road Performance by lane

Lane	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Movements Served	LTR	L	T	R	L	T	T	R	L	T	T	R
Denied Del/Veh (s)												
Total Del/Veh (s)	39.0	50.8	47.3	14.7	11.2	15.2	13.2	2.3	20.4	7.3	5.9	0.8

90: Victory Drive & Thompson Ravine Road/Raintree Road Performance by lane

Lane	All
Movements Served	
Denied Del/Veh (s)	1.0
Total Del/Veh (s)	13.6

Total Network Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	11.2

Intersection: 10: N Riverfront Drive & W Dukes Street/Good Counsel Drive

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	LT	R	L	TR	L
Maximum Queue (ft)	82	148	110	28	24	115
Average Queue (ft)	27	45	52	3	2	43
95th Queue (ft)	65	109	86	18	12	89
Link Distance (ft)	326	394			306	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			80	75		250
Storage Blk Time (%)		7	1			
Queuing Penalty (veh)		15	0			

Intersection: 20: N 4th Street & Good Counsel Drive

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	58	43
Average Queue (ft)	8	11
95th Queue (ft)	37	36
Link Distance (ft)	1044	760
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 30: N Broad Street & E Mabel Street

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	9	28	31
Average Queue (ft)	0	2	7
95th Queue (ft)	5	14	28
Link Distance (ft)	678	344	926
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 40: N 4th Street & E Mabel Street

Movement	EB	NB	NB
Directions Served	L	L	T
Maximum Queue (ft)	22	31	50
Average Queue (ft)	1	12	29
95th Queue (ft)	10	36	50
Link Distance (ft)	344	632	632
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 50: N 2nd Street & May Street

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	6	18	12
Average Queue (ft)	0	1	1
95th Queue (ft)	5	8	9
Link Distance (ft)	350	455	470
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 60: N Broad Street & May Street

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	63	61	10
Average Queue (ft)	28	31	0
95th Queue (ft)	52	52	5
Link Distance (ft)	341	726	926
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 70: N 5th Street & May Street

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	24	25	18
Average Queue (ft)	2	3	2
95th Queue (ft)	12	19	14
Link Distance (ft)	103	399	183
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 80: Thompson Ravine Road & Emergency Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 90: Victory Drive & Thompson Ravine Road/Raintree Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	122	146	87	198	135	324	266	54	178	206	178	29
Average Queue (ft)	54	65	25	88	17	167	117	9	75	82	56	3
95th Queue (ft)	102	121	63	155	58	282	225	30	148	158	133	13
Link Distance (ft)	1490		1014			1186	1186			1190	1190	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		200		435	175			275	275			300
Storage Blk Time (%)						6	0					
Queuing Penalty (veh)						2	0					

Network Summary

Network wide Queuing Penalty: 18

Year 2026 Existing Conditions Warrant Analysis (0% WBR Volumes)



WARRANTS ANALYSIS

Existing Conditions (Year 2026)

N Riverfront Drive & Good Counsel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Background Information	Location : Mankato						Speed (mph)	Lanes	RT Vol%	Approach							
	Date: 2/25/2026						35	2 or more	100%	Major Approach 1: Northbound N Riverfront Drive							
	Analysis Prepared By: Ashley Stueve						35	2 or more	100%	Major Approach 3: Southbound N Riverfront Drive							
	Population Less than 10,000: No						30	1		Minor Approach 2: Westbound Good Counsel Drive							
	Seventy Percent Factor Used: No						30	1	100%	Minor Approach 4: Eastbound Dukes Street							
Notes: Warrant analysis calculations performed to align with Minnesota ICE Manual, 2025 v1																	
Warrants Analysis: Warrants 1A, 1B, and 1C	Hour	Major Approach 1	Major Approach 3	Total 1 + 3	Warrant Met 600 900		Minor Approach 2	Minor Approach 4	Largest Minor App.	Warrant Met 150 75		Met Same Hours Condition A Condition B		Combination A B		MWSA (C) 300 200	
	6 - 7 AM	236	308	544			11	3	11							X	
	7 - 8 AM	499	943	1442	X	X	20	12	20							X	
	8 - 9 AM	379	591	970	X	X	21	14	21							X	
	9 - 10 AM	347	389	736	X		13	21	21							X	
	10 - 11 AM	367	385	752	X		18	29	29							X	
	11 - 12 AM	439	443	882	X		40	18	40							X	
	12 - 1 PM	502	510	1012	X	X	39	22	39							X	
	1 - 2 PM	439	395	834	X		31	17	31							X	
	2 - 3 PM	504	527	1031	X	X	26	13	26							X	
	3 - 4 PM	618	634	1252	X	X	48	16	48							X	
	4 - 5 PM	719	671	1390	X	X	34	16	34							X	
	5 - 6 PM	668	517	1185	X	X	43	17	43							X	
	6 - 7 PM	358	300	658	X		28	17	28							X	
	7 - 8 PM	0	0	0			0	0	0								
8 - 9 PM	0	0	0			0	0	0									
9 - 10 PM	0	0	0			0	0	0									
10 - 11 PM	0	0	0			0	0	0									
												0	0	0	0	0	
Warrant Summary	Warrant and Description						Hours Met		Hours Required		Met/Not Met						
	MWSA (C): Multiway Stop Applications Condition C						0		8		Not Met						
	Warrant 1A: Minimum Vehicular Volume						0		8		Not Met						
	Warrant 1B: Interruption of Continuous Traffic						0		8		Not Met						
	Warrant 1C: Combination of Warrants						0		8		Not Met						
	Warrant 2: Four-Hour Vehicular Volume						0		4		Not Met						
	Warrant 3B: Peak Hour						0		1		Not Met						



