

Memo

Date: 7/27/2023

To: Mr. Bradley Kosco, P.E., P.S.
City of Hudson

From: Michael W. Schweickart, P.E., PTOE
TMS Engineers, Inc.

Subject: Stow Road & Middleton Road
No Turn on Red Signs

The following information is submitted to summarize our response for the necessity of the use of “No Turn on Red” signs to be installed on the traffic signal support mast arms at the intersection of Stow Road and Middleton Road. You stated that we are to review the new walk to the elementary school, existing sight distances and if Middleton and Stow Road should be left as presented or possibly the installation of such signs marked for during school hours only.

The need for “No Turn on Red” signs are usually determined by an engineering study which looks at the following aspects:

1. Sight distance from the stop position to approaching traffic is less than adequate for the right or left-turning driver to observe safe gaps.
2. Geometrics of the intersection are such that the path of the right or left-turning vehicle crosses rather than merges with the path of the vehicle which has a green indication.
3. Right or left-turning vehicles conflict with other traffic which has been given a green arrow indication.
4. Right or left-turning vehicles create a storage or capacity problem on the street onto which they are turning.
5. Right or left-turns are permitted from two or more lanes on an approach. (Consideration can be given to permitting turns against a steady red signal from the curb lane only.)
6. An intersection has five or more approaches.
7. An intersection is used by a substantial number of school children, elderly persons or other pedestrians where right or left-turning vehicles would be a hazard to the pedestrians.
8. An intersection is near a highway-rail grade crossing.

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9. Other hazards or conflicts.

Items 2, 3, 5, 6 and 8 are not applicable and do not apply to the intersection of Stow Road and Middleton Road.

We have visited the site and reviewed the sight distances for right turning vehicles, particularly with the presence of pedestrians who may be crossing in front of the vehicle making the right turn on red. We find no issues with sight distances and pedestrians can be seen prior to crossing and when they are crossing.

We have reviewed engineering calculations regarding the capacity of the intersection including those with pedestrian activity. The intersection was found to operate at an acceptable level-of-service.

Currently, school is not in session and the review of pedestrian activity found minimal pedestrian traffic. Another review should be taken once school is in session.

We did not observe any other hazards or conflicts at the intersection during our field review that would impact the need for “No Turn On Red” signs.

We did review the motor vehicle crash records for this intersection. The review consisted of crash records from 2017 through 2023.

A crash diagram was prepared that diagrammatically shows the number of crashes, the date that they occurred and the type of crash. The diagram is attached to this report.

A total of twenty-eight motor vehicles crashes occurred during the time period. There were no crashes involving pedestrians or bicyclists.

I have also attached statistics of the crash history which include:

1. Number of crashes per year
2. Number of injury and property only damage crash types.
3. Crash types
4. Number of crashes by day of week
5. Number of crashes by hour of day
6. Number of crashes by month of year
7. Other crash statistics

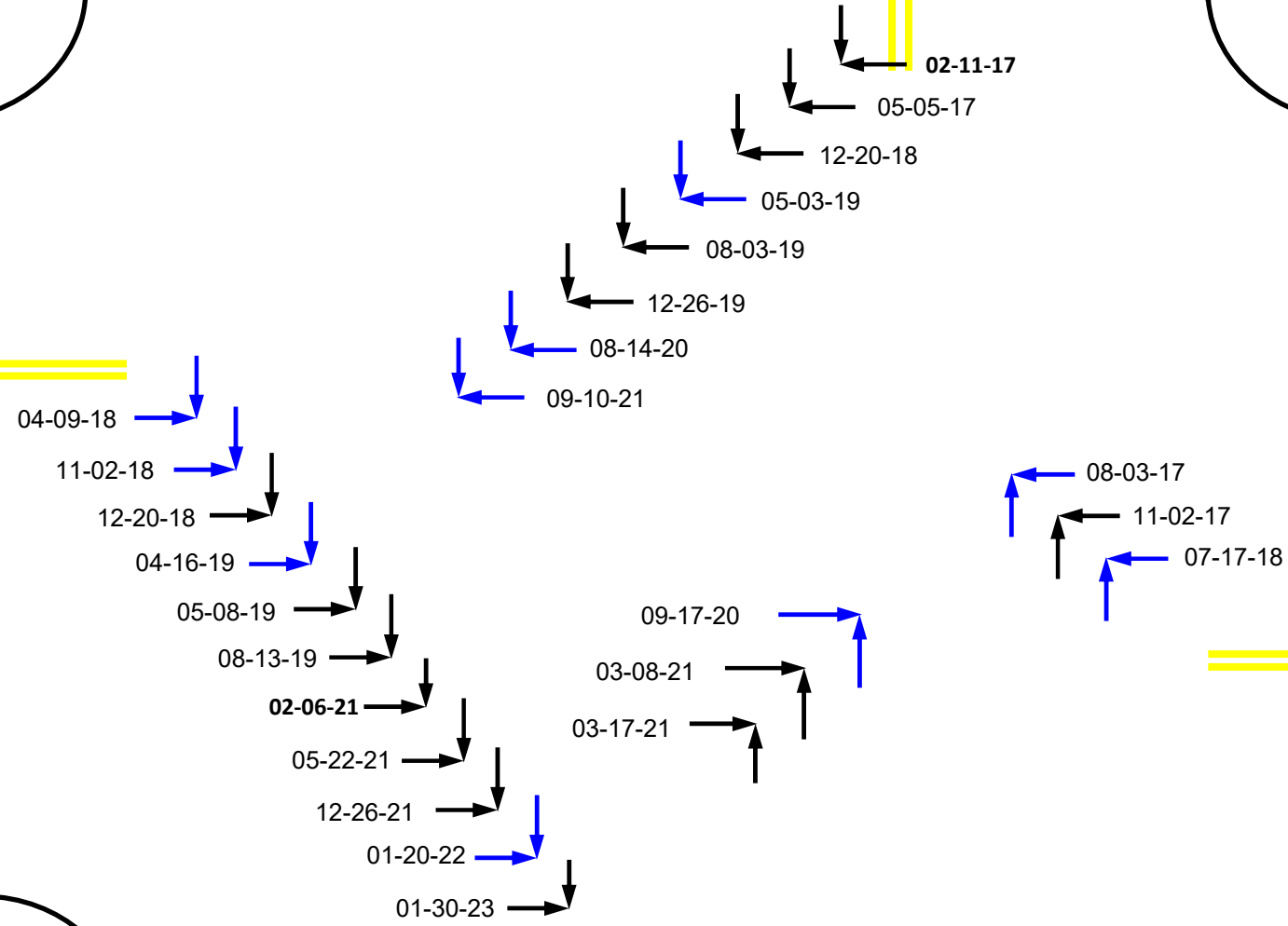
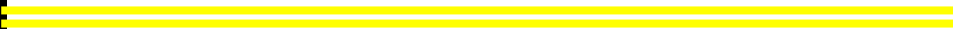
The most common crash type at the intersection involved “angle” collisions. Twenty-five of twenty-eight crashes were angle type. It is expected that the traffic signal will reduce a significant number of these crashes.

