

AGENDA

Traffic Committee Meeting

September 21, 2016 – 7:30 P.M.

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

1. Roll Call
2. Minutes – July 20, 2016

REGULAR BUSINESS

3. Request for Traffic Control – Mayflower at Aster
4. Request for Traffic Control – Mayflower at Bridle Path
5. Request for Traffic Control – Calvert at Chapel
6. Public Comment
7. Other Business
8. Adjourn

cc: Item 3 & 4: Bill Bounds, 2205 Mayflower
Properties within 300'

Item 4: Darrin Millar, 4700 Chapel
Properties within 300'

Traffic Committee Members

Captain Robert Redmond & Sgt. Mike Szuminski, Police Department

Lt. Eric Caloia, Fire Department

William J. Huotari, Deputy City Engineer/Traffic Engineer

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.

REGULAR BUSINESS

3. Request for Traffic Control – Mayflower at Aster

Mr. Bill Bounds of 2205 Mayflower states that the lack of existing traffic control at the intersection of Mayflower and Aster creates a hazardous condition. Traffic does not yield the right-of-way and travels through the intersection at a high rate of speed and is unsafe for drivers and pedestrians.

SUGGESTED RESOLUTION:

- a. RESOLVED, that the intersection of Mayflower at Aster be **MODIFIED** from NO traffic control to a YIELD sign on the Aster Drive southbound approach to the intersection.

4. Request for Traffic Control – Mayflower at Bridle Path

Mr. Bill Bounds of 2205 Mayflower states that the lack of existing traffic control at the intersection of Mayflower and Bridle Path creates a hazardous condition. Traffic does not yield the right-of-way and travels through the intersection at a high rate of speed and is unsafe for drivers and pedestrians.

SUGGESTED RESOLUTION:

- a. RESOLVED, that **NO CHANGE** be made at the intersection of Mayflower at Bridle Path.

5. Request for Traffic Control –Calvert at Chapel

Mr. Darrin Millar of 4700 Chapel states that drivers are not exhibiting caution and/or stopping at the existing YIELD signs on Calvert when traffic is approaching from Chapel. Traffic does not yield the right-of-way and travels through the intersection at a high rate of speed and is unsafe for drivers and pedestrians.

SUGGESTED RESOLUTION:

- a. RESOLVED, that **NO CHANGE** be made at the intersection of Calvert at Chapel.

6. Public Comment

7. Other Business

8. Adjourn

A regular meeting of the Troy Traffic Committee was held Wednesday, July 20, 2016 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: Tim Brandstetter
Mitch Huber
Richard Kilmer
Al Petrulis
Cynthia Wilsher
Pete Ziegenfelder
Katie Regan (Student Representative)

Absent: David Easterbrook

Also present: Sgt. Mike Szuminski, Police Department
Bill Huotari, Deputy City Engineer/Traffic Engineer

2. Minutes – June 15, 2016

Resolution # 2016-07-23

Moved by Kilmer

Seconded by Petrulis

To approve the June 15, 2016 minutes as printed.

Yes: Brandstetter, Huber, Kilmer, Petrulis, Wilsher, Ziegenfelder

No: None

Absent: Easterbrook

MOTION CARRIED

REGULAR BUSINESS

3. Request for No Parking Zone – 6660 John R – South side of Stirling, east of John R

Lynn Pung of 6660 John R requests that a No Parking zone be created on the south side of Stirling, along her northerly property line. Residents, landscapers, general public, etc. have been parking in this area and Ms. Pung is concerned for her safety, privacy and utilization of her property.

No residents were in attendance at the meeting to discuss the request.

Mr. Ziegenfelder discussed that posting just this property as a No Parking zone could create confusion for motorists. He believes that the entire south side of Stirling, from John R to Ravenna should be posted No Parking if any posting is done.

Mr. Huber questioned if we would have to do the entire street or if just this property could be posted No Parking. Site specific No Parking zones have been approved in the past in other areas of the city, but have been approved based on factors typically related to the motoring public (sight distance, corner clearance for turning vehicles, etc.) or due to proximity to a school. It has not been common to just post a location as No Parking due to a concern from a resident that they do not want someone parking next to their property.

Mr. Brandstetter stated that a No Parking zone adjacent to the property would not create a hardship for other property owners. He is concerned that it could set a precedent for future requests where a resident does not want someone parking in front of their home. Mr. Brandstetter stated that the fence that has been installed should mitigate some of the concerns that the resident had prior to the fence being installed.

Resolution # 2016-07-24
Moved by Kilmer
Seconded by Petrulis

RESOLVED, that NO CHANGE be made at 6660 John R.

Yes: Brandstetter, Huber, Kilmer, Petrulis, Wilsher, Ziegenfelder
No: None
Absent: Easterbrook

MOTION CARRIED

4. Request for No Parking Zone – 3557 Delaware – West side of Delaware, south of McManus

Dave Lovio of 971 Portsmouth requests that a NO PARKING zone be established on the west side of Delaware, from the southern edge of the sidewalk to a point approximately 20' to the south. Mr. Lovio reports that vehicles, landscape contractors, etc. park very close to the intersection creating a vision obstruction for vehicles turning and/or passing through the intersection of Delaware at McManus.

Mr. Petrulis requested clarification regarding the No Parking zone to be established. The request was to create a No Parking zone at the corner to prohibit vehicles from parking at or near the intersection and creating a vision obstruction.

Mr. Brandstetter commented that this request would provide for increased sight distance for the general motoring public. The request is not just to eliminate parking at a specific location but to eliminate parking that can or has been creating a safety concern.

Resolution # 2016-07-25
Moved by Brandstetter
Seconded by Huber

RESOLVED, that a NO PARKING zone be **ESTABLISHED** on the west side of Delaware, from the southern edge of the sidewalk ramp at the corner of Delaware and McManus to a

point approximately twenty (20) feet to the south.