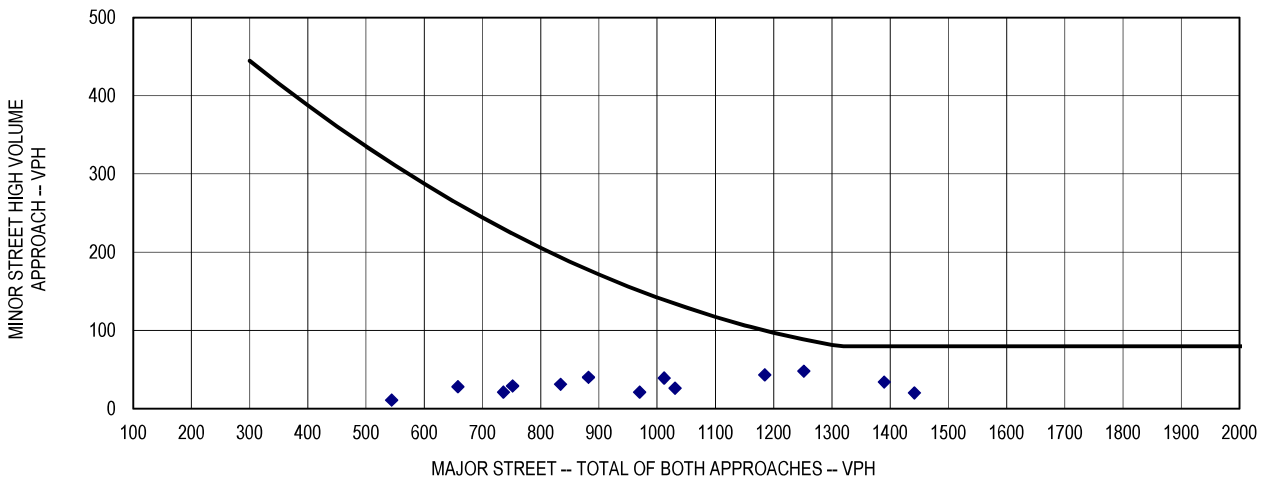
WARRANTS ANALYSIS

Existing Conditions (Year 2026)

N Riverfront Drive & Good Cousel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 2

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME



Number of Hours Satisfying Requirements: 0

Notes: 1. 115 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.



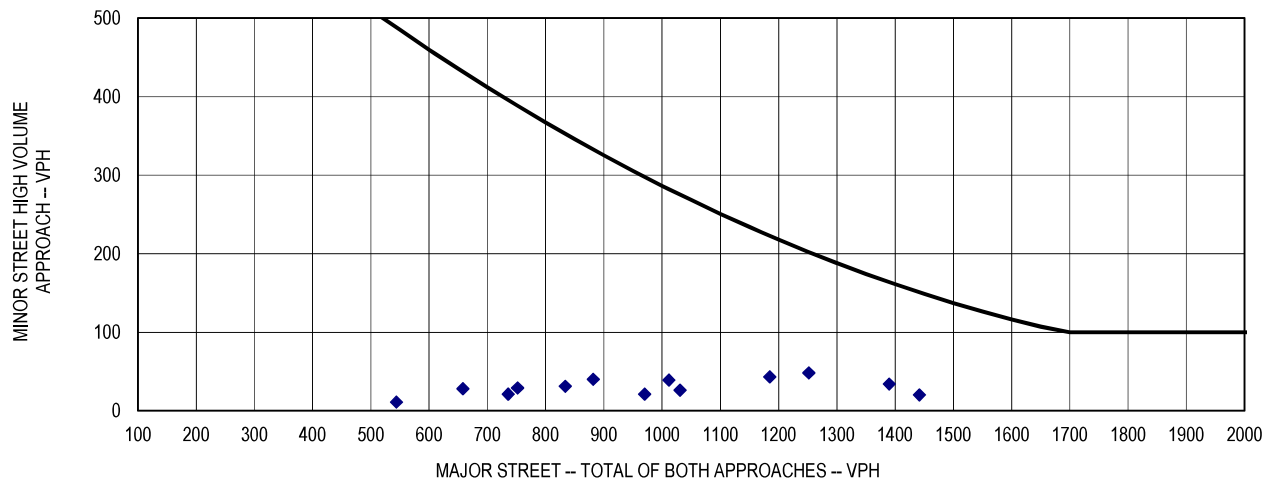
WARRANTS ANALYSIS

Existing Conditions (Year 2026)

N Riverfront Drive & Good Cousel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 3

WARRANT 3 - PEAK HOUR



Number of Hours Satisfying Requirements: 0

Notes: 1. 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Year 2030 No Build Warrant Analysis (0% WBR Volumes)

WARRANTS ANALYSIS

Year 2030 No Build Conditions (Year 2030)

N Riverfront Drive & Good Counsel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Background Information	Location : Mankato						Speed (mph)	Lanes	RT Vol%	Approach								
	Date: 2/25/2026						35	2 or more	100%	Major Approach 1: Northbound N Riverfront Drive								
	Analysis Prepared By: Ashley Stueve						35	2 or more	100%	Major Approach 3: Southbound N Riverfront Drive								
	Population Less than 10,000: No						30	1		Minor Approach 2: Westbound Good Counsel Drive								
	Seventy Percent Factor Used: No						30	1	100%	Minor Approach 4: Eastbound Dukes Street								
Notes: Warrant analysis calculations performed to align with Minnesota ICE Manual, 2025 v1																		
Warrants Analysis: Warrants 1A, 1B, and 1C	Hour	Major Approach 1	Major Approach 3	Total 1 + 3	Warrant Met 600 900		Minor Approach 2	Minor Approach 4	Largest Minor App.	Warrant Met 150 75		Met Same Hours Condition A Condition B		Combination A B		MWSA (C) 300 200		
	6 - 7 AM	246	321	567			11	3	11								X	
	7 - 8 AM	520	986	1506	X	X	23	12	23								X	
	8 - 9 AM	394	616	1010	X	X	22	14	22								X	
	9 - 10 AM	361	406	767	X		13	22	22								X	
	10 - 11 AM	382	400	782	X		19	31	31								X	
	11 - 12 AM	457	462	919	X	X	41	19	41								X	
	12 - 1 PM	523	531	1054	X	X	41	23	41								X	
	1 - 2 PM	457	411	868	X		34	18	34								X	
	2 - 3 PM	525	549	1074	X	X	28	13	28								X	
	3 - 4 PM	643	662	1305	X	X	54	17	54								X	
	4 - 5 PM	748	700	1448	X	X	38	17	38								X	
	5 - 6 PM	695	538	1233	X	X	46	18	46								X	
	6 - 7 PM	372	312	684	X		30	18	30								X	
	7 - 8 PM	0	0	0			0	0	0									
8 - 9 PM	0	0	0			0	0	0										
9 - 10 PM	0	0	0			0	0	0										
10 - 11 PM	0	0	0			0	0	0										
											0		0		0		0	
Warrant Summary	Warrant and Description						Hours Met		Hours Required		Met/Not Met							
	MWSA (C): Multiway Stop Applications Condition C						0		8		Not Met							
	Warrant 1A: Minimum Vehicular Volume						0		8		Not Met							
	Warrant 1B: Interruption of Continuous Traffic						0		8		Not Met							
	Warrant 1C: Combination of Warrants						0		8		Not Met							
	Warrant 2: Four-Hour Vehicular Volume						0		4		Not Met							
	Warrant 3B: Peak Hour						0		1		Not Met							



