TRAFFIC COMMITTEE AGENDA

June 19, 2024 – 7:30 P.M.

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

1. Roll Call
2. Approval of Minutes – April 17, 2024 Traffic Committee

PUBLIC HEARINGS

3. No Public Hearings

REGULAR BUSINESS

4. Request for Traffic Control – Establish School Zone – Troy High School
5. Request for Traffic Control – Connolly Drive & Corbin Drive
6. Request for Traffic Control – Troyvally Drive & Herbmoor Street
7. Public Comment
8. Other Business – Legal Review - City Attorney
9. Adjourn

Copy to: 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 – April 17, 2024 Traffic Committee

PUBLIC HEARING

3. No Public Hearing

REGULAR BUSINESS

4. Request for Traffic Control – Northfield Parkway – Troy High School

There were two vehicle/pedestrian accidents this year on Northfield Parkway at Troy High School. Troy Police Department asked if a School Zone could be established to lower the speed limit during school arrival and departure, similar to Hamilton Elementary north of Troy High School on Northfield Parkway. A sign and pavement marking review of all schools in done was completed in February 2022, establishing a school zone was a recommendation.

SUGGESTED RESOLUTIONS:

a. RESOLVED, that a School Zone be established on Northfield Parkway at Troy High School for the purpose of reducing the speed limit in accordance with the Michigan Vehicle Code

b. RESOLVED, that **NO CHANGE** be made to Northfield Parkway

5. Request for Traffic Control – Connolly Drive & Corbin Drive

Kalpit Kadia of 1984 Connolly Drive requested that the intersection of Connolly Drive and Corbin Drive be reviewed for purposes of traffic control at the uncontrolled intersection. He believed the existing uncontrolled intersection was dangerous and that a stop sign was needed on Connolly. The study indicated that a stop sign was warranted for Corbin, not Connolly. Mr. Kadia indicated that his concern was to control speed on Connolly, a stop sign on Corbin would not help.

SUGGESTED RESOLUTIONS:

a. RESOLVED, that the Corbin Drive Approach at Connolly Drive be modified from UNCONTROLLED, to STOP CONTROLLED.

b. RESOLVED, that the Connolly Drive Approach at Corbin Drive be modified from UNCONTROLLED, to STOP CONTROLLED.

c. RESOLVED, that **NO CHANGE** be made to the Connolly Drive & Corbin Drive intersection

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6. Request for Traffic Control – Troyvally Drive & Herbmoor Street

Jyh-Shin Chen of 6275 Riverton requested that the intersection of Troyvally Drive and Herbmoor Street be reviewed for purposes of changing the stop control on Troyvally at Herbmoor to uncontrolled. He states Herbmoor faces a dead end and Troyvally has more traffic. The stop sign should face Herbmoor instead of Troyvally to reduce vehicle stops and reduce greenhouse gases.

SUGGESTED RESOLUTIONS:

a. RESOLVED, that the Troyvally Drive Approach at Herbmoor Street be modified from STOP CONTROLLED, to UNCONTROLLED and Herbmoor Street be modified from UNCONTROLLED, to STOP CONTROLLED

b. RESOLVED, that **NO CHANGE** be made to the Troyvally Drive Approach at Herbmoor Street.

7. Public Comment

8. Other Business – City Attorney Legal Review Presentation

9. Adjourn

A regular meeting of the Troy Traffic Committee was held Wednesday, April 17, 2024 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
Cindy Nurak
Al Petrulis
Abi Swaminathan
Pete Ziegenfelder

Absent: Deputy Fire Chief, Michael Koehler
Sgt. Brian Warzecha, Police Department
Angela Zhou, Student Representative

Also present: G. Scott Finlay, City Engineer
Merissa Clark, Administrative Assistant

2. Minutes – March 20, 2024 Traffic Committee

Resolution # 2024-04-09
Moved by Swaminathan
Seconded by Kenkre

To approve the March 20, 2024 minutes as printed.

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

MOTION CARRIED

PUBLIC HEARINGS

3. No Public Hearing

REGULAR BUSINESS

4. Request for Traffic Control – West Troy Meadows

West Troy Meadows Site Condominiums has been completed. All intersections within this development were reviewed for intersection control. OHM provided a detailed study attached and makes to following recommendations: OHM recommends implementing STOP sign on the Harlow Dive approach at Blakely Court and YIELD signs on the Harlow Drive approach at Audley Court, the Webb Avenue approach at Virgilia Drive, and the Blakely Court approach at Virgilia Drive.