Yes: Brandstetter, Huber, Kilmer, Petruilis, Wilsher, Ziegenfelder

No: None

Absent: Easterbrook

MOTION CARRIED

5. Public Comment

There was no additional public comment made.

6. Other Business

There was no other business brought forward.

7. Adjourn

The meeting adjourned at 8:06 p.m.

Pete Ziegenfelder, Chairperson

Bill Huotari, Deputy City Engineer/Traffic Engineer

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TRAFFIC COMMITTEE REPORT

August 22, 2016

TO: Traffic Committee

FROM: Bill Huotari, Deputy City Engineer/ Traffic Engineer

SUBJECT: Request for Traffic Control
Mayflower at Aster

Background:

Mr. Bill Bounds of 2205 Mayflower states that the lack of existing traffic control at the intersection of Mayflower and Aster creates a hazardous condition. Traffic does not yield the right-of-way and travels through the intersection at a high rate of speed and is unsafe for drivers and pedestrians.

There have been no crashes reported at this intersection in the past five (5) years.

The posted speed limit on both streets is 25 mph. Due to the geometrics, Mayflower is considered the continuing roadway.

The major potential sight distance obstructions at the intersection are houses in the northwest and northeast quadrants of the intersection.

The safe approach speed was found to be 16.3 mph for southbound Aster Drive; therefore, a YIELD sign is the recommended treatment.

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

July 21, 2016

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

RE: Traffic Control Recommendation for Mayflower Drive at Aster Drive
OHM JN: 0128-16-0190

Dear Mr. Huotari:

As requested, we have reviewed the Mayflower Drive at Aster Drive intersection to determine the proper traffic control. The subject intersection is a 3-leg intersection (tee) located in the City of Troy approximately 1,025 feet east of John R Road and 2,300 feet north of E Long Lake Road. The speed limit on both streets is 25 mph. There are currently no traffic control devices at this intersection. Reference the attachments for aerial and intersection photos.

Background on Traffic Control Determination

Based on the Michigan Manual of Uniform Traffic Control Devices (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.*

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



Based on the Michigan Manual of Uniform Traffic Control Devices (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.

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.

Crash Analysis

Based on information obtained through Traffic Improvement Association of Michigan, there were no crashes recorded in the past 5-years at the intersection of Mayflower Drive and Aster Drive. The crash data does not constitute a compelling case for modifying the existing controls.

Minimum Volumes

Given the orientation of the intersection, Mayflower Drive is considered the major road and Aster Drive the minor one. Although traffic counts were not collected in the vicinity of the intersection, based on knowledge of the area and the residential nature of the location, it is highly improbable that there are any daily hours in which Mayflower Drive meets the 300 vehicles per hour threshold for a minimum of 8 hours, therefore the minimum volume criteria for an all-way STOP has not been met.



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.

Types of Roadways

Both Mayflower Drive and Aster Drive are considered local streets. Due to the geometry, Mayflower Drive would be considered the continuing roadway. It should be noted that currently there are “no parking” signs posted along southbound Aster Drive and eastbound Mayflower Drive.

Sight Distance

The major potential sight distance obstructions at the intersection are houses in the northwest and northeast quadrants of the intersection. 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, a YIELD sign is commonly used. In this case, the safe approach speed was found to be 16.3 mph for southbound Aster Drive; therefore, a YIELD sign is the recommended treatment. The safe approach speed calculation spreadsheet is attached for your reference.



Recommendation

OHM recommends that the intersection control be made a one-way YIELD control. The sign should be placed on the southbound approach to the intersection on Aster Drive.

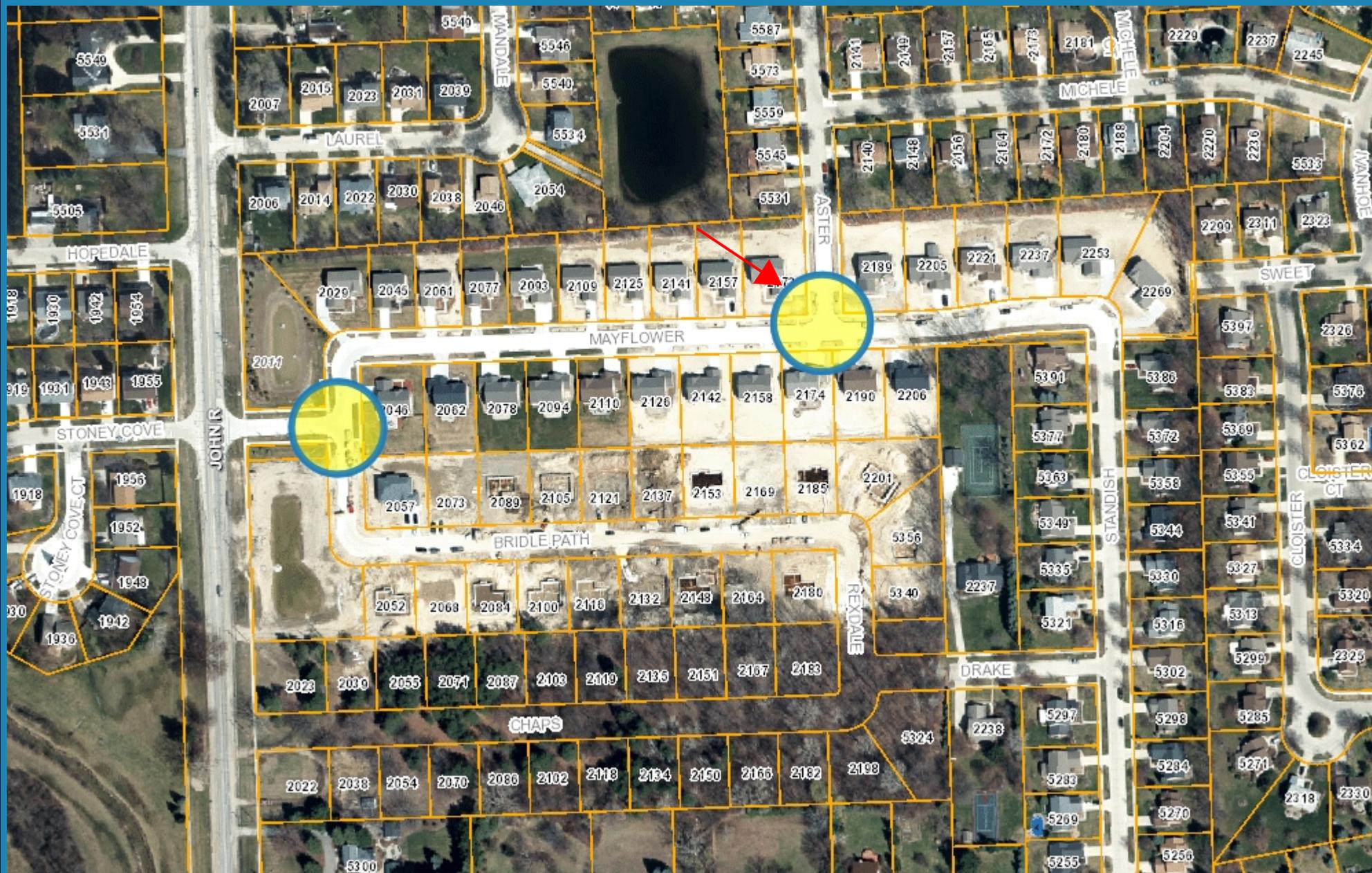
Sincerely,
Orchard Hiltz & McCliment, Inc.

