



TRAFFIC COMMITTEE AGENDA

September 18, 2019 – 7:30 P.M.

Lower Level Conference Room – Troy City Hall, 500 West Big Beaver Road

1. Roll Call
2. Minutes – July 17, 2019

PUBLIC HEARINGS

3. No Public Hearings

REGULAR BUSINESS

4. Request for Traffic Control – Banmoor Drive at Emerson Drive
5. Request for Traffic Control – Jamaica Drive at Key West Drive
6. Request for Traffic Control – Lovell Drive at Montclair Drive
7. Request for Traffic Control – Plum Drive at Hickory Drive
8. Public Comment
9. Other Business – Alfred Drive at Edith Street
10. Adjourn

cc: Item 4: Dan Mistura, 924 Banmoor
 Properties within 300'

 Item 5: Rick Swanquist, 1301 Key West
 Properties within 300'

 Item 6: Leah Kellow, 416 E. Lovell
 Properties within 300'

 Item 7: Richard Kilmer, 62 Hickory
 Properties within 300'

Traffic Committee Members
Sgt. Mike Szuminski, Police Department;
Lt. Eric Caloia, Fire Department;

TRAFFIC COMMITTEE

MESSAGE TO VISITORS, DELEGATIONS AND CITIZENS

The Traffic Committee is composed of seven Troy citizens who have volunteered their time to the City to be involved in traffic and safety concerns. The stated role of this Committee is:

- a. To give first hearing to citizens' requests and obtain their input.
- b. To make recommendations to the City Council based on technical considerations, traffic surveys, established standards, and evaluation of citizen input.
- c. To identify hazardous locations and recommend improvements to reduce the potential for traffic crashes.

Final decisions on sidewalk waivers will be made by the Committee at this meeting.

The recommendations and conclusions arrived at on regular items this evening will be forwarded to the City Council for their final action. Any citizen can discuss these recommendations before City Council. The items discussed at the Traffic Committee meeting will be placed on the City Council Agenda by the City Manager. The earliest date these items might be considered by City Council would normally be 10 days to 2 weeks from the Traffic Committee meeting. If you are interested, you may wish to contact the City Manager's Office in order to determine when a particular item is on the Agenda.

Persons wishing to speak before this Committee should attempt to hold their remarks to no more than 5 minutes. Please try to keep your remarks relevant to the subject at hand. Please speak only when recognized by the Chair. These comments are made to keep this meeting moving along. Anyone wishing to be heard will be heard; we are here to listen and help in solving or resolving your particular concerns.

PUBLIC HEARING**3. No Public Hearings****REGULAR BUSINESS****4. Request for Traffic Control – Banmoor Drive at Emerson Drive**

Dan Mistura of 924 Banmoor states that the lack of traffic control at the intersection of Banmoor Drive at Emerson Drive creates a hazardous condition.

SUGGESTED RESOLUTIONS:

- a. RESOLVED, that the intersection of Banmoor Drive at Emerson Drive be **MODIFIED** from no traffic control to a STOP sign on the Emerson Drive approach to the intersection.
- b. RESOLVED, that **NO CHANGE** be made at the intersection of Banmoor Drive at Emerson Drive.

5. Request for Traffic Control – Jamaica Drive at Key West Drive

Rick Swanquist of 1301 Key West states that the lack of a Stop sign on the northbound Jamaica Drive approach to Key West Drive creates a hazardous condition. Key West Drive has been under STOP control since 1964, while Jamaica Drive has no traffic control.

SUGGESTED RESOLUTIONS:

- a. RESOLVED, that the intersection of Jamaica Drive at Key West Drive be **MODIFIED** from STOP control on the Key West Drive approaches to the intersection to ALL-WAY STOP control at the intersection of Jamaica Drive and Key West Drive.
- b. RESOLVED, that **NO CHANGE** be made at the intersection of Jamaica Drive at Key West Drive.

6. Request for Traffic Control – Lovell Drive at Montclair Drive

Leah Kellow of 416 E. Lovell states that the existing YIELD signs on Lovell Drive do not cause traffic to yield the right-of-way or stop at the intersection with Montclair Drive, creating a hazardous condition.

SUGGESTED RESOLUTIONS:

- a. RESOLVED, that the intersection of Lovell Drive at Montclair Drive be **MODIFIED** from YIELD signs on the Lovell Drive approaches to the intersection to STOP signs on the Lovell Drive approaches to the intersection.
- b. RESOLVED, that **NO CHANGE** be made at the intersection of Lovell Drive at Montclair Drive.

7. Request for Traffic Control – Plum Drive at Hickory Drive

Traffic Committee member Richard Kilmer of 62 Hickory requested at the July 17, 2019 Traffic Committee meeting that the intersection of Plum Drive at Hickory Drive be reviewed for purposes of an ALL-WAY STOP. Mr. Kilmer states that STOP signs on the Plum Drive approaches only do not provide adequate traffic control at the intersection.

SUGGESTED RESOLUTIONS:

- a. RESOLVED, that the intersection of Plum Drive at Hickory Drive be **MODIFIED** from STOP signs on the Plum Drive approaches to ALL-WAY STOP control at the intersection of Plum Drive at Hickory Drive.
- b. RESOLVED, that **NO CHANGE** be made at the intersection of Plum Drive at Hickory Drive.

8. Public Comment

9. Other Business – Alfred Drive at Edith Street

10. Adjourn

A regular meeting of the Troy Traffic Committee was held Wednesday, July 17, 2019 in the Lower Level Conference Room at Troy City Hall. Pete Ziegenfelder called the meeting to order at 7:30 p.m.

1. Roll Call

Present: Don Johnson
Richard Kilmer
Cindy Nurak
Al Petrulis
Cynthia Wilsher
Pete Ziegenfelder

Absent: Sunil Sivaraman (Arrived at 8:15PM)
Marvin Jiang, Student Representative

Also present: Ann Hogan, 2115 Alfred
Jeff Robertson, 1585 Rockfield
Dwenell Mills, 6039 Country Ridge
Kathi Strickland, 6242 Carriage Trail
Laura Azoni, 2091 Alfred
Sgt. Mike Szuminski, Police Department
Bill Huotari, City Engineer/Traffic Engineer

2. Minutes – February 20, 2019

Resolution # 2019-07-12
Moved by Kilmer
Seconded by Nurak

To approve the minutes as printed.

Yes: Johnson, Kilmer, Nurak, Petrulis, Wilsher, Ziegenfelder
No: None
Absent: Sivaraman

MOTION CARRIED**PUBLIC HEARINGS****3. Request for Sidewalk Waiver – 1585 Rockfield Drive (Sidwell #88-20-14-401-037)**

Jeff Robertson of 1585 Rockfield, requests a sidewalk waiver for the sidewalk at 1585 Rockfield Drive (Sidwell #88-20-14-401-037). Mr. Robertson states “*there are no sidewalks on either side of Rockfield except for a small portion at the east end*”.

The Department of Public Works (DPW) recommends approving the waiver request and not requiring the installation of sidewalk “*due to the lack of sidewalk on the surrounding parcels,*

the open drainage ditches and grading of the area”, contingent upon the submission of a cash deposit for future construction and to assure consent and participation in any future sidewalk installation.

Mr. Robertson was in attendance at the meeting and discussed the sidewalk waiver request. More specifically that there was no sidewalk on the street. This would be a sidewalk to nowhere. The existing drainage is open ditch and would make it very expensive to construct sidewalk. Mr. Robertson did state that he is in favor of sidewalks and would support the installation of sidewalk in the future should a project be approved.

There was discussion regarding the special assessment process for sidewalks. Sidewalk SAD's are paid for 100% by residents and are initiated by residents.

Mr. Ziegenfelder stated that he is in favor of sidewalks and his preference would be to have the sidewalk constructed.

Resolution # 2019-07-13

Moved by Johnson

Seconded by Kilmer

WHEREAS, City of Troy Ordinances, Chapter 34, allows the Traffic Committee to grant waivers of the City of Troy Design Standards for Sidewalks upon a demonstration of necessity; and

WHEREAS, Jeff Robertson has requested a waiver of the requirement to construct sidewalk based on a lack of adjoining sidewalk and drainage concerns; and

WHEREAS, the Traffic Committee has determined the following:

- a. A waiver will not impair the public health, safety or general welfare of the inhabitants of the City and will not unreasonably diminish or impair established property values within the surrounding area, and
- b. A strict application of the requirements to construct a sidewalk would result in practical difficulties to, or undue hardship upon, the owners, and
- c. The construction of a new sidewalk would lead nowhere and connect to no other walk, and thus will not serve the purpose of a pedestrian travel-way.

NOW THEREFORE, BE IT RESOLVED, that the Traffic Committee **GRANTS** a waiver of the sidewalk requirement for 1585 Rockfield Drive (Sidwell #88-20-14-401-037) contingent upon the receipt of a cash deposit commensurate with the cost of sidewalk construction.

Yes: Johnson, Kilmer, Nurak, Petrulis, Wilsher, Ziegenfelder

No: None

Absent: Sivaraman

MOTION CARRIED

REGULAR BUSINESS

4. Request for Traffic Control – Alfred Drive at Edith Street

Laura Azoni of 2091 Alfred states that the lack of traffic control at the intersection of Alfred at Edith creates a hazardous condition.

Traffic Engineering received an email from Don Lapak of 6579 Shoreline Drive in support of YIELD signs at the intersection as he noted that the intersection vegetation has been cleaned up and visibility has been improved.

Ann Hogan of 2115 Alfred Drive supports making the intersection an ALL-WAY STOP. She reports that this intersection connects two (2) subdivisions and drivers don't know who has the right-of-way. There are no sidewalks on the streets. John R construction is adding to the confusion. Troy Police has had officers patrol the area which is appreciated. Ms. Hogan discussed "calming islands" that she observed in Dublin, OH.

Laura Azoni of 2091 Alfred was in attendance at the meeting and agreed that an ALL-WAY STOP would be preferred. She discussed that she was almost in a crash the other morning and several of the intersections in this area are confusing for non-residents that may be cutting through to avoid the John R construction.

Ms. Wilsher discussed that some of the additional traffic is most likely due to the John R construction.

Mr. Petrulis stated that the OHM study recommended STOP signs on the Edith Street approaches to the intersection.

Ms. Nurak does not want to install a bunch of signs if they are not needed.

Mr. Ziegenfelder believes that ALL-WAY STOP control is the safest approach.

Mr. Petrulis believes that ALL-WAY STOP may be overkill. He would prefer to install the STOP signs on Edith Street and then observe traffic for a time period to be determined.

Sgt. Szuminski stated that Troy Police do not have a strong opinion. There have been no crashes at the intersection in the past 10 years. 2-Way or 4-Way Stop control at the intersection is fine from Troy Police perspective.

Mr. Kilmer stated that residents that live there know what they need and they know what is going on in their neighborhood.

Mr. Johnson questioned why Stop signs would be placed on Edith Street and not Alfred Drive. He agrees that ALL-WAY STOP may be the best solution.

Mr. Ziegenfelder believes that the ALL-WAY STOP removes any ambiguity at the intersection as everyone must stop.

Resolution # 2019-07-14
Moved by Kilmer
Seconded by Wilsher

RESOLVED, that the intersection of Alfred Drive at Edith Street be **MODIFIED** from no traffic control to ALL-WAY STOP control at the intersection of Alfred Drive at Edith Street.

Yes: Johnson, Kilmer, Nurak, Wilsher, Ziegenfelder
No: Petrulis
Absent: Sivaraman

MOTION CARRIED

5. Request for No Parking Zone – Country Ridge Drive

Kathi Strickland of 6242 Carriage Trail requests that a NO PARKING zone be established on the north and east side of Country Ridge (around the inside of the curve at 6078 Country Ridge Drive). Ms. Strickland reports that vehicles parked along the inside of the curve create a vision obstruction for vehicles traveling around the curve. She requests that a No Parking zone be established to encompass the inside of the curve. The outside of the curve, south and west side of Country Ridge Drive is posted No Parking as the fire hydrant side of the road.

Ms. Strickland was in attendance at the meeting and stated that she has lived in this subdivision since 1990. There were No Parking signs posted on both sides of the street, but the City removed the No Parking signs from the non-fire hydrant side of the street years ago. She believes that vehicles parking on the inside of the curve creates a hazardous condition which is worse during the winter months when there is snow. Ms. Strickland believes a No Parking zone would make it safer for residents.

Dwenell Mills of 6039 County Ridge Drive stated that he has lived in Troy since 2001. Mr. Mills disagrees with the request. He states that people rarely park there and when they do there has not been an issue. He does not believe that this is a safety issue and questioned why this area was being discussed.

Mr. Ziegenfelder stated that other “inside curves” have been reviewed by the Traffic Committee over the years, so this area was not being “picked on”.

Mr. Johnson noted that there were no other resident comments provided, other than the two residents in attendance. He is inclined to deny the request.

Mr. Petrulis asked about removing the No Parking restrictions on the outside of the curve, but that is not possible as that is the fire hydrant side of the road and would remain no parking, regardless of the outcome on the inside of the curve.

Resolution # 2019-07-15
Moved by Johnson
Seconded by Petrulis

RESOLVED, that **NO CHANGE** be made along the inside of the curve on Country Ridge Drive.

Yes: Johnson, Nurak, Petrulis, Wilsher, Ziegenfelder
No: None
Absent: Sivaraman
Abstain: Kilmer

MOTION CARRIED

6. Public Comment

There was no public comment at the meeting.

7. Other Business

The Parks & Recreation Master Plan update is underway and a copy of a survey for resident input was discussed and copies provided to the Traffic Committee members.

Sunil Sivaraman arrived at the meeting at 8:15PM.

8. Adjourn

The meeting adjourned at 8:25 p.m.

Pete Ziegenfelder, Chairperson

Bill Huotari, City Engineer/Traffic Engineer

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TRAFFIC COMMITTEE REPORT

August 22, 2019

TO: Traffic Committee

FROM: Bill Huotari, City Engineer/ Traffic Engineer

SUBJECT: Request for Traffic Control
Banmoor Drive at Emerson Drive

Background:

Dan Mistura of 6579 states that the lack of traffic control at the intersection of Banmoor Drive at Emerson Drive creates a hazardous condition.

There were no crashes in the past five (5) years at the intersection.

The posted speed limit on both streets is 25 mph.

Banmoor Drive would be considered the major road as it continues through the intersection and provides access to Crooks Road. All approaches to the intersection are uncontrolled.

The major potential sight distance obstructions at the intersection are lines of shrubs, predominately the hedge located adjacent to the sidewalk in the southwest quadrant of the intersection.

The safe approach speed was found to be 8.6 mph for a vehicle traveling north on Emerson Drive as a result of the sight obstruction from the shrubs growing along the sidewalk at the southwest quadrant, therefore a STOP sign on the Emerson Drive approach to the intersection is the recommended treatment.

The city requested that OHM review the intersection and provide their findings and recommendations (copy attached).

City of troy---traffic safety unit

I LIVE AT 924 BANMOOR OFF CROOK.EMERSON STREET CUTS INTO BANMOOR.YEARS AGO THERE WAS A STOP SIGN ON EMERSON.DRIVERS COMING ONTO BANMOOR FROM EMERSON JUST PULL OUT.MANY TIMES I HAVE HAD TO SLAM ON MY BRAKES TO AVOID HITTING ANOTHER CAR.

GOING TO CROOKS I CAN SEE FAR ENOUGH AHEAD BUT COMING FROM CROOKS ONTO BANMOOR IT IS ONLY ABOUT 50 YARDS SO MANY TIMES I,VE HAD TO PUT ON MY BRAKES TO AVOID AN ACCIDENT AND JUST LUCKY TO STOP IN TIME.

MAYBE YOU DON,T THINK A STOP SIGN IS REQUIRED.BUT A YIELD SIGN WOULD CERTAINLY HELP.CAN YOU CHECK ON THIS AND ADVISE ME YOUR CONCLUSION

DAN MISTURA----248-892-0228 OR
DMISTURA@GMAIL.COM

A handwritten signature in cursive script that reads "Dan Mistura". The signature is written in black ink and is positioned below the printed contact information.

August 9, 2019

Mr. William Huotari, PE
City Engineer
City of Troy
500 W. Big Beaver Rd
Troy, MI 48084

RE: Traffic Control Recommendation for Emerson Drive at Banmoor Drive
OHM JN: 0128-19-0010

Dear Mr. Huotari:

As requested, we have reviewed the intersection of Emerson Drive at Banmoor Drive to determine the proper traffic control. The subject intersection is a 3-leg intersection located in the City of Troy approximately 260' east of Crooks Road and 1,970' north of Big Beaver Road. The speed limit on both streets is 25 mph. The intersection is uncontrolled. Reference the attachments for aerial and intersection photos.

Types of Roadways

Both Emerson Drive and Banmoor Drive are considered local streets. Banmoor Drive runs east / west and connects the neighborhood via local streets to Crooks Road (principal arterial). Emerson Drive runs north / south and serves access to /from the neighborhood via Banmoor Drive. All approaches to the intersection are uncontrolled. Banmoor Drive would be considered the major road as it continues through the intersection and provides access to Crooks Road.

The ensuing traffic control analysis adheres to the guidance presented in the 2011 Michigan Manual on Uniform Traffic Control Devices (MMUTCD). A reference document explaining the background behind the analysis is attached to this memo.

Approach Speeds

The approach speed limit on both streets is 25 mph. Speed limits alone cannot be used in this case to determine which direction of traffic should be assigned the right-of-way.

Crash Analysis

Based on information obtained through the Traffic Improvement Association of Michigan, there were no crashes recorded in the past five (5) years within a 250' radius of the intersection. The crash history does not constitute a compelling case for modifying the existing controls.



Traffic Volumes

Traffic counts were collected on the eastbound and northbound approaches to the intersection from July 23 to July 26, 2019. From Wednesday, July 24 to Thursday, July 25, the average daily traffic (ADT) observed on the eastbound Banmoor Drive approach was 154 vehicles. The maximum hourly volume of 18 vehicles occurred on Wednesday, July 24 between 5:00 to 6:00 PM. While the counts were not performed while local K-12 schools were in session, based on the data collected, one can reasonably ascertain that Banmoor Drive fails to meet and /or sustain the 300 vehicles per hour threshold required for all-way STOP-control for even one hour, let alone the minimum of 8 hours.

The ADT observed on the northbound Emerson Drive approach was 70 vehicles, with a maximum hourly volume of 11 vehicles between 11:00 to 12:00 PM on Thursday, July 25. Given the vehicle volumes observed, the combined entering vehicular, pedestrian, and bicycle volumes are highly unlikely to average at least 200 units for any 8 hours, even if traffic was grown by an appropriate percentage to accommodate missing school trips.

Since the posted speed limit is only 25 mph on Banmoor Drive, it is reasonable to assume that the 85th percentile approach speed does not exceed 40 mph. Thus, the minimum vehicular volume warrants on either road cannot be discounted to 70 percent of the values described previously. Finally, the study intersection falls significantly shy of even the reduced 80 percent volumes, based on the count data collected. Therefore, the minimum volume criteria for an all-way STOP has not been met. The summary reports for the traffic counts conducted on Emerson Drive and Banmoor Drive are attached to this memo.

Sight Distance

The major potential sight distance obstructions at the intersection are lines of shrubs, predominately the hedge located adjacent to the sidewalk in the southwest quadrant of the intersection. Reference the attachments for intersection photos. These obstructions come into play when determining the safe approach speeds for the intersection. The safe approach speed is the speed at which a vehicle can approach an intersection and still stop in time to avoid a collision with a vehicle on the cross street. Safe approach speeds are determined through calculations.

When the safe approach speed is found to be less than 10 mph, a STOP sign is recommended. In this case, the safe approach speed was found to be 8.6 mph for a vehicle traveling north on Emerson Drive as a result of the sight obstruction from the shrubs growing along the sidewalk at the southwest quadrant of the intersection, therefore a STOP sign is the recommended treatment. The safe approach speed calculation spreadsheet is attached for your reference.



Recommendation

OHM recommends installing a STOP sign on the Emerson Drive approach to the intersection. The intersection should continue to be monitored if traffic volumes increase or crashes begin to occur.

Sincerely,
Orchard, Hiltz & McCliment, Inc.

