TRAFFIC COMMITTEE AGENDA

January 17, 2024 – 7:30 P.M.

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

1. Roll Call
2. Approval of Minutes – November 15, 2023 Traffic Committee

PUBLIC HEARINGS

3. No Public Hearings

REGULAR BUSINESS

4. Request for Traffic Control – Hearthside Drive & Country Ridge Drive
5. Request for Traffic Control – Hopedale Road & Viking Drive
6. Public Comment
7. Other Business
8. Adjourn

Copy to:

Item 4: Cheryl Gonda, 6113 Hearthside; Properties within 300'

Item 5: Mary Gnyp, 1930 Hopedale; Properites within 300'

Traffic Committee Members; Sgt. Brian Warzecha, Police Department; Deputy Fire Chief, Michael Koehler, 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.

2. Approval of Minutes – November 15, 2023 Traffic Committee

PUBLIC HEARING

3. No Public Hearings

REGULAR BUSINESS

4. Request for Traffic Control – Hearthside Drive & Country Ridge Drive

Cheryl Gonda of 6113 Hearthside Drive requested that the intersection of Hearthside Drive and Contry Ridge Drive be reviewed for purposes of traffic control at the uncontrolled intersection. She states: I live in cul-de-sac on Hearthside Drive and the existing uncontrolled intersection is dangerous, cars turning off Country Ridge Drive turn without looking. This creates a hazardous situation for drivers, there have been several near misses recently.

SUGGESTED RESOLUTIONS:

a. RESOLVED, that the Country Ridge Drive Approach at Hearthside Drive be modified from UNCONTROLLED, to YEILD CONTROLLED.

b. RESOLVED, that **NO CHANGE** be made to the Country Ridge Drive Approach at Hearthside Drive.

5. Request for Traffic Control – Hopedale Road & Viking Drive

Mary Gnyp of 1930 Hopedale Road requested that the intersection of Hopedale Road and Viking Drive be reviewed for purposes of traffic control at the uncontrolled intersection. She states: I live on Hopedale Road and the existing uncontrolled intersection is dangerous, cars turning off Viking Drive turn without looking and there is a bus stop at the intersection. This creates a hazardous situation for drivers, there have been several near misses recently.

SUGGESTED RESOLUTIONS:

c. RESOLVED, that the Viking Drive Approach at Hopedale Road be modified from UNCONTROLLED, to YEILD CONTROLLED.

d. RESOLVED, that **NO CHANGE** be made to the Viking Drive Approach at Hopedale Road.

6. Public Comment

7. Other Business

8. Adjourn

A regular meeting of the Troy Traffic Committee was held Wednesday, November 23, 2023 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: Shama Kenkre
Richard Kilmer
Cindy Nurak
Al Petrulis
Abi Swaminathan
Cynthia Wilsher
Pete Ziegenfelder
Angela Zhou, Student Representative

Also present: G. Scott Finlay, City Engineer
Sgt. Brian Warzecha, Police Department
Deputy Fire Chief, Paul Firth, Fire Department
Merissa Clark, Administrative Assistant

2. Minutes – September 20, 2023 Traffic Committee

Resolution # 2023-11-10
Moved by Kilmer
Seconded by Nurak

To approve the September 20, 2023 minutes as printed.

Yes: Kenkre, Kilmer, Nurak, Petrulis, Swaminathan, Wilsher, Ziegenfelder
No: None
Absent: None

MOTION CARRIED

PUBLIC HEARINGS

3. Request for Sidewalk Waiver – 6970 Donaldson (Sidwell # 88-20-03-126-048)

Harsha & Danelle Chandra-Sekhar, homeowners request a sidewalk waiver for the sidewalk at 6970 Donaldson (Sidwell # 88-20-03-126-048). The homeowners state:

> *There are no other sidewalks in the subdivision. This would be the only sidewalk and property on both sides as well as across the street have no sidewalks. A sidewalk would literally be a sidewalk to nowhere.*

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*

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

ITEM REMOVED BY APPLICANT

4. Request for Sidewalk Waiver – 5921 Willow Grove (Sidwell # 88-20-11-126-026)

Mike Agnetti, homeowner requests a sidewalk waiver for the sidewalk at 5921 Willow Grove (Sidwell # 88-20-11-126-026). Mr. Agnetti states:

a. *There are no other sidewalks in the subdivision. This would be the only sidewalk and property on both sides as well as across the street have no sidewalks. A sidewalk would literally be a sidewalk to nowhere.*

b. *There are several new construction homes in the subdivision and none of them have sidewalks.*

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 and the open drainage ditches of the area"*, subject to the submission of a cash deposit for future construction to assure consent and participation in any future sidewalk installation.