Steve M. Loveland, PE, PTOE
Traffic Project Manager

Matt L. Clark, EIT
Engineer

Attachments:

- Aerial and Intersection Photos
- Safe Approach Speed Calculation Spreadsheet



596 0 298 596Feet



Note: The information provided by this application has been compiled from recorded deeds, plats, tax maps, surveys, and other public records and data. It is not a legally recorded map survey. Users of this data are hereby notified that the source information represented should be consulted for verification.

Safe Approach Speed Calculation

Mayflower at Aster
City of Troy

Road 1 = Mayflower
Road 2 = Aster

Date: 7/19/2016
Analyst: Matt Clark

Measured:

Width of Roads
Road 1 = 25 (ft)
Road 2 = 25 (ft)

Distance to Obstruction
a = 48 (ft)
b = 48 (ft)
c = 48 (ft)
d = 48 (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)
V₁ = 30 (mph)

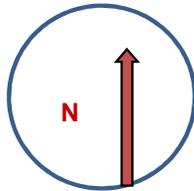
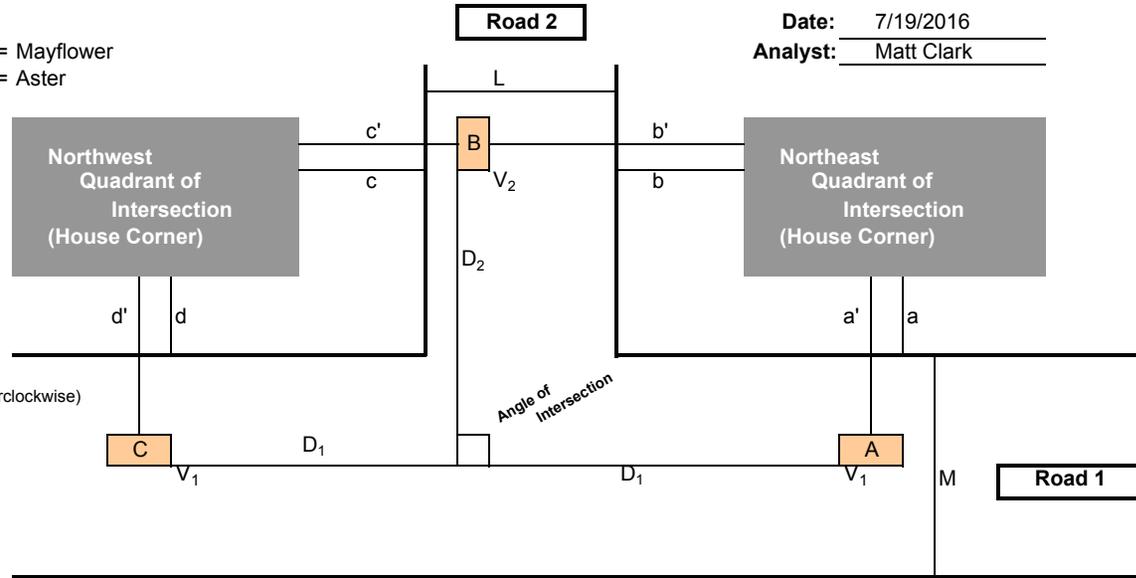
Perception / Reaction Time (AASHTO)
t = 2.5 (sec)

Deceleration rate (AASHTO)
A = 11.20

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

Calculated Safe Approach Speed for Vehicle B
Approaching on Road 2

V₂ = 16.3 (mph) [Based on Veh. A]
or V₂ = 16.3 (mph) [Based on Veh. C]



Intermediate Calculations:
D₁ = 196
D_{2A} = 85
D_{2C} = 85.0
a' = 57.5
b' = 63.5
c' = 57.5
d' = 63.5

Based On $D_1 = (1.075 V_1^2 / A) + 1.4667 V_1 t + EC$
 $D_{2A} = \frac{a' * D_1}{(D_1 - b')}$ or $D_{2C} = \frac{c' * D_1}{(D_1 - d')}$

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

TRUE

Recommended ROW control for Road 2

based on safe approach speed : **YIELD Sign**



Mayflower Drive looking east



Mayflower Drive looking west



Aster Drive looking southeast



Aster Drive looking southwest



Aster Drive looking south



Aster Drive looking north



TRAFFIC COMMITTEE REPORT

August 22, 2016

TO: Traffic Committee

FROM: Bill Huotari, Deputy City Engineer/ Traffic Engineer

SUBJECT: Request for Traffic Control
Mayflower at Bridle Path

Background:

Mr. Bill Bounds of 2205 Mayflower states that the lack of existing traffic control at the intersection of Mayflower and Bridle Path creates a hazardous condition. Traffic does not yield the right-of-way and travels through the intersection at a high rate of speed and is unsafe for drivers and pedestrians.

