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# MEMORANDUM

Date: 8/26/2026

To: Cory Bienfang, PE – City Engineer

From: Maury Hooper, PE – City Traffic Engineer

Subject: Dane Street and Marsh Street All-Way Stop Control (AWSC) Evaluation
City of Mankato, Minnesota
Project No.: 26X.143202
Task Order No.: 05

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## Introduction

The City of Mankato has received feedback regarding safety concerns at the intersection of Dane Street (MSAS 131) and west leg of Marsh Street (MSAS 110). The City requested assistance in evaluating changing from a side-street stop to an all-way stop controlled (AWSC) condition to help address reported safety concerns, which include both pedestrian and right-angle conflicts. The intersection is shown below in **Figure 1.**

**Figure 1. Existing Conditions – Dane St./Marsh St. (West Leg) Intersection**






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The Dane Street and Marsh Street intersection is in the Hilltop area near Mayo Clinic Health System, Bethany Lutheran College, Washington Elementary School, and Mount Olive Lutheran School. Dane Street and Marsh Street are both two-lane roadways with one travel lane in each direction. The intersection is side-street stop controlled on Marsh Street, which includes dedicated left and right-turn lanes. Dane Street provides a southbound through-right lane and a northbound through-left lane. On-street parking is permitted north of Marsh Street and restricted elsewhere near the intersection.

Both roadways are posted at 30 mph and include sidewalks on all approaches. According to MnDOT's Enterprise MnDOT Mapping Application (EMMA), the AADT is 7,084 vehicles per day on Dane Street (2023) and 5,301 vehicles per day on the west leg of Marsh Street (2025). Dane Street is functionally classified as a major collector, while Marsh Street is a minor collector.

A marked crosswalk is provided on the west leg of Marsh Street. However, based on available Google Street View imagery, accessible pedestrian connections appear incomplete, as no receiving curb ramps are present on the opposite side of Dane Street. As a result, pedestrians using wheelchairs or other mobility devices must travel to the east leg to cross Dane Street, creating out-of-direction travel and reducing accessibility. Street lighting is present at the intersection.

## AWSC Warrant Evaluation

Section 2B.12 of the Minnesota Manual for Minimum Uniform Traffic Control Devices (Mn MUCTD) establishes the engineering warrants under which all-way stop control should be considered. This evaluation is presented below.

**Warrant A – Crash Experience:**

Observed Existing Condition

Crash data obtained from MnCMAT2 indicates one (1) angle-related crash has been reported at the intersection within the last 10 years.

Source: Minnesota’s crash database (MnCMAT2)

Warrant Requirements (3-leg Intersection)

Four (4) or more reported crashes within a 12-month period or five (5) or more reported crashes within a 36-month period, which are of a type susceptible to correction by the installation of all-way stop control.

Conclusion

**Warrant A is not met**.



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**Warrant B – Sight Distance:**

Observed Existing Condition

For the posted speed of 30 mph on Dane Street, a minimum sight distance of 335 feet measured along the roadway to in both directions is required. Based on review of Google Maps and Street View imagery, there may be intermittent sightline limitations caused by vegetation in the northwest quadrant of the intersection. The presence of tree branches extending into the right of way may impact sightlines for vehicles approaching the intersection from Marsh Street, particularly during periods of full foliage. The existing vertical and horizontal alignment of the roadways does not appear to create sight distance concerns for the posted speed. Minor tree trimming and ongoing vegetation maintenance are expected to address the localized sight distance limitations at the intersection. On-street parking on the north approach (along the west curb line) may result in intermittent sight-line challenges without restriction.

Warrant Requirements

All-way stop control may be installed at an intersection where an engineering study indicates that sight distance on the minor-road approaches controlled by a stop sign is not adequate for a vehicle to turn onto or cross the major uncontrolled road.

Conclusion

**Warrant B is not met.** Existing site conditions can be addressed with regular maintenance of vegetation, and parking restrictions if necessary.

**Warrant C – Transition to a Signal Control or Circular Intersection:**

Observed Existing Condition

The intersection is not programmed for a traffic signal or circular intersection. It is acknowledged that the city's CIP will include future funding to further investigate whether long-term geometric changes at the intersection should be implemented.

Warrant Requirements

All-way stop control may be installed at locations where an all-way stop control is an interim measure that can be installed to control traffic while arrangements are being made for the installation of a traffic control signal or circular intersection.

Conclusion

**Warrant C is not met**.

**Warrant D – 8 Hour Volume:**

Observed Existing Condition

Existing traffic volumes were collected on Thursday, April 30, 2026. The combined motor vehicle, bicycle, and pedestrian volume on the major street approaches of Dane Street exceeded 300 vehicles per hour for 13 hours of the day, with a maximum hourly volume of 861.

The combined motor vehicle, bicycle, and pedestrian volume on the minor street approach of Marsh Street exceeded 200 vehicles per hour for 6 hours of the day and a maximum hourly volume of 313. It is worth noting that two additional hours approached the threshold but fell short. Minor street volumes were present for the same hours as major street volumes.



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Warrant Requirements

All-way stop control may be installed at an intersection where an engineering study indicates:

A. The combined motor vehicle, bicycle, and pedestrian volume entering the intersection from the major- street approaches is at least 300 units per hour for each of any 8 hours of a typical day; **and**
B. The combined motor vehicle, bicycle, and pedestrian volume entering the intersection from the minor- street approaches is at least 200 units per hour for each of the same 8 hours.