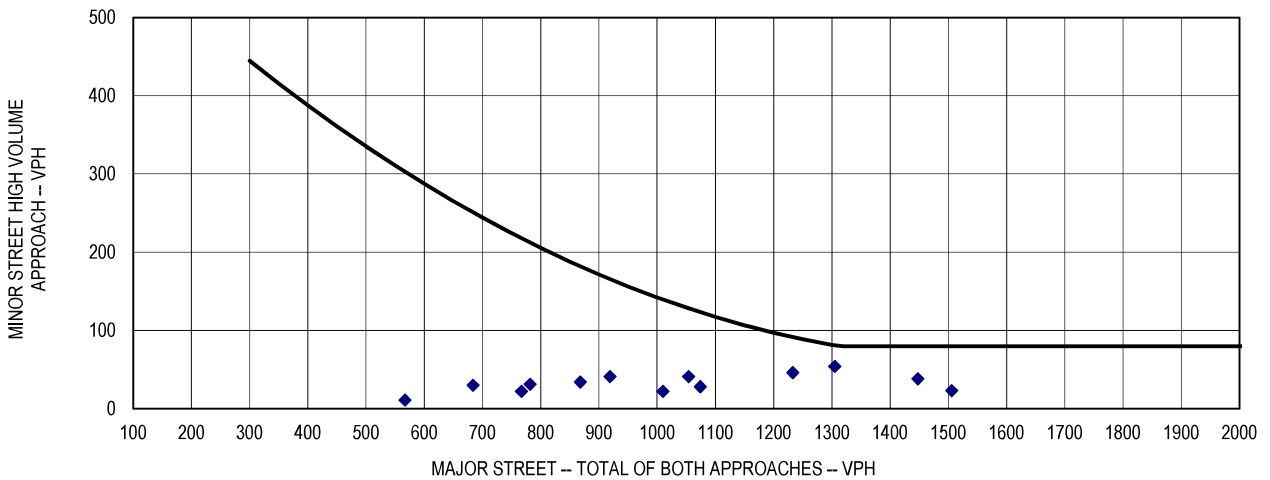
WARRANTS ANALYSIS

Year 2030 No Build Conditions (Year 2030)

N Riverfront Drive & Good Cousel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 2

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME



Number of Hours Satisfying Requirements: 0

Notes: 1. 115 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.



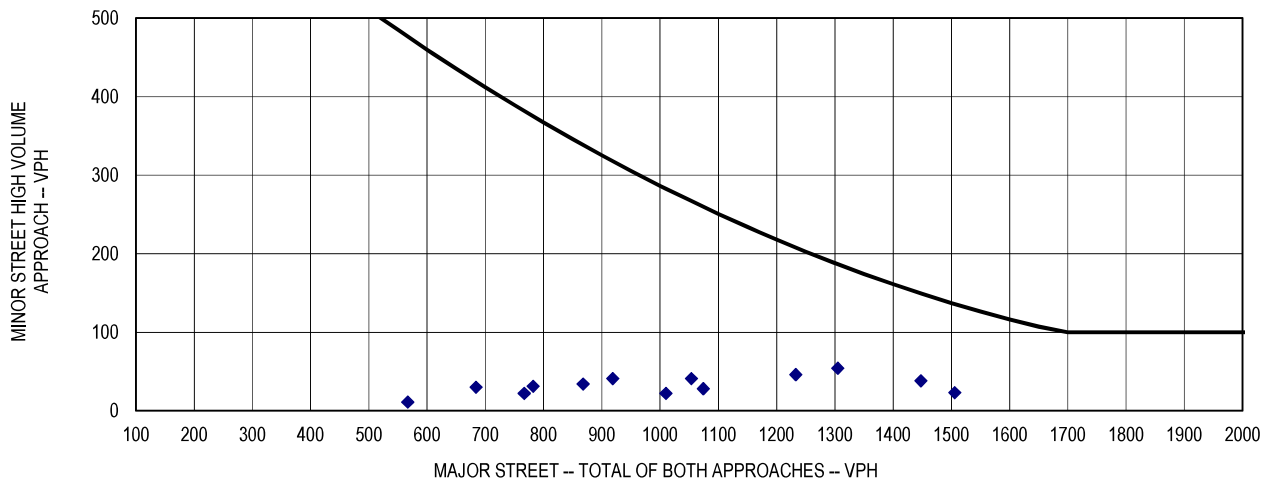
WARRANTS ANALYSIS

Year 2030 No Build Conditions (Year 2030)

N Riverfront Drive & Good Cousel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 3

WARRANT 3 - PEAK HOUR



Number of Hours Satisfying Requirements: 0

Notes: 1. 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Year 2030 Build Warrant Analysis (0% WBR Volumes)



WARRANTS ANALYSIS

Year 2030 Build Conditions (Year 2030)