Matt Clark, EIT
Engineer

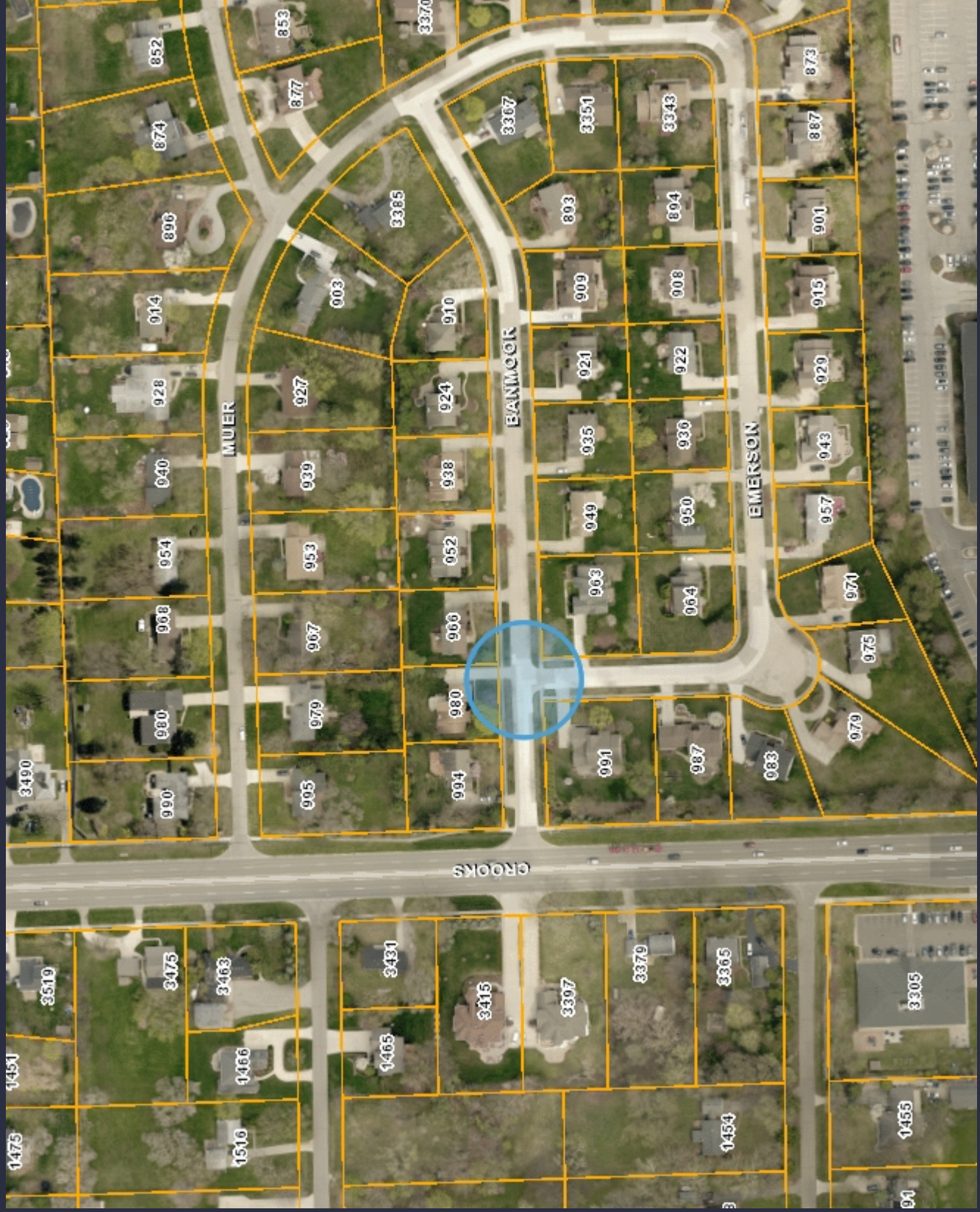
Sara Merrill, PE, PTOE
Traffic Project Manager

Attachments:

- Aerial Photo
- Safe Approach Speed Calculation Spreadsheet
- Intersection Photos
- Traffic Control Determination Reference Guide
- Traffic Data Summaries

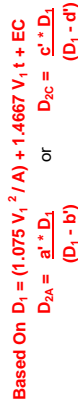
Legend:

Notes:



Banmoor Dr and Emerson Dr
City of Troy

Width of Roads						
Road 1 =		28	(ft)			
Road 2 =		28	(ft)			
Distance to Obstruction						
a =		17	(ft)			
b =		63	(ft)			
c =		16	(ft)			
d =		81	(ft)			
Angle of Intersection						
Delta =		90	(deg)			
Road 1 Posted						
Speed Limit =		25	(mp)			



Speed of Vehicle A = Speed of Vehicle C
= Posted Speed Limit on Road 1

Intermediate Calculations:	D ₁ = 196	a' = 23
	D _{2A} = 38.5	b' = 79
	D _{2C} = 43.5	c' = 22
		d' = 97

Approaching on Road 2

8.6

Threshold of Safe Approach Speed (AAA, FHWA & NSC)	
to Recommend STOP Control	10.0 (mph)
to Recommend YIELD Control	25.0 (mph)
Otherwise Recommends NO CONTROL.	

Enter field measurements in yellow highlighted area.
Blue fields are std. default values; change only for cause.
Calculated by spreadsheet

Recommended ROW control for Road 2 based on safe approach speed :



Photograph No. 1: Banmoor Drive – Heading East
Date: 7/23/2019 **Photographer:** Matt Clark



Photograph No. 2: Banmoor Drive - Heading East and Looking Right
Date: 7/23/2019 **Photographer:** Matt Clark



Photograph No. 3: Emerson Drive - Heading North
Date: 7/23/2019 **Photographer:** Matt Clark



Photograph No. 4: Emerson Drive - Heading North and Looking Left
Date: 7/23/2019 **Photographer:** Matt Clark



Photograph No. 5: Emerson Drive – Heading North and Looking Right
Date: 7/23/2019 **Photographer:** Matt Clark



Photograph No. 6: Banmoor Drive – Heading West
Date: 7/23/2019 **Photographer:** Matt Clark



Photograph No. 7: Banmoor Drive - Heading West and Looking Left
Date: 7/23/2019 **Photographer:** Matt Clark



Photograph No. 8: Emerson Drive – Looking South
Date: 7/23/2019 **Photographer:** Matt Clark

Reference Guide on Traffic Control Determination in the State of Michigan

Background

This document is intended to be used as a reference guide for performing intersection traffic control studies of intersections on public roadways in Michigan. The document explains the procedure and requirements necessary to implement traffic control at an intersection as stipulated by the Michigan Manual on Uniform Traffic Control Devices (MMUTCD). Generally, the starting premise is an uncontrolled intersection. The first step would then be to verify if the intersection should remain uncontrolled or if YIELD or STOP controls on the minor street approach(es) should be provided. For locations with higher traffic volumes and /or crash issues, then an evaluation of the location for all-way STOP warrants would be performed. The appropriate analysis for each level of control described below.

YIELD Traffic Control Guidance

The use of a YIELD sign is intended to assign the right-of-way at intersections where it is not usually necessary to stop before proceeding into the intersection. Conversely, the STOP sign is intended for use where it is usually necessary to stop before proceeding into the intersection.

The following conditions should be fully evaluated to determine how the right-of-way should be assigned:

- Traffic Volumes: Normally, the heavier volume of traffic should be given the right-of-way.
- Approach Speeds: The higher speed traffic should normally be given the right-of-way.
- Types of Highways: When a minor highway intersects a major highway, it is usually desirable to control the minor highway.
- Sight Distance: Sight distance across the corners of the intersection is the most important factor and is critical in determining safe approach speeds.

STOP Traffic Control Guidance

Based on the MMUTCD there are four conditions where STOP signs may be warranted:

- At the intersection of a less important road with a main road where application of the normal right-of-way rule is unduly hazardous.
- On a street entering a through highway or street.
- At an unsignalized intersection in a signalized area.
- At other intersections where a combination of high speed, restricted view, or crash records indicate a need for control by the STOP sign.

Many times STOP signs are installed where they may not be warranted. Traffic experts agree that unnecessary STOP signs:

- Cause accidents they are designed to prevent.
- Breed contempt for other necessary STOP signs.
- Waste millions of gallons of gasoline annually.
- Create added noise and air pollution.
- Increase, rather than decrease, speeds between intersections.

There is also an explicit restriction in the MMUTCD that STOP signs are not to be used for speed control, in Section 2B.04.

Evaluation of All-Way STOP Traffic Control

Based on the MMUTCD there are four conditions where **all-way** STOP signs may be warranted:

- A. *Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.*
- B. *Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.*
- C. *Minimum volumes:*
 - 1. *The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and*
 - 2. *The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but*
 - 3. *If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.*
- D. *Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.*

OHM Advisors

34000 Plymouth Road
Livonia, MI 48150

Advancing Communities

Weather: Various
Serial Number: 32214
Installed by: Matt Clark
Other Notes: None

NB Emerson Dr
S of Banmoor Dr

Start Time	Mon 22-Jul-19	Tue 23-Jul-19	Wed 24-Jul-19	Thu 25-Jul-19	Fri 26-Jul-19	Average Day	Sat 27-Jul-19	Sun 28-Jul-19	Week Average
12:00 AM	*	*	0	1	1	1	*	*	1
01:00	*	*	0	0	0	0	*	*	0
02:00	*	*	0	1	0	0	*	*	0
03:00	*	*	0	0	0	0	*	*	0
04:00	*	*	0	2	0	1	*	*	1
05:00	*	*	0	1	0	0	*	*	0
06:00	*	*	3	1	2	2	*	*	2
07:00	*	*	0	4	3	2	*	*	2
08:00	*	2	2	4	7	4	*	*	4
09:00	*	4	3	2	5	4	*	*	4
10:00	*	4	3	5	*	4	*	*	4
11:00	*	9	3	11	*	8	*	*	8
12:00 PM	*	4	4	7	*	5	*	*	5
01:00	*	2	8	5	*	5	*	*	5
02:00	*	2	3	4	*	3	*	*	3
03:00	*	3	8	6	*	6	*	*	6
04:00	*	1	3	5	*	3	*	*	3
05:00	*	2	5	7	*	5	*	*	5
06:00	*	1	8	5	*	5	*	*	5
07:00	*	5	0	3	*	3	*	*	3
08:00	*	1	5	3	*	3	*	*	3
09:00	*	2	3	0	*	2	*	*	2
10:00	*	5	0	1	*	2	*	*	2
11:00	*	0	1	0	*	0	*	*	0
Day Total	0	47	62	78	18	68	0	0	68
% Avg. WkDay	0.0%	69.1%	91.2%	114.7%	26.5%				
% Avg. Week	0.0%	69.1%	91.2%	114.7%	26.5%	100.0%	0.0%	0.0%	
AM Peak	-	11:00	06:00	11:00	08:00	-	-	-	-
Vol.	-	9	3	11	7	-	-	-	-
PM Peak	-	19:00	13:00	12:00	-	-	-	-	-
Vol.	-	5	8	7	-	-	-	-	-
Grand Total	0	47	62	78	18	68	0	0	68
ADT		ADT 70		AADT 70					

OHM Advisors

34000 Plymouth Road
Livonia, MI 48150

Advancing Communities

Weather: Various
Serial Number: 27494
Installed by: Matt Clark
Other Notes: None

EB Banmoor Dr
W of Emerson Dr

Start Time	Mon 22-Jul-19	Tue 23-Jul-19	Wed 24-Jul-19	Thu 25-Jul-19	Fri 26-Jul-19	Average Day	Sat 27-Jul-19	Sun 28-Jul-19	Week Average
12:00 AM	*	*	3	1	3	2	*	*	2
01:00	*	*	1	0	0	0	*	*	0
02:00	*	*	0	1	0	0	*	*	0
03:00	*	*	0	0	0	0	*	*	0
04:00	*	*	0	0	0	0	*	*	0
05:00	*	*	1	0	1	1	*	*	1
06:00	*	*	1	1	1	1	*	*	1
07:00	*	*	4	3	0	2	*	*	2
08:00	*	*	4	2	3	3	*	*	3
09:00	*	4	5	4	7	5	*	*	5
10:00	*	2	10	9	*	7	*	*	7
11:00	*	13	5	12	*	10	*	*	10
12:00 PM	*	9	9	15	*	11	*	*	11
01:00	*	6	10	15	*	10	*	*	10
02:00	*	10	8	7	*	8	*	*	8
03:00	*	6	13	12	*	10	*	*	10
04:00	*	14	8	7	*	10	*	*	10
05:00	*	15	18	15	*	16	*	*	16
06:00	*	20	14	12	*	15	*	*	15
07:00	*	9	12	9	*	10	*	*	10
08:00	*	12	12	10	*	11	*	*	11
09:00	*	6	11	9	*	9	*	*	9
10:00	*	10	6	3	*	6	*	*	6
11:00	*	2	3	3	*	3	*	*	3
Day Total	0	138	158	150	15	150	0	0	150
% Avg. WkDay	0.0%	92.0%	105.3%	100.0%	10.0%				
% Avg. Week	0.0%	92.0%	105.3%	100.0%	10.0%	100.0%	0.0%	0.0%	
AM Peak Vol.	-	11:00 13	10:00 10	11:00 12	09:00 7	- 11:00 10	- - -	- - 10	11:00 10
PM Peak Vol.	-	18:00 20	17:00 18	12:00 15	- - -	- 17:00 16	- - -	- - 16	17:00 16
Grand Total	0	138	158	150	15	150	0	0	150
ADT		ADT 154		AADT 154					



TRAFFIC COMMITTEE REPORT

August 22, 2019

TO: Traffic Committee

FROM: Bill Huotari, City Engineer/ Traffic Engineer

SUBJECT: Request for Traffic Control
Jamaica Drive at Key West Drive

Background:

Rick Swanquist of 1301 Key West states that the lack of a Stop sign on the northbound Jamaica Drive approach to Key West Drive creates a hazardous condition. Key West Drive has been under STOP control since 1964, while Jamaica Drive has no traffic control.

There was one (1) crash in the past five (5) years at the intersection.

The posted speed limit on both streets is 25 mph.

Key West Drive has been STOP-controlled since 1964 and would be considered the major road intersection, while Jamaica Drive is currently uncontrolled.

The major potential sight distance obstructions at the intersection are the vegetation and houses, predominately the shrubbery located next to the house corner in the southeast quadrant of the intersection.

The safe approach speed was found to be 10.4 mph for a vehicle traveling north on Jamaica Drive as a result of the sight obstruction from the shrub next to the house corner at the southeast quadrant of the intersection, therefore a YIELD sign is the recommended treatment.

However, while the sight distance analysis determined that a YIELD sign would be recommended control treatment on Jamaica Drive, the controlling sight distance obstructions were vegetation next to the houses on either quadrant. Growth of the shrub at the southeast quadrant by only two (2) feet towards Jamaica Drive would facilitate the recommendation of a STOP sign based on the safe approach speed analysis. These shrubs appear to be outside of the 25' corner clearance triangle stipulated in the City of Troy's Zoning Ordinance, Article 7, Section 7.04 Corner Clearance and thus cannot be required to be trimmed.

No criteria were met for ALL-WAY STOP control. However, the safe approach speed analysis determined that STOP-control on Jamaica Drive would be warranted should the shrub at the southeast quadrant continue to grow. Key West Drive has been the controlled street since the Traffic Control Order to install the STOP signs was enacted in 1964.

ITEM #5

The recommendation is therefore to make no changes to the intersection of Jamaica Drive at Key West Drive and to maintain the STOP signs on the Key West Drive approach to the intersection.

The city requested that OHM review the intersection and provide their findings and recommendations (copy attached).

August 7, 2019

Mr. William Huotari, PE
City Engineer
City of Troy
500 W. Big Beaver Rd
Troy, MI 48084

RE: Traffic Control Recommendation for Key West Drive at Jamaica Drive
OHM JN: 0128-19-0010

Dear Mr. Huotari:

As requested, we have reviewed the intersection of Key West Drive at Jamaica Drive to determine the suitability of converting the intersection to all-way STOP-control. The subject intersection is a 3-leg intersection located in the City of Troy approximately 2,130' east of Rochester Road and 2,490' north of 14 Mile Road. The speed limit on both streets is 25 mph. The intersection is STOP-controlled on the Key West Drive approaches. Reference the attachments for aerial and intersection photos.

Types of Roadways

Both Key West Drive and Jamaica Drive are considered local streets. Key West Drive runs east / west, and Jamaica Drive runs north / south. Each street provides access to several other neighborhood streets. Key West Drive also provides indirect access to Redwood Park located at the northeast corner of the local neighborhood.

The immediate surrounding land use is single-family residential, while high density commercial land use is present just to the north, occupying the area between Key West Drive and Maple Road. On-street parking is permitted on each side of the west leg of Key West Drive, while on-street parking is only permitted on the south side of the east leg of Key West Drive. On-street parking is also permitted on the west side of Jamaica Drive. Key West Drive is currently STOP-controlled and would be considered the major road at the intersection, while Jamaica Drive is currently uncontrolled.

The ensuing traffic control analysis adheres to the guidance presented in the 2011 Michigan Manual on Uniform Traffic Control Devices (MMUTCD). A reference document explaining the background behind the analysis is attached to this memo.

Approach Speeds

The approach speed limit on both streets is 25 mph. Speed limits alone cannot be used in this case to determine which direction of traffic should be assigned the right-of-way.



Crash Analysis

Based on information obtained through the Traffic Improvement Association of Michigan, there was one crash recorded in the past five (5) years within a 250' radius of the intersection. On April 4, 2014 at 10:34 PM, a vehicle exiting a driveway located just west of Jamaica Drive backed into a vehicle legally parked on the north side of Key West Drive. The crash resulted in property damage only (PDO). The crash history does not constitute a compelling case for modifying the existing controls.

Traffic Volumes

Traffic counts were collected on the westbound and northbound approaches to the intersection from July 17 to July 23, 2019. On Thursday, July 18, the total daily entering traffic observed on the westbound Key West Drive approach was 374 vehicles, with a maximum hourly volume of 36 vehicles occurring between 7:00 to 8:00 AM. While the counts were not performed while local K-12 schools were in session, based on the data collected, one can reasonably ascertain that Key West Drive fails to meet and /or sustain the 300 vehicles per hour threshold required for all-way STOP-control for even one hour, let alone the minimum of 8 hours.

The total daily entering traffic observed on the Jamaica Drive approach on Thursday, July 18 was 274 vehicles, with a maximum hourly volume of 24 vehicles between 2:00 to 3:00 PM. Given the vehicle volumes observed, the combined entering vehicular, pedestrian, and bicycle volumes are highly unlikely to average at least 200 units for any 8 hours, even if traffic was grown by an appropriate percentage to accommodate missing school trips.

Since the posted speed limit is only 25 mph on Key West Drive, it is reasonable to assume that the 85th percentile approach speed does not exceed 40 mph. Thus, the minimum vehicular volume warrants on either road cannot be discounted to 70 percent of the values described previously. Finally, the study intersection falls significantly shy of even the reduced 80 percent volumes, based on the count data collected. Therefore, the minimum volume criteria for an all-way STOP has not been met. The summary reports for the traffic counts conducted on Key West Drive and Jamaica Drive are attached to this memo.

Sight Distance

The major potential sight distance obstructions at the intersection are the vegetation and houses, predominately the shrubbery located next to the house corner in the southeast quadrant of the intersection. Reference the attachments for intersection photos. These obstructions come into play when determining the safe approach speeds for the intersection. The safe approach speed is the speed at which a vehicle can approach an intersection and still stop in time to avoid a collision with a vehicle on the cross street. Safe approach speeds are determined through calculations.

When the safe approach speed is found to be more than 10 mph and less than 25 mph, a YIELD sign is recommended. In this case, the safe approach speed was found to be 10.4 mph for a vehicle traveling north on Jamaica Drive as a result of the sight obstruction from the shrub next to the house corner at the southeast quadrant of the intersection, therefore a YIELD sign is the recommended treatment. The safe approach speed calculation spreadsheet is attached for your reference.



Recommendation

While the sight distance analysis determined that a YIELD sign would be the recommended control treatment on Jamaica Drive, the controlling sight distance obstructions were vegetation next to the houses on either quadrant. Growth of the shrub at the southeast quadrant by only 2' towards Jamaica Drive would facilitate the recommendation of a STOP sign based on the safe approach speed analysis. Additionally, it appears that these shrubs are outside of the 25' corner clearance triangle stipulated in the City of Troy's Zoning Ordinance Article 7 Section 7.04 *Corner Clearance* (as attached), and thus cannot be required to be trimmed according to the ordinance.

No criteria were met for all-way STOP-control. However, the safe approach speed analysis determined that STOP-control on Jamaica Drive would be warranted should the shrub at the southeast quadrant continue to grow. Key West Drive has been the controlled street since the Traffic Control Order to install the STOP signs was enacted in 1964. We would not recommend reversing the STOP-controlled roadway from Key West Drive to Jamaica Drive as residents are conditioned to stop on Key West Drive at the intersection. Thus, OHM recommends that the City maintain the STOP signs on the Key West Drive approaches. The intersection should continue to be monitored if traffic volumes increase or more crashes occur.

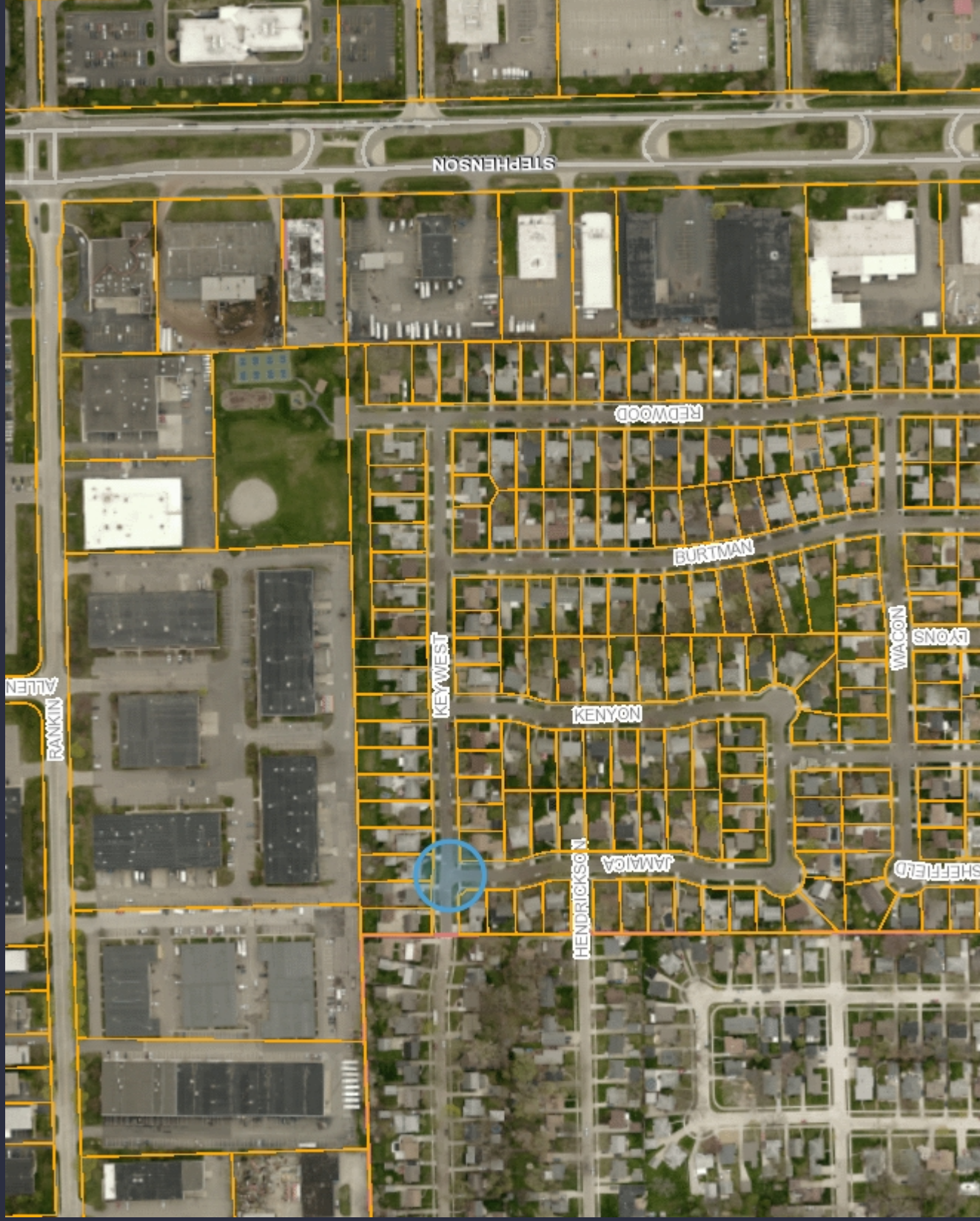
Sincerely,
Orchard, Hiltz & McCliment, Inc.