There have been no crashes reported at this intersection in the past five (5) years.

The posted speed limit on both streets is 25 mph. Due to the geometrics, Mayflower/Bridle Path is considered the continuing roadway.

There are no sight distance obstructions affecting safe approach speeds at the intersection. Right-of-way cannot be determined according to sight distance limitations.

Given that no criteria were met for STOP or YIELD sign intersection control; OHM recommends that the intersection remain uncontrolled. If, in the future, it is deemed that traffic control is necessary at the intersection, control the eastbound Mayflower Drive approach, rather than impeding the major north/south traffic.

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

July 27, 2016

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

RE: Traffic Control Recommendation for Mayflower Drive at Mayflower Drive/Bridle Path Drive
OHM JN: 0128-16-0200

Dear Mr. Huotari:

As requested, we have reviewed the Mayflower Drive at Mayflower Drive and Bridle Path Drive intersection to determine the proper traffic control. The subject intersection is a 3-leg intersection (tee) located in the City of Troy approximately 215 feet east of John R Road and 2,160 feet north of E Long Lake Road. The speed limit on both streets is 25 mph. There are currently no traffic control devices at this intersection. Reference the attachments for aerial and intersection photos.

Background on Traffic Control Determination

Based on the Michigan Manual of Uniform Traffic Control Devices (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.*

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



Based on the Michigan Manual of Uniform Traffic Control Devices (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.

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.

Crash Analysis

Based on information obtained through Traffic Improvement Association of Michigan, there were no crashes recorded in the past 5-years at the intersection of Mayflower Drive and Mayflower Drive/Bridle Path Drive. The crash data does not constitute a compelling case for modifying the existing controls.

Minimum Volumes

Given the orientation of the intersection, Mayflower Drive/Bridle Path Drive (the road that runs north-south) is considered the major road and Mayflower Drive the minor one. Although traffic counts were not collected in the vicinity of the intersection, based on knowledge of the area and the residential nature of the location, it is highly improbable that there are any daily hours in which Mayflower/Bridle Path



meets the 300 vehicles per hour threshold for a minimum of 8 hours, therefore the minimum volume criteria for an all-way STOP has not been met.

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.

Types of Roadways

Both Mayflower Drive and Mayflower Drive/Bridle Path Drive are considered local streets. Due to the geometry, Mayflower Drive/Bridle Path Drive (the road that runs north-south) would be considered the continuing roadway. It should be noted that currently there are “no parking” signs posted along northbound Mayflower Drive/Bridle Path Drive and both directions of Mayflower Drive.

Sight Distance

There are no sight distance obstructions affecting safe approach speeds at the intersection. Right-of-way cannot be determined according to sight distance limitations.

Recommendation

At this intersection, the road geometry dictates that Mayflower Drive/Bridle Path Drive (runs north-south) is the major through road. Given that no criteria were met for STOP or YIELD sign intersection control; OHM recommends that the intersection remain uncontrolled. If, in the future, it is deemed that traffic control is necessary at the intersection, control the eastbound Mayflower Drive approach, rather than impeding the major north/south traffic.

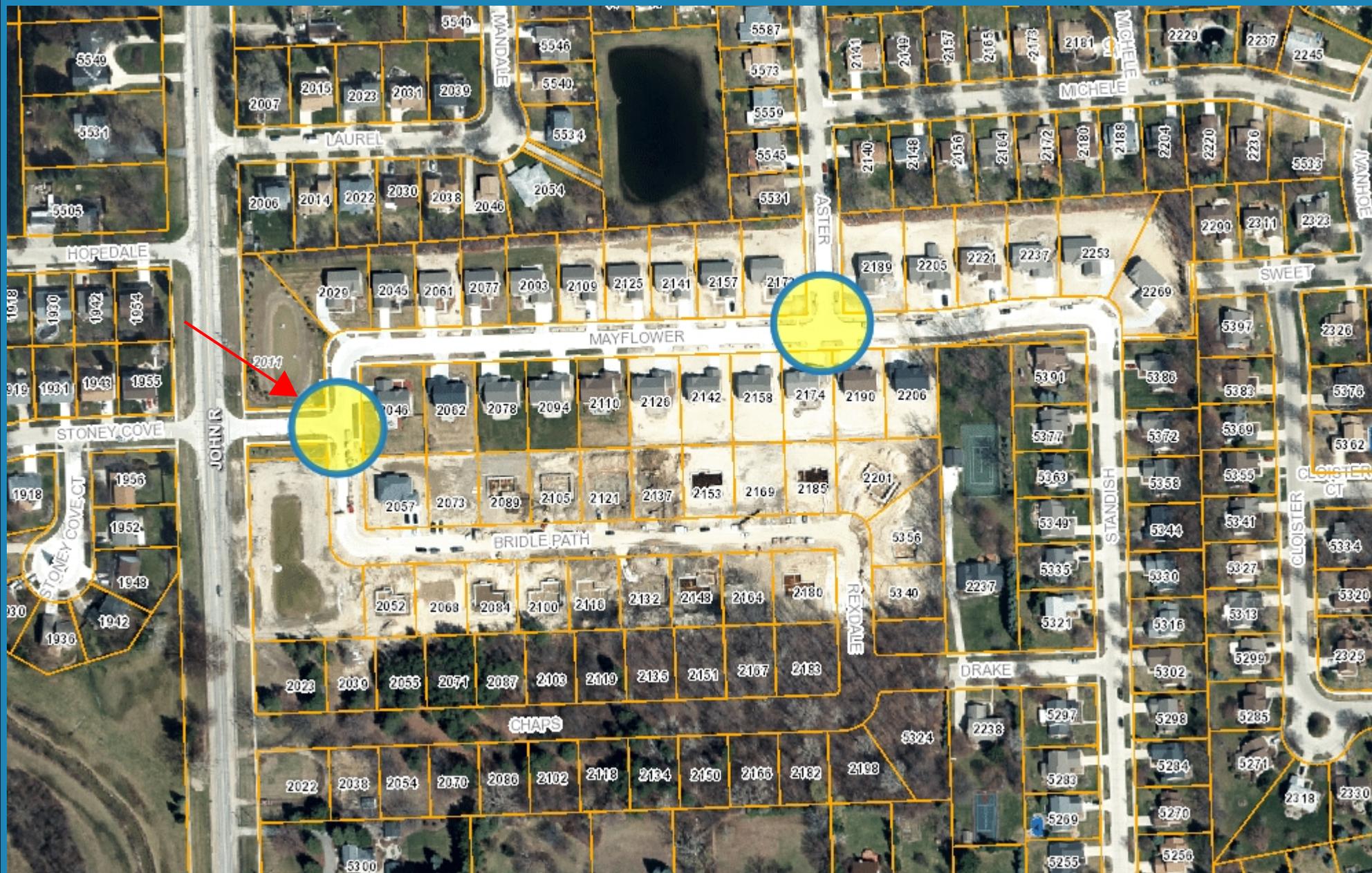
Sincerely,
Orchard Hiltz & McCliment, Inc.