Pete Ziegenfelder stated he is in favor of stop signs at all intersections.

Shama Kenkre agreed.

Cindy Nurak is not a fan of stop signs being installed at all intersections because she thinks it causes more rolling stops, and accidents/injuries can happen.

Al Petrulis stated that yields can be changed to stops if need be in the future.

MOTION CARRIED

Resolution # 2024-04-10
Moved by Nurak
Seconded by Petrulis

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

RESOLVED, that the Harlow Drive Approach at Blakely Court be modified from UNCONTROLLED, to STOP CONTROLLED.

BE IT FURTHER RESOLVED, that the Harlow Drive Approach at Audley Court be modified from UNCONTROLLED, to YIELD CONTROLLED

BE IT FURTHER RESOLVED, that the Webb Avenue Approach at Virgilia Drive be modified from UNCONTROLLED, to YIELD CONTROLLED

BE IT FINALLY RESOLVED, that the Blakely Court Approach at Virgilia Drive be modified from UNCONTROLLED, to YIELD CONTROLLED

5. Public Comment

No public comment.

6. Other Business

I.D. Badges were discussed for Traffic Committee members, new badges are needed.

7. Adjourn

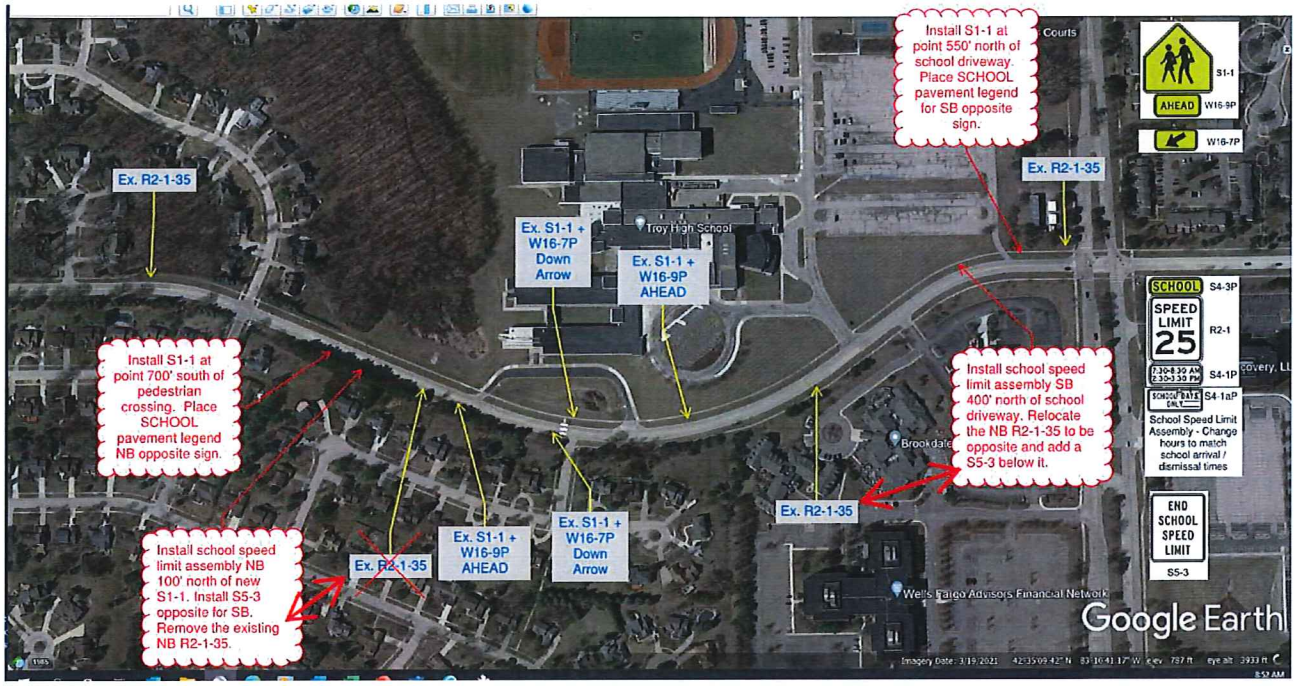
The meeting adjourned at 7:45 PM.

Pete Ziegenfelder -Chairperson

G. Scott Finlay, City Engineer/Traffic Engineer

Troy High School:

Located on Long Lake Rd at Northfield Pkwy. The main recommendations for this school include installing new signs and replacing speed limit signs. There are two locations provided on the plans where new pedestrian signs should be installed. At these locations, the "SCHOOL" pavement marking legend should also be implemented. Additionally, instead of the current speed limit signs, school speed limit assembly signs should be installed. These new assembly locations are shown in the plans. Once these new assemblies have been installed, the existing speed limit signs should be removed/relocated.