ITEM REMOVED BY APPLICANT

5. Request for Sidewalk Waiver – 1868 Eastport (Sidwell # 88-20-27-333-017)

Jonathan Janke, homeowner requests a sidewalk waiver for the sidewalk at 1868 Eastport (Sidwell # 88-20-27-333-017). Mr. Janke states:

a. *There are no other sidewalks in the subdivision. This would be the only sidewalk and property on both sides as well as across the street have no sidewalks. A sidewalk would literally be a sidewalk to nowhere.*

b. *There are several new construction homes in the subdivision and none of them have sidewalks.*

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 and the open drainage ditches of the area"*, subject to the submission of a cash deposit for future construction to assure consent and participation in any future sidewalk installation.

Rebekah Perry the homeowner at 1868 Eastport stated that there are no other sidewalks in the subdivision or on Eastport. The sidewalk would lead nowhere, and none of the other new construction homes installed sidewalk.

Tim Ostler the homeowner at 1856 Eastport stated that he sold this lot to the owners and mentioned that the builder was not aware of the sidewalk requirement/process that Troy has in place. Pointed out that a culvert pipe was recently installed when the streets were repaved this year and the culvert pipe is exactly where the sidewalk would be placed. He does not think it should be required.

Mr. Savoie at 1853 Eastport agreed with both of his neighbors.

Pete Ziegenfelder stated that the sidewalk would eventually connect/lead to somewhere.

Al Petrulis stated that it wouldn't make sense to install the sidewalk, especially with the culvert pipe being placed where it is.

Cynthia Wilsher stated she has lived next to this subdivision since the 60's and it has never had sidewalk – Maple had it installed but nowhere else.

Richard Kilmer asked why the culvert pipe was placed there, and Scott Finlay explained the reasoning in regards to the Engineering Departments paving job.

Resolution # 2023-11-11
Moved by Petrulis
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, Jonathan Janke has requested a waiver of the requirement to construct sidewalk based on lack of sidewalk on surrounding parcels; 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 1868 Eastport (Sidwell # 88-20-27-333-017) subject to the submission of a cash deposit commensurate with the cost of sidewalk construction.

Yes: Kenkre, Kilmer, Nurak, Petrulis, Swaminathan, Wilsher, Ziegenfelder
No: None
Abesnt: None

MOTION CARRIED
REGULAR BUSINESS

6. 2024 Traffic Committee Meeting Schedule

According to the City of Troy Traffic Committee By-Laws, Article IV – Meetings:

"Regular meetings will be held on the third Wednesday of each month at 7:30 p.m. at the Troy City Hall, 500 West Big Beaver Road, Troy, Michigan."

There are no other by-laws or procedures that establish the actual dates of the meetings, but an annual calendar of meetings is published by the City so meeting dates need to be set for this purpose.

Resolution # 2023-11-12
Moved by Wilsher
Seconded by Nurak

> RESOLVED, that the Traffic Committee SHALL HOLD Regular Meetings in 2024 according to the following schedule at 7:30 PM:

- Wednesday, January 17
- Wednesday, February 21
- Wednesday, March 20
- Wednesday, April 17
- Wednesday, May 15
- Wednesday, June 19
- Wednesday, July 17
- August – NO MEETING
- Wednesday, September 18
- Wednesday, October 16
- Wednesday, November 20
- December – NO MEETING

7. Public Comment

There was no further public comment at the meeting.

8. Other Business

9. Adjourn

The meeting adjourned at 7:50 PM.