Steve M. Loveland, PE, PTOE
Traffic Project Manager

Matt L. Clark, EIT
Engineer

Attachments:

- Aerial and Intersection Photos



596 0 298 596Feet



Note: The information provided by this application has been compiled from recorded deeds, plats, tax maps, surveys, and other public records and data. It is not a legally recorded map survey. Users of this data are hereby notified that the source information represented should be consulted for verification.



Mayflower Drive/Bridle Path Drive looking north



Mayflower Drive/Bridle Path Drive looking south



Mayflower Drive looking southeast



Mayflower Drive looking northeast



Mayflower Drive looking east



Mayflower Drive looking west



TRAFFIC COMMITTEE REPORT

August 22, 2016

TO: Traffic Committee

FROM: Bill Huotari, Deputy City Engineer/ Traffic Engineer

SUBJECT: Request for Traffic Control
Chapel at Calvert

Background:

Mr. Darrin Millar of 4700 Chapel states that drivers are not exhibiting caution and/or stopping at the existing YIELD signs on Calvert when traffic is approaching from Chapel. Traffic does not yield the right-of-way and travels through the intersection at a high rate of speed and is unsafe for drivers and pedestrians.

Based on information obtained through the Traffic Improvement Association of Michigan, there were two crashes recorded in the past 5-years at the intersection of Chapel Drive at Calvert Court/Calvert Drive. Both crashes involved a single vehicle with a distracted driver running off the road and striking a static object. The crash data does not constitute a compelling case for modifying the existing controls.

The posted speed limit on both streets is 25 mph. Due to the geometrics, Chapel Drive is considered the continuing roadway.

The major potential sight distance obstructions at the intersection are houses at the northeast, southwest and southeast quadrants of the intersection and a line of bushes on the northwest quadrant.

The safe approach speed was found to be 10.3 mph for southwest-bound Calvert Drive based on a vehicle traveling southeast-bound on Chapel Drive as a result of the sight obstruction from the line of bushes on the right side on approach to the intersection.

Similarly, the safe approach speed was found to be 18.6 mph for northeast-bound Calvert Court based on a vehicle traveling southeast-bound on Chapel Drive as a result of the sight obstruction from the house corner. Thus, maintaining the existing YIELD signs on Calvert Court and Calvert Drive is recommended.

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

August 15, 2016

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

RE: Traffic Control Recommendation for Chapel Drive at Calvert Court/Calvert Drive
OHM JN: 0128-16-0220

Dear Mr. Huotari:

As requested, we have reviewed the Chapel Drive at Calvert Court/Calvert Drive intersection to determine the proper traffic control. The subject intersection is a 4-leg intersection located in the City of Troy approximately 1,800 feet south of E. Long Lake Road and 2,050 feet west of John R. Road. The speed limit on both streets is 25 mph. There are currently YIELD signs on the northeast and southwest legs of this intersection. Reference the attachments for aerial and intersection photos.

Background on Traffic Control Determination

Based on the Michigan Manual of Uniform Traffic Control Devices (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.*

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



Based on the Michigan Manual of Uniform Traffic Control Devices (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.

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.

Crash Analysis

Based on information obtained through the Traffic Improvement Association of Michigan, there were two crashes recorded in the past 5-years at the intersection of Chapel Drive at Calvert Court/Calvert Drive. Both crashes involved a single vehicle with a distracted driver running off the road and striking a static object. The crash data does not constitute a compelling case for modifying the existing controls. A crash summary report is attached to this memo.

Minimum Volumes

Given the orientation of the intersection, Chapel Drive (the road that runs northwest-southeast) is considered the major road and Calvert Court/Calvert Drive the minor one. Although traffic counts were not collected in the vicinity of the intersection, based on knowledge of the area and the residential nature



of the location, it is highly improbable that there are any daily hours in which Chapel Drive meets the 300 vehicles per hour threshold for a minimum of 8 hours, therefore the minimum volume criteria for an all-way STOP has not been met.

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.