N Riverfront Drive & Good Counsel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Background Information	Location : Mankato					Speed (mph)		Lanes	RT Vol%	Approach									
	Date: 2/25/2026					35		2 or more	100%	Major Approach 1: Northbound N Riverfront Drive									
	Analysis Prepared By: Ashley Stueve					35		2 or more	100%	Major Approach 3: Southbound N Riverfront Drive									
	Population Less than 10,000: No					30		1		Minor Approach 2: Westbound Good Counsel Drive									
	Seventy Percent Factor Used: No					30		1	100%	Minor Approach 4: Eastbound Dukes Street									
Notes: Warrant analysis calculations performed to align with Minnesota ICE Manual, 2025 v1																			
Warrants Analysis: Warrants 1A, 1B, and 1C	Hour	Major Approach 1	Major Approach 3	Total 1 + 3	Warrant Met		Minor Approach 2	Minor Approach 4	Largest Minor App.	Warrant Met		Met Same Hours		Combination		MWSA (C)			
					600	900				150	75	Condition A	Condition B	A	B	300	200		
	6 - 7 AM	252	338	590			19	3	19								X		
	7 - 8 AM	532	1032	1564	X	X	25	12	25								X		
	8 - 9 AM	416	638	1054	X	X	37	14	37								X		
	9 - 10 AM	380	425	805	X		26	22	26								X		
	10 - 11 AM	400	418	818	X		31	31	31								X		
	11 - 12 AM	478	483	961	X	X	52	19	52								X		
	12 - 1 PM	540	588	1128	X	X	52	23	52								X		
	1 - 2 PM	471	456	927	X	X	42	18	42								X		
	2 - 3 PM	540	602	1142	X	X	36	13	36								X		
	3 - 4 PM	657	713	1370	X	X	53	17	53								X		
	4 - 5 PM	762	754	1516	X	X	40	17	40								X		
	5 - 6 PM	714	606	1320	X	X	55	18	55								X		
	6 - 7 PM	387	365	752	X		38	18	38								X		
7 - 8 PM	0	0	0			0	0	0											
8 - 9 PM	0	0	0			0	0	0											
9 - 10 PM	0	0	0			0	0	0											
10 - 11 PM	0	0	0			0	0	0											
												0	0	0	0	0	0		
Warrant Summary	Warrant and Description						Hours Met		Hours Required		Met/Not Met								
	MWSA (C): Multiway Stop Applications Condition C						0		8		Not Met								
	Warrant 1A: Minimum Vehicular Volume						0		8		Not Met								
	Warrant 1B: Interruption of Continuous Traffic						0		8		Not Met								
	Warrant 1C: Combination of Warrants						0		8		Not Met								
	Warrant 2: Four-Hour Vehicular Volume						0		4		Not Met								
	Warrant 3B: Peak Hour						0		1		Not Met								



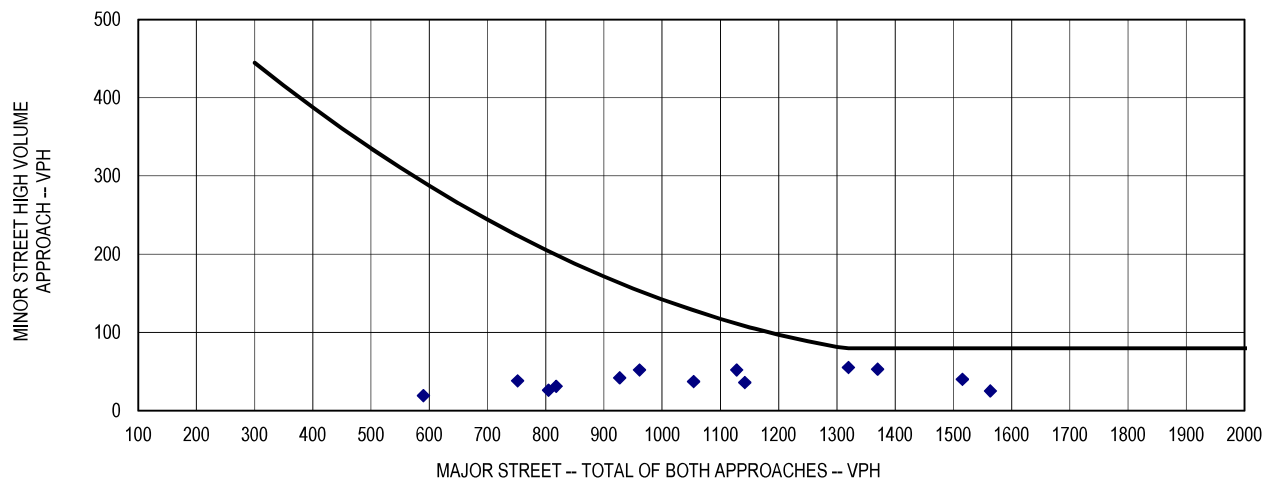
WARRANTS ANALYSIS

Year 2030 Build Conditions (Year 2030)

N Riverfront Drive & Good Cousel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 2

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME



Number of Hours Satisfying Requirements: 0

Notes: 1. 115 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.



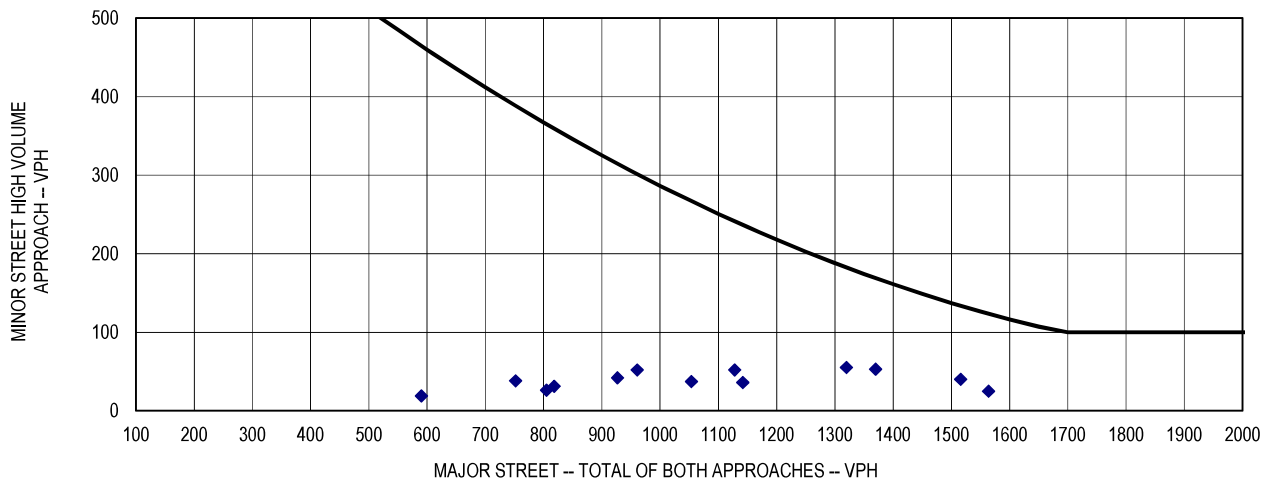
WARRANTS ANALYSIS

Year 2030 Build Conditions (Year 2030)