Pete Ziegenfelder -Chairperson

G. Scott Finlay, City Engineer/Traffic Engineer

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December 6th, 2023

Mr. Scott G Finlay, PE
City Engineer
City of Troy
500 W. Big Beaver Rd
Troy, MI 48084

RE: Traffic Control Recommendation for
Hearthside Dr at County Ridge Dr

Dear Mr. Finlay:

As requested, we have reviewed the intersection of Hearthside Rd at County Ridge Dr to determine the proper traffic control. Hearthside Dr at County Ridge Dr is a 3-legged intersection located in the City of Troy. The speed limit on both streets under investigation is 25 mph. The intersection does not have any stop-controlled approaches. Attached are aerial and intersection photos.

Types of Roadways

Both Hearthside Dr and County Ridge Dr are considered local streets. Hearthside Dr runs north to south providing direct access to the neighborhood from W Square Lake Road. County Ridge Dr runs east to west offering access to the neighborhood off Coolidge Hwy.

The surrounding land use is entirely single-family residential. On-street parking is permitted on the east side of Hearthside Dr and prohibited on the west side. On-Street parking is permitted on the north side of County Ridge Dr and prohibited on the south side. There is no clear major versus minor street. However, for the purpose of analysis Hearthside Dr is presumed to be the major road, while County Ridge Dr is considered the minor road. Both County Ridge Dr and Hearthside Dr serve as key routes throughout the neighborhood.

Traffic Control Analyses

Traffic control analyses described herein adheres to the requirements presented in the Michigan Manual on Uniform Traffic Control Devices (MMUTCD) that are considered mandates of state law. A reference document explaining the background behind the analyses is attached to this memo.

Crash Analysis

Based on information obtained through the Traffic Improvement Association of Michigan, there were no crashes recorded in the past full five (5) years within a 200' radius of the intersection. The crash history does not constitute a compelling case for modifying the existing controls.

OHM Advisors
34000 PLYMOUTH ROAD
LIVONIA, MICHIGAN 48150
T 734.522.6711
F 734.522.6427
OHM-Advisors.com

Traffic Volumes

Traffic counts were not collected in the vicinity of the intersection. Traffic volumes in residential areas are predominantly driven by the number of single-family residential homes in the neighborhood. Based on the residential nature and the number of homes in the surrounding area it is highly improbable that this location would satisfy any of the minimum volume warrants for an all-way STOP (see attached Reference Guide).

It is therefore extremely unlikely that County Ridge Dr meets and sustains the 300 vehicles per hour threshold for a minimum of 8 hours. The combined vehicular, pedestrian, and bicycle volumes entering from Hearthside Dr is similarly unlikely to average at least 200 units for any 8 hours. Additionally, since the posted speed limit is only 25mph, it is reasonable to assume that the 85th percentile approach speed does not exceed 40mph on either road; thus, the minimum vehicular volume warrants cannot be discounted to 70 percent of the values described previously. Finally, the study intersection is likely to fall significantly shy even of the reduced 80 percent volumes, based on expected trip generation for this neighborhood. Therefore, the minimum volume criteria for an all-way STOP have not likely been met. Traffic volumes in residential areas are predominantly driven by the number of single-family residential homes in the neighborhood.

Approach Speed Limits

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

Sight Distance

The major potential sight distance obstruction at the intersection of County Ridge Dr at Hearthside Dr for a motorist traveling eastbound on County Ridge Rd would be the coniferous tree and house corner on the southwest quadrant and the house corner on the northwest quadrant of the intersection. These obstructions impact the calculated 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 seen on the cross street.

When the safe approach speed is found to be 10 mph or less, a STOP sign is recommended. 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 for northbound vehicles on County Ridge Dr is 17.7 mph due to the permanent sight distance obstructions on the southwest and northwest quadrants. Thus, based on the safe approach speed calculations, YIELD-control is the computed right-of-way control for Hearthside Dr approach. The safe approach speed calculation spreadsheet for the intersection is attached for reference.

Recommendation

The preceding analysis did not determine that any criteria were met for all-way STOP-control. The safe approach speed calculations suggested YIELD-control would be appropriate for the minor street County Ridge Dr approach.