If the 85th-percentile approach speed of the major street traffic exceeds 40 mph, the minimum vehicular volume warrant may be reduced to 70 percent of the values given in Items A and B.

Conclusion

**Warrant D is not technically met;** however, the observed volumes indicate the warrant is very nearly satisfied because the major-street volume threshold was met for 13 hours and the minor-street volume threshold was met for 6 of the same hours, two additional hours approached the 200 combined motor vehicle, bicycle, and pedestrian volume threshold.

**Warrant E – Other Factors:**

Observed Existing Conditions

Data collection indicates that approximately 85 percent of vehicle volume from Marsh Street turns left onto Dane Street, and approximately 15 percent of northbound Dane Street volume turns left onto Marsh Street.

Dane Street and Marsh Street are both Municipal State Aid Streets (MSAS) and are similar in operating characteristics, with both streets functionally classified as collectors, serving a more significant role on the network. Both facilitate connections between other MSAS routes in the area including Glenwood Ave (MSAS 109), Madison Avenue (MSAS 123) and Main (MSAS 108).

Pedestrian counts were collected on Thursday, April 30th, 2026. Weather conditions were favorable for field observations, with mild spring temperatures, dry pavement conditions, and no significant precipitation. Pedestrian crossing activity was highest between 5:00 PM and 6:00 PM where pedestrian crossings at the intersection totaled 20 over the 1-hour period. A total of 43 pedestrians and cyclists were found to have crossed the intersection during the 13-hour data collection period. It should be noted that these counts may not fully capture overall pedestrian activity at the intersection as they represent just one spring day. There are institutional and residential uses near the intersection, including the Mayo Clinic Health System hospital, Cornerstone Lutheran School, and nearby multi-family residential developments along Marsh Street, which may generate increased pedestrian traffic.

As part of the city's CIP, this intersection was placed into a temporary all-way stop-controlled condition for the 2026 reconstruction of Main Street. This provided an opportunity to see how the intersection would function under all-way stop control. City staff monitored the all-way stop operations on separate occasions, including during the afternoon Mayo shift change and noted no operational concerns with this temporary condition. No additional operational concerns have been received from the public regarding the all-way stop operations



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Warrant Requirements

All-way stop control may be installed at an intersection where an engineering study indicates that all-way stop control is needed due to other factors not addressed in the other all-way stop control warrants. Such other factors may include, but are not limited to, the following:

A. The need to control left-turn conflicts,
B. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where all-way stop control would improve traffic operational characteristics of the intersection, or
C. Where pedestrian and/or bicyclist movements support the installation of all-way stop control.

Conclusion

**Warrant E is met.** Based on engineering judgment, the observed conditions support all-way stop control under the other factors identified in Warrant E. The intersection experiences notable left-turn activity, including a high percentage of Marsh Street traffic turning left onto Dane Street, and both roadways function as collector-level Municipal State Aid Streets with similar operating characteristics. Pedestrian and bicyclist activity was also observed at the intersection, with nearby institutional and residential land uses expected to contribute to pedestrian demand. In addition, the temporary all-way stop condition implemented during the 2026 Main Street reconstruction was monitored by City staff and no operational concerns were noted. These factors support the installation of all-way stop control at this location. In addition, the volume warrant is very nearly satisfied, as the major-street volume threshold was met for 13 hours of the 8 required and the minor-street volume threshold was met for 6 of the same hours, noting that two additional hours approached the 200 combined vehicle/bicycle/pedestrian threshold.



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## Conclusion and Recommendation

An analysis of the study intersection finds that Warrant E supports the installation of all-way stop control based on observed left-turn activity, similar collector-street operating characteristics, pedestrian and bicyclist activity, and successful temporary all-way stop operations during the 2026 Main Street reconstruction project. While Warrants A, B, C, and D were not technically met, Warrant D is very nearly satisfied, with the major-street volume threshold met for 13 of 8 hours needed and the minor-street volume threshold met for 6 of the same 8 hours, noting two additional hours approaching the 200 combined vehicle/bicycle/pedestrian threshold. A summary of the warrant review is provided in **Table 1**.

**Table 1 – Warrant Evaluation Summary**

| Warrant | Evaluation result |
|---|---|
| **Warrant A – Crash Experience** | Not met based on crash history. |
| **Warrant B – Sight Distance** | Not met because localized sight line issues can be addressed through maintenance and parking restrictions if needed. |
| **Warrant C – Transition to Signal Control or Circular Intersection** | Not met because the intersection is not currently being used as an interim measure before signal or circular intersection installation. |
| **Warrant D – 8 Hour Volume** | Not technically met, but very nearly satisfied. |
| **Warrant E – Other Factors** | Met based on other factors documented in the engineering study. |

Based on the engineering study and the additional factors identified under Warrant E, all-way stop control is recommended at the intersection of Dane Street and Marsh Street. This recommendation is supported by notable left-turn activity, the comparable collector function of both roadways, a nearly satisfied volume warrant, and the lack of operational concerns observed during the temporary all-way stop condition implemented for the 2026 Main Street reconstruction.



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