N Riverfront Drive & Good Cousel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 3

WARRANT 3 - PEAK HOUR



Number of Hours Satisfying Requirements: 0

Notes: 1. 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Year 2026 Existing Conditions Warrant Analysis (50% WBR Volumes)

WARRANTS ANALYSIS

N Riverfront Drive & Good Counsel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Existing Conditions (Year 2026)

Background Information	Location : Mankato Date: 2/25/2026 Analysis Prepared By: Ashley Stueve Population Less than 10,000: No Seventy Percent Factor Used: No						Speed (mph)	Lanes	RT Vol%	Approach							
							35	2 or more	100%	Major Approach 1: Northbound N Riverfront Drive							
							35	2 or more	100%	Major Approach 3: Southbound N Riverfront Drive							
							30	1	50%	Minor Approach 2: Westbound Good Counsel Drive							
							30	1	100%	Minor Approach 4: Eastbound Dukes Street							
	Notes: Warrant analysis calculations performed to align with Minnesota ICE Manual, 2025 v1																
Warrants Analysis: Warrants 1A, 1B, and 1C	Hour	Major Approach 1	Major Approach 3	Total 1 + 3	Warrant Met 600 900		Minor Approach 2	Minor Approach 4	Largest Minor App.	Warrant Met 150 75		Met Same Hours Condition A Condition B		Combination A B		MWSA (C) 300 200	
	6 - 7 AM	236	308	544			14	3	14								X
	7 - 8 AM	499	943	1442	X	X	81	12	81		X		X		X	X	
	8 - 9 AM	379	591	970	X	X	61	14	61						X	X	
	9 - 10 AM	347	389	736	X		27	21	27							X	
	10 - 11 AM	367	385	752	X		30	29	30							X	
	11 - 12 AM	439	443	882	X		83	18	83		X				X	X	
	12 - 1 PM	502	510	1012	X	X	93	22	93		X		X		X	X	
	1 - 2 PM	439	395	834	X		57	17	57							X	
	2 - 3 PM	504	527	1031	X	X	76	13	76		X		X		X	X	
	3 - 4 PM	618	634	1252	X	X	125	16	125		X		X	X	X	X	
	4 - 5 PM	719	671	1390	X	X	90	16	90		X		X	X	X	X	
	5 - 6 PM	668	517	1185	X	X	95	17	95		X		X		X	X	
	6 - 7 PM	358	300	658	X		62	17	62							X	
	7 - 8 PM	0	0	0			0	0	0								
	8 - 9 PM	0	0	0			0	0	0								
9 - 10 PM	0	0	0			0	0	0									
10 - 11 PM	0	0	0			0	0	0									
												0	6	1	8	0	
Warrant Summary	Warrant and Description						Hours Met		Hours Required		Met/Not Met						
	MWSA (C): Multiway Stop Applications Condition C						0		8		Not Met						
	Warrant 1A: Minimum Vehicular Volume						0		8		Not Met						
	Warrant 1B: Interruption of Continuous Traffic						6		8		Not Met						
	Warrant 1C: Combination of Warrants						1		8		Not Met						
	Warrant 2: Four-Hour Vehicular Volume						3		4		Not Met						
	Warrant 3B: Peak Hour						0		1		Not Met						



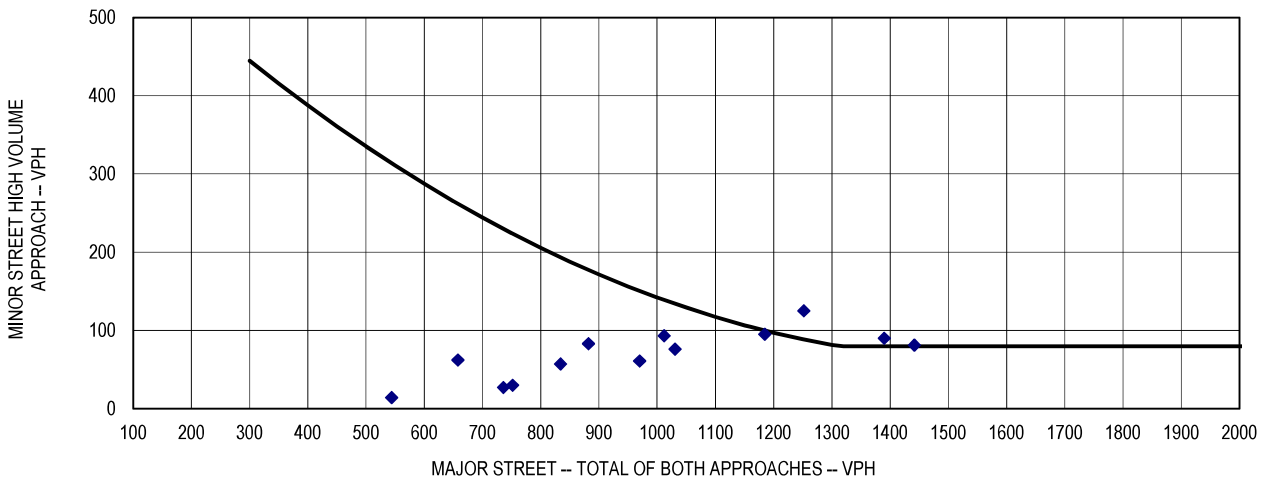
WARRANTS ANALYSIS

Existing Conditions (Year 2026)

N Riverfront Drive & Good Cousel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 2

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME



Number of Hours Satisfying Requirements: 3

Notes: 1. 115 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.