OHM recommends implementing a YIELD sign on the County Ridge Dr approach. The intersection should be re-evaluated if traffic volumes increase, or crashes begin to occur.

Sincerely,
OHM Advisors

Alyssa Downs

Alyssa Downs
Traffic Engineer

Attachments:
- Aerial Photo
- Safe Approach Speed Calculation Spreadsheet
- Intersection Photos
- Traffic Control Determination Reference Guide

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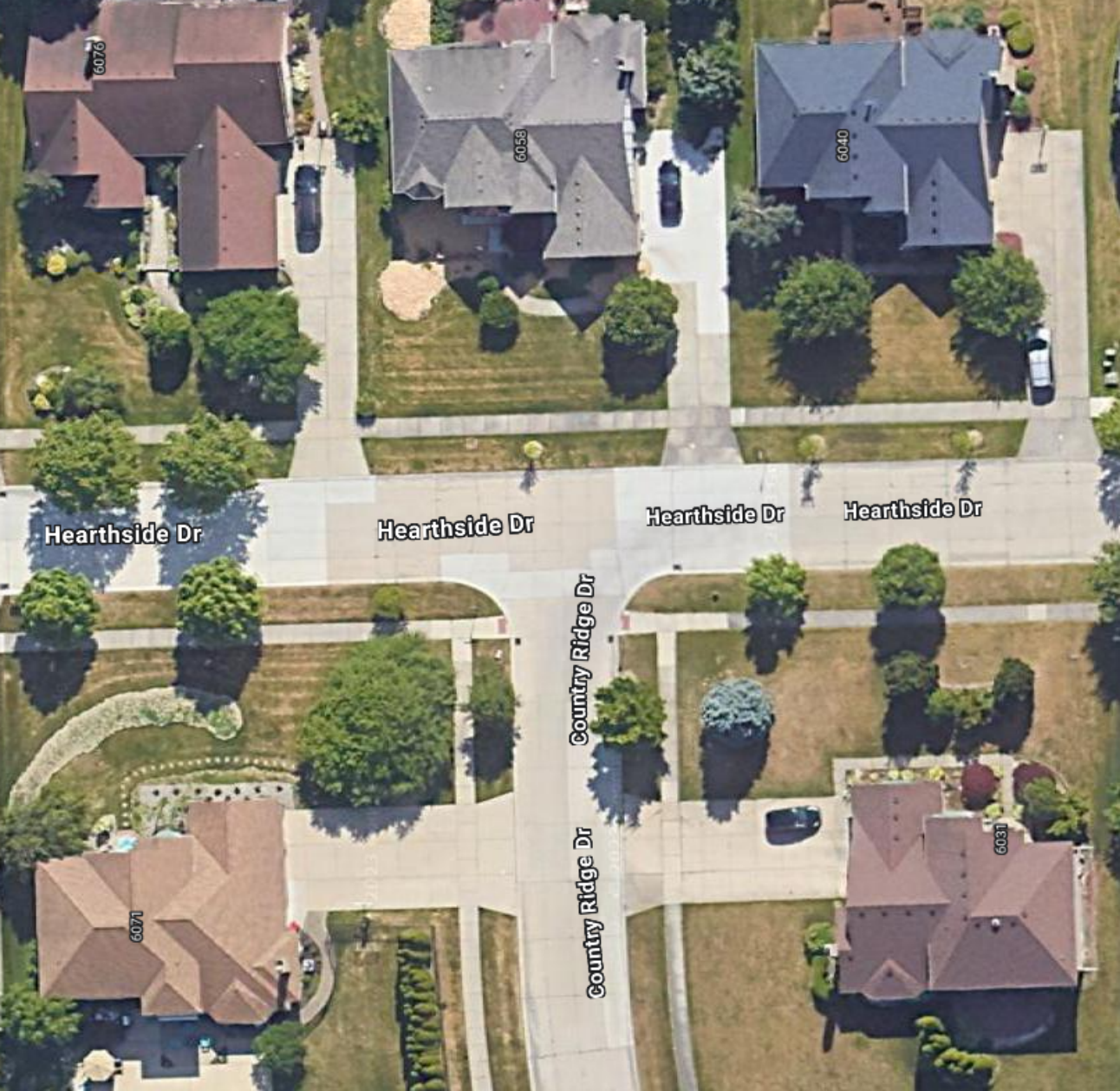
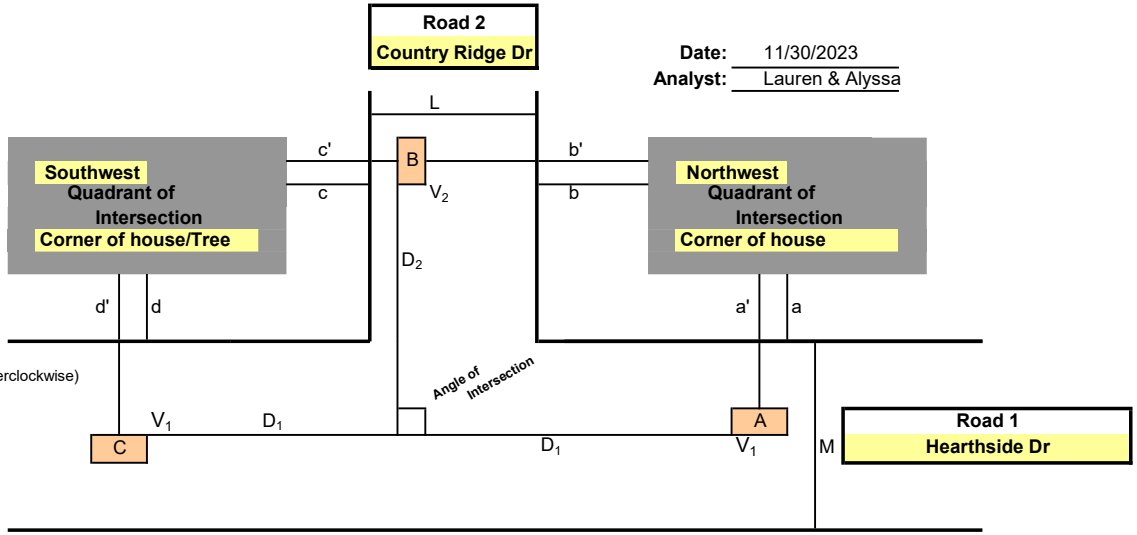
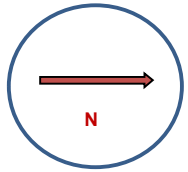