Matt Clark, EIT
Engineer

Sara Merrill, PE, PTOE
Traffic Project Manager

Attachments:

- Aerial Photo
- Safe Approach Speed Calculation Spreadsheet
- Intersection Photos
- UD-10 Crash Report
- City of Troy's Zoning Ordinance Chapter 28 Section 11
- Traffic Control Determination Reference Guide
- Traffic Data Summaries



Notes:



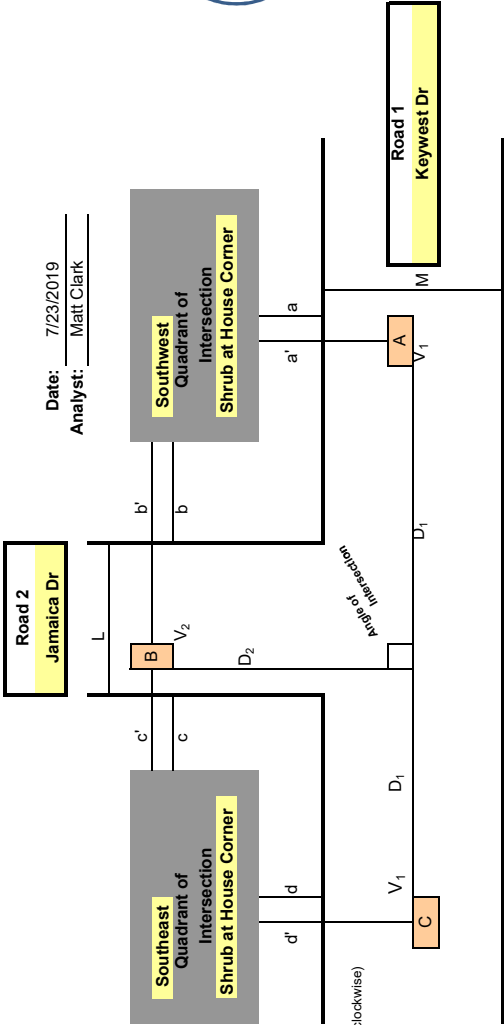
Safe Approach Speed Calculation

Keywest Dr and Jamaica Dr
City of Troy

Measured:

Width of Roads	
Road 1 =	26 (ft)
Road 2 =	26 (ft)
Distance to Obstruction	
a =	34 (ft)
b =	47 (ft)
c =	30 (ft)
d =	37 (ft)
Angle of Intersection	
Delta =	90 (degrees, measure counterclockwise)
Road 1 Posted	
Speed Limit =	25 (mph)

Date: 7/23/2019
Analyst: Matt Clark



Assumed:

Speed of Vehicle A = Speed of Vehicle C
= Posted Speed Limit on Road 1
+
V₁ = 30 (mph)
Perception / Reaction Time (AASHTO)
t = 2.5 (sec)
Deceleration rate (AASHTO)
A = 11.20
Clearance distance in excess of safe stopping distance (AAA)
EC = 0 (ft)

Intermediate Calculations:
D₁ = 196
D_{2A} = 58
D_{2C} = 48.6
a' = 40
b' = 61
c' = 36
d' = 51
Based On $D_1 = (1.075 V_1^2 / A) + 1.4667 V_1 t + EC$
 $D_{2A} = \frac{a' \cdot D_1}{(D_1 - b')}$ or $D_{2C} = \frac{c' \cdot D_1}{(D_1 - d')}$

Calculated Safe Approach Speed for Vehicle B

Approaching on Road 2

TRUE
FALSE
12.0 (mph) [Based on Veh. A]
or V₂ = 10.4 (mph) [Based on Veh. C]

Notes:

Enter field measurements in yellow highlighted area.

Blue fields are std. default values; change only for cause.

Calculated by spreadsheet

Threshold of Safe Approach Speed (AAA, FHWA & NSC)

to Recommend STOP Control

to Recommend YIELD Control 10.0 (mph)

Otherwise Recommends NO CONTROL. 25.0 (mph)

Recommended ROW control for Road 2

based on safe approach speed

YIELD SIGN



Photograph No. 1: Key West Drive – Heading East
Date: 7/17/2019 **Photographer:** Matt Clark



Photograph No. 2: Key West Drive - Heading East and Looking Right
Date: 7/17/2019 **Photographer:** Matt Clark



Photograph No. 3: Jamaica Drive - Heading North
Date: 7/17/2019 **Photographer:** Matt Clark



Photograph No. 4: Jamaica Drive - Heading North and Looking Left
Date: 7/17/2019 **Photographer:** Matt Clark



Photograph No. 5: Jamaica Drive – Heading North and Looking Right
Date: 7/17/2019 **Photographer:** Matt Clark



Photograph No. 6: Key West Drive – Heading West
Date: 7/17/2019 **Photographer:** Matt Clark



Photograph No. 7: Key West Drive - Heading West and Looking Left
Date: 7/17/2019 **Photographer:** Matt Clark



Photograph No. 8: Jamaica Drive – Looking South
Date: 7/17/2019 **Photographer:** Matt Clark

Authority: 1949 PA 300, Sec.257 622
Compliance: Required MSP UD-10E
Penalty: \$100 and/or 90 days (Rev 11/2006)

External # 0445870
Crash ID 8935046

Page 01 of 01
Incident # 140001218 File Class 3150

STATE OF MICHIGAN TRAFFIC CRASH REPORT

ORI: MI 6331600		Department Name Clawson Police Department		Incident Disposition Closed	
Crash Date 04/04/2014	Crash Time 22:34	No. of Units 02	Crash Type Other/Unknown	Special Circumstances <input type="radio"/> School Bus <input type="radio"/> None <input type="radio"/> Deer <input type="radio"/> Hit and Run <input type="radio"/> Fleeing Police	Special Checks <input type="radio"/> Fatal <input type="radio"/> Non-Traffic Area <input type="radio"/> ORV/Snowmobile
County 63 - Oakland	Traffic Control None	Relation to Roadway On Road	Special Study	Weather Clear	Area 08 - Intersection Driveway
City/Twsp 68 - Clawson	Construction Zone (if applicable) Type	Lane Closed	Activity	Light Dark-Unlighted	Road Condition Wet
		Total Lanes 02	Speed Limit 25	Posted Yes	

Prefix	Road Name KEY WEST	Road Type DR	Suffix	Divided Roadway
Distance 100 Feet W	Traffic Way 01 - Not physically divided		Access Control 01 - No access control	
Prefix	Intersecting Road JAMAICA	Road Type DR	Suffix	Divided Roadway

Unit Number 01	Unit Known No	State MI	Driver License Number #####	Date of Birth (Age) ##/##/#### (22)	License Type <input type="radio"/> Operator <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex M	Total Occupants 01	Hazardous Action 11 - Improper backing
Unit Type MV	Driver Information ##### ##### CLAWSON, MI 48017-2329 (###) ###-####				Injury O	Position 01	Restraint 04	Hospital NONE	
Driver Condition <input type="radio"/> 01 <input type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09 <input type="radio"/> 099				Interlock No	Ejected	Trapped	Airbag Deployed No	Ambulance NONE	
Alcohol <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Refused <input checked="" type="radio"/> Not offered <input type="radio"/> PBT <input type="radio"/> Breath <input type="radio"/> Blood <input type="radio"/> Urine				Test Results		Drugs <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Test Type <input type="radio"/> Blood <input type="radio"/> Urine	Test Results		Citation Issued <input checked="" type="radio"/> Hazardous <input checked="" type="radio"/> Other
Vehicle Registration #####		State MI	Insurance / Policy # #####		Towed To/By		Special Vehicles 0	Private Trailer Type	Vehicle Defect
VIN #####		Vehicle Description DODGE		Make RAM	Model	Color RED	Year 1999	Vehicle Type Passenger Car	
Location of Greatest Damage 05	First Impact 05	Extent of Damage 1	Driveable Yes	Vehicle Direction S	Vehicle Use 01 - Private		Action Prior 07 - Backing		
Sequence of Events (● indicates MOST harmful event)				First ● 18 - Parked motor vehicle		Second		Third	
						Fourth			

PASSENGERS	Passenger Information		Date of Birth (Age)	Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information		Date of Birth (Age)	Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information		Date of Birth (Age)	Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance
PASSENGERS	Passenger Information		Date of Birth (Age)	Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information		Date of Birth (Age)	Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information		Date of Birth (Age)	Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance
PASSENGERS	Passenger Information		Date of Birth (Age)	Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information		Date of Birth (Age)	Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information		Date of Birth (Age)	Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance

TRUCK/BUS	Carrier Information		Carrier Source	GVWR	ICCMC	USDOT	MPSC
			Driver's CDL Type	Endorsements <input type="radio"/> H <input type="radio"/> P <input type="radio"/> T <input type="radio"/> N <input type="radio"/> S <input type="radio"/> X	CDL Exempt <input type="radio"/> Farm <input type="radio"/> Other	CDL Restrictions <input type="radio"/> 28 <input type="radio"/> 29 <input type="radio"/> 30 <input type="radio"/> 35 <input type="radio"/> 36	
	Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth	Cargo Body Type	Medical Card	Hazardous Material <input type="radio"/> Placard <input type="radio"/> Cargo Spill	ID #

OWNERS	Owner Information		Owner Information	

Person Advised of Damaged Traffic Control		Damaged Property	Public
Contact Name: Contact Date: Contact Time:		Owner & Phone	

UNIT / DRIVER	Unit Number 02	Unit Known No	State MI	Driver License Number #####	Date of Birth (Age) ###/##/####	License Type <input type="radio"/> Operator <input type="radio"/> Chauffeur <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex	Total Occupants 00	Hazardous Action		
	Unit Type MV	Driver Information ##### (###) ###-####				Injury	Position	Restraint 09	Hospital NONE			
	Driver Condition 01 02 03 04 05 06 07 08 09 099				Interlock No	Ejected	Trapped	Airbag Deployed Not Equipped	Ambulance NONE			
	Alcohol 0 Yes <input checked="" type="radio"/> No <input type="radio"/> Refused <input type="radio"/> Not offered <input type="radio"/> Test Results				Drugs 0 Yes <input type="radio"/> No <input type="radio"/> Test Results				Citation Issued <input type="radio"/> Hazardous <input type="radio"/> Other			
	Test Type 0 Field <input type="radio"/> PBT <input type="radio"/> Breath <input type="radio"/> Blood <input type="radio"/> Urine				Towed To/By				Special Vehicles 0	Private Trailer Type	Vehicle Defect	
	Vehicle Registration #####		State MI	Insurance / Policy # #####			Color SILVER		Year 2006	Vehicle Type Passenger Car		
	VIN #####		Vehicle Description HONDA		Make Model ACCORD	Color SILVER		Year 2006	Vehicle Type Passenger Car			
	Location of Greatest Damage 07		First Impact 07	Extent of Damage 3	Driveable Yes	Vehicle Direction W	Vehicle Use 01 - Private		Action Prior 23 - Parked			
	Sequence of Events ● 17 - Motor veh in transport (● indicates MOST harmful event)											
	PASSENGERS	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital		
Injury				Airbag Deployed	Ejected	Trapped	Ambulance					
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital				
Injury				Airbag Deployed	Ejected	Trapped	Ambulance					
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital				
Injury				Airbag Deployed	Ejected	Trapped	Ambulance					
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital				
Injury				Airbag Deployed	Ejected	Trapped	Ambulance					
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital				
Injury				Airbag Deployed	Ejected	Trapped	Ambulance					
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital				
Injury				Airbag Deployed	Ejected	Trapped	Ambulance					
TRUCK / BUS	Carrier Information					Carrier Source GVWR	ICCMC	USDOT	MPSC			
	Driver's CDL Type					Endorsements OH OP OT ON OS OX	CDL Exempt <input type="radio"/> Farm <input type="radio"/> Other	CDL Restrictions 028 029 030 035 036				
	Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth		Cargo Body Type	Medical Card	Hazardous Material <input type="radio"/> Placard <input type="radio"/> Cargo Spill		ID #	Class #		
OWNERS	Owner Information ##### ##### #####, ## ####-#### (###) ###-####					Owner Information						
	Witness Information					Witness Information						
WITNESS	Investigated at Scene Yes					Reported Date (Time) 04/04/2014 (22:34)		1st Investigator Name (Badge) SHEARER (00040)		2nd Investigator Name (Badge)		Photos By
	Narrative UNIT 2 PARKED LEGALLY ON NORTH SIDE OF KEY WEST FACING W/B DIRECTLY ACROSS FROM THE END OF THE DRIVEWAY AT 1242 KEY WEST. SOME TIME BETWEEN 2200 AND 2230 THE VEHICLE WAS STRUCK BY A VEHICLE THAT WAS EXITING THE DRIVEWAY OF 1242 KEY WEST. THERE WAS SILVER PAINT TRANSFER WITH RED EMBEDDED IN THE SCRATCHES ON THE PARKED VEHICLE. PHOTOS ARE ATTACHED TO THIS REPORT. SEE CFS 14-1218 FOR REPORT. W/N FOLLOW UP: SUSPECT VEHICLE FOUND, HAD CONCURRENT DAMAGE TO REAR BUMPER AND SHARDS OF GLASS FROM STRUCK VEHICLE ON BUMPER. OWNER ADMITTED IT WAS LIKELY HIM BECAUSE HE HAD BEEN DRIVING AT THAT TIME AND NOBODY ELSE DROVE HIS VEHICLE. HIS LICENSE WAS SUSPENDED AND HE WAS MAILED A CITATION.					Diagram 						

type antennas may, however, be permitted to be constructed to a height equal to the permitted maximum height of structures in the District. Other pole, mast, whip, or panel type antennas that are roof-mounted or attached to a building shall not extend more than twelve (12) feet above the highest point of a roof.

- a. In residential districts, no more than two (2) antenna structures, which shall include no more than one (1) which may be ground-mounted, and thus detached from the main building, shall be permitted for each lot or parcel, with the following exception:
 - b. In non-residential districts, two (2) antenna structures shall be permitted for the first twenty thousand (20,000) square feet of gross building area, with one (1) antenna structure permitted for each additional twenty thousand (20,000) square feet of gross building area, or major portion thereof.
 - c. The numerical limits of this Section shall not apply in the following situations:
 - i. Panel-type antennas which are visually integrated with the building surface on which they are mounted (similar color, not extending above wall, equipment penthouse, or enclosure surface).
 - ii. Pole, mast, whip, or panel-type antennas mounted on or adjacent to the roof of residential or non-residential buildings sixty (60) feet or more in height.
2. Satellite dish antennas in Residential Districts, which extend more than fourteen (14) feet in height or fourteen (14) feet above grade, shall not exceed twenty-four (24) inches in diameter.
3. Satellite dish and amateur radio antennas shall be located in a [side](#) or [rear yard](#) and shall be placed so that rotation can occur without encroachment into the required setback.

SECTION 7.04 CORNER CLEARANCE

No fence, wall, shrubbery, sign, or other obstruction to vision above a height of thirty (30) inches from the established street [grades](#) shall be permitted within the triangular area formed at the intersection of any street right-of-way lines by a straight line drawn between said right-of-way lines at a distance along each line of twenty-five (25) feet from their point of intersection.

Reference Guide on Traffic Control Determination in the State of Michigan

Background

This document is intended to be used as a reference guide for performing intersection traffic control studies of intersections on public roadways in Michigan. The document explains the procedure and requirements necessary to implement traffic control at an intersection as stipulated by the Michigan Manual on Uniform Traffic Control Devices (MMUTCD). Generally, the starting premise is an uncontrolled intersection. The first step would then be to verify if the intersection should remain uncontrolled or if YIELD or STOP controls on the minor street approach(es) should be provided. For locations with higher traffic volumes and /or crash issues, then an evaluation of the location for all-way STOP warrants would be performed. The appropriate analysis for each level of control described below.

YIELD Traffic Control Guidance

The use of a YIELD sign is intended to assign the right-of-way at intersections where it is not usually necessary to stop before proceeding into the intersection. Conversely, the STOP sign is intended for use where it is usually necessary to stop before proceeding into the intersection.

The following conditions should be fully evaluated to determine how the right-of-way should be assigned:

- Traffic Volumes: Normally, the heavier volume of traffic should be given the right-of-way.
- Approach Speeds: The higher speed traffic should normally be given the right-of-way.
- Types of Highways: When a minor highway intersects a major highway, it is usually desirable to control the minor highway.
- Sight Distance: Sight distance across the corners of the intersection is the most important factor and is critical in determining safe approach speeds.

STOP Traffic Control Guidance

Based on the MMUTCD there are four conditions where STOP signs may be warranted:

- At the intersection of a less important road with a main road where application of the normal right-of-way rule is unduly hazardous.
- On a street entering a through highway or street.
- At an unsignalized intersection in a signalized area.
- At other intersections where a combination of high speed, restricted view, or crash records indicate a need for control by the STOP sign.

Many times STOP signs are installed where they may not be warranted. Traffic experts agree that unnecessary STOP signs:

- Cause accidents they are designed to prevent.
- Breed contempt for other necessary STOP signs.
- Waste millions of gallons of gasoline annually.
- Create added noise and air pollution.
- Increase, rather than decrease, speeds between intersections.

There is also an explicit restriction in the MMUTCD that STOP signs are not to be used for speed control, in Section 2B.04.