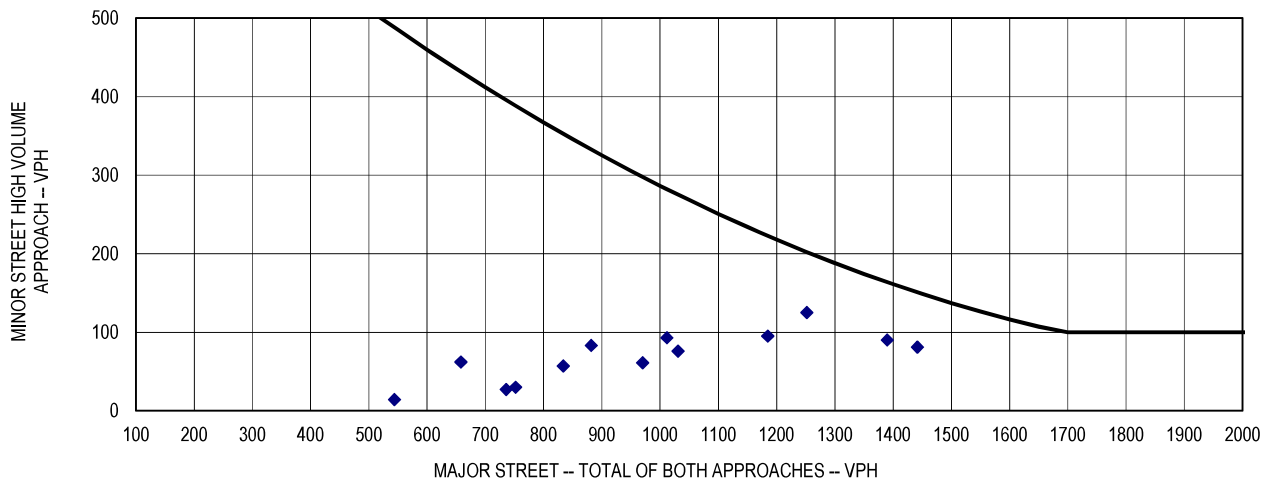
WARRANTS ANALYSIS

Existing Conditions (Year 2026)

N Riverfront Drive & Good Cousel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 3

WARRANT 3 - PEAK HOUR



Number of Hours Satisfying Requirements: 0

Notes: 1. 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Year 2030 No Build Warrant Analysis (50% WBR Volumes)

WARRANTS ANALYSIS

Year 2030 No Build Conditions (Year 2030)

N Riverfront Drive & Good Counsel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Background Information	Location : Mankato						Speed (mph)	Lanes	RT Vol%	Approach									
	Date: 2/25/2026						35	2 or more	100%	Major Approach 1: Northbound N Riverfront Drive									
	Analysis Prepared By: Ashley Stueve						35	2 or more	100%	Major Approach 3: Southbound N Riverfront Drive									
	Population Less than 10,000: No						30	1	50%	Minor Approach 2: Westbound Good Counsel Drive									
	Seventy Percent Factor Used: No						30	1	100%	Minor Approach 4: Eastbound Dukes Street									
Notes: Warrant analysis calculations performed to align with Minnesota ICE Manual, 2025 v1																			
Warrants Analysis: Warrants 1A, 1B, and 1C	Hour	Major Approach 1	Major Approach 3	Total 1 + 3	Warrant Met 600 900		Minor Approach 2	Minor Approach 4	Largest Minor App.	Warrant Met 150 75		Met Same Hours Condition A Condition B		Combination A B		MWSA (C) 300 200			
	6 - 7 AM	246	321	567			15	3	15								X		
	7 - 8 AM	520	986	1506	X	X	87	12	87		X		X		X	X			
	8 - 9 AM	394	616	1010	X	X	63	14	63						X	X			
	9 - 10 AM	361	406	767	X		28	22	28							X			
	10 - 11 AM	382	400	782	X		31	31	31							X			
	11 - 12 AM	457	462	919	X	X	86	19	86		X		X		X	X			
	12 - 1 PM	523	531	1054	X	X	98	23	98		X		X		X	X			
	1 - 2 PM	457	411	868	X		60	18	60						X	X			
	2 - 3 PM	525	549	1074	X	X	80	13	80		X		X		X	X			
	3 - 4 PM	643	662	1305	X	X	135	17	135		X		X	X	X	X			
	4 - 5 PM	748	700	1448	X	X	97	17	97		X		X		X	X			
	5 - 6 PM	695	538	1233	X	X	101	18	101		X		X		X	X			
	6 - 7 PM	372	312	684	X		66	18	66							X			
	7 - 8 PM	0	0	0			0	0	0										
8 - 9 PM	0	0	0			0	0	0											
9 - 10 PM	0	0	0			0	0	0											
10 - 11 PM	0	0	0			0	0	0											
											0		7		1		9		0
Warrant Summary	Warrant and Description						Hours Met		Hours Required		Met/Not Met								
	MWSA (C): Multiway Stop Applications Condition C						0		8		Not Met								
	Warrant 1A: Minimum Vehicular Volume						0		8		Not Met								
	Warrant 1B: Interruption of Continuous Traffic						7		8		Not Met								
	Warrant 1C: Combination of Warrants						1		8		Not Met								
	Warrant 2: Four-Hour Vehicular Volume						4		4		Met - Warrant 2 Satisfied								
Warrant 3B: Peak Hour						0		1		Not Met									