The following recommendations are made based upon our review of conditions at the intersection of Stow Road and Middleton Road:

1. There are no conditions currently that suggest that “No Turn on Red” signs are necessary. A review should be performed once school is in session to determine if conditions change that would necessitate the need for these signs or signs under specific time periods.
2. It is our opinion that the capacity of the intersection will degrade if “No Turn on Red” signs are installed. A review after school is in session will reveal if the reduction of vehicular efficiency is justified if “No Turn on Red” signs are installed.



Middleton Road



04-19-21 →→→



Stow Road

03-08-18 ↗

09-10-21 ↓

Diagram Label Key

#REF!

Stow Road & Middleton Road Crash History Crash Summary Sheet

Fatalities	0
Serious Injuries	0
Other Injuries	15

Crash Severity	Crashes	%
(3) Minor Injury Suspected	5	17.86%
(4) Injury Possible	5	17.86%
(5) PDO/No Injury	18	64.29%
Grand Total	28	100.00%

Day of Week	Crashes	%
(1) Sunday	1	3.57%
(2) Monday	4	14.29%
(3) Tuesday	3	10.71%
(4) Wednesday	2	7.14%
(5) Thursday	8	28.57%
(6) Friday	6	21.43%
(7) Saturday	4	14.29%
Grand Total	28	100.00%

Hour of Day	Crashes	%
6	1	3.57%
8	2	7.14%
10	1	3.57%
12	3	10.71%
13	2	7.14%
14	4	14.29%
16	8	28.57%
17	4	14.29%
18	2	7.14%
19	1	3.57%
Grand Total	28	100.00%

Crashes Per Year	4.00
Fatal and All Injury Crashes	10
Percent Injury	35.7%
Equivalent PDO Index Value	2.61

Year	Crashes	%
2017	4	14.29%
2018	6	21.43%
2019	6	21.43%
2020	2	7.14%
2021	8	28.57%
2022	1	3.57%
2023	1	3.57%
Grand Total	28	100.00%

Crash Type	Crashes	%
Angle	25	89.29%
Rear End	1	3.57%
Sideswipe - Passing	1	3.57%
Head On	1	3.57%
Grand Total	28	100.00%

Month	Crashes	%
1	2	7.14%
2	2	7.14%
3	3	10.71%
4	3	10.71%
5	4	14.29%
7	1	3.57%
8	4	14.29%
9	3	10.71%
11	2	7.14%
12	4	14.29%
Grand Total	28	100.00%

Stow Road & Middleton Road Crash History

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	14	50.00%
Cloudy	11	39.29%
Rain	2	7.14%
Snow	1	3.57%
Grand Total	28	100.00%

Road Condition	Crashes	%
Dry	20	71.43%
Wet	8	28.57%
Grand Total	28	100.00%

Light Condition	Crashes	%
Daylight	26	92.86%
Dark - Lighted Roadway	2	7.14%
Grand Total	28	100.00%

Number of Units	Crashes	%
2	27	96.43%
3	1	3.57%
Grand Total	28	100.00%

ODOT Location	Crashes	%
Four-Way Intersection	26	92.86%
Not An Intersection	2	7.14%
Grand Total	28	100.00%

Work Zone Related	Crashes	%
No	28	100.00%
Grand Total	28	100.00%

Alcohol Related	Crashes	%
No	28	100.00%
Grand Total	28	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	28	100.00%
Grand Total	28	100.00%

Contour	Crashes	%
Straight Grade	1	3.57%
Straight Level	27	96.43%
Grand Total	28	100.00%

Marijuana Related	Crashes	%
No	28	100.00%
Grand Total	28	100.00%

Roadway Departure	Crashes	%
No	28	100.00%
Grand Total	28	100.00%

Older Driver (65+)	Crashes	%
No	19	67.86%
Yes	9	32.14%
Grand Total	28	100.00%

Intersection Related	Crashes	%
Yes	28	100.00%
Grand Total	28	100.00%

Young Driver (15-25)	Crashes	%
No	13	46.43%
Yes	15	53.57%
Grand Total	28	100.00%

Speed Related	Crashes	%
No	24	85.71%
Yes	4	14.29%
Grand Total	28	100.00%

Motorcycle Involved	Crashes	%
No	28	100.00%
Grand Total	28	100.00%