CITY OF APPLETON

MEMORANDUM

Date: 7/23/24

To: Municipal Services Committee

From: Eric Lom, P.E., City Traffic Engineer

Subject: Information Item: Coop Rd/Midway Rd (CTH AP) intersection control (proposed all-way stop)

In response to recent crash history and increases in peak hour queuing, City Traffic Engineering staff recently met with representatives of the Calumet County Highway Department and the Village of Harrison to discuss the Coop Road / Midway Road (CTH AP) intersection. A decision was made to conduct a traffic study to determine if all-way stop control would be advisable.

This two-way stop-controlled intersection is located 1.0 miles south of Calumet Street (CTH KK) and 0.25 miles east of Eisenhower Drive (northbound and southbound stops). The land use in the area is a mixture of undeveloped lands, industrial, single family residential and multi-family residential, with an elementary/intermediate school located about 0.5 miles to the south. Development in the area is occurring at a rapid pace.

Jurisdiction

The intersection itself is located at the municipal boundary and has split jurisdiction, with the City having jurisdiction over the southbound approach lane, the Village of Harrison having jurisdiction over the northbound approach lane, and the Calumet County Highway Department having jurisdiction over the eastbound and westbound approach lanes. Since the City's jurisdiction is limited to the southbound approach lane, the decision to add stop signs for eastbound and westbound traffic (thereby creating an all-way stop condition) falls exclusively under the jurisdiction of the Calumet County Highway Department.

Study Results

Generally, the study (summary memo attached) showed that all-way stop thresholds are met, or extremely close to being met, for the busiest eight hours of the day, with large increases in traffic volumes expected in coming years. As such, the study recommended all-way stop control as an interim measure until such time as more robust changes, such as a single-lane roundabout or a traffic signal, can be implemented.

Actions

The Calumet County Traffic Safety Commission voted to approve the transition to all-way stop control at their 7/16/24 meeting. The related ordinance change will be considered by the Calumet County Board in August. Implementation of all-way stop control is currently planned for September or October. No action is required by the City, since no control changes are proposed for the southbound approach.

CITY OF APPLETON

MEMORANDUM

Date: 4/25/24

To: File

From: Eric Lom, P.E., City Traffic Engineer

Subject: Intersection control evaluation: Midway Rd (CTH AP) / Coop Road

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Overview

Based on crash history and complaints received, the City was approached by the Village of Harrison and the Calumet Couty Highway Department to evaluate whether all-way stop control (AWSC) would be advisable at the intersection Midway Rd (CTH AP) / Coop Road. The subject intersection falls under the jurisdiction of all three agencies.

AWSC Evaluation

The City of Appleton Traffic Section conducted an AWSC warrant analysis based on the methodologies outlined in the Federal Highway Administration's *Manual on Uniform Traffic Control Devices* (MUTCD), 2009 Edition (Revision 3, July 2022). A summary of the warrant analysis is attached. Traffic count data was collected during a 13-hour period (6 a.m. to 7 p.m.) on Tuesday, March 26, 2024, utilizing Miovision equipment. School was verified to have been in session on this date.

MUTCD guidance states the following criteria should be considered:

1. Vehicle and pedestrian traffic counts: When 85th percentile operating speeds exceed 40 mph (as is assumed to be the case on Miday Road), the following volumes should be met or exceeded for the same eight hours:

    a. Major road: 210 vehicles per hour
    b. Minor road: 140 vehicles per hour for the same hours

    These thresholds were met or exceeded for seven of the needed eight hours. The eighth highest hour missed the threshold by only three vehicles. Given the inherent daily variability of traffic, it is reasonable to say this criterion is effectively met.

2. Crash history: This criterion considers the number of reportable crashes that have occurred during the past five years, and the potential correctability of the crashes with AWSC.

    a. Number of correctable crashes in any 36-month period (minimum of six): Seven such crashes were reported at the subject intersection. This criterion is met.

    b. Number of correctable crashes in any 12-month period (minimum of five): Four such crashes were reported at the subject intersection. This criterion falls just short of the minimum.

Overall, the crash criterion is met. However, it is notable that correctable crash frequency has declined in recent years (2018=3, 2019=3, 2020=0, 2021=2, 2022=1, 2023=0, 2024=1).

Other Concerns

The Wisconsin Department of Transportation states that for AWSC, it is highly desirable for the intersecting roadways to have closely balanced ADTs on at least three approaches. Closely balanced ADTs would be considered as the volume of at least one of the minor roadway approaches (stop controlled on a 2-way stop) being not less than 70% of the higher volume of the two approaches on the major roadway. In the case of the Coop/Midway intersection, this criterion is only met for four hours (6 a.m. to 10 a.m.). There are several hours in the afternoon where the traffic is unbalanced, with the higher major approach carrying more than double the volume of one of the minor approaches. For this reason, and in an effort to fully understand the implications of the traffic imbalance, the intersection peak-hour operation was analyzed using SimTraffic microsimulation software. The model predicted a maximum peak-hour 95th percentile queue of five vehicles on Midway Rd, which should not cause any operational concerns.

Conclusion

Based on the observed traffic volumes, crash history, microsimulation results, and anticipated future traffic growth, AWSC control is recommended at the subject intersection, and would likely reduce crash frequency if properly implemented. In consideration of the anticipated future traffic growth, it is highly advised that planning for a traffic signal or a future roundabout be undertaken in the near future.

If all agencies elect to move forward with AWSC, we recommend the following strategies to minimize the likelihood of safety issues associated with the conversion:

1. At a minimum, install two 36" stop signs *per approach* (near left and near right) for eastbound and westbound traffic. However, we recommended utilizing flashing stop signs (beacon style or perimeter LED style) for the eastbound and westbound near-right signs due to the observed speeds and the associated potential safety concerns.
2. Install a 36" stop ahead sign (W3-1) for the eastbound and westbound approaches.
3. Add fluorescent orange flags to all signs.
4. Mark stop lines for all four approaches.
5. Mark at least 200 cl-ft of double yellow markings on the westbound approach.