6078
6058
6040
Hearthside Dr
Hearthside Dr
Hearthside Dr
Hearthside Dr
Country Ridge Dr
Country Ridge Dr
6071
6031

Safe Approach Speed Calculation

Hearthside Dr and Country Ridge Dr
City of Troy

Date: 11/30/2023
Analyst: Lauren & Alyssa





Measured:

Width of Roads
- Road 1 = 28 (ft)
- Road 2 = 28 (ft)

Distance to Obstruction
- a = 59 (ft)
- b = 59 (ft)
- c = 63 (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} =	105	b' =	75
D_{2C} =	95.2	c' =	69
		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
- 19.1 (mph) [Based on Veh. A]
- or V_2 = 17.7 (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 : **YIELD SIGN**

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

Photograph No. 1: Hearthside Drive -Heading North Looking Left
Date: 11/30/2023 **Photographer:** Lauren Hull

Photograph No. 2: Hearthside Drive - Heading North
Date: 11/30/2023 **Photographer:** Lauren Hull

Photograph No. 3: County Ridge Drive - Heading East Looking Left
Date: 11/30/2023 **Photographer:** Lauren Hull

Photograph No. 4: Country Ridge Drive - Heading East Looking Right
Date: 11/30/2023 **Photographer:** Lauren Hull

Photograph No. 5: Hearthside Drive - Heading South
Date: 11/30/2023 **Photographer:** Lauren Hull

Photograph No. 6: Hearthside Drive - Heading South Looking Right
Date: 11/30/2023 **Photographer:** Lauren Hull

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). Act 300 of Public Acts of 1949 (as amended) requires the adoption of this Manual, and further requires conformance to the manual for all state highways, county roads and local streets open to public travel.