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May 23, 2024

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

RE: Traffic Control Recommendation for
Connolly Dr at Corbin Dr

Dear Mr. Finlay:

As requested, we have reviewed the intersection of Connolly Dr at Corbin Dr to determine the proper traffic control. Connolly Dr at Corbin 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 Connolly Dr and Corbin Dr are considered local streets. Connolly Dr runs north to south providing access to the neighborhood off of Coolidge Hwy. Corbin Dr runs east to west offering access to the neighborhood from Coolidge Hwy as well.

The surrounding land use is entirely single-family residential. On-street parking is permitted on the east side of Connolly Dr and on the north side of Corbin Dr. There is no clear major versus minor street. However, for the purpose of analysis Connolly Dr is presumed to be the major road, while Corbin Dr is considered the minor road. Both Connolly Dr and Corbin 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 250' radius of the intersection. The crash history does not constitute a compelling case for modifying the existing controls.

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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 Corbin 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 Connolly 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 likely not been met.

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 Connolly Dr at Corbin Dr for a motorist traveling westbound on Corbin Dr would be the large tree on the southeast quadrant of the intersection and the trees and brush on the northeast corner 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 westbound vehicles on Corbin Dr is 7.2 mph due to the permanent sight distance obstruction from the trees and brush on the northeast and southeast quadrants. Thus, based on the safe approach speed calculations, STOP-control is the computed right-of-way control for the Corbin Dr approach. The safe approach speed calculation spreadsheet for the intersection is attached for reference.

Recommendation

The preceding analysis determined that the criteria were met for STOP-control on the minor street (Corbin Dr) approach, based on the safe approach speed calculations.

OHM recommends implementing a STOP sign on the Corbin Dr approach. The intersection should be reevaluated if traffic volumes increase, or crashes begin to occur.