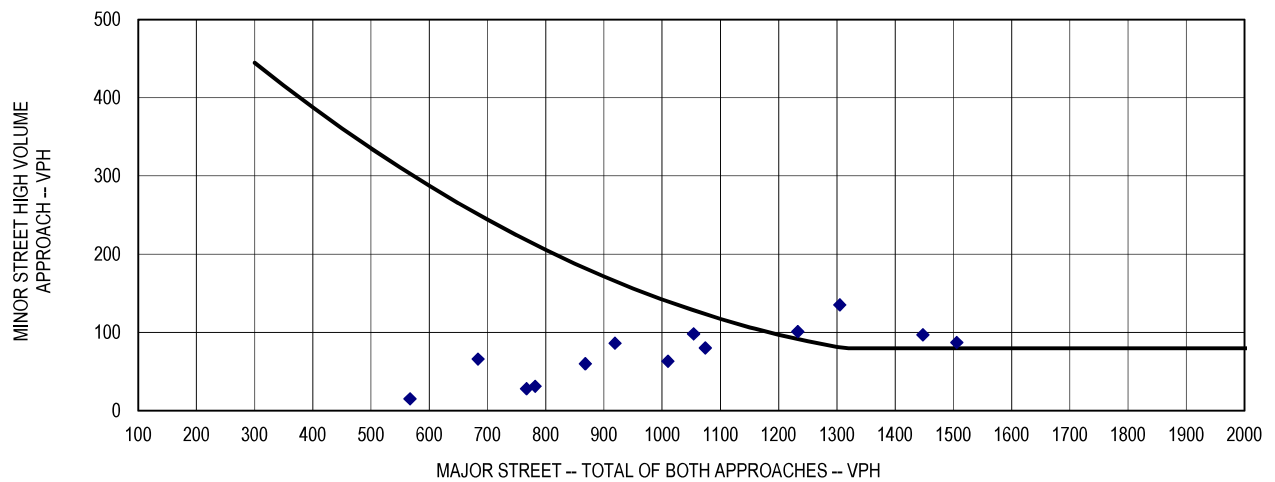
WARRANTS ANALYSIS

Year 2030 No Build Conditions (Year 2030)

N Riverfront Drive & Good Cousel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 2

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME



Number of Hours Satisfying Requirements: 4

Notes: 1. 115 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.



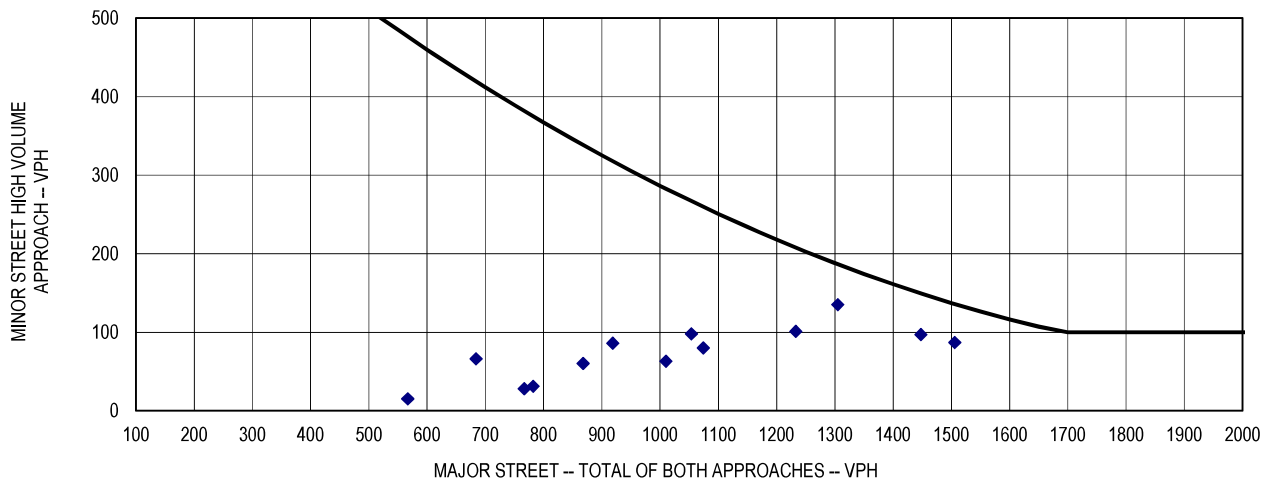
WARRANTS ANALYSIS

Year 2030 No Build Conditions (Year 2030)

N Riverfront Drive & Good Counsel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 3

WARRANT 3 - PEAK HOUR



Number of Hours Satisfying Requirements: 0

Notes: 1. 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Year 2030 Build Warrant Analysis (50% WBR Volumes)



WARRANTS ANALYSIS

Year 2030 Build Conditions (Year 2030)

N Riverfront Drive & Good Counsel Drive
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Mankato

Background Information	Location : Mankato					Speed (mph)		Lanes	RT Vol%	Approach								
	Date: 2/25/2026					35		2 or more	100%	Major Approach 1: Northbound N Riverfront Drive								
	Analysis Prepared By: Ashley Stueve					35		2 or more	100%	Major Approach 3: Southbound N Riverfront Drive								
	Population Less than 10,000: No					30		1	50%	Minor Approach 2: Westbound Good Counsel Drive								
	Seventy Percent Factor Used: No					30		1	100%	Minor Approach 4: Eastbound Dukes Street								
Notes: Warrant analysis calculations performed to align with Minnesota ICE Manual, 2025 v1																		
Warrants Analysis: Warrants 1A, 1B, and 1C	Hour	Major Approach 1	Major Approach 3	Total 1 + 3	Warrant Met		Minor Approach 2	Minor Approach 4	Largest Minor App.	Warrant Met		Met Same Hours		Combination		MWSA (C)		
					600	900				150	75	Condition A	Condition B	A	B	300	200	
	6 - 7 AM	252	338	590			34	3	34								X	
	7 - 8 AM	532	1032	1564	X	X	119	12	119		X		X		X		X	
	8 - 9 AM	416	638	1054	X	X	106	14	106		X		X		X		X	
	9 - 10 AM	380	425	805	X		63	22	63						X		X	
	10 - 11 AM	400	418	818	X		62	31	62						X		X	
	11 - 12 AM	478	483	961	X	X	116	19	116		X		X		X		X	
	12 - 1 PM	540	588	1128	X	X	135	23	135		X		X	X	X		X	
	1 - 2 PM	471	456	927	X	X	87	18	87		X		X		X		X	
	2 - 3 PM	540	602	1142	X	X	110	13	110		X		X		X		X	
	3 - 4 PM	657	713	1370	X	X	162	17	162	X	X	X	X	X	X		X	
	4 - 5 PM	762	754	1516	X	X	123	17	123		X		X	X	X		X	
	5 - 6 PM	714	606	1320	X	X	139	18	139		X		X		X		X	
	6 - 7 PM	387	365	752	X		87	18	87		X				X		X	
7 - 8 PM	0	0	0			0	0	0										
8 - 9 PM	0	0	0			0	0	0										
9 - 10 PM	0	0	0			0	0	0										
10 - 11 PM	0	0	0			0	0	0										
												1	9	4	12	0		
Warrant Summary	Warrant and Description						Hours Met		Hours Required		Met/Not Met							
	MWSA (C): Multiway Stop Applications Condition C						0		8		Not Met							
	Warrant 1A: Minimum Vehicular Volume						1		8		Not Met							
	Warrant 1B: Interruption of Continuous Traffic						9		8		Met - Warrant 1B Satisfied							
	Warrant 1C: Combination of Warrants						4		8		Not Met							
	Warrant 2: Four-Hour Vehicular Volume						6		4		Met - Warrant 2 Satisfied							
	Warrant 3B: Peak Hour						0		1		Not Met							