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.

In many cases 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.*

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December 1, 2023

Mr. Scott G Finlay, PE
City Engineer
City of Troy
500 W. Big Beaver Rd
Troy, MI 48084

RE: Traffic Control Recommendation for
Hopedale Drive at Viking Drive

Dear Mr. Finlay:

As requested, we have reviewed the intersection of Hopedale Drive at Viking Drive to determine the proper traffic control. Hopedale Drive at Viking Drive is a 3-legged intersection located in the City of Troy. The speed limit on both streets under investigation is 25 mph. The intersection does not have any controlled approaches. Attached are aerial and intersection photos.

Types of Roadways

Both Hopedale Drive and Viking Drive are considered local streets. Hopedale Drive runs east to west providing direct access to the neighborhood from John R Road. Viking Drive runs north to south offering access to the neighborhood between Hopedale Drive and Abbotsford Drive.

The surrounding land use is entirely single-family residential. On-street parking is permitted on the south side of Hopedale Drive and on the west side of Viking Drive. Hopedale Drive is presumed to be the major road, while Viking Drive is considered the minor road as it represents the stem of this tee intersection. Both Hopedale Drive and Viking Drive serve as key routes throughout the neighborhood.

Traffic Control Analyses

Traffic control analyses described herein adheres to the requirements presented in the Michigan Manual on Uniform Traffic Control Devices (MMUTCD) that are considered mandates of state law. A reference document explaining the background behind the analyses is attached to this memo.

Crash Analysis

Based on information obtained through the Traffic Improvement Association of Michigan, there were no crashes recorded in the past full five (5) years within a 200' radius of the intersection. The crash history does not constitute a compelling case for modifying the existing controls.

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34000 PLYMOUTH ROAD
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Traffic Volumes

Traffic counts were not collected in the vicinity of the intersection. Traffic volumes in residential areas are predominantly driven by the number of single-family residential homes in the neighborhood. Based on the residential nature and the number of homes in the surrounding area it is highly improbable that this location would satisfy any of the minimum volume warrants for an all-way STOP (see attached Reference Guide).

It is therefore extremely unlikely that Hopedale Drive meets and sustains the 300 vehicles per hour threshold for a minimum of 8 hours. The combined vehicular, pedestrian, and bicycle volumes entering from Viking Drive is similarly unlikely to average at least 200 units for any 8 hours. Additionally, since the posted speed limit is only 25mph, it is reasonable to assume that the 85th percentile approach speed does not exceed 40mph on either road; thus, the minimum vehicular volume warrants cannot be discounted to 70 percent of the values described previously. Finally, the study intersection is likely to fall significantly shy even of the reduced 80 percent volumes, based on expected trip generation for this neighborhood. Therefore, the minimum volume criteria for an all-way STOP has not likely been met. Traffic volumes in residential areas are predominantly driven by the number of single-family residential homes in the neighborhood.

Approach Speed Limits

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

Sight Distance

The major potential sight distance obstruction at the intersection of Hopedale Drive at Viking Drive for a motorist traveling southbound on Viking Drive would be the house corners on the northeast and northwest quadrants of the intersection. These obstructions impact the calculated 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 seen on the cross street.

When the safe approach speed is found to be 10 mph or less, a STOP sign is recommended. 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 for southbound vehicles on Viking Drive is 17.5 mph due to the permanent sight distance obstruction from the house corner on the northeast and northwest quadrants. Thus, based on the safe approach speed calculations, YIELD-control is the computed right-of-way control for Viking Road approach. The safe approach speed calculation spreadsheet for the intersection is attached for reference.

Recommendation

The preceding analysis did not determine that any criteria were met for all-way STOP-control. The safe approach speed calculations suggested YIELD-control would be appropriate for the minor street (Viking Drive) approach.

OHM recommends implementing a YIELD sign on the Viking Drive approach. The intersection should be reevaluated if traffic volumes increase or crashes begin to occur.