Sincerely,
OHM Advisors

Laure Hull
Traffic Engineer

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

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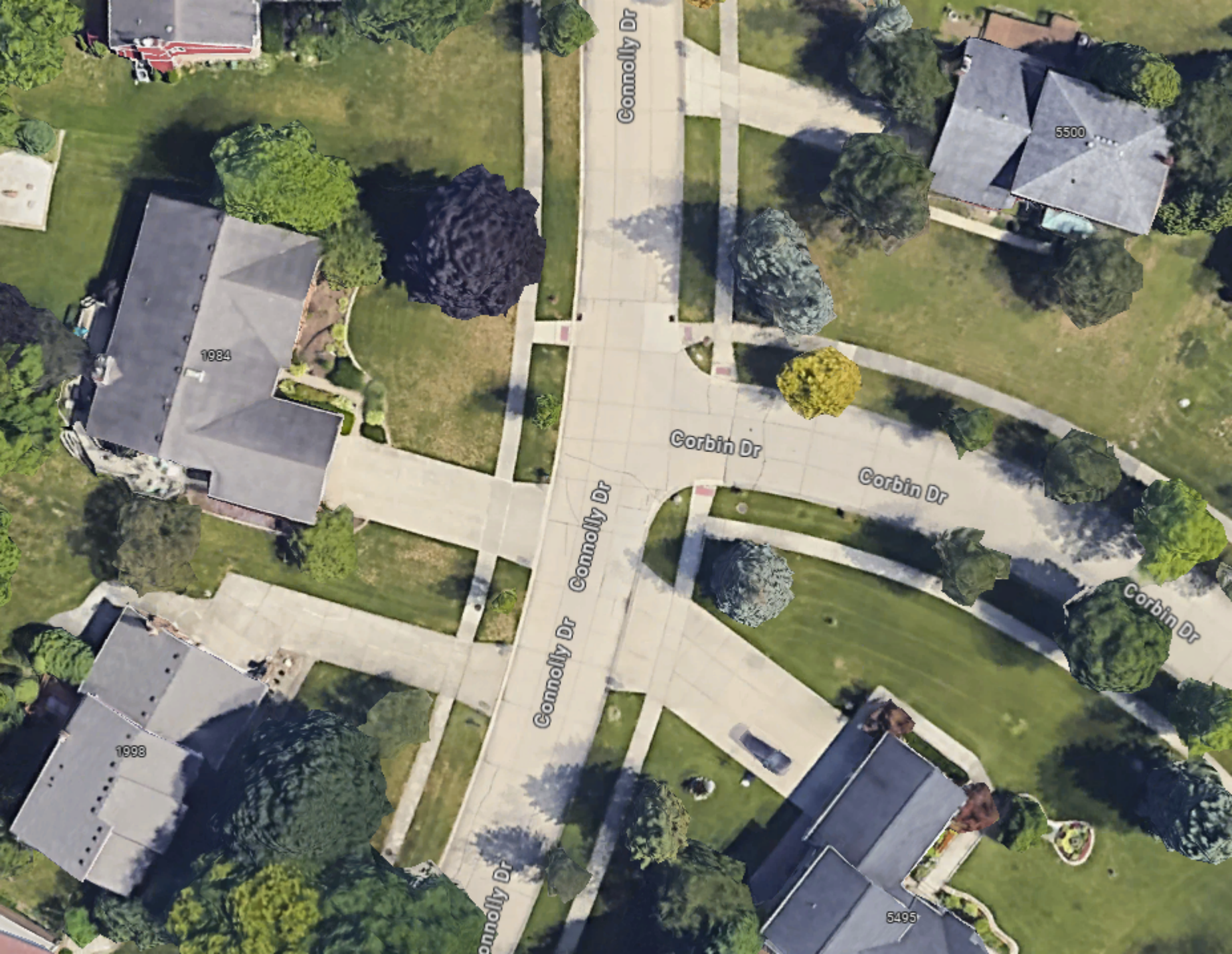
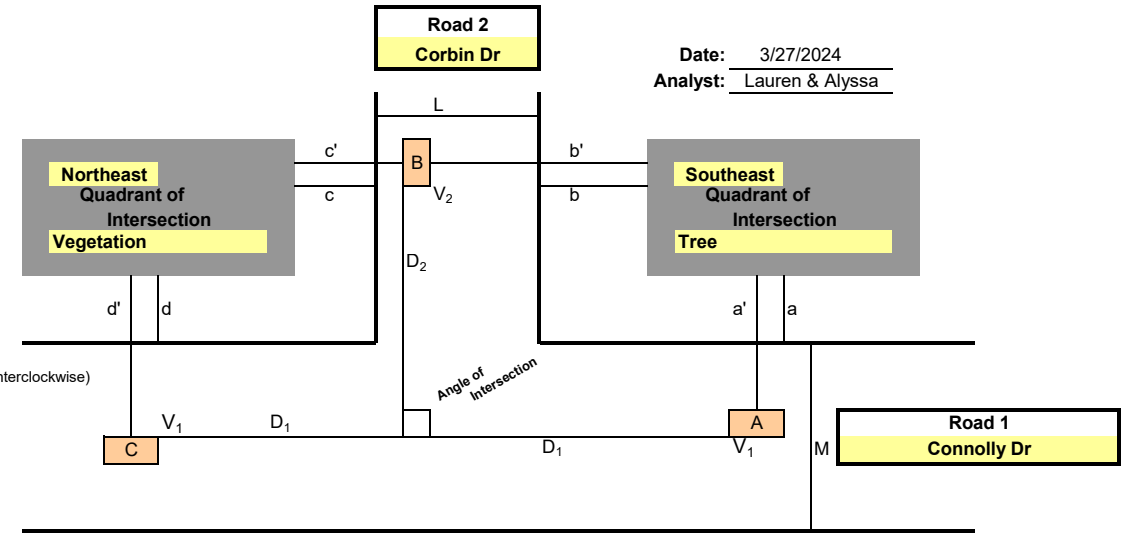
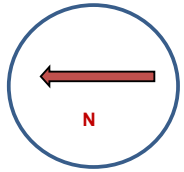

Connolly Dr
5500
1984
Corbin Dr
Corbin Dr
Corbin Dr
Connolly Dr
Connolly Dr
1998
5495

Safe Approach Speed Calculation

Connolly Dr and Corbin Dr
City of Troy

Date: 3/27/2024
Analyst: Lauren & Alyssa





Measured:

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

Distance to Obstruction
- a = 21 (ft)
- b = 13.5 (ft)
- c = 16 (ft)
- d = 18 (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' =	27
D_{2A} =	31.4	b' =	27.5
D_{2C} =	26.3	c' =	22
		d' =	32

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

FALSE 7.2 (mph) [Based on Veh. A]
FALSE or V_2 = 6.2 (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 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: Connolly Dr -Heading North
Date: 03/27/2024 **Photographer:** Lauren Hull