Evaluation of All-Way STOP Traffic Control

Based on the MMUTCD there are four conditions where **all-way** STOP signs may be warranted:

- A. *Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.*
- B. *Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.*
- C. *Minimum volumes:*
 - 1. *The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and*
 - 2. *The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but*
 - 3. *If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.*
- D. *Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.*

OHM Advisors

34000 Plymouth Road
Livonia, MI 48150

Advancing Communities

Weather: Various
Serial Number: 32213
Installed by: Matt Clark
Other Notes: None

Date Start: 17-Jul-19
WB Keywest
E of Jamaica

Start Time	Mon 15-Jul-19	Tue 16-Jul-19	Wed 17-Jul-19	Thu 18-Jul-19	Fri 19-Jul-19	Average Day	Sat 20-Jul-19	Sun 21-Jul-19	Week Average
12:00 AM	*	*	*	4	4	4	7	5	5
01:00	*	*	*	2	1	2	7	2	3
02:00	*	*	*	1	0	0	0	3	1
03:00	*	*	*	1	2	2	1	3	2
04:00	*	*	*	1	1	1	2	0	1
05:00	*	*	*	3	3	3	2	1	2
06:00	*	*	*	14	12	13	5	2	8
07:00	*	*	*	36	31	34	11	6	21
08:00	*	*	*	21	16	18	24	14	19
09:00	*	*	*	18	17	18	25	9	17
10:00	*	*	*	14	10	12	16	14	14
11:00	*	*	*	24	22	23	25	13	21
12:00 PM	*	*	*	21	11	16	27	19	20
01:00	*	*	*	15	16	16	28	25	21
02:00	*	*	*	24	14	19	23	19	20
03:00	*	*	*	17	32	24	25	15	22
04:00	*	*	27	31	19	26	26	12	23
05:00	*	*	36	28	35	33	26	21	29
06:00	*	*	26	29	25	27	22	13	23
07:00	*	*	22	22	23	22	23	11	20
08:00	*	*	25	25	13	21	13	13	18
09:00	*	*	21	10	9	13	14	16	14
10:00	*	*	8	10	9	9	9	5	8
11:00	*	*	4	3	0	2	5	3	3
Day Total	0	0	169	374	325	358	366	244	335
% Avg. WkDay	0.0%	0.0%	47.2%	104.5%	90.8%				
% Avg. Week	0.0%	0.0%	50.4%	111.6%	97.0%	106.9%	109.3%	72.8%	
AM Peak	-	-	-	07:00	07:00	-	09:00	08:00	07:00
Vol.	-	-	-	36	31	-	25	14	21
PM Peak	-	-	17:00	16:00	17:00	-	13:00	13:00	17:00
Vol.	-	-	36	31	35	-	28	25	29

OHM Advisors

34000 Plymouth Road
Livonia, MI 48150

Advancing Communities

Weather: Various
Serial Number: 32213
Installed by: Matt Clark
Other Notes: None

Date Start: 17-Jul-19
WB Keywest
E of Jamaica

Start Time	Mon 22-Jul-19	Tue 23-Jul-19	Wed 24-Jul-19	Thu 25-Jul-19	Fri 26-Jul-19	Average Day	Sat 27-Jul-19	Sun 28-Jul-19	Week Average
12:00 AM	0	6	*	*	*	3	*	*	3
01:00	4	2	*	*	*	3	*	*	3
02:00	1	2	*	*	*	2	*	*	2
03:00	2	1	*	*	*	2	*	*	2
04:00	0	0	*	*	*	0	*	*	0
05:00	4	1	*	*	*	2	*	*	2
06:00	7	9	*	*	*	8	*	*	8
07:00	25	*	*	*	*	25	*	*	25
08:00	25	*	*	*	*	25	*	*	25
09:00	18	*	*	*	*	18	*	*	18
10:00	20	*	*	*	*	20	*	*	20
11:00	12	*	*	*	*	12	*	*	12
12:00 PM	19	*	*	*	*	19	*	*	19
01:00	19	*	*	*	*	19	*	*	19
02:00	18	*	*	*	*	18	*	*	18
03:00	22	*	*	*	*	22	*	*	22
04:00	31	*	*	*	*	31	*	*	31
05:00	28	*	*	*	*	28	*	*	28
06:00	30	*	*	*	*	30	*	*	30
07:00	27	*	*	*	*	27	*	*	27
08:00	18	*	*	*	*	18	*	*	18
09:00	18	*	*	*	*	18	*	*	18
10:00	2	*	*	*	*	2	*	*	2
11:00	5	*	*	*	*	5	*	*	5
Day Total	355	21	0	0	0	357	0	0	357
% Avg. WkDay	99.4%	5.9%	0.0%	0.0%	0.0%				
% Avg. Week	99.4%	5.9%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak Vol.	07:00 25	06:00 9	-	-	-	07:00 25	-	-	07:00 25
PM Peak Vol.	16:00 31	-	-	-	-	16:00 31	-	-	16:00 31
Grand Total	355	21	169	374	325	715	366	244	692
ADT		ADT 374		AADT 374					

Start Time	Mon 15-Jul-19	Tue 16-Jul-19	Wed 17-Jul-19	Thu 18-Jul-19	Fri 19-Jul-19	Average Day	Sat 20-Jul-19	Sun 21-Jul-19	Week Average
12:00 AM	*	*	*	4	5	4	2	2	3
01:00	*	*	*	1	1	1	2	1	1
02:00	*	*	*	0	0	0	0	1	0
03:00	*	*	*	0	0	0	1	1	0
04:00	*	*	*	0	0	0	0	0	0
05:00	*	*	*	0	1	0	1	1	1
06:00	*	*	*	5	4	4	2	0	3
07:00	*	*	*	19	17	18	6	3	11
08:00	*	*	*	19	12	16	17	9	14
09:00	*	*	*	18	16	17	14	7	14
10:00	*	*	*	12	10	11	8	7	9
11:00	*	*	*	13	17	15	14	11	14
12:00 PM	*	*	*	23	11	17	23	12	17
01:00	*	*	*	11	9	10	14	13	12
02:00	*	*	*	24	20	22	25	16	21
03:00	*	*	*	15	23	19	13	11	16
04:00	*	*	12	23	9	15	17	6	13
05:00	*	*	17	16	17	17	9	12	14
06:00	*	*	24	17	8	16	10	9	14
07:00	*	*	16	13	11	13	7	8	11
08:00	*	*	20	22	10	17	7	12	14
09:00	*	*	15	6	5	9	9	7	8
10:00	*	*	7	9	5	7	5	3	6
11:00	*	*	1	4	2	2	2	4	3
Day Total	0	0	112	274	213	250	208	156	219
% Avg. WKDay	0.0%	0.0%	44.8%	109.6%	85.2%				
% Avg. Week	0.0%	0.0%	51.1%	125.1%	97.3%	114.2%	95.0%	71.2%	
AM Peak	-	-	-	07:00	07:00	-	08:00	11:00	08:00
Vol.	-	-	-	19	17	-	17	11	14
PM Peak	-	-	18:00	14:00	15:00	-	14:00	14:00	14:00
Vol.	-	-	24	24	23	-	25	16	21



TRAFFIC COMMITTEE REPORT

August 22, 2019

TO: Traffic Committee

FROM: Bill Huotari, City Engineer/ Traffic Engineer

SUBJECT: Request for Traffic Control
Lovell Drive at Montclair Drive

Background:

Leah Kellow of 416 E. Lovell states that the existing YIELD signs on Lovell do not cause traffic to yield the right-of-way or stop at the intersection with Montclair, creating a hazardous condition.

There was one (1) crash in the past five (5) years at the intersection.

The posted speed limit on both streets is 25 mph.

Lovell Drive connects two arterials, with STOP-controlled approaches at Donaldson Drive approximately 1,300' to the west and at Norton Drive approximately 800' to the east. Conversely, Montclair Drive runs free between South Boulevard and Booth Road. For the present analysis, Montclair Drive was considered the major road as it is uncontrolled at the intersection.

The major potential sight distance obstructions at the intersection are the vegetation and houses, predominately the vegetation in the southwest quadrant of the intersection.

The safe approach speed was found to be 14.2 mph for a vehicle traveling east on Lovell Drive as a result of the sight obstruction from the vegetation at the southwest quadrant of the intersection, therefore a YIELD sign on the Lovell Drive approaches to the intersection is the recommended treatment.

The city requested that OHM review the intersection and provide their findings and recommendations (copy attached).

August 5, 2019

Mr. William Huotari, PE
City Engineer
City of Troy
500 W. Big Beaver Rd
Troy, MI 48084

RE: Traffic Control Recommendation for Lovell Drive at Montclair Drive
OHM JN: 0128-19-0010

Dear Mr. Huotari:

As requested, we have reviewed the intersection of Lovell Drive at Montclair Drive to determine the proper traffic control. The subject intersection is a 4-leg intersection located in the City of Troy approximately 1,820' south of South Boulevard and mid-way between Livernois Road and Rochester Road. The speed limit on both streets is 25 mph. The intersection is YIELD-controlled on the Lovell Drive approaches. Reference the attachments for aerial and intersection photos.

Types of Roadways

Both Lovell Drive and Montclair Drive are considered local streets. Lovell Drive runs east / west, providing access to / from the local neighborhood and Livernois Road (minor arterial) and Rochester Road (principal arterial). Montclair Drive runs north / south, providing access to / from several other neighborhood streets and South Boulevard (minor arterial).

The surrounding land use is single-family residential. On-street parking is permitted on the east side of the south leg and on the west side of the north leg of Montclair Drive. On-street parking is also permitted on the north side of Lovell Drive.

Lovell Drive connects two arterials, with STOP-controlled approaches at Donaldson Drive approximately 1,300' to the west and at Norton Drive approximately 800' to the east. Conversely, Montclair Drive runs free between South Boulevard and Booth Road. For the present analysis, Montclair Drive was considered the major road as it is uncontrolled at the intersection. The analysis adheres to the guidance presented in the 2011 Michigan Manual on Uniform Traffic Control Devices (MMUTCD). A reference document explaining the background behind the analysis is attached to this memo.

Approach Speeds

The approach speed limit on both streets is 25 mph. Speed limits alone cannot be used in this case to determine which direction of traffic should be assigned the right-of-way.



Crash Analysis

Based on information obtained through the Traffic Improvement Association of Michigan, there was a single crash recorded in the past five (5) years at the intersection. The angle collision occurred on February 7th, 2014 at 11:04 AM. The crash involved a vehicle on westbound Lovell Drive failing to yield to a vehicle traveling southbound on Montclair Drive. The crash resulted in property damage only (PDO) to both vehicles. A single angle crash does not meet the all-way STOP-control threshold of five crashes in a 12 month period.

Traffic Volumes

Traffic counts and vehicle speed data were collected on Montclair Drive between Hurst Street and Lesdale Drive from December 13 to December 19, 2018. The average daily traffic (ADT) observed during this time period was 307 vehicles per day. Based on the data collected, one can reasonably ascertain that Montclair Drive fails to meet and/or sustain the 300 vehicles per hour threshold required for all-way STOP-control for even one hour, let alone the minimum of 8 hours.

Traffic counts and vehicle speed data were collected on Lovell Drive at a location between Donaldson Drive and Montclair Drive from June 11 to June 18, 2019. The average daily traffic (ADT) observed during this time period was 420 vehicles per day. While the counts were not performed while local K-12 schools were in session, based on the data collected, the combined entering vehicular, pedestrian, and bicycle volumes are highly unlikely to average at least 200 units for any 8 hours, given the vehicle traffic volumes collected on Lovell Drive.

During the traffic data collection period, the 85th percentile speed was found to be 29 mph on both directions of Lovell Drive. Since the 85th percentile speeds do not exceed 40 mph, the minimum vehicular volume warrants on either road cannot be discounted to 70 percent of the values described previously. Finally, the study intersection falls significantly shy of even the reduced 80 percent volumes, based on the count data collected. Therefore, the minimum volume criteria for an all-way STOP has not been met. The summary reports for the traffic counts and/or speed studies conducted on Montclair Drive and Lovell Drive are attached to this memo.

Sight Distance

The major potential sight distance obstructions at the intersection are the vegetation and houses, predominately the vegetation in the southwest quadrant of the intersection. Reference the attachments for intersection photos. These obstructions come into play when determining the safe approach speeds for the intersection. The safe approach speed is the speed at which a vehicle can approach an intersection and still stop in time to avoid a collision with a vehicle on the cross street. Safe approach speeds are determined through calculations.

When the safe approach speed is found to be greater than 10 mph and less than 25 mph, a YIELD sign is recommended. In this case, the safe approach speed was found to be 14.2 mph for a vehicle traveling east on Lovell Drive as a result of the sight obstruction from the vegetation at the southwest quadrant of the intersection, therefore a YIELD sign is the recommended treatment. The safe approach speed calculation spreadsheet is attached for your reference.



Recommendation

OHM recommends retaining the YIELD signs on the Lovell Drive approaches to the intersection. The intersection should continue to be monitored if traffic volumes increase or more crashes occur.

Sincerely,
Orchard, Hiltz & McClimment, Inc.

Matt Clark, EIT
Engineer

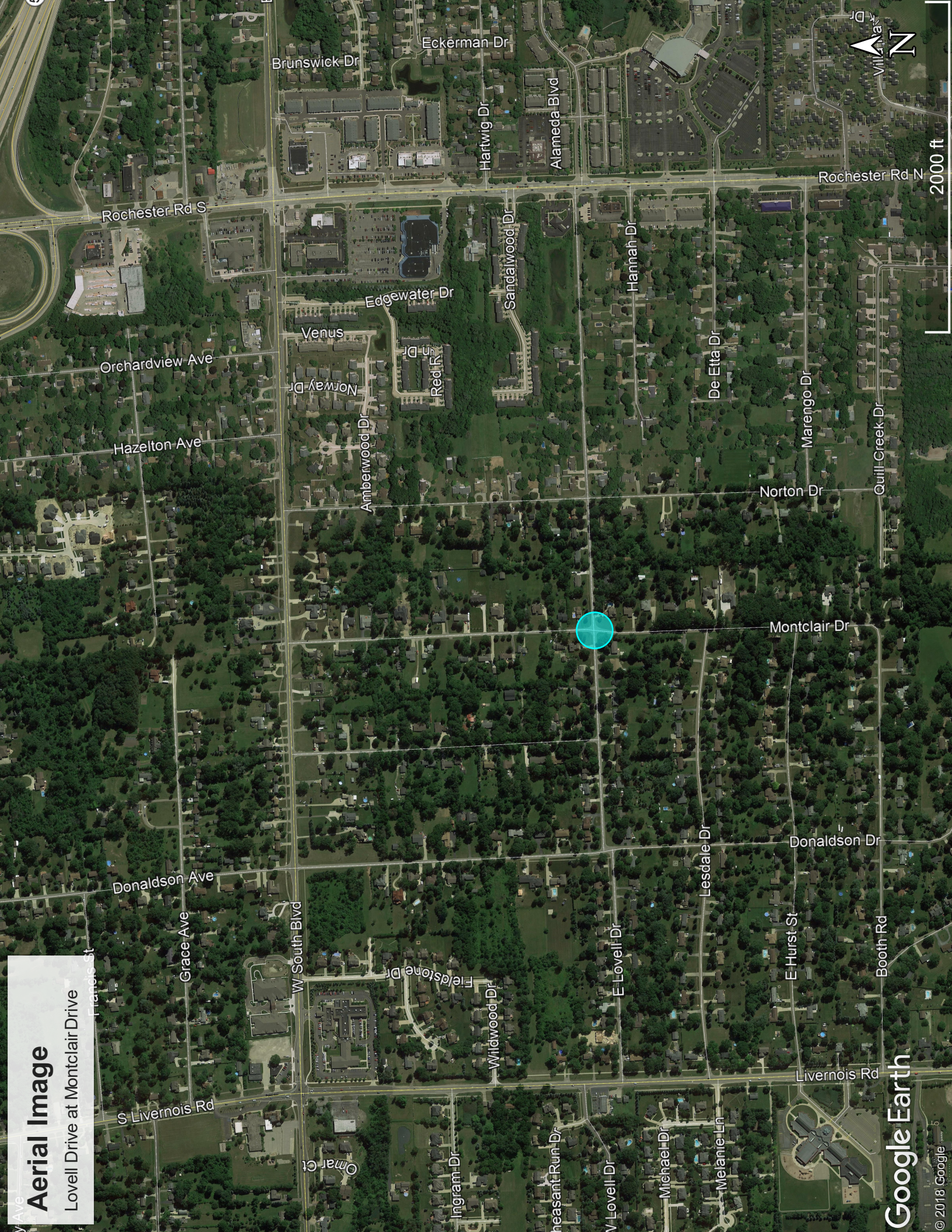
Sara Merrill, PE, PTOE
Traffic Project Manager

Attachments:

- Aerial Photo
- Safe Approach Speed Calculation Spreadsheet
- Intersection Photos
- UD-10 Crash Report
- Traffic Control Determination Reference Guide
- Traffic Data Summaries

Aerial Image

Lovell Drive at Montclair Drive



Notes:



Photograph No. 1: Lovell Drive – Heading East
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 2: Lovell Drive - Heading East and Looking Left
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 3: Lovell Drive - Heading East and Looking Right
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 4: Montclair Drive - Heading North
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 5: Montclair Drive – Heading North and Looking Left
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 6: Montclair Drive – Heading North and Looking Right
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 7: Lovell Drive - Heading West
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 8: Lovell Drive - Heading West and Looking Left
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 9: Lovell Drive - Heading West and Looking Right
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 10: Montclair Drive - Heading South
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 11: Montclair Drive - Heading South and Looking Left
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 12: Montclair Drive - Heading South and Looking Right
Date: 7/10/2019 **Photographer:** Matt Clark

Authority: 1949 PA 300, Sec.257 622
Compliance: Required MSP UD-10E
Penalty: \$100 and/or 90 days (Rev 11/2006)

External # 4028865
Crash ID 8889584

Page 01 of 01
Incident # 140004241 File Class 93001

STATE OF MICHIGAN TRAFFIC CRASH REPORT

ORI: MI 6378400		Department Name Troy Police Department			Special Checks <input type="radio"/> Fatal <input type="radio"/> Non-Traffic Area <input type="radio"/> ORV/Snowmobile		
Crash Date 02/07/2014	Crash Time 11:04	No. of Units 02	Crash Type Angle	Special Circumstances <input type="radio"/> School Bus <input checked="" type="radio"/> None <input type="radio"/> Hit and Run <input type="radio"/> Deer <input type="radio"/> Fleeing Police			
County 63 - Oakland	Traffic Control Yield sign	Relation to Roadway On Road		Special Study	Weather Clear	Area 07 - NON-FRWY in Intersection	
City/Twsp 84 - Troy	Construction Zone (if applicable) Type		Lane Closed	Activity	Light Daylight	Road Condition Snowy	
		Total Lanes 02	Speed Limit 25	Posted Yes			

LOCATION	Prefix E	Road Name LOVELL	Road Type ST	Suffix	Divided Roadway
	Distance 2 Feet W		Traffic Way 01 - Not physically divided		Access Control 01 - No access control
	Prefix	Intersecting Road MONTCLAIR	Road Type ST	Suffix	Divided Roadway

UNIT/DRIVER	Unit Number 01	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) ##/##/#### (45)	License Type <input checked="" type="radio"/> Operator <input type="radio"/> Chauffeur <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex M	Total Occupants 01	Hazardous Action 03 - Failed to yield
	Unit Type MV	Driver Information ##### ##### TROY, MI 48085-1676 (###) ###-####				Injury O	Position 01	Restraint 04	Hospital NONE	
	Driver Condition <input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 99				Interlock No	Ejected	Trapped	Airbag Deployed Yes	Ambulance NONE	
	Alcohol <input type="radio"/> Yes <input checked="" type="radio"/> No Test Type <input type="radio"/> Field <input type="radio"/> PBT <input type="radio"/> Not offered <input type="radio"/> Breath <input type="radio"/> Blood <input type="radio"/> Urine				Test Results		Drugs <input type="radio"/> Yes <input checked="" type="radio"/> No Test Type <input type="radio"/> Blood <input type="radio"/> Urine	Test Results		Citation Issued <input checked="" type="radio"/> Hazardous <input type="radio"/> Other
	Vehicle Registration #####	State MI	Insurance / Policy # #####			Towed To/By		Special Vehicles 0	Private Trailer Type	Vehicle Defect
	VIN #####	Vehicle Description CADILLAC	Make STS	Model	Color SILVER	Year 2007	Vehicle Type Passenger Car			
	Location of Greatest Damage 01	First Impact 01	Extent of Damage 4	Driveable Yes	Vehicle Direction W	Vehicle Use 01 - Private	Action Prior 01 - Going Straight Ahead			

Sequence of Events (# indicates MOST harmful event)	First <input checked="" type="radio"/> 17 - Motor veh in transport	Second	Third	Fourth
--	---	--------	-------	--------

PASSENGERS	Passenger Information		Date of Birth (Age)		Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance	
	Passenger Information		Date of Birth (Age)		Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance	
	Passenger Information		Date of Birth (Age)		Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance	
	Passenger Information		Date of Birth (Age)		Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance	
	Passenger Information		Date of Birth (Age)		Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance	
	Passenger Information		Date of Birth (Age)		Sex	Position	Restraint	Hospital
			Injury	Airbag Deployed	Ejected	Trapped	Ambulance	

TRUCK/BUS	Carrier Information			Carrier Source GVWR	ICCMC	USDOT	MPSC
	Driver's CDL Type			Endorsements <input type="radio"/> H <input type="radio"/> P <input type="radio"/> T <input type="radio"/> N <input type="radio"/> S <input type="radio"/> X	CDL Exempt <input type="radio"/> Farm <input type="radio"/> Other	CDL Restrictions <input type="radio"/> 28 <input type="radio"/> 29 <input type="radio"/> 30 <input type="radio"/> 35 <input type="radio"/> 36	
	Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth	Cargo Body Type	Medical Card	Hazardous Material <input type="radio"/> Placard <input type="radio"/> Cargo Spill	ID #

OWNERS	Owner Information		Owner Information	

Person Advised of Damaged Traffic Control Contact Name: Contact Date: Contact Time:		Damaged Property	Public
		Owner & Phone	

UNIT / DRIVER	Unit Number 02	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) ###/###/#### (32)	License Type ● Operator ○ Chauffeur ○ Moped	Endorsements ○ Cycle ○ Farm ○ Recreation	Sex M	Total Occupants 01	Hazardous Action 00 - None
	Unit Type MV	Driver Information ##### ##### MACOMB, MI 48042-2932 (###) ###-####				Injury O	Position 01	Restraint 04	Hospital NONE	
	Driver Condition ● 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 99				Interlock No	Ejected	Trapped	Airbag Deployed No	Ambulance NONE	
	Alcohol ○ Yes ● No Test Type ○ Field ○ PBT				● Not offered ○ Breath ○ Blood ○ Urine		Test Results		Citation Issued ○ Hazardous ○ Other	
	Vehicle Registration #####		State MI	Insurance / Policy # #####		Towed To/By		Special Vehicles 0	Private Trailer Type	Vehicle Defect
	VIN #####		Vehicle Description FORD		Make ECONOLINE VAN	Model WHITE	Year 2008	Vehicle Type Van, motor home		
	Location of Greatest Damage 07		First Impact 07	Extent of Damage 3	Driveable No	Vehicle Direction S	Vehicle Use 01 - Private		Action Prior 01 - Going Straight Ahead	
	Sequence of Events ● 17 - Motor veh in transport (● indicates MOST harmful event)									
	PASSENGERS	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital		
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital		
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital		
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital		
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
TRUCK / BUS	Carrier Information					Carrier Source GVWR	ICCMC	USDOT	MPSC	
						Driver's CDL Type	Endorsements ○ H ○ P ○ T ○ N ○ S ○ X	CDL Exempt ○ Farm ○ Other	CDL Restrictions ○ 28 ○ 29 ○ 30 ○ 35 ○ 36	
	Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth			Cargo Body Type	Medical Card	Hazardous Material ○ Placard ○ Cargo Spill		ID # Class #
OWNERS	Owner Information					Owner Information				
WITNESS	Witness Information					Witness Information				
Investigated at Scene Yes		Reported Date (Time) 02/07/2014 (11:04)		1st Investigator Name (Badge) S.MORSE (91)		2nd Investigator Name (Badge)		Photos By		
Narrative UNIT 2 WAS SB AND HAD THE RIGHT OF WAYUNIT 1 WAS WB AND HAD A YIELD SIGNUNIT 1 FAILED TO YIELD AND STRUCK UNIT 2UNIT 1 SPUN AROUND AND STRUCK UNIT 2 A SECOND TIME					Diagram 					

Reference Guide on Traffic Control Determination in the State of Michigan

Background

This document is intended to be used as a reference guide for performing intersection traffic control studies of intersections on public roadways in Michigan. The document explains the procedure and requirements necessary to implement traffic control at an intersection as stipulated by the Michigan Manual on Uniform Traffic Control Devices (MMUTCD). Generally, the starting premise is an uncontrolled intersection. The first step would then be to verify if the intersection should remain uncontrolled or if YIELD or STOP controls on the minor street approach(es) should be provided. For locations with higher traffic volumes and /or crash issues, then an evaluation of the location for all-way STOP warrants would be performed. The appropriate analysis for each level of control described below.