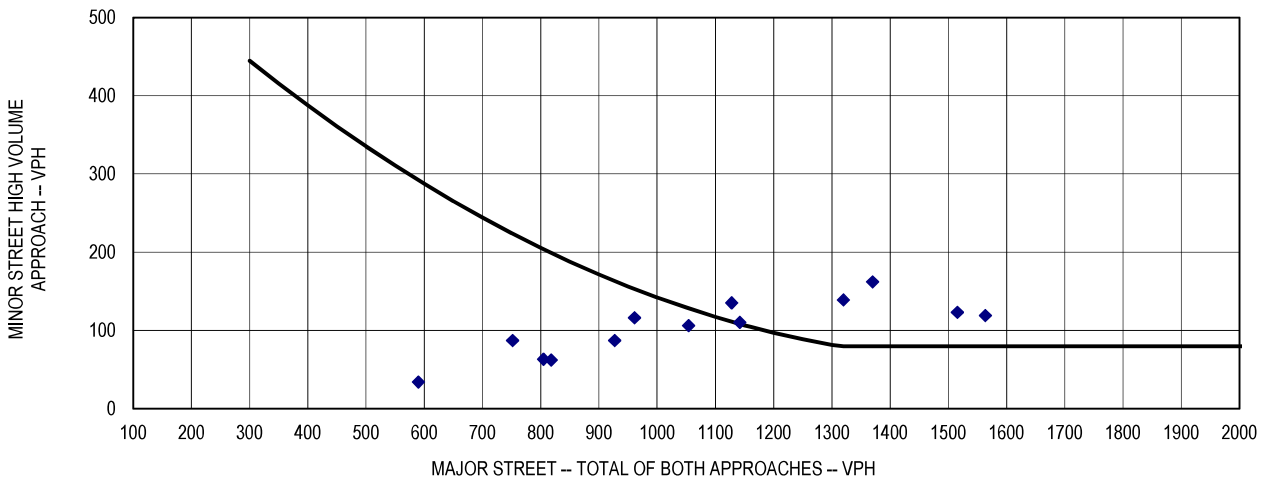
WARRANTS ANALYSIS

Year 2030 Build Conditions (Year 2030)

N Riverfront Drive & Good Cousel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 2

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME



Number of Hours Satisfying Requirements: 6

Notes: 1. 115 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.



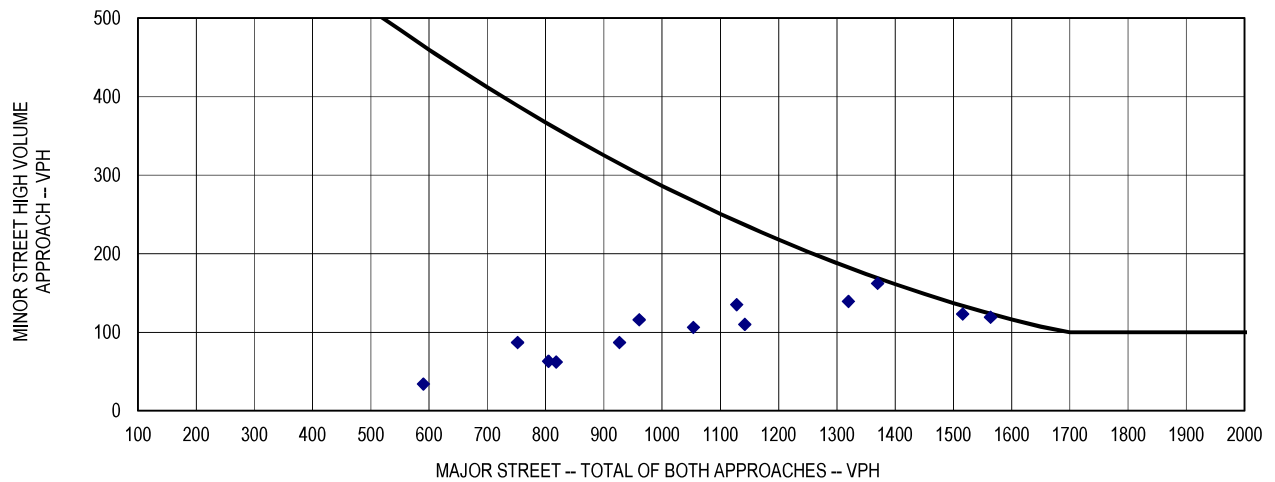
WARRANTS ANALYSIS

Year 2030 Build Conditions (Year 2030)

N Riverfront Drive & Good Cousel Drive
School Sisters of Notre Dame Traffic Study
Mankato

Warrants Analysis: Warrant 3

WARRANT 3 - PEAK HOUR



Number of Hours Satisfying Requirements: 0

Notes: 1. 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.