Sincerely,
OHM Advisors

Lauren Hull

Lauren Hull
Traffic Engineer

Attachments:
- Aerial Photo
- Safe Approach Speed Calculation Spreadsheet
- Intersection Photos
- Traffic Control Determination Reference Guide

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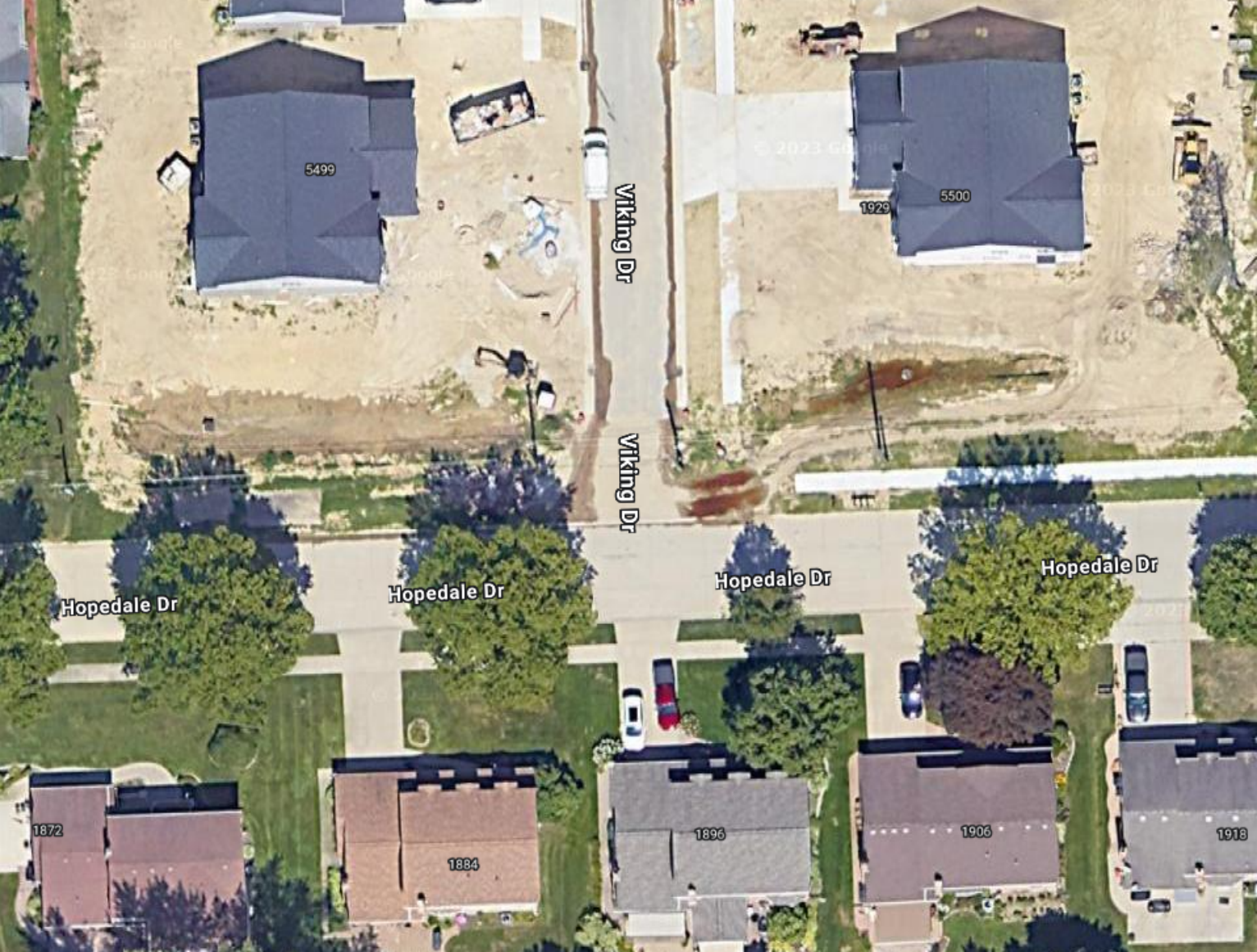
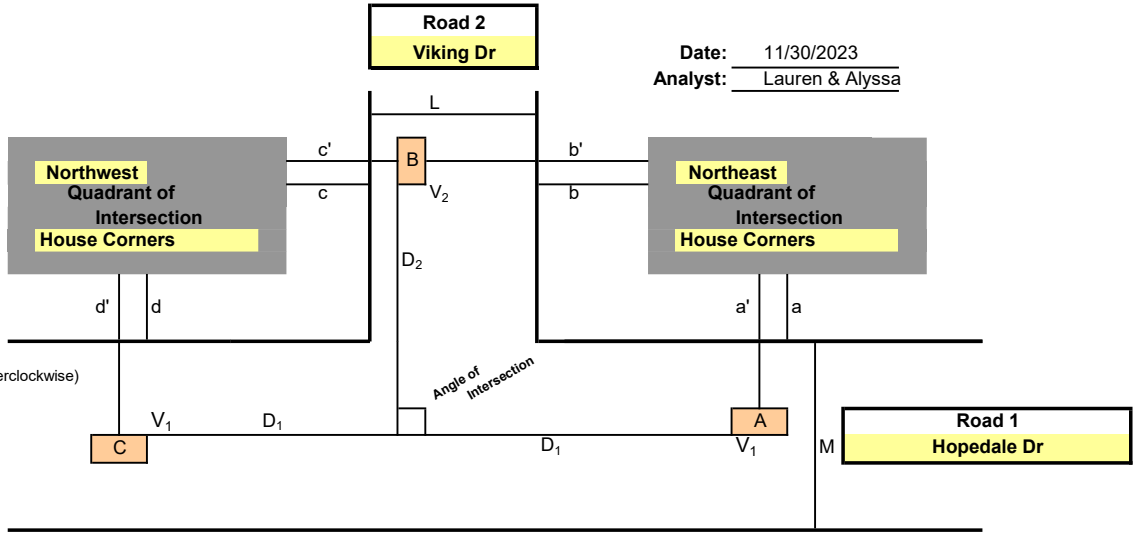
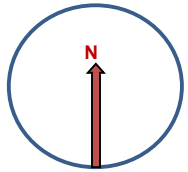