YIELD Traffic Control Guidance

The use of a YIELD sign is intended to assign the right-of-way at intersections where it is not usually necessary to stop before proceeding into the intersection. Conversely, the STOP sign is intended for use where it is usually necessary to stop before proceeding into the intersection.

The following conditions should be fully evaluated to determine how the right-of-way should be assigned:

- Traffic Volumes: Normally, the heavier volume of traffic should be given the right-of-way.
- Approach Speeds: The higher speed traffic should normally be given the right-of-way.
- Types of Highways: When a minor highway intersects a major highway, it is usually desirable to control the minor highway.
- Sight Distance: Sight distance across the corners of the intersection is the most important factor and is critical in determining safe approach speeds.

STOP Traffic Control Guidance

Based on the MMUTCD there are four conditions where STOP signs may be warranted:

- At the intersection of a less important road with a main road where application of the normal right-of-way rule is unduly hazardous.
- On a street entering a through highway or street.
- At an unsignalized intersection in a signalized area.
- At other intersections where a combination of high speed, restricted view, or crash records indicate a need for control by the STOP sign.

Many times STOP signs are installed where they may not be warranted. Traffic experts agree that unnecessary STOP signs:

- Cause accidents they are designed to prevent.
- Breed contempt for other necessary STOP signs.
- Waste millions of gallons of gasoline annually.
- Create added noise and air pollution.
- Increase, rather than decrease, speeds between intersections.

There is also an explicit restriction in the MMUTCD that STOP signs are not to be used for speed control, in Section 2B.04.

Evaluation of All-Way STOP Traffic Control

Based on the MMUTCD there are four conditions where **all-way** STOP signs may be warranted:

- A. *Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.*
- B. *Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.*
- C. *Minimum volumes:*
 - 1. *The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and*
 - 2. *The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but*
 - 3. *If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.*
- D. *Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.*

OHM Advisors

34000 Plymouth Road
Livonia, MI 48150
Advancing Communities

Weather: Sunny
Serial Number: 27880
Installed by Matt Clark
Other Notes: None

Date Start: 12/13/2018
Montclair - 12_13_2018 - Volume
Montclair Dr
Hurst St to Lesdale Dr

Start Time	Mon 12/10/2018	Tue 12/11/2018	Wed 12/12/2018	Thu 12/13/2018	Fri 12/14/2018	Average Day	Sat 12/15/2018	Sun 12/16/2018	Week Average
12:00 AM	*	*	*	*	1	1	6	8	5
01:00	*	*	*	*	3	3	0	2	2
02:00	*	*	*	*	4	4	0	2	2
03:00	*	*	*	*	0	0	1	0	0
04:00	*	*	*	*	0	0	0	1	0
05:00	*	*	*	*	4	4	1	0	2
06:00	*	*	*	*	12	12	1	3	5
07:00	*	*	*	*	5	5	2	3	3
08:00	*	*	*	*	20	20	8	5	11
09:00	*	*	*	*	14	14	15	12	14
10:00	*	*	*	*	15	15	15	17	16
11:00	*	*	*	*	9	9	21	24	18
12:00 PM	*	*	*	*	19	19	30	21	23
01:00	*	*	*	*	13	13	16	25	18
02:00	*	*	*	*	21	21	33	20	25
03:00	*	*	*	*	24	24	10	19	18
04:00	*	*	*	18	36	27	14	15	21
05:00	*	*	*	29	21	25	21	14	21
06:00	*	*	*	16	21	18	14	13	16
07:00	*	*	*	5	16	10	20	12	13
08:00	*	*	*	15	10	12	7	9	10
09:00	*	*	*	9	11	10	7	2	7
10:00	*	*	*	3	6	4	9	6	6
11:00	*	*	*	5	8	6	7	1	5
Day Total	0	0	0	100	293	276	258	234	261
% Avg. WkDay	0.0%	0.0%	0.0%	36.2%	106.2%				
% Avg. Week	0.0%	0.0%	0.0%	38.3%	112.3%	105.7%	98.9%	89.7%	
AM Peak Vol.	-	-	-	-	08:00	-	11:00	11:00	11:00
PM Peak Vol.	-	-	-	17:00	16:00	-	14:00	13:00	14:00
	-	-	-	29	36	-	33	25	25

OHM Advisors

34000 Plymouth Road
Livonia, MI 48150
Advancing Communities

Weather: Sunny
Serial Number: 27880
Installed by Matt Clark
Other Notes: None

Date Start: 12/13/2018
Montclair - 12_13_2018 - Volume
Montclair Dr
Hurst St to Lesdale Dr

Start Time	Mon 12/17/2018	Tue 12/18/2018	Wed 12/19/2018	Thu 12/20/2018	Fri 12/21/2018	Average Day	Sat 12/22/2018	Sun 12/23/2018	Week Average
12:00 AM	1	1	2	*	*	1	*	*	1
01:00	1	0	0	*	*	0	*	*	0
02:00	1	0	0	*	*	0	*	*	0
03:00	0	0	0	*	*	0	*	*	0
04:00	0	0	0	*	*	0	*	*	0
05:00	1	4	2	*	*	2	*	*	2
06:00	10	12	7	*	*	10	*	*	10
07:00	11	8	10	*	*	10	*	*	10
08:00	14	23	21	*	*	19	*	*	19
09:00	13	19	*	*	*	16	*	*	16
10:00	19	19	*	*	*	19	*	*	19
11:00	8	25	*	*	*	16	*	*	16
12:00 PM	15	23	*	*	*	19	*	*	19
01:00	17	13	*	*	*	15	*	*	15
02:00	17	27	*	*	*	22	*	*	22
03:00	26	22	*	*	*	24	*	*	24
04:00	31	32	*	*	*	32	*	*	32
05:00	20	26	*	*	*	23	*	*	23
06:00	17	18	*	*	*	18	*	*	18
07:00	14	9	*	*	*	12	*	*	12
08:00	12	15	*	*	*	14	*	*	14
09:00	7	8	*	*	*	8	*	*	8
10:00	5	2	*	*	*	4	*	*	4
11:00	1	1	*	*	*	1	*	*	1
Day Total	261	307	42	0	0	285	0	0	285
% Avg. WkDay	91.6%	107.7%	14.7%	0.0%	0.0%				
% Avg. Week	91.6%	107.7%	14.7%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak Vol.	10:00 19	11:00 25	08:00 21	-	-	08:00 19	-	-	08:00 19
PM Peak Vol.	16:00 31	16:00 32	-	-	-	16:00 32	-	-	16:00 32
Grand Total	261	307	42	100	293	561	258	234	546
ADT	ADT 307		AADT 307						

Weather: Sunny
Serial #: 27494
Installed by Stephan Maxe

Start Time	06/10/19		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	*	*	0	0	0	0	1	1	2	2	2	2	1	1
01:00	*	*	*	*	1	1	1	1	1	0	1	3	1	2	1	1
02:00	*	*	*	*	2	0	1	0	0	0	2	0	1	1	1	0
03:00	*	*	*	*	0	1	0	1	0	2	0	0	0	0	0	1
04:00	*	*	*	*	0	1	0	1	0	2	0	2	0	0	0	1
05:00	*	*	*	*	0	1	1	3	1	2	1	2	0	3	1	2
06:00	*	*	*	*	0	8	1	3	3	3	1	1	1	0	1	3
07:00	*	*	*	*	4	15	4	11	4	11	2	5	2	6	3	10
08:00	*	*	*	*	5	24	8	21	8	20	6	6	6	8	7	16
09:00	*	*	*	*	9	13	8	7	12	14	11	16	2	10	8	12
10:00	*	*	*	*	10	19	10	18	6	14	18	9	7	12	10	14
11:00	*	*	*	*	14	18	18	17	18	24	8	14	9	12	13	17
12:00 PM	*	*	11	13	16	14	23	16	15	12	12	15	12	20	15	15
01:00	*	*	17	16	13	15	10	22	10	21	16	15	8	11	12	17
02:00	*	*	25	24	11	15	17	14	13	7	22	19	11	9	16	15
03:00	*	*	19	23	14	16	14	15	9	23	20	12	18	17	16	18
04:00	*	*	20	18	33	20	20	21	32	20	13	12	11	11	22	17
05:00	*	*	32	23	80	21	37	19	28	28	11	15	9	8	33	19
06:00	*	*	15	18	28	15	28	15	19	15	13	9	10	12	19	14
07:00	*	*	18	20	17	8	3	8	12	6	7	6	10	7	11	9
08:00	*	*	7	10	4	2	9	9	10	8	8	6	8	12	7	8
09:00	*	*	5	4	7	9	10	7	7	4	7	5	2	8	6	6
10:00	*	*	5	5	4	1	5	2	8	6	2	2	3	2	4	3
11:00	*	*	7	0	2	1	0	1	4	0	2	1	1	0	3	0
Lane	0	0	181	174	274	237	222	232	221	243	185	177	134	171	210	219
Day	0	0	355	355	511	511	454	454	464	464	362	362	305	305	429	429
AM Peak	-	-	-	-	11:00	08:00	11:00	08:00	11:00	11:00	10:00	09:00	11:00	10:00	11:00	11:00
Vol.	-	-	-	-	14	24	18	21	18	24	18	16	9	12	13	17
PM Peak	-	-	17:00	14:00	17:00	17:00	13:00	13:00	16:00	17:00	14:00	14:00	15:00	12:00	17:00	17:00
Vol.	-	-	32	24	80	21	37	22	32	28	22	19	18	20	33	19

Weather: Sunny
Serial #: 27494
Installed by Stephan Maxe

Date Start: 06/11/19
E. Lovell Dr
Donaldson to Montclair

Start Time	06/17/19		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	2	0	1	1	*	*	*	*	*	*	*	*	*	*	2	0
01:00	0	0	1	0	*	*	*	*	*	*	*	*	*	*	0	0
02:00	0	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
03:00	0	1	0	1	*	*	*	*	*	*	*	*	*	*	0	1
04:00	0	2	0	2	*	*	*	*	*	*	*	*	*	*	0	2
05:00	2	1	1	2	*	*	*	*	*	*	*	*	*	*	2	2
06:00	0	6	2	8	*	*	*	*	*	*	*	*	*	*	1	7
07:00	1	11	3	11	*	*	*	*	*	*	*	*	*	*	2	11
08:00	4	17	10	12	*	*	*	*	*	*	*	*	*	*	7	14
09:00	3	6	8	10	*	*	*	*	*	*	*	*	*	*	6	8
10:00	10	9	16	6	*	*	*	*	*	*	*	*	*	*	13	8
11:00	13	8	13	15	*	*	*	*	*	*	*	*	*	*	13	12
12:00 PM	11	11	17	17	*	*	*	*	*	*	*	*	*	*	14	14
01:00	9	8	*	*	*	*	*	*	*	*	*	*	*	*	9	8
02:00	12	11	*	*	*	*	*	*	*	*	*	*	*	*	12	11
03:00	15	15	*	*	*	*	*	*	*	*	*	*	*	*	15	15
04:00	20	16	*	*	*	*	*	*	*	*	*	*	*	*	20	16
05:00	29	15	*	*	*	*	*	*	*	*	*	*	*	*	29	15
06:00	18	17	*	*	*	*	*	*	*	*	*	*	*	*	18	17
07:00	12	11	*	*	*	*	*	*	*	*	*	*	*	*	12	11
08:00	7	10	*	*	*	*	*	*	*	*	*	*	*	*	7	10
09:00	7	2	*	*	*	*	*	*	*	*	*	*	*	*	7	2
10:00	3	1	*	*	*	*	*	*	*	*	*	*	*	*	3	1
11:00	3	1	*	*	*	*	*	*	*	*	*	*	*	*	3	1
Lane	181	179	72	85	0	0	0	0	0	0	0	0	0	0	195	186
Day	360		157		0	0	0	0	0	0	0	0	0	0	381	
AM Peak	11:00	08:00	10:00	11:00	-	-	-	-	-	-	-	-	-	-	10:00	08:00
Vol.	13	17	16	15	-	-	-	-	-	-	-	-	-	-	13	14
PM Peak	17:00	18:00	12:00	12:00	-	-	-	-	-	-	-	-	-	-	17:00	18:00
Vol.	29	17	17	17	-	-	-	-	-	-	-	-	-	-	29	17

Comb. Total	360	512	511	454	464	362	305	810
ADT	ADT 420	AADT 420						

Date Start: 11-Jun-19

E. Lovell Dr
Donaldson to Montclair

[illegible]

Weather: Sunny
Serial #: 27494
Installed by Stephan Maxe

Eastbound

[illegible]

Date Start: 11-Jun-19

E. Lovell Dr
Donaldson to Montclair

[illegible]

Weather: Sunny
Serial #: 27494
Installed by Stephan Maxe

Eastbound

[illegible]

Weather: Sunny
Serial #: 27494
Installed by Stephan Maxe

Date Start: 11-Jun-19

E. Lovell Dr
Donaldson to Montclair

Eastbound	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
06/15/19	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2
01:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
06:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
07:00	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
08:00	0	1	2	2	1	0	0	0	0	0	0	0	0	0	6
09:00	0	0	6	4	0	1	0	0	0	0	0	0	0	0	11
10:00	1	4	10	2	1	0	0	0	0	0	0	0	0	0	18
11:00	0	2	3	3	0	0	0	0	0	0	0	0	0	0	8
12 PM	2	2	5	3	0	0	0	0	0	0	0	0	0	0	12
13:00	3	0	6	7	0	0	0	0	0	0	0	0	0	0	16
14:00	0	4	12	5	1	0	0	0	0	0	0	0	0	0	22
15:00	3	3	3	9	2	0	0	0	0	0	0	0	0	0	20
16:00	1	1	5	3	2	0	0	1	0	0	0	0	0	0	13
17:00	1	0	4	6	0	0	0	0	0	0	0	0	0	0	11
18:00	1	1	2	7	2	0	0	0	0	0	0	0	0	0	13
19:00	0	0	6	1	0	0	0	0	0	0	0	0	0	0	7
20:00	1	0	6	0	1	0	0	0	0	0	0	0	0	0	8
21:00	0	1	4	2	0	0	0	0	0	0	0	0	0	0	7
22:00	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
23:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	13	19	80	60	11	1	0	1	0	0	0	0	0	0	185

Weather: Sunny
Serial #: 27494
Installed by Stephan Maxe

Eastbound

[illegible]

Date Start: 11-Jun-19

E. Lovell Dr
Donaldson to Montclair

Eastbound																												Total	
Start Time	15	1	16	20	21	25	26	30	31	35	36	40	41	45	46	50	51	55	56	60	61	65	66	70	71	75	76	999	Total
06/17/19	0	0	0	0	0	0	2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
08:00	1	0	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1
09:00	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
10:00	0	0	0	0	3	0	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0
11:00	1	4	4	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
12 PM	0	2	4	0	4	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
13:00	1	3	3	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0
14:00	2	2	2	0	6	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
15:00	3	1	1	0	7	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
16:00	3	3	3	0	4	0	9	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
17:00	0	5	5	0	17	0	4	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0
18:00	7	3	3	0	3	0	3	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0
19:00	1	7	7	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
20:00	1	1	1	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
21:00	0	1	1	0	4	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
22:00	1	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
23:00	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Total	22	34	66	49	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	181	0

Eastbound		1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total
Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999		
06/18/19	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
06:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:00	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
08:00	2	1	5	1	1	0	0	0	0	0	0	0	0	0	0	10
09:00	1	1	2	4	0	0	0	0	0	0	0	0	0	0	0	8
10:00	1	7	7	1	0	0	0	0	0	0	0	0	0	0	0	16
11:00	4	3	5	1	0	0	0	0	0	0	0	0	0	0	0	13
12 PM	2	5	5	4	1	0	0	0	0	0	0	0	0	0	0	17
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	12	18	29	11	2	0	0	0	0	0	0	0	0	0	0	72
Grand Total	130	198	549	452	118	11	0	0	1	0	0	0	0	0	0	1459

Statistics	Mean Speed(Average) : 10 MPH Pace Speed : Number in Pace : Percent in Pace : Number of Vehicles > 25 MPH : Percent of Vehicles > 25 MPH :	15th Percentile :	17 MPH
		50th Percentile :	23 MPH
		85th Percentile :	29 MPH
		95th Percentile :	32 MPH
		21-30 MPH	1001
		68.6%	582
		39.9%	

Date Start: 11-Jun-19

E. Lovell Dr
Donaldson to Montclair

[illegible]

Weather: Sunny
Serial #: 27494
Installed by Stephan Maxe

Westbound[illegible]

Weather: Sunny
Serial #: 27494
Installed by Stephan Maxe

Westbound[illegible]

Weather: Sunny
Serial #: 27494
Installed by Stephan Maxe

Date Start: 11-Jun-19

E. Lovell Dr
Donaldson to Montclair

Westbound																
Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	
06/14/19	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
03:00	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	
04:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	
05:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	
06:00	0	0	1	1	0	1	0	0	0	0	0	0	0	0	3	
07:00	1	2	2	4	1	1	0	0	0	0	0	0	0	0	11	
08:00	2	0	5	6	5	2	0	0	0	0	0	0	0	0	20	
09:00	0	2	3	8	1	0	0	0	0	0	0	0	0	0	14	
10:00	1	2	3	5	2	1	0	0	0	0	0	0	0	0	14	
11:00	1	2	9	8	2	2	0	0	0	0	0	0	0	0	24	
12 PM	0	0	4	6	2	0	0	0	0	0	0	0	0	0	12	
13:00	2	2	10	5	1	1	0	0	0	0	0	0	0	0	21	
14:00	1	0	1	4	1	0	0	0	0	0	0	0	0	0	7	
15:00	1	2	8	7	5	0	0	0	0	0	0	0	0	0	23	
16:00	2	1	4	9	4	0	0	0	0	0	0	0	0	0	20	
17:00	0	2	11	6	8	0	1	0	0	0	0	0	0	0	28	
18:00	0	2	8	3	2	0	0	0	0	0	0	0	0	0	15	
19:00	1	2	1	2	0	0	0	0	0	0	0	0	0	0	6	
20:00	2	1	3	2	0	0	0	0	0	0	0	0	0	0	8	
21:00	0	0	2	2	0	0	0	0	0	0	0	0	0	0	4	
22:00	0	0	2	3	1	0	0	0	0	0	0	0	0	0	6	
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	15	20	79	82	37	9	1	0	0	0	0	0	0	0	243	

Date Start: 11-Jun-19

E. Lovell Dr
Donaldson to Montclair

[illegible]

Weather: Sunny
Serial #: 27494
Installed by Stephan Maxe

Westbound																													
Start Time	15	1	16	20	21	25	26	30	31	35	36	40	41	45	46	50	51	55	56	60	61	65	66	70	71	75	76	999	Total
06/16/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
07:00	1	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	3	0	0	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
09:00	1	0	2	0	5	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
10:00	1	0	1	0	6	0	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
11:00	0	0	1	0	7	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
12 PM	0	0	3	0	3	0	11	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
13:00	0	0	1	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
14:00	0	0	0	0	6	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
15:00	1	0	3	0	3	0	5	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
16:00	0	0	1	0	3	0	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
17:00	0	0	0	0	2	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
18:00	3	0	1	0	5	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
19:00	0	0	1	0	1	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
20:00	2	0	3	0	4	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
21:00	0	0	1	0	5	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
22:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	13	0	20	0	59	0	53	0	21	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	171

Date Start: 11-Jun-19

E. Lovell Dr
Donaldson to Montclair

Westbound																												Total	
Start Time	15	1	16	20	21	25	26	30	31	35	36	40	41	45	46	50	51	55	56	60	61	65	66	70	71	75	76	99	Total
06/17/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
04:00	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
05:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
06:00	0	1	1	1	1	3	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6
07:00	1	1	1	5	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11
08:00	1	2	8	3	3	2	0	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	17
09:00	0	1	1	2	1	2	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6
10:00	2	0	0	5	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9
11:00	0	2	2	2	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8
12 PM	0	1	1	1	1	8	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11
13:00	2	3	3	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8
14:00	1	3	2	5	5	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11
15:00	4	1	5	5	5	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	15
16:00	3	4	4	2	4	2	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	16
17:00	3	2	2	3	3	6	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	15
18:00	2	1	12	2	2	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	17
19:00	2	2	2	3	2	1	3	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11
20:00	0	2	4	3	4	0	3	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10
21:00	0	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
22:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
23:00	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	21	27	62	54	62	11	4	54	11	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	179	179

Westbound																																
Start Time	15	1	16	20	21	25	26	30	26	31	35	36	40	36	41	45	46	50	46	51	55	56	60	61	65	66	70	71	75	76	999	Total
06/18/19	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
06:00	1	2	2	2	2	0	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
07:00	0	1	1	1	5	3	4	4	4	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
08:00	1	3	3	3	3	3	2	2	2	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
09:00	0	1	1	1	8	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
10:00	0	0	0	0	4	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
11:00	3	2	2	2	5	5	5	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
12 PM	0	2	2	2	11	3	3	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	5	13	40	20	40	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85

Grand Total	128	189	490	490	2	34	152	490	20	34	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1485	1485
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Statistics	Mean Speed(Average) :		24 MPH	
	10 MPH Pace Speed :		21-30 MPH	
	Number in Pace :		980	
	Percent in Pace :		66.0%	
	Number of Vehicles > 25 MPH :		678	
Percent of Vehicles > 25 MPH :		45.7%		



TRAFFIC COMMITTEE REPORT

August 22, 2019

TO: Traffic Committee

FROM: Bill Huotari, City Engineer/ Traffic Engineer

SUBJECT: Request for Traffic Control
Plum Drive at Hickory Drive

Background:

Traffic Committee member Richard Kilmer of 62 Hickory requested at the July 17, 2019 Traffic Committee meeting that the intersection of Plum Drive at Hickory Drive be reviewed for purposes of an ALL-WAY STOP. Mr. Kilmer states that STOP signs on the Plum Drive approaches only do not provide adequate traffic control at the intersection.