Types of Roadways

Both Chapel Drive and Calvert Court/Calvert Drive are considered local streets. Due to the geometry, Chapel Drive would be considered the continuing roadway. It should be noted that currently there are “no parking” signs posted along southwest-bound Calvert Court/Calvert Drive and southeast-bound Chapel Drive.

Sight Distance

The major potential sight distance obstructions at the intersection are houses at the northeast, southwest and southeast quadrants of the intersection and a line of bushes on the northwest quadrant. 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, a YIELD sign is recommended. In this case, the safe approach speed was found to be 10.3 mph for southwest-bound Calvert Drive based on a vehicle traveling southeast-bound on Chapel Drive as a result of the sight obstruction from the line of bushes on the right side on approach to the intersection. Similarly, the safe approach speed was found to be 18.6 mph for northeast-bound Calvert Court based on a vehicle traveling southeast-bound on Chapel Drive as a result of the sight obstruction from the house corner. Thus, maintaining the existing YIELD signs on Calvert Court and Calvert Drive is recommended.



Recommendation

At this intersection, the road geometry dictates that Chapel Drive is the major through road. Given that no criteria were met for STOP sign intersection control; OHM recommends that Calvert Court and Calvert Drive remain under YIELD control.

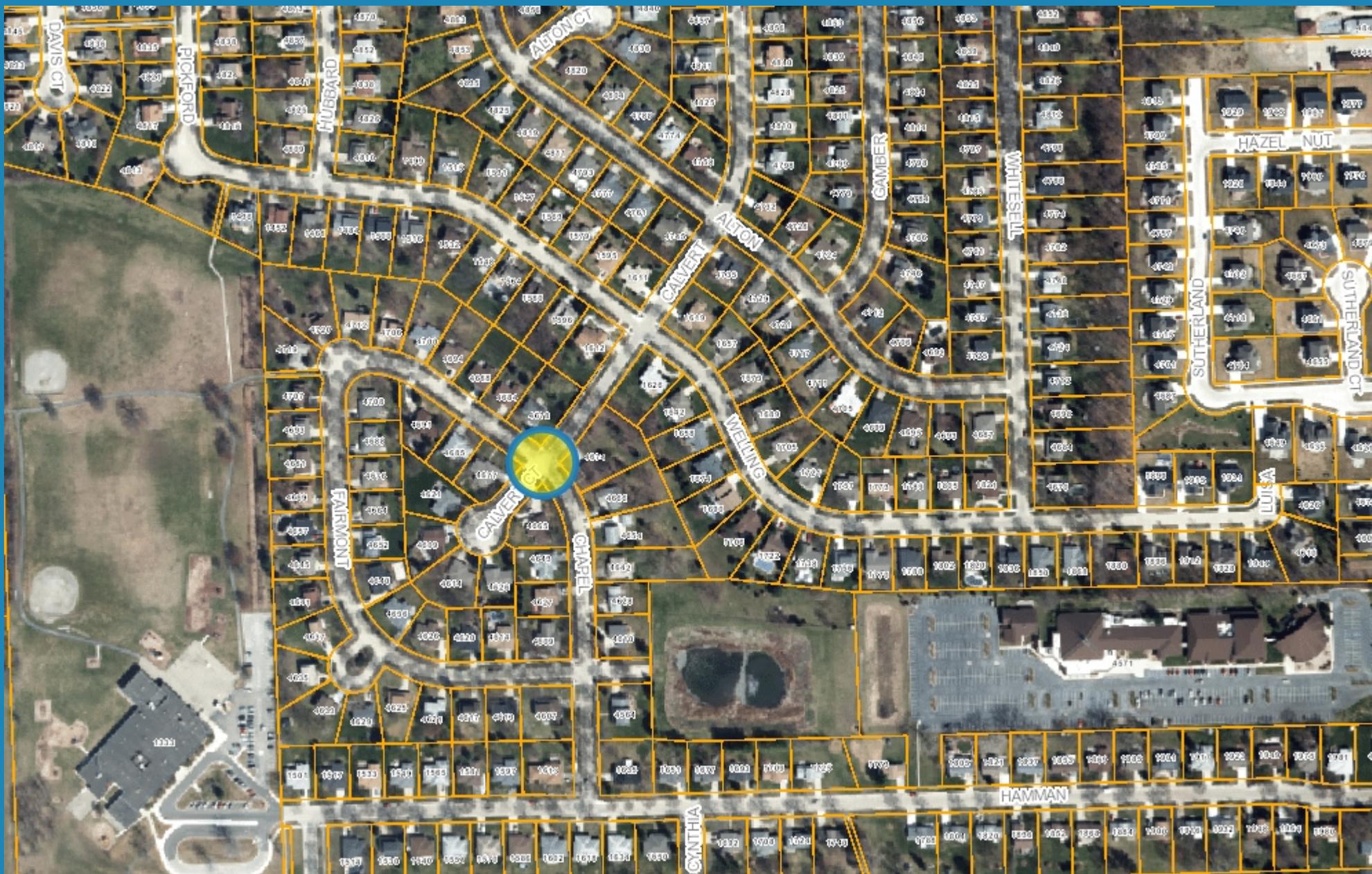
Sincerely,
Orchard Hiltz & McCliment, Inc.

Steve M. Loveland, PE, PTOE
Traffic Project Manager

Matt L. Clark, EIT
Engineer

Attachments:

- Aerial and Intersection Photos
- Crash Data Summary



833 0 417 833Feet



Note: The information provided by this application has been compiled from recorded deeds, plats, tax maps, surveys, and other public records and data. It is not a legally recorded map survey. Users of this data are hereby notified that the source information represented should be consulted for verification.