5499
Viking Dr
Viking Dr
5500
1929
Hopedale Dr
Hopedale Dr
Hopedale Dr
Hopedale Dr
1872
1884
1896
1906
1918

Safe Approach Speed Calculation

Hopedale Dr and Viking Dr
City of Troy

Date: 11/30/2023
Analyst: Lauren & Alyssa





Measured:

Width of Roads
- Road 1 = 28 (ft)
- Road 2 = 28 (ft)

Distance to Obstruction
- a = 66 (ft)
- b = 53 (ft)
- c = 47 (ft)
- d = 69.5 (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' =	72
D_{2A} =	111	b' =	69
D_{2C} =	93.9	c' =	53
		d' =	85.5

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 $D_{2C} = \frac{c' * D_1}{(D_1 - d')}$

Calculated Safe Approach Speed for Vehicle B Approaching on Road 2
- 19.9 (mph) [Based on Veh. A]
- or V_2 = 17.5 (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 : **YIELD SIGN**

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

Photograph No. 1: Hopedale Drive - Heading East Looking Left
Date: 11/30/2023 **Photographer:** Lauren Hull

Photograph No. 2: Hopedale Drive - Heading East
Date: 11/30/2023 **Photographer:** Lauren Hull

Photograph No. 3: Viking Drive - Heading South Looking Left
Date: 11/30/2023 **Photographer:** Lauren Hull

Photograph No. 4: Viking Drive - Heading South Looking Right
Date: 11/30/2023 **Photographer:** Lauren Hull

Photograph No. 5: Hopedale Drive - Heading West
Date: 11/30/2023 **Photographer:** Lauren Hull

Photograph No. 6: Hopedale Drive - Heading West Looking Right
Date: 11/30/2023 **Photographer:** Lauren Hull

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). Act 300 of Public Acts of 1949 (as amended) requires the adoption of this Manual, and further requires conformance to the manual for all state highways, county roads and local streets open to public travel.

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.

In many cases 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.*