There were three (3) crashes in the past five (5) years at the intersection.

The posted speed limit on both streets is 25 mph.

Hickory Drive is currently uncontrolled and would be considered the major road at the intersection, while Plum Drive is currently STOP-controlled on each approach.

The major potential sight distance obstructions at the intersection are the vegetation and houses, predominately the house corner in the northeast quadrant of the intersection.

The safe approach speed was found to be 8.9 mph for a vehicle traveling south on Plum Drive as a result of the sight obstruction from the house corner at the northeast quadrant of the intersection, therefore the recommended treatment is maintaining the existing STOP signs on the Plum Drive approaches to the intersection (i.e. no change).

In addition it is also recommended to increase the conspicuity of the existing STOP signs by installing over-sized STOP signs, installing reflective panels on the signposts and/or posting the STOP signs on each side of both approaches.

The city requested that OHM review the intersection and provide their findings and recommendations (copy attached).

August 9, 2019

Mr. William Huotari, PE
City Engineer
City of Troy
500 W. Big Beaver Rd
Troy, MI 48084

RE: Traffic Control Recommendation for Plum Drive at Hickory Drive
OHM JN: 0128-19-0010

Dear Mr. Huotari:

As requested, we have reviewed the intersection of Plum Drive at Hickory Drive to determine the suitability of converting the intersection to all-way STOP-control. The subject intersection is a 4-leg intersection located in the City of Troy approximately 1,500' east of Livernois Road and 2,770' north of Maple Road. The speed limit on both streets is 25 mph. The intersection is STOP-controlled on the Plum Drive approaches. Reference the attachments for aerial and intersection photos.

Types of Roadways

Both Plum Drive and Hickory Drive are considered local streets. Hickory Drive runs east / west, providing access to / from the local neighborhood and Livernois Road (minor arterial). Hickory Drive dead-ends to the east where it abuts the Morse Elementary School parking lot. Plum Drive runs north / south, providing access to / from local residents and Starr Drive to the north and Cherry Drive to the south.

The surrounding land use is single-family residential. On-street parking is prohibited on the west side of Plum Drive, both north and south of the intersection. On-street parking is also prohibited on both sides of the street on the west leg of Hickory Drive. On the east leg of Hickory Drive, on-street parking is prohibited on the north side of the street at all times, and on the south side of the street between the hours of 8:00 AM to 6:00 PM on Monday through Saturday. Hickory Drive is currently uncontrolled and would be considered the major road at the intersection, while Plum Drive is currently STOP-controlled on each approach.

The ensuing traffic control analysis adheres to the guidance presented in the 2011 Michigan Manual on Uniform Traffic Control Devices (MMUTCD). A reference document explaining the background behind the analysis is attached to this memo.

Approach Speeds

The approach speed limit on both streets is 25 mph. Speed limits alone cannot be used in this case to determine which direction of traffic should be assigned the right-of-way.



Crash Analysis

Based on information obtained through the Traffic Improvement Association of Michigan, there were three crashes recorded in the past five (5) years at the intersection of Plum Drive at Hickory Drive. No more than one crash occurred within a 12 month period. A brief summary of each crash follows next:

- On January 1, 2014 at 2:59 AM, a City of Troy plow driver backed into a vehicle parked in a driveway on the west side of Plum Drive just south of Hickory Drive. The crash resulted in property damage only (PDO).
- On March 9, 2015 at 4:08 PM, a vehicle traveling southbound on Plum Drive failed to yield and struck a westbound vehicle on Hickory Drive. The driver of the southbound vehicle suffered C-level (possible) injuries, while the westbound vehicle sustained PDO.
- On December 28, 2017 at 4:42 PM, another angle crash occurred with similar characteristics as the crash on March 9, 2015. The responsible party mentioned icy pavement as a contributing factor in failing to stop, however the driver was cited for excessive speed. The crash resulted in PDO for both involved parties.

The frequency of angle crashes did not meet the all-way STOP-control threshold for five crashes in a 12 month period. However, the crash history does signify a potential issue with motorists not complying with the existing STOP-control on the Plum Drive approaches.

Traffic Volumes

Traffic counts were collected on each approach to the intersection from July 15 to July 17, 2019. On Tuesday, July 16, the total daily entering traffic observed on the Hickory Drive approaches was 964 vehicles. The highest observed hourly combined entering traffic on the Hickory Drive approaches was 153 vehicles, which occurred between 5:00 to 6:00 PM. While the counts were not performed while local K-12 schools were in session, based on the data collected, one can reasonably ascertain that Lovell Drive fails to meet and/or sustain the 300 vehicles per hour threshold required for all-way STOP-control for even one hour, let alone the minimum of 8 hours.

The total daily entering traffic observed on the Plum Drive approaches on Tuesday, July 16 was 651 vehicles, with a maximum hourly volume of 105 vehicles between 5:00 to 6:00 PM. Given the vehicle volumes observed, the combined entering vehicular, pedestrian, and bicycle volumes are highly unlikely to average at least 200 units for any 8 hours, even if traffic was grown by an appropriate percentage to accommodate school trips.

Since the posted speed limit is only 25 mph on Hickory Drive, it is reasonable to assume that the 85th percentile approach speed does not exceed 40 mph. Thus, the minimum vehicular volume warrants on either road cannot be discounted to 70 percent of the values described previously. Finally, the study intersection falls significantly shy of even the reduced 80 percent volumes, based on the count data collected. Therefore, the minimum volume criteria for an all-way STOP has not been met. The summary reports for the traffic counts conducted on Plum Drive and Hickory Drive are attached to this memo.



Sight Distance

The major potential sight distance obstructions at the intersection are the vegetation and houses, predominately the house corner in the northeast quadrant of the intersection. Reference the attachments for intersection photos. These obstructions come into play when determining the safe approach speeds for the intersection. The safe approach speed is the speed at which a vehicle can approach an intersection and still stop in time to avoid a collision with a vehicle on the cross street. Safe approach speeds are determined through calculations.

When the safe approach speed is found to be less than 10 mph, a STOP sign is recommended. In this case, the safe approach speed was found to be 8.9 mph for a vehicle traveling south on Plum Drive as a result of the sight obstruction from the house corner at the northeast quadrant of the intersection, therefore a STOP sign is the recommended treatment. The safe approach speed calculation spreadsheet is attached for your reference.

Recommendation

OHM recommends maintaining the existing STOP signs on the Plum Drive approaches to the intersection. OHM also recommends that the City consider increasing the conspicuity of the existing STOP signs by installing over-sized STOP signs, installing reflective panels on the signposts, and / or posting the STOP signs on each side of both approaches. The intersection should continue to be monitored if traffic volumes increase or more crashes occur.

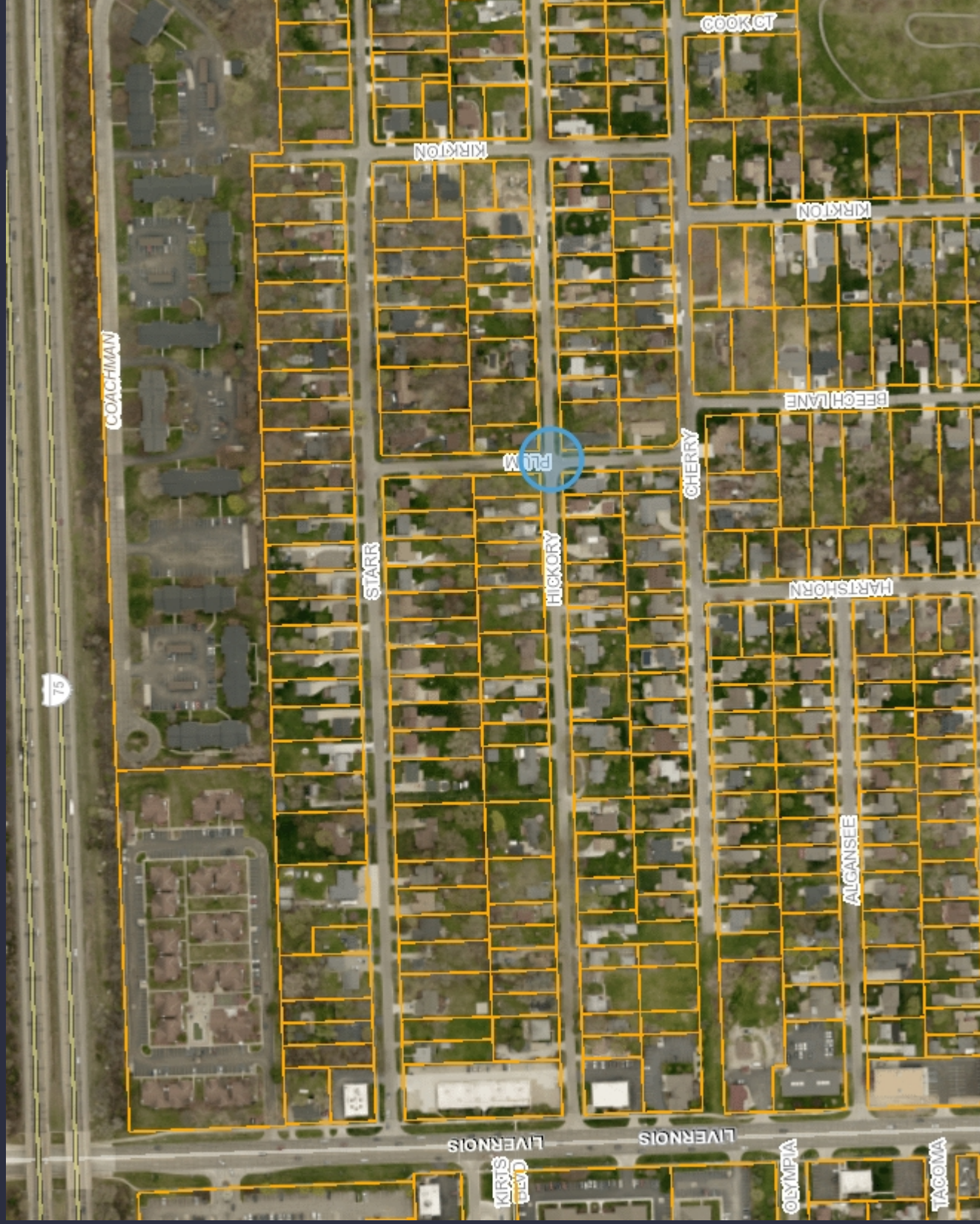
Sincerely,
Orchard, Hiltz & McCliment, Inc.

Matt Clark, EIT
Engineer

Sara Merrill, PE, PTOE
Traffic Project Manager

Attachments:

- Aerial Photo
- Safe Approach Speed Calculation Spreadsheet
- Intersection Photos
- UD-10 Crash Reports
- Traffic Control Determination Reference Guide
- Traffic Data Summaries



Notes:



Safe Approach Speed Calculation

Hickory Dr and Plum Dr
Troy, MI

Measured:

Width of Roads
Road 1 = 22 (ft)
Road 2 = 22 (ft)

Distance to Obstructions

a =	25 (ft)	e =	41 (ft)
b =	35 (ft)	f =	25 (ft)
c =	78 (ft)	g =	35 (ft)
d =	27 (ft)	h =	36 (ft)

Angle of Intersection
Delta = 90 (degrees, measure counterclockwise)

Road 1 Posted
Speed Limit = 25 (mph)

Assumed:

Speed of Vehicle A = Speed of Vehicle C
= Posted Speed Limit on Road 1
+ 5 (mph)
 $V_1 = 30$ (mph)

Perception / Reaction Time (AASHTO)
 $t = 2.5$ (sec)

Deceleration rate (AASHTO)
 $A = 11.20$

Clearance distance in excess of safe stopping distance (AAA)
 $EC = 0$ (ft)

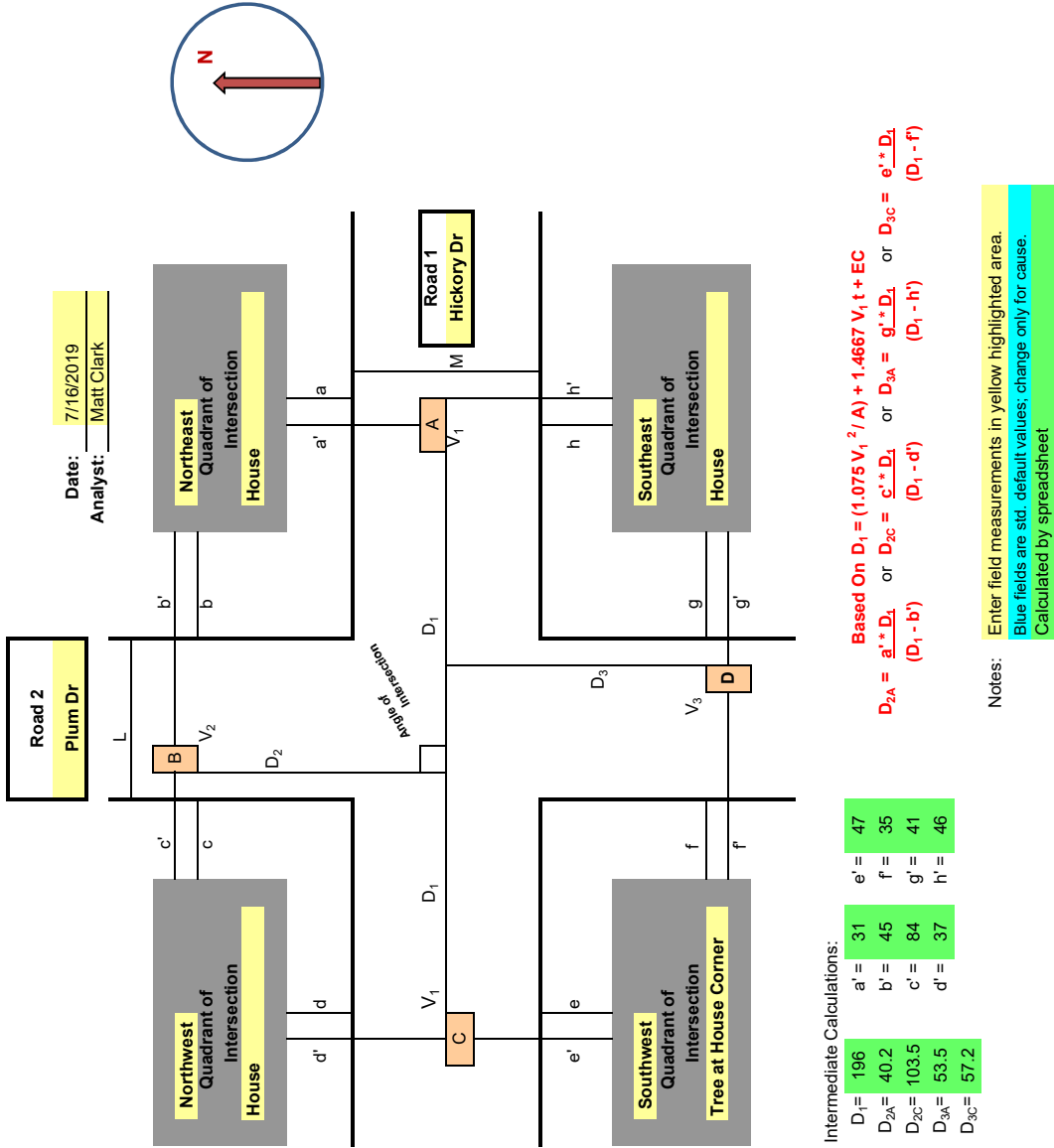
Calculated Safe Approach Speed for Vehicle B
Approaching on Road 2

$V_2 = 8.9$ (mph) [Based on Veh. A]
or $V_2 = 18.9$ (mph) [Based on Veh. C]

Calculated Safe Approach Speed for Vehicle D
Approaching on Road 2

$V_3 = 11.3$ (mph) [Based on Veh. A]
or $V_3 = 11.9$ (mph) [Based on Veh. C]

Threshold of Safe Approach Speed (AAA, FHWA & NSC)
to Recommend STOP Control 10.0 (mph),
to Recommend YIELD Control 25.0 (mph),
Otherwise Recommends NO CONTROL.



Recommended ROW control for Road 2
based on safe approach speed :
STOP Sign



Photograph No. 1: Hickory Drive – Heading East
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 2: Hickory Drive - Heading East and Looking Left
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 3: Hickory Drive - Heading East and Looking Right
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 4: Plum Drive - Heading North
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 5: Plum Drive – Heading North and Looking Left
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 6: Plum Drive – Heading North and Looking Right
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 7: Hickory Drive - Heading West
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 8: Hickory Drive - Heading West and Looking Left
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 9: Hickory Drive - Heading West and Looking Right
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 10: Plum Drive - Heading South
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 11: Plum Drive - Heading South and Looking Left
Date: 7/10/2019 **Photographer:** Matt Clark



Photograph No. 12: Plum Drive - Heading South and Looking Right
Date: 7/10/2019 **Photographer:** Matt Clark

Page 01 of 01
Incident # 140000700 File Class C3145

STATE OF MICHIGAN TRAFFIC CRASH REPORT

ORI: MI 6378400		Department Name Troy Police Department				Reviewer NOVAK (104493)			
Crash Date 01/07/2014	Crash Time 02:59	No. of Units 02	Crash Type Other/Unknown	Special Circumstances <input type="radio"/> School Bus <input checked="" type="radio"/> None <input type="radio"/> Deer <input type="radio"/> Hit and Run <input type="radio"/> Fleeing Police		Special Checks <input type="radio"/> Fatal <input type="radio"/> Non-Traffic Area <input type="radio"/> ORV/Snowmobile			
County 63 - Oakland	Traffic Control None	Relation to Roadway Outside of shoulder/curb		Special Study	Weather Clear	Area 08 - Intersection Driveway			
City/Twsp 84 - Troy	Construction Zone (if applicable) Type		Lane Closed	Activity	Light Dark-Unlighted	Road Condition Snowy	Total Lanes 02	Speed Limit 25	Posted Yes

LOCATION	Prefix	Road Name PLUM	Road Type ST	Suffix	Divided Roadway
	Distance 82 Feet S	Traffic Way 01 - Not physically divided			Access Control 01 - No access control
	Prefix	Intersecting Road HICKORY	Road Type ST	Suffix	Divided Roadway

Unit Number 01	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) ##/##/#### (52)	License Type ● Operator ○ Chauffeur ○ Moped	Endorsements ○ Cycle ○ Farm ○ Recreation	Sex M	Total Occupants 01	Hazardous Action 11 - Improper backing	
Unit Type MV	Driver Information ##### ##### WATERFORD, MI 48329-2066 (###) ###-####			Injury O	Position 01	Restraint 04	Hospital NONE			
Driver Condition ● 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 99				Interlock No	Ejected	Trapped	Airbag Deployed No		Ambulance NONE	
Alcohol ○ Yes ● No Test Type ○ Field ○ Refused ○ PBT ○ Not offered ○ Breath ○ Blood ○ Urine				Test Results			Drugs ○ Yes ● No Test Type ○ Blood ○ Urine		Citation Issued ○ Hazardous ○ Other	
Vehicle Registration #####	State MI	Insurance / Policy # #####			Towed To/By			Special Vehicles 6	Private Trailer Type	Vehicle Defect
VIN #####		Vehicle Description STERLING		Make Model	Color ORANGE		Year 2006	Vehicle Type Passenger Car		
Location of Greatest Damage 04	First Impact 04	Extent of Damage 2	Driveable Yes	Vehicle Direction N	Vehicle Use 02 - Commercial(business)			Action Prior 07 - Backing		
Sequence of Events (● indicates MOST harmful event)		First ● 18 - Parked motor vehicle		Second		Third		Fourth		

PASSENGERS	Passenger Information	Date of Birth (Age)		Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed		Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)		Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed		Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)		Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed		Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)		Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed		Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)		Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed		Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)		Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed		Ejected	Trapped	Ambulance
Passenger Information	Date of Birth (Age)		Sex	Position	Restraint	Hospital	
	Injury	Airbag Deployed		Ejected	Trapped	Ambulance	

TRUCK/BUS	Carrier Information					Carrier Source	GVWR	ICCMC	USDOT	MPSC
						Driver's CDL Type		Endorsements	CDL Exempt	CDL Restrictions
						<input type="checkbox"/> H <input type="checkbox"/> P <input type="checkbox"/> T <input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> X		<input type="checkbox"/> Farm <input type="checkbox"/> Other	<input type="checkbox"/> 28 <input type="checkbox"/> 29 <input type="checkbox"/> 30 <input type="checkbox"/> 35 <input type="checkbox"/> 36	
Interstate/Intrastate	Vehicle Type	Type & Axle	Per Unit			Cargo Body Type	Medical Card	Hazardous Material	ID #	Class #
		First	Second	Third	Fourth			<input type="checkbox"/> Placard <input type="checkbox"/> Cargo Spill		

OWNERS	Owner Information	Owner Information
	#####	
	#####	
	#####, ## #####-#### (###) ###-####	