Safe Approach Speed Calculation

Chapel at Calvert - Northeast Leg
City of Troy

Road 1 = Chapel
Road 2 = Calvert

Date: 8/12/2016
Analyst: Matt Clark

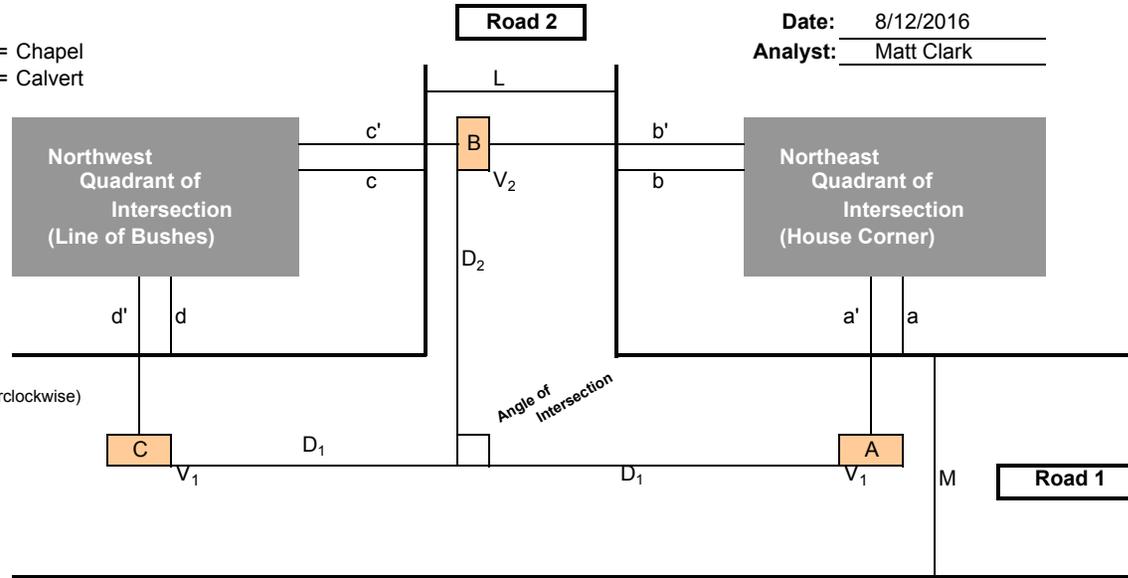
Measured:

Width of Roads
Road 1 = 26 (ft)
Road 2 = 25 (ft)

Distance to Obstruction
a = 45 (ft)
b = 49 (ft)
c = 16 (ft)
d = 76 (ft)

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

Road 1 Posted
Speed Limit = 25 (mph)



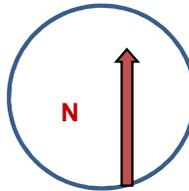
Assumed:

Speed of Vehicle A = Speed of Vehicle C
= Posted Speed Limit on Road 1
+ 5 (mph)
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} = 81.9
D_{2C} = 48.0
a' = 55
b' = 64.5
c' = 25.5
d' = 92

Based On $D_1 = (1.075 V_1^2 / A) + 1.4667 V_1 t + EC$
 $D_{2A} = \frac{a' * D_1}{(D_1 - b')}$ or $D_{2C} = \frac{c' * D_1}{(D_1 - d)}$

Calculated Safe Approach Speed for Vehicle B

Approaching on Road 2
V₂ = 15.8 (mph) [Based on Veh. A]
or V₂ = 10.3 (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

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

Safe Approach Speed Calculation

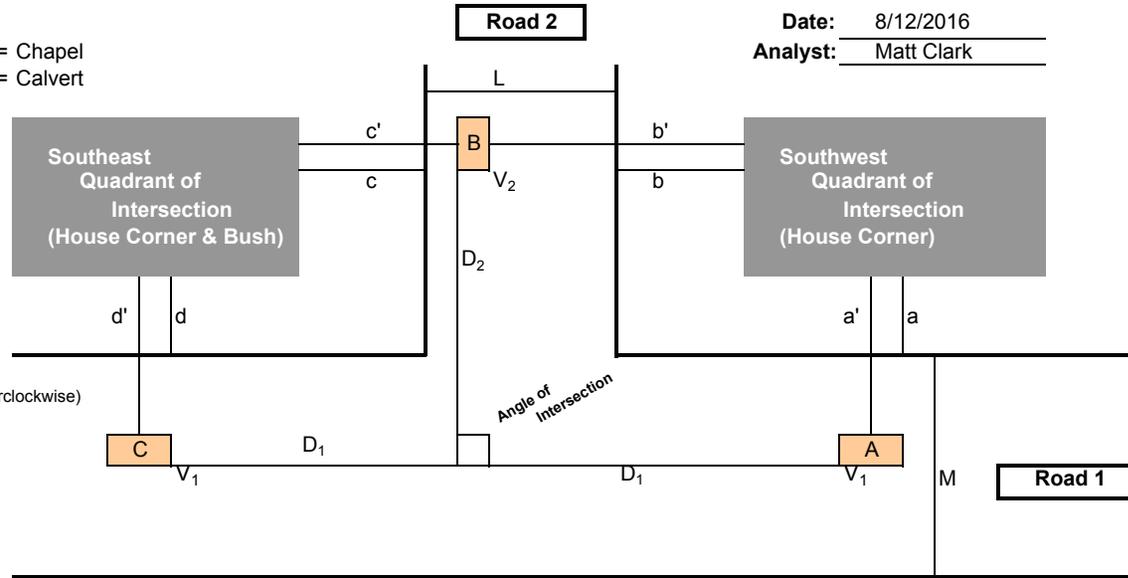
Chapel at Calvert - Southwest Leg
City of Troy

Road 1 = Chapel
Road 2 = Calvert

Date: 8/12/2016
Analyst: Matt Clark

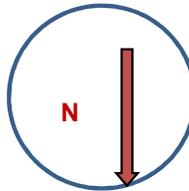
Measured:

- Width of Roads
 - Road 1 = 26 (ft)
 - Road 2 = 25 (ft)
- Distance to Obstruction
 - a = 55 (ft)
 - b = 55 (ft)
 - c = 72 (ft)
 - d = 38 (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)