Person Advised of Damaged Traffic Control	Damaged Property	Public
Contact Name:	Owner & Phone	
Contact Date:		
Contact Time:		

UNIT / DRIVER	Unit Number 02	Unit Known No	State MI	Driver License Number #####	Date of Birth (Age) ##/##/####	License Type <input type="radio"/> Operator <input type="radio"/> Chauffeur <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex	Total Occupants 00	Hazardous Action		
	Unit Type MV	Driver Information ##### (###) ###-####				Injury	Position	Restraint 09	Hospital NONE			
	Driver Condition 01 02 03 04 05 06 07 08 09 099				Interlock No	Ejected	Trapped	Airbag Deployed Not Equipped	Ambulance NONE			
	Alcohol 0 Yes <input checked="" type="radio"/> No <input type="radio"/> Refused <input type="radio"/> Not offered <input type="radio"/> PBT <input type="radio"/> Breath <input type="radio"/> Blood <input type="radio"/> Urine				Test Results		Drugs 0 Yes <input checked="" type="radio"/> No <input type="radio"/> Test Type <input type="radio"/> Blood <input type="radio"/> Urine		Citation Issued <input type="radio"/> Hazardous <input type="radio"/> Other			
	Vehicle Registration #####	State MI	Insurance / Policy # #####			Towed To/By			Special Vehicles 0	Private Trailer Type	Vehicle Defect	
	VIN #####	Vehicle Description NISSAN		Make 173600 A	Model	Color BLACK	Year 2003	Vehicle Type Passenger Car				
	Location of Greatest Damage 06	First Impact 06	Extent of Damage 2	Driveable Yes	Vehicle Direction E	Vehicle Use 01 - Private		Action Prior 23 - Parked				
	Sequence of Events ● 17 - Motor veh in transport (● indicates MOST harmful event)											
PASSENGERS	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
TRUCK / BUS	Carrier Information					Carrier Source GVWR	ICCMC	USDOT	MPSC			
						Driver's CDL Type	Endorsements OH OP OT ON OS OX	CDL Exempt <input type="radio"/> Farm <input type="radio"/> Other	CDL Restrictions 028 029 030 035 036			
	Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth			Cargo Body Type	Medical Card	Hazardous Material <input type="radio"/> Placard <input type="radio"/> Cargo Spill		ID # Class #		
OWNERS	Owner Information ##### ##### #####, ## ####-#### (###) ###-####					Owner Information						
	Witness Information					Witness Information						
WITNESS	Investigated at Scene Yes					Reported Date (Time) 01/07/2014 (02:59)		1st Investigator Name (Badge) KRAMER (79)		2nd Investigator Name (Badge)		Photos By
	Narrative DRIVER OF VEH #1 (PLOW DRIVER FOR CITY OF TROY) STATED THAT HE WAS BACKING UP AND STRUCK VEHICLE #2. VEHICLE #2 WAS PARKED IN THE DRIVEWAY OF 268 HICKORY DR.					Diagram 						

Authority: 1949 PA 300, Sec.257-622
Compliance: Required MSP UD-10E
Penalty: \$100 and/or 90 days (Rev 11/2006)

External # 0541179
Crash ID 9224565

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Incident # 150007813 File Class C3145

STATE OF MICHIGAN TRAFFIC CRASH REPORT

ORI: MI 6378400		Department Name Troy Police Department		Special Checks <input type="radio"/> Fatal <input type="radio"/> Non-Traffic Area <input type="radio"/> ORV/Snowmobile	
Crash Date 03/09/2015	Crash Time 16:08	No. of Units 02	Crash Type Angle	Special Circumstances <input type="radio"/> School Bus <input checked="" type="radio"/> None <input type="radio"/> Hit and Run <input type="radio"/> Deer <input type="radio"/> Fleeing Police	Area 08 - Intersection Driveway
County 63 - Oakland	Traffic Control Stop sign	Relation to Roadway On Road	Special Study	Weather Clear	
City/Twsp 84 - Troy	Construction Zone (if applicable) Type	Lane Closed	Activity	Light Daylight	Road Condition Dry
		Total Lanes 02	Speed Limit 25	Posted Yes	

Prefix	Road Name HICKORY	Road Type ST	Suffix	Divided Roadway
Distance 10 Feet W	Traffic Way 01 - Not physically divided		Access Control 01 - No access control	
Prefix	Intersecting Road PLUM	Road Type ST	Suffix	Divided Roadway

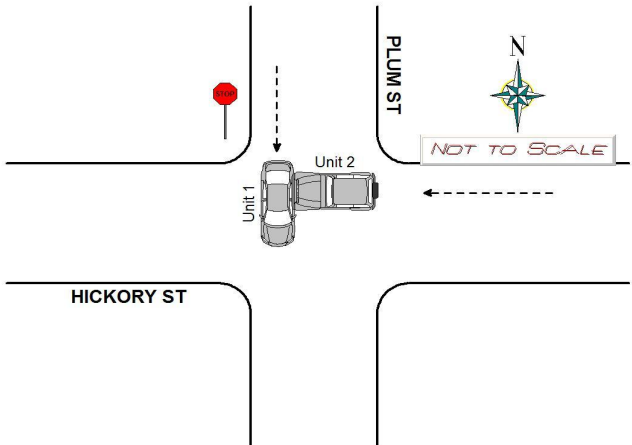
Unit Number 01	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) ##/##/#### (65)	License Type <input checked="" type="radio"/> Operator <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex M	Total Occupants 01	Hazardous Action 03 - Failed to yield
Unit Type MV	Driver Information ##### ##### TROY, MI 48083-1609 (###) ###-####				Injury C	Position 01	Restraint 04	Hospital REFUSED	
Driver Condition <input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 99				Interlock No	Ejected	Trapped	Airbag Deployed No	Ambulance REFUSED	
Alcohol <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Refused <input type="radio"/> Not offered <input type="radio"/> PBT <input type="radio"/> Breath <input type="radio"/> Blood <input type="radio"/> Urine				Test Results		Drugs <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Blood <input type="radio"/> Urine	Test Results		Citation Issued <input checked="" type="radio"/> Hazardous <input type="radio"/> Other
Vehicle Registration #####	State MI	Insurance / Policy # #####			Towed To/By		Special Vehicles 0	Private Trailer Type	Vehicle Defect
VIN #####	Vehicle Description HYUNDAI	Make ELANTRA	Model SILVER	Year 2015	Vehicle Type Passenger Car				
Location of Greatest Damage 07	First Impact 07	Extent of Damage 3	Driveable Yes	Vehicle Direction S	Vehicle Use 01 - Private	Action Prior 01 - Going Straight Ahead			
Sequence of Events ● 17 - Motor veh in transport (● indicates MOST harmful event)									

PASSENGERS	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance
Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital	
	Injury	Airbag Deployed	Ejected	Trapped	Ambulance	
Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital	
	Injury	Airbag Deployed	Ejected	Trapped	Ambulance	
Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital	
	Injury	Airbag Deployed	Ejected	Trapped	Ambulance	

TRUCK/BUS	Carrier Information		Carrier Source GVWR	ICCMC	USDOT	MPSC	
	Driver's CDL Type		Endorsements <input type="radio"/> H <input type="radio"/> P <input type="radio"/> T <input type="radio"/> N <input type="radio"/> S <input type="radio"/> X	CDL Exempt <input type="radio"/> Farm <input type="radio"/> Other	CDL Restrictions <input type="radio"/> 28 <input type="radio"/> 29 <input type="radio"/> 30 <input type="radio"/> 35 <input type="radio"/> 36		
	Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth	Cargo Body Type	Medical Card	Hazardous Material <input type="radio"/> Placard <input type="radio"/> Cargo Spill	ID #

OWNERS	Owner Information	Owner Information

Person Advised of Damaged Traffic Control Contact Name: Contact Date: Contact Time:	Damaged Property Owner & Phone	Public
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UNIT / DRIVER	Unit Number 02	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) ##/##/#### (17)	License Type ● Operator ○ Chauffeur ○ Moped	Endorsements ○ Cycle ○ Farm ○ Recreation	Sex F	Total Occupants 01	Hazardous Action 00 - None	
	Unit Type MV	Driver Information ##### ##### TROY, MI 48083-1515 (###) ###-####				Injury O	Position 01	Restraint 04	Hospital NONE		
	Driver Condition ● 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 99				Interlock No	Ejected	Trapped	Airbag Deployed Yes	Ambulance NONE		
	Alcohol ○ Yes ● No Test Type ○ Field ○ PBT				● Not offered ○ Breath ○ Blood ○ Urine		Test Results	Drugs ○ Yes ● No Test Type ○ Blood ○ Urine	Test Results	Citation Issued ○ Hazardous ○ Other	
	Vehicle Registration #####	State MI	Insurance / Policy # #####			Towed To/By			Special Vehicles 0	Private Trailer Type	Vehicle Defect
	VIN #####	Vehicle Description JEEP		Make LIBERTY	Model	Color SILVER	Year 2012	Vehicle Type Passenger Car			
	Location of Greatest Damage 01	First Impact 01	Extent of Damage 3	Driveable No	Vehicle Direction W	Vehicle Use 01 - Private	Action Prior 01 - Going Straight Ahead				
	Sequence of Events ● 17 - Motor veh in transport (● indicates MOST harmful event)										
	PASSENGERS	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital	
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
TRUCK / BUS	Carrier Information					Carrier Source GVWR	ICCMC	USDOT	MPSC		
						Driver's CDL Type	Endorsements ○ H ○ P ○ T ○ N ○ S ○ X	CDL Exempt ○ Farm ○ Other	CDL Restrictions ○ 28 ○ 29 ○ 30 ○ 35 ○ 36		
	Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth			Cargo Body Type	Medical Card	Hazardous Material ○ Placard ○ Cargo Spill	ID #	Class #	
OWNERS	Owner Information					Owner Information					
WITNESS	Witness Information ##### ##### #####, ## ####-#### (###) ###-####					Witness Information					
Investigated at Scene Yes											
Reported Date (Time) 03/09/2015 (16:08)											
1st Investigator Name (Badge) B. WARZECHA (61)											
2nd Investigator Name (Badge)											
Photos By											
Narrative UNIT 1 S/B ON PLUM ST AT HICKORY ST. UNIT 2 W/B HICKORY ST AT PLUM ST. UNIT 1 FAILED TO YIELD AND WAS STRUCK BY UNIT 2.					Diagram 						

Authority: 1949 PA 300, Sec.257-622
Compliance: Required MSP UD-10E
Penalty: \$100 and/or 90 days (Rev 01/2016)

External # 0849589
Crash ID 1266308

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File Class C3145

STATE OF MICHIGAN TRAFFIC CRASH REPORT

ORI MI 6378400		Department Name Troy Police Department				Incident # 170040577			
Crash Date 12/28/2017		Crash Time 16:42	No. of Units 02	Crash Type Angle		Special Circumstances <input checked="" type="radio"/> None <input type="radio"/> Fleeing Police <input type="radio"/> Hit and Run <input type="radio"/> Unknown <input type="radio"/> School Bus <input type="radio"/> Animal		Special Checks <input type="radio"/> Fatal <input type="radio"/> Non-Traffic Area <input type="radio"/> ORV/Snowmobile	
County 63 - Oakland		Traffic Control Stop Sign		Relation to Roadway On the Road		Weather Cloudy		Area INTR Within Intersection	
City/Twsp 84 - Troy		Contributing Circumstances 1st None		2nd		Light Daylight		Road Surface Condition Snow	
Total Lanes 02		Speed Limit 25		Posted Yes					
Work Zone (if applicable) Type Workers Present Activity Location									

LOCATION	Prefix		Primary Road Name HICKORY		Road Type		Suffix		Divided Roadway	
	Distance / Direction AT		Trafficway Not Physically Divided							
	Prefix		Intersecting Road Name PLUM		Road Type		Suffix		Divided Roadway	

UNIT / DRIVER	Unit Number 01	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) ##/##/#### (66)	License Type <input checked="" type="radio"/> Operator <input type="radio"/> Chauffeur <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex M	Total Occupants 01	Hazardous Action Speed Too Fast
	Unit Type MV	Driver Information ##### HAZEL PARK, MI 48030-1905 (###) ###-####				Driver is Owner Yes	Injury O	Position Front - Left		Restraint Shoulder and Lap Belt
	Driver Condition at Time of Crash 1st Appeared Normal				2nd		Driver Distracted By Not Distracted		Ejected	Trapped
	Hospital NONE				Ambulance NONE					
	Alcohol Suspected No	Contributing Factor No	Alcohol Test Type <input type="radio"/> Breath <input type="radio"/> Blood <input type="radio"/> Urine <input type="radio"/> Field <input type="radio"/> PBT <input type="radio"/> Refused <input checked="" type="radio"/> Not Offered			Alcohol Test Results <input type="radio"/> Pending Test Results:		Interlock Device No		
	Drug Suspected No	Contributing Factor No	Drug Test Type <input type="radio"/> Blood <input type="radio"/> Urine <input type="radio"/> Field <input type="radio"/> Refused <input checked="" type="radio"/> Not Offered			Drug Test Results <input type="radio"/> Pending Test Results:		Citation Issued <input checked="" type="radio"/> Hazardous <input type="radio"/> Other		
	Vehicle Registration DTS8078		State MI	Vehicle Description 2005		Make CHRYSLER	Model TOWN & COUNTRY		Color GOLD	
	VIN 2C4GP54L95R136927		Vehicle Type Passenger Car, SUV, Van		Special Vehicles Not Applicable		Private Trailer Type		Vehicle Defect	
	Automation System(s) in Vehicle		Automation System Level in Vehicle				Automation System Level Engaged at Time of Crash			
	Insurance Company #####			Insurance Policy # #####			Towed By		Towed To	

PASSENGERS	Passenger Information				Date of Birth (Age)		Sex	Position		Restraint
					Injury	Ejected	Trapped	Airbag Deployed		
	Hospital				Ambulance					
	Passenger Information				Date of Birth (Age)		Sex	Position		Restraint
					Injury	Ejected	Trapped	Airbag Deployed		
	Hospital				Ambulance					

TRUCK / BUS	Carrier Information				USDOT		MC	MPSC	
					Driver's CDL Type		Endorsements <input type="radio"/> H <input type="radio"/> P <input type="radio"/> T <input type="radio"/> N <input type="radio"/> S <input type="radio"/> O <input type="radio"/> X	CDL Exempt <input type="radio"/> Farm <input type="radio"/> Other	
	GVWR/GCWR <input type="radio"/> 10,000 lbs. or Less <input type="radio"/> 10,001 - 26,000 lbs. <input type="radio"/> Greater than 26,000 lbs.		Vehicle Configuration		Cargo Body Type		Medical Card		Hazardous Material <input type="radio"/> Placard <input type="radio"/> Cargo Spill

OWNERS	Owner Information ##### ##### #####, ## #####-#### (###) ###-####				Owner Information			

Damaged Property		Public	Owner & Phone

UNIT / DRIVER	Unit Number 02	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) ##/##/#### (38)	License Type ● Operator ○ Chauffeur ○ Moped	Endorsements ○ Cycle ○ Farm ○ Recreation	Sex F	Total Occupants 01	Hazardous Action None	
	Unit Type MV	Driver Information ##### ##### OAK PARK, MI 48237-1356 (###) ###-####				Driver is Owner Yes	Injury O	Position Front - Left		Restraint Shoulder and Lap Belt	
	Driver Condition at Time of Crash 1st Appeared Normal				2nd Driver Distracted By Not Distracted		Ejected	Trapped	Airbag Deployed Not Deployed		
	Hospital NONE					Ambulance NONE					
	Alcohol Suspected No	Contributing Factor No	Alcohol Test Type ○ Breath ○ Blood ○ Urine ○ Field ○ PBT ○ Refused ● Not Offered			Alcohol Test Results ○ Pending	Test Results:		Interlock Device No		
	Drug Suspected No	Contributing Factor No	Drug Test Type ○ Blood ○ Urine ○ Field ○ Refused ● Not Offered			Drug Test Results ○ Pending	Test Results:		Citation Issued ○ Hazardous ○ Other		
	Vehicle Registration BPK9274		State MI	Vehicle Description 2005	Year 2005	Make TOYOTA	Model COROLLA		Color GRAY		
	VIN 1NXBR32E75Z504761		Vehicle Type Passenger Car, SUV, Van		Special Vehicles Not Applicable		Private Trailer Type		Vehicle Defect		
	Automation System(s) in Vehicle		Automation System Level in Vehicle				Automation System Level Engaged at Time of Crash				
	Insurance Company #####			Insurance Policy # #####			Towed By PRIVATE		Towed To PRIVATE		
Location of Greatest Damage 02	First Impact 02	Extent of Damage (Power Unit and/or Trailers) Disabling Damage		Vehicle Direction W	Vehicle Use Private		Action Prior Going Straight Ahead				
Sequence of Events ● 17 - Motor Veh in Transport (● indicates MOST harmful event)											
PASSENGERS	Passenger Information				Date of Birth (Age)	Sex	Position		Restraint		
					Injury	Ejected	Trapped	Airbag Deployed			
	Hospital				Ambulance						
	Passenger Information				Date of Birth (Age)	Sex	Position		Restraint		
					Injury	Ejected	Trapped	Airbag Deployed			
	Hospital				Ambulance						
TRUCK / BUS	Carrier Information				USDOT		MC	MPSC			
					Driver's CDL Type		Endorsements OH OP OT ON OS OX	CDL Exempt ○ Farm ○ Other			
	GVWR/GCWR ○ 10,000 lbs. or Less ○ 10,001 - 26,000 lbs. ○ Greater than 26,000 lbs.		Vehicle Configuration		Cargo Body Type		Medical Card	Hazardous Material ○ Placard ○ Cargo Spill		ID # Class #	
OWNERS	Owner Information ##### ##### #####, ## #####-#### (###) ###-####				Owner Information						
	Witness Information				Witness Information						
WITNESS	Investigated at Scene Yes				Reported Date (Time) 12/28/2017 (16:42)		1st Investigator Name (Badge) MCWILLIAMS (22)		2nd Investigator Name (Badge)		Photos No
	Narrative #2 WAS WB ON HICKORY GOING THRU THE INTERSECTION AT PLUM. THERE ARE STOP SIGNS FOR NB AND SB PLUM BUT NOT FOR HICKORY. #1 WAS SB ON PLUM. #1 SAID HE COULDN'T IN TIME FOR THE STOP SIGN DUE TO THE ICY ROADS AND HE HIT #2. #2 SAID #1 MADE NO ATTEMPT TO STOP AT THE STOP SIGN AND HIT HER.				Diagram 						

Reference Guide on Traffic Control Determination in the State of Michigan

Background

This document is intended to be used as a reference guide for performing intersection traffic control studies of intersections on public roadways in Michigan. The document explains the procedure and requirements necessary to implement traffic control at an intersection as stipulated by the Michigan Manual on Uniform Traffic Control Devices (MMUTCD). Generally, the starting premise is an uncontrolled intersection. The first step would then be to verify if the intersection should remain uncontrolled or if YIELD or STOP controls on the minor street approach(es) should be provided. For locations with higher traffic volumes and /or crash issues, then an evaluation of the location for all-way STOP warrants would be performed. The appropriate analysis for each level of control described below.

YIELD Traffic Control Guidance

The use of a YIELD sign is intended to assign the right-of-way at intersections where it is not usually necessary to stop before proceeding into the intersection. Conversely, the STOP sign is intended for use where it is usually necessary to stop before proceeding into the intersection.

The following conditions should be fully evaluated to determine how the right-of-way should be assigned:

- Traffic Volumes: Normally, the heavier volume of traffic should be given the right-of-way.
- Approach Speeds: The higher speed traffic should normally be given the right-of-way.
- Types of Highways: When a minor highway intersects a major highway, it is usually desirable to control the minor highway.
- Sight Distance: Sight distance across the corners of the intersection is the most important factor and is critical in determining safe approach speeds.

STOP Traffic Control Guidance

Based on the MMUTCD there are four conditions where STOP signs may be warranted:

- At the intersection of a less important road with a main road where application of the normal right-of-way rule is unduly hazardous.
- On a street entering a through highway or street.
- At an unsignalized intersection in a signalized area.
- At other intersections where a combination of high speed, restricted view, or crash records indicate a need for control by the STOP sign.

Many times STOP signs are installed where they may not be warranted. Traffic experts agree that unnecessary STOP signs:

- Cause accidents they are designed to prevent.
- Breed contempt for other necessary STOP signs.
- Waste millions of gallons of gasoline annually.
- Create added noise and air pollution.
- Increase, rather than decrease, speeds between intersections.

There is also an explicit restriction in the MMUTCD that STOP signs are not to be used for speed control, in Section 2B.04.