Intermediate Calculations:	
$D_1 = 196$	$a' = 65$
$D_{2A} = 101$	$b' = 70.5$
$D_{2C} = 112.4$	$c' = 81.5$
	$d' = 54$

Based On $D_1 = (1.075 V_1^2 / A) + 1.4667 V_1 t + EC$
 $D_{2A} = \frac{a' * D_1}{(D_1 - b')}$ or $D_{2C} = \frac{c' * D_1}{(D_1 - d')}$

Calculated Safe Approach Speed for Vehicle B
Approaching on Road 2

- $V_2 = 18.6$ (mph) [Based on Veh. A]
- or $V_2 = 20.1$ (mph) [Based on Veh. C]

TRUE

Recommended ROW control for Road 2

based on safe approach speed : **YIELD Sign**

Notes: Enter field measurements in yellow highlighted area.

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

Calculated by spreadsheet



Calvert Drive looking southwest



Calvert Drive looking southeast



Calvert Drive looking northwest



Chapel Drive looking southeast



Calvert Court looking northeast



Calvert Court looking northwest



Calvert Court looking southeast



Chapel Drive looking northwest


Traffic Improvement Association of Michigan
TIA Crash Summary - Chapel & Calvert - 11-15

Request #: 0040065

Printed By: Stephen Dearing

Printed On: 8/12/2016

 DATE_VAL: between 01/01/2011 and 12/31/2015

#1 Location: CALVERT DR (0.06) 100 feet N of CHAPEL DR **Crash ID:** 8775087
Crash Date: 10/28/2013 **Day:** Mon **Hour:** 6pm **Weather:** cloudy **Roadway:** dry **Light:** dark/unltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 1 **How:** single
CVT: Troy **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 130034165

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	N	go straight	ran off road/r	tree	none	none	negl driving	car	rtfront

UD-10: [8775087](#)

#2 Location: EB CHAPEL DR (0.13) 99 feet SE of CALVERT DR **Crash ID:** 9265419
Crash Date: 05/07/2015 **Day:** Thu **Hour:** 8pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 1 **How:** single
CVT: Troy **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150014825

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	ran off road/r	mailbox	none	none	negl driving	car	ctrfront

UD-10: [9265419](#)

Crash Type

Count	Type
0	uncoded
2	single
0	head-on
0	head-on/lt
0	angle
0	rr-end
0	rr-end/lt
0	rr-end/rt
0	ss-same
0	ss-opp
0	unknown
Totals:	2

Light Conditions

Count	Type
0	uncoded
1	day
0	dawn
0	dusk
0	dark/lt
1	dark/unltd
0	unknown
Totals:	2

Weather

Count	Type
0	uncoded
1	clear
1	cloudy
0	fog/smoke
0	rain
0	snow
0	wind
0	sleet/hail
0	unknown
Totals:	2

Road Condition

Count	Type
0	uncoded
2	dry
0	wet
0	icy
0	snowy
0	muddy
0	slushy
0	debris
0	unknown
Totals:	2

Crashes By Month

Count	Type
0	January
0	February
0	March
0	April
1	May
0	June
0	July
0	August
0	September
1	October
0	November
0	December
Totals:	2

Hazardous Action

Count	Type
0	none
0	speeding
0	imprp/no signal
0	imprp backing
0	unable to stop
0	other
0	unknown
0	reckls driving
2	negl driving
0	spd too slow
0	failed to yield
0	disrgd traffic cntrl
0	wrong way
0	left of center
0	imprp passing
0	imprp lane use
0	imprp turn
Totals:	2

Unit Type

Count	Type
0	Bicyclist
0	Engineer
2	Vehicle
0	Pedestrian
Totals:	2

Crashes By Year

Count	Type
0	2000
0	2001
0	2002
0	2003
0	2004
0	2005
0	2006
0	2007
0	2008
0	2009
0	2010
0	2011
0	2012
1	2013
0	2014
1	2015
0	2016
Totals:	2

Crash Severity

	FATAL	A	B	C	No Inj	Total
Persons	0	0	0	0	2	2
Crashes	0	0	0	0	2	2

Alcohol in Crashes

	FATAL	PI	PD	Total
Drinking	0	0	0	0
Not Drinking	0	0	2	2
Total	0	0	2	2

Crashes per Hour by Day

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Unknown	Total
12a - 1a	0	0	0	0	0	0	0	0	0
1a - 2a	0	0	0	0	0	0	0	0	0
2a - 3a	0	0	0	0	0	0	0	0	0
3a - 4a	0	0	0	0	0	0	0	0	0
4a - 5a	0	0	0	0	0	0	0	0	0
5a - 6a	0	0	0	0	0	0	0	0	0
6a - 7a	0	0	0	0	0	0	0	0	0
7a - 8a	0	0	0	0	0	0	0	0	0
8a - 9a	0	0	0	0	0	0	0	0	0
9a - 10a	0	0	0	0	0	0	0	0	0
10a - 11a	0	0	0	0	0	0	0	0	0
11a - 12p	0	0	0	0	0	0	0	0	0
12p - 1p	0	0	0	0	0	0	0	0	0
1p - 2p	0	0	0	0	0	0	0	0	0
2p - 3p	0	0	0	0	0	0	0	0	0
3p - 4p	0	0	0	0	0	0	0	0	0
4p - 5p	0	0	0	0	0	0	0	0	0
5p - 6p	0	0	0	0	0	0	0	0	0
6p - 7p	0	1	0	0	0	0	0	0	1
7p - 8p	0	0	0	0	0	0	0	0	0
8p - 9p	0	0	0	0	1	0	0	0	1
9p - 10p	0	0	0	0	0	0	0	0	0
10p - 11p	0	0	0	0	0	0	0	0	0
11p - 12a	0	0	0	0	0	0	0	0	0
Unknown Time	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	2