Evaluation of All-Way STOP Traffic Control

Based on the MMUTCD there are four conditions where **all-way** STOP signs may be warranted:

- A. *Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.*
- B. *Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.*
- C. *Minimum volumes:*
 - 1. *The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and*
 - 2. *The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but*
 - 3. *If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.*
- D. *Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.*

OHM Advisors
34000 Plymouth Road
Livonia, MI 48150
Advancing Communities

Weather: Sunny
Serial Number: 27880
Installed by: Matt Clark
Other Notes: None

Date Start: 15-Jul-19
SB Plum Dr
N of Hickory Dr

Start Time	Mon 15-Jul-19	Tue 16-Jul-19	Wed 17-Jul-19	Thu 18-Jul-19	Fri 19-Jul-19	Average Day	Sat 20-Jul-19	Sun 21-Jul-19	Week Average
12:00 AM	*	0	1	*	*	0	*	*	0
01:00	*	1	0	*	*	0	*	*	0
02:00	*	2	0	*	*	1	*	*	1
03:00	*	1	0	*	*	0	*	*	0
04:00	*	0	1	*	*	0	*	*	0
05:00	*	2	2	*	*	2	*	*	2
06:00	*	2	5	*	*	4	*	*	4
07:00	*	10	8	*	*	9	*	*	9
08:00	*	14	25	*	*	20	*	*	20
09:00	*	8	11	*	*	10	*	*	10
10:00	*	9	4	*	*	6	*	*	6
11:00	*	9	15	*	*	12	*	*	12
12:00 PM	*	20	9	*	*	14	*	*	14
01:00	*	11	13	*	*	12	*	*	12
02:00	15	14	*	*	*	14	*	*	14
03:00	11	21	*	*	*	16	*	*	16
04:00	21	29	*	*	*	25	*	*	25
05:00	55	70	*	*	*	62	*	*	62
06:00	27	30	*	*	*	28	*	*	28
07:00	13	14	*	*	*	14	*	*	14
08:00	20	8	*	*	*	14	*	*	14
09:00	10	9	*	*	*	10	*	*	10
10:00	1	10	*	*	*	6	*	*	6
11:00	3	5	*	*	*	4	*	*	4
Day Total	176	299	94	0	0	283	0	0	283
% Avg. WkDay	62.2%	105.7%	33.2%	0.0%	0.0%				
% Avg. Week	62.2%	105.7%	33.2%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak Vol.	-	08:00 14	08:00 25	-	-	08:00 20	-	-	08:00 20
PM Peak Vol.	17:00 55	17:00 70	13:00 13	-	-	17:00 62	-	-	17:00 62
Grand Total	176	299	94	0	0	283	0	0	283
ADT	ADT 299		AADT 299						

OHM Advisors

34000 Plymouth Road
Livonia, MI 48150

Advancing Communities

Weather: Sunny
Serial Number: 32213
Installed by: Matt Clark
Other Notes: None

Date Start: 15-Jul-19
EB Hickory Dr
W of Plum Dr

Start Time	Mon 15-Jul-19	Tue 16-Jul-19	Wed 17-Jul-19	Thu 18-Jul-19	Fri 19-Jul-19	Average Day	Sat 20-Jul-19	Sun 21-Jul-19	Week Average
12:00 AM	*	2	4	*	*	3	*	*	3
01:00	*	6	2	*	*	4	*	*	4
02:00	*	0	1	*	*	0	*	*	0
03:00	*	1	0	*	*	0	*	*	0
04:00	*	1	1	*	*	1	*	*	1
05:00	*	7	6	*	*	6	*	*	6
06:00	*	4	11	*	*	8	*	*	8
07:00	*	15	15	*	*	15	*	*	15
08:00	*	23	16	*	*	20	*	*	20
09:00	*	18	32	*	*	25	*	*	25
10:00	*	7	16	*	*	12	*	*	12
11:00	*	21	24	*	*	22	*	*	22
12:00 PM	*	32	10	*	*	21	*	*	21
01:00	*	24	21	*	*	22	*	*	22
02:00	30	18	*	*	*	24	*	*	24
03:00	28	20	*	*	*	24	*	*	24
04:00	36	51	*	*	*	44	*	*	44
05:00	57	101	*	*	*	79	*	*	79
06:00	28	29	*	*	*	28	*	*	28
07:00	21	18	*	*	*	20	*	*	20
08:00	20	22	*	*	*	21	*	*	21
09:00	20	15	*	*	*	18	*	*	18
10:00	6	7	*	*	*	6	*	*	6
11:00	8	4	*	*	*	6	*	*	6
Day Total	254	446	159	0	0	429	0	0	429
% Avg. WkDay	59.2%	104.0%	37.1%	0.0%	0.0%				
% Avg. Week	59.2%	104.0%	37.1%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak	-	08:00	09:00	-	-	09:00	-	-	09:00
Vol.	-	23	32	-	-	25	-	-	25
PM Peak	17:00	17:00	13:00	-	-	17:00	-	-	17:00
Vol.	57	101	21	-	-	79	-	-	79
Grand Total	254	446	159	0	0	429	0	0	429
ADT		ADT 446		AADT 446					

OHM Advisors
34000 Plymouth Road
Livonia, MI 48150
Advancing Communities

Weather: Sunny
Serial Number: 32214
Installed by: Matt Clark
Other Notes: None

Date Start: 15-Jul-19
NB Plum Dr
S of Hickory Dr

Start Time	Mon 15-Jul-19	Tue 16-Jul-19	Wed 17-Jul-19	Thu 18-Jul-19	Fri 19-Jul-19	Average Day	Sat 20-Jul-19	Sun 21-Jul-19	Week Average
12:00 AM	*	2	4	*	*	3	*	*	3
01:00	*	1	2	*	*	2	*	*	2
02:00	*	1	1	*	*	1	*	*	1
03:00	*	0	0	*	*	0	*	*	0
04:00	*	0	1	*	*	0	*	*	0
05:00	*	2	4	*	*	3	*	*	3
06:00	*	6	4	*	*	5	*	*	5
07:00	*	18	23	*	*	20	*	*	20
08:00	*	46	25	*	*	36	*	*	36
09:00	*	30	34	*	*	32	*	*	32
10:00	*	16	19	*	*	18	*	*	18
11:00	*	17	18	*	*	18	*	*	18
12:00 PM	*	28	30	*	*	29	*	*	29
01:00	*	20	31	*	*	26	*	*	26
02:00	13	16	17	*	*	15	*	*	15
03:00	30	14	*	*	*	22	*	*	22
04:00	21	25	*	*	*	23	*	*	23
05:00	31	35	*	*	*	33	*	*	33
06:00	25	18	*	*	*	22	*	*	22
07:00	11	18	*	*	*	14	*	*	14
08:00	17	17	*	*	*	17	*	*	17
09:00	18	14	*	*	*	16	*	*	16
10:00	5	4	*	*	*	4	*	*	4
11:00	3	4	*	*	*	4	*	*	4
Day Total	174	352	213	0	0	363	0	0	363
% Avg. WkDay	47.9%	97.0%	58.7%	0.0%	0.0%				
% Avg. Week	47.9%	97.0%	58.7%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak	-	08:00	09:00	-	-	08:00	-	-	08:00
Vol.	-	46	34	-	-	36	-	-	36
PM Peak	17:00	17:00	13:00	-	-	17:00	-	-	17:00
Vol.	31	35	31	-	-	33	-	-	33
Grand Total	174	352	213	0	0	363	0	0	363
ADT		ADT 352		AADT 352					

OHM Advisors

34000 Plymouth Road

Livonia, MI 48150

Advancing Communities

Weather: Sunny
Serial Number: 27494
Installed by: Matt Clark
Other Notes: None

Date Start: 15-Jul-1
WB Hickory Dr
E of Plum Dr

Start Time	Mon 15-Jul-19	Tue 16-Jul-19	Wed 17-Jul-19	Thu 18-Jul-19	Fri 19-Jul-19	Average Day	Sat 20-Jul-19	Sun 21-Jul-19	Week Average
12:00 AM	*	3	1	*	*	2	*	*	2
01:00	*	4	2	*	*	3	*	*	3
02:00	*	1	2	*	*	2	*	*	2
03:00	*	1	0	*	*	0	*	*	0
04:00	*	0	0	*	*	0	*	*	0
05:00	*	8	5	*	*	6	*	*	6
06:00	*	9	12	*	*	10	*	*	10
07:00	*	31	24	*	*	28	*	*	28
08:00	*	45	37	*	*	41	*	*	41
09:00	*	57	49	*	*	53	*	*	53
10:00	*	27	22	*	*	24	*	*	24
11:00	*	11	10	*	*	10	*	*	10
12:00 PM	*	57	48	*	*	52	*	*	52
01:00	*	30	33	*	*	32	*	*	32
02:00	25	21	14	*	*	20	*	*	20
03:00	21	21	*	*	*	21	*	*	21
04:00	32	40	*	*	*	36	*	*	36
05:00	42	52	*	*	*	47	*	*	47
06:00	28	27	*	*	*	28	*	*	28
07:00	27	21	*	*	*	24	*	*	24
08:00	18	24	*	*	*	21	*	*	21
09:00	17	15	*	*	*	16	*	*	16
10:00	9	9	*	*	*	9	*	*	9
11:00	5	4	*	*	*	4	*	*	4
Day Total	224	518	259	0	0	489	0	0	489
% Avg. WkDay	45.8%	105.9%	53.0%	0.0%	0.0%				
% Avg. Week	45.8%	105.9%	53.0%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak Vol.	-	09:00 57	09:00 49	-	-	09:00 53	-	-	09:00 53
PM Peak Vol.	17:00 42	12:00 57	12:00 48	-	-	12:00 52	-	-	12:00 52
Grand Total	224	518	259	0	0	489	0	0	489
ADT		ADT 518		AADT 518					



TRAFFIC COMMITTEE REPORT

August 30, 2019

TO: Traffic Committee

FROM: Bill Huotari, City Engineer/ Traffic Engineer

SUBJECT: Alfred Drive at Edith Street

Background:

At the July 17, 2019 Traffic Committee meeting, traffic control was discussed at the intersection of Alfred Drive at Edith Street. Mr. Don Lapak of 6579 Shoreline Drive provided an email in support of YIELD signs at the intersection, if signs were determined necessary, which was provided to all Traffic Committee members at the July 17, 2019 meeting.

By a 5-1-1 vote, the Traffic Committee:

"RESOLVED, that the intersection of Alfred Drive at Edith Street be MODIFIED from no traffic control to ALL-WAY STOP control at the intersection of Alfred Drive at Edith Street".

The recommendation was forwarded to Troy City Council at their meeting of August 5, 2019 and the recommendation was approved 7-0. Traffic Control Order #19-04-SS was subsequently issued on August 12, 2019 and the signs were installed on August 19, 2019.

Mr. Lapak was informed of the Traffic Committee recommendation on July 20, 2019 and entered into discussions with the Traffic Engineer over the next month questioning the recommendation and subsequent approval by City Council and ultimately the installation of the ALL-WAY STOP at the intersection.

His last communication was via email on August 30, 2019 where he rescinded his request to appear before the Traffic Committee to reconsider the recommendation. He did however request that his last email be provided as information to the Traffic Committee.

Mr. Lapak's original email of July 12, 2019 and his last email of August 30, 2019 are both provided in their entirety.

There were several other emails and at least one phone call, but are not included as they were requests for information on the process, study, notices, decision and meeting minutes used by or generated by the Traffic Committee to reach their recommendation. This is information that you were provided as part of the agenda item or as the normal course of action for the Traffic Committee meeting.

William J Huotari

From: djlapak@aol.com
Sent: Friday, July 12, 2019 12:14 PM
To: William J Huotari
Subject: Re: July 17 meeting...concerning Traffic signs at Alfred and Edith streets.

Bill,

I just took a ride by the corner being talked about. There used to be some bushes/trees at 2091 Alfred that partially blocked a drivers view to the west when coming to the corner (driving south on Edith approaching Alfred). Someone did a good job removing those so the vision is much better now and the other bushes on the north east side of that corner you can easily see thru. If it's decided a sign is necessary a yield sign may be sufficient, since you can scan the corner as you approach the intersection and slowly roll thru if it's clear.

I also think that house at 2091 has recently been sold and the new owners may have moved in.

Thanks, Don Lapak 6579 Shoreline Drive

-----Original Message-----

From: William J Huotari
To: 'Don'
Sent: Thu, Jul 11, 2019 3:19 pm
Subject: RE: Please forward to me the agenda and any back up data for the July 17 meeting...concerning Traffic signs at Alfred and Edith streets.

Don, I don't know what is happening with the website as I had posted the agenda previously, but it was not there when I just checked today.

I just posted it again right now, so it is up on the website and I also attached a copy just in case it disappears again.

The link to the online version is:

<https://o.troy.mi.gov/BoardsandCommittees/?Board=trafficcommittee>

Thanks, Bill

From: Don [mailto:djlapak@aol.com]
Sent: Thursday, July 11, 2019 2:15 PM
To: William J Huotari
Subject: Please forward to me the agenda and any back up data for the July 17 meeting...concerning Traffic signs at Alfred and Edith streets.
Could not find agenda on the Troy website. Thanks Don
Sent from [Mail](#) for Windows 10

William J Huotari

From: William J Huotari
Sent: Friday, August 30, 2019 1:03 PM
To: William J Huotari
Subject: FW: Questions and Comments - Alfred & Edith Streets Stop Signs

From: Rick DiBartolomeo [mailto:rickdibart@yahoo.com]
Sent: Friday, August 30, 2019 12:56 PM
To: djlapak@aol.com
Cc: William J Huotari ; brianakoors@yahoo.com; bb2992@gmail.com
Subject: Re: Questions and Comments - Alfred & Edith Streets Stop Signs

Definitely overkill. Once again, we are over regulating things.

Grazie,

Rick DiBartolomeo
(248)331-6098
Rickdibart@yahoo.com

On Aug 30, 2019, at 12:51 PM, djlapak@aol.com wrote:

Bill,

I will not be attending the September 18th meeting. I don't think it's worth going just to complain when regardless of what we might say your group is more than likely to stand firm on their original decision. It's easier putting signs up than getting them taken down. Words and comments like crashes, near misses, people not yielding, confusion, etc. put some scare into some.

We went from zero signs to a 4 way stop in one swoop. The study committee even concluded there was minimal traffic at that intersection. After the construction is completed the traffic volume will cease to exist. If you draw a flow diagram showing all of the streets coming out of both of the subdivisions, and where those cars are likely to go when they want to head either north or south on John R, you'll see that it's highly unlikely that any residents will use southbound Edith as their choice of travel.

Mr. Petrulis had the most reasonable answer to "the Problem". "He believed that the ALL -WAY STOP was overkill. He preferred to install the STOP signs on Edith and then observe traffic for a time period to be determined".

If you chose to, you can share this note with your group. Thanks for all of your help and feedback discussing this matter. Don Lapak

-----Original Message-----

From: William J Huotari <HuotariWJ@troymi.gov>

To: 'djlapak@aol.com' <djlapak@aol.com>

Sent: Wed, Aug 28, 2019 7:28 am

Subject: RE: Questions and Comments - Alfred & Edith Streets Stop Signs

Don, the recommendation from OHM was to install Stop signs on the Edith Street approaches to the intersection.

2B.04.07 relates to the control of a "roadway", not a leg.

07 Once the decision has been made to control an intersection, the decision regarding the appropriate roadway to control should be based on engineering judgment. In most cases, the roadway carrying the lowest volume of traffic should be controlled.

Bill

From: djlapak@aol.com [<mailto:djlapak@aol.com>]

Sent: Tuesday, August 27, 2019 9:16 PM

To: William J Huotari <HuotariWJ@troymi.gov>

Subject: Fwd: Questions and Comments - Alfred & Edith Streets Stop Signs

Bill,

Thanks for your thorough explanations. The question that remains is could that corner have been made a 2-way stop for Edith like the study recommended. It seems like your explanations in "The Short Story is" area at the end, (which I underlined) and your explanations in Section 2B.04.07 (which I underlined) contradict a 2 way stop? (note: The green font turned to black so I changed it back, and while there I put some dotted black lines in to make it easier to read..just a fyi. No content changes).

Thanks, Don

-----Original Message-----

From: William J Huotari <HuotariWJ@troymi.gov>

To: 'djlapak@aol.com' <djlapak@aol.com>

Cc: briankoors@yahoo.com <briankoors@yahoo.com>; rickdibart@yahoo.com <rickdibart@yahoo.com>; bb2992@gmail.com <bb2992@gmail.com>

Sent: Fri, Aug 23, 2019 3:17 pm

Subject: RE: Questions and Comments - Alfred & Edith Streets Stop Signs

Don, my responses to your questions are embedded within the body of your email in green below.

If I can get your request for reconsideration next week, then I will add it to the agenda for September 18, 2019 as the 1st Regular Business item for discussion so you don't have to sit through the entire meeting.

The agenda goes out on 9/6 and notices of the meeting would go out 9/9.

Have a great weekend.

Thanks, Bill

From: djlapak@aol.com [<mailto:djlapak@aol.com>]
Sent: Friday, August 23, 2019 10:14 AM
To: William J Huotari <HuotariWJ@troymi.gov>
Cc: briankooors@yahoo.com; rickdibart@yahoo.com; bb2992@gmail.com
Subject: Questions and Comments - Alfred & Edith Streets Stop Signs

Bill,

This is Don Lapak. I'm trying to get some background information and timeline on how the process flows, how much information our residents know, and also get some questions answered that might have already been discussed. Could you answer and also share documents where available?

-- Who initiated the sign request with the City of Troy and when? What was the reason given to the city? Can you provide a copy of the requesting document?

As noted in the agenda, Laura Azoni of 2091 Alfred initiated the request on 6/12/19 by calling. Reason given was near misses and traffic that does not yield the right-of-way at the intersection, if I recall correctly. There is no copy of a requesting document as she called in to request traffic control at the intersection.

-- After receiving the initial request at the City, was any information shared with residents letting them know a study was underway, before the meeting notice was sent out on July 8th alerting residents of the July 17th meeting?

No, there is no notice that a study is taking place.

-- Your minutes referenced the email I had sent you in support of yield signs at the intersection. Was there any discussion at the meeting about yield signs? Was there any discussion what the effect of installing stop signs on Alfred might have on our subdivision, Troy Lake Estates?

The meeting minutes note:

"Traffic Engineering received an email from Don Lapak of 6579 Shoreline Drive in support of YIELD signs at the intersection as he noted that the intersection vegetation has been cleaned up and visibility has been improved".

A copy of your email was provided to each Traffic Committee member for their review at the meeting.

I'm not sure what your last question regarding "what the effect of installing stop signs on Alfred might have on our subdivision, Troy Lake Estates" is referring to? Please elaborate but the discussion at the meeting is as summarized in the meeting minutes (see attached) and revolves around the intersection in question. Minutes attached are the DRAFT version as they are approved at the next available Traffic Committee meeting and then become FINAL minutes based on any revisions or corrections that may be requested.

-- I've read the study that took place and see that "for a vehicle traveling south on Edith Street "a STOP sign is the recommended stated treatment". However, I do not see any direct reference to a vehicle traveling north on Edith approaching Alfred, even though the study recommended a stop sign there also. There are only 5 houses coming out of that circle. Is there any other document I didn't get that addresses this point? Was there any discussion on it at the meeting?

Please refer to the meeting minutes for the discussion that ensued.

The short story is:

Traffic control signs at a 4-way intersection are intended to control a specific roadway (which is typically the lower-volume, minor road) and not just a single leg of the intersection. The southbound direction, on Edith Street, was identified as the direction with the major potential for sight distance obstruction at the intersection. Therefore, Edith Street was recommended for Stop control to define who has the right-of-way at the intersection. If southbound Edith were Stop controlled and the other 3 legs of the intersection were uncontrolled you would create potential conflicts with northbound Edith and eastbound/westbound Alfred.

The rest of the story is:

The applicable provisions from the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) are:

Section 2B.04 Right-of-Way at Intersections

04 The use of YIELD or STOP signs should be considered at the intersection of two minor streets or local roads where the intersection has more than three approaches and where one or more of the following conditions exist:

- A. The combined vehicular, bicycle, and pedestrian volume entering the intersection from all approaches averages more than 2,000 units per day;**
- B. The ability to see conflicting traffic on an approach is not sufficient to allow a road user to stop or yield in compliance with the normal right-of-way rule if such stopping or yielding is necessary; and/or**
- C. Crash records indicate that five or more crashes that involve the failure to yield the right-of-way at the intersection under the normal right-of-way rule have been reported within a 3-year period, or that three or more such crashes have been reported within a 2-year period.**

07 Once the decision has been made to control an intersection, the decision regarding the appropriate roadway to control should be based on engineering judgment. In most cases, the roadway carrying the lowest volume of traffic should be controlled.

11 Except as provided in Section 2B.09, STOP signs and YIELD signs shall not be installed on different approaches to the same unsignalized intersection if those approaches conflict with or oppose each other.

Sections 2B.04.04 and .07 are considered guidance and .11 is considered a standard. Section 2B.04.04 basically allows the use of STOP or YIELD signs at the intersection of two minor streets, i.e. subdivision streets, with 4 or more approaches. If there were to be only 3 approaches, namely a tee intersection, then the through street is always considered the major street and the stem of the tee the minor street.

Section 2B.04.07 is a key point, though awkwardly worded. Once a decision is made to control an approach to an intersection, the control applies to that roadway at the intersection. That is to say, all of the approaches of that roadway to the intersection. This point is emphasized by Section 2B.04.11 that says you can't mix and match... If one approach is a STOP, the opposite one cannot be a YIELD. Nor can you use STOP signs for one roadway and YIELD signs for the other roadway at the same intersection. The reference to another part of the MMUTCD, Section 2B.09, deals with use of all-way YIELD controls at roundabouts.

-- Were the 2 people who signed the study present at the meeting? Will they be there on September 18th?

No, they were not present at the meeting and they would not be present at the meeting on the 18th. OHM provides their professional review of the intersection and summarizes it in the study that is provided. It is included in the meeting agenda for the Traffic Committee members to aid in their discussion at the meeting along with any other input provided (such as your email or residents that attended the meeting) from which the Traffic Committee makes their recommendation.

-- After the committee meeting was finished, and the decision to install the 4 way stop signs was made, did this get conveyed back to the 22 residents that had been invited to the meeting? (I'm taking my count from the list of invites you had sent me)

No, there is no notice after-the-fact.

-- As far as the Traffic Committee goes I see there are 7 members for 3 year terms. Are these the people who are volunteers?

Yes, the members are volunteers who apply to serve on the Traffic Committee (much like most of the other boards and committees of the City). They are then nominated by the Mayor Pro-Tem at a City Council meeting and then the full City Council approves their appointment at a subsequent meeting.

I appreciate your help. Thanks.