Photograph No. 2: Connolly Dr - Heading North looking left
Date: 03/27/2024 **Photographer:** Lauren Hull

Photograph No. 3: Connolly Dr - Heading South
Date: 03/27/2024 **Photographer:** Lauren Hull

Photograph No. 4: Connolly Dr - Heading South looking right
Date: 03/27/2024 **Photographer:** Lauren Hull

Photograph No. 5: Cordin Dr - Heading West
Date: 03/27/2024 **Photographer:** Lauren Hull

Photograph No. 6: Cordin Dr - Heading West looking right
Date: 03/27/2024 **Photographer:** Lauren Hull

Photograph No. 7: Cordin Dr - Heading West looking left
Date: 03/27/2024 **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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April 24, 2024

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

RE: Traffic Control Recommendation for
Troyvally Drive at Herbmoor Drive

Dear Mr. Finlay:

As requested, we have reviewed the intersection of Troyvally Drive at Herbmoor Drive to determine the proper traffic control. Troyvally Drive at Herbmoor Drive is a 4-legged intersection located in the City of Troy. The speed limit on both streets under investigation is 25 mph. Under existing conditions, both Troyvally Drive approaches are under stop control. Attached are aerial and intersection photos.

Types of Roadways

Both Troyvally Drive at Herbmoor Drive are considered local streets. Troyvally Drive runs east to west providing access throughout the neighborhood. Herbmoor Drive runs north to south offering access to the neighborhood off of Square Lake Road.

The surrounding land use is entirely single-family residential. There are no existing parking restrictions on either Troyvally Drive or Herbmoor Drive. There is no clear major versus minor street. However, the placement of the existing controls presupposes that Troyvally Drive is the minor road and Herbmoor Drive is the major. It is not self-evident that this is correct, so for the purpose of our analysis Troyvally Drive is presumed to be the major road, while Herbmoor Drive is considered the minor road. Both Troyvally Drive and Herbmoor 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 250' radius of the intersection. The crash history does not constitute a compelling case for modifying the existing controls.

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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 Troyvally 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 Herbmoor Drive is similarly unlikely to average at least 200 units for any 8 hours. Additionally, since the posted speed limit is only 25 mph, it is reasonable to assume that the 85th percentile approach speed does not exceed 40 mph 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.

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. However, we note that Herbmoor Drive is a long, uninterrupted straightaway while Troyvally Drive has been stopped at Canmoor Drive, just a short block to the west. This is a factor in determining which set of approaches should be subject to intersection controls for Troyvally Drive at Herbmoor Drive. If any two-way controls are merited, they should be assessed against Herbmoor Drive, not Troyvally Drive.

Sight Distance

The major potential sight distance obstruction at the intersection of Troyvally Drive at Herbmoor Drive for a motorist traveling northbound on Herbmoor Drive would be the hill on the southeast corner of the intersection. This obstruction impacts 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 Herbmoor Drive is 9.5 mph due to the permanent sight distance obstruction from the hill on the southeast quadrant. Thus, based on the safe approach speed calculations, STOP-control is the computed right-of-way control for Herbmoor Drive 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 STOP-control would be appropriate for the minor street (Herbmoor Drive) approach.

OHM recommends implementing STOP signs on the Herbmoor Drive approaches and removing the STOP signs on the Troyvally Drive approaches. Under existing conditions, drivers are used to the STOP signs on Troyvally Drive and expect to stop. Similarly, drivers on Herbmoor Drive are not used to stopping at this intersection and therefore do not expect to stop. Due to this change in driver expectation, there

could be an increase in crashes at this intersection. To help counteract this change, additional warning signs should be provided including W23-2 "NEW TRAFFIC PATTERN AHEAD" on all four approaches along with W4-4P "CROSS TRAFFIC DOES NOT STOP" on both new STOP signs. Additionally, once the new STOP signs are in place flags should be added to help warn drivers. The W23-2 signs and flags should remain in place for a minimum of 6 months. The intersection should be reevaluated if traffic volumes increase, or crashes begin to occur.

Sincerely,
OHM Advisors

Lauren Hull

Lauren Hull, EIT
Traffic Engineer

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

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Troyvally Dr
Hershberger Dr

Safe Approach Speed Calculation

Troyvally and Herbmoor
City of Troy

Date: 3/20/2024
Analyst: Lauren & Alyssa

Measured:

Width of Roads

Road 1 =	26	(ft)
Road 2 =	26	(ft)

Distance to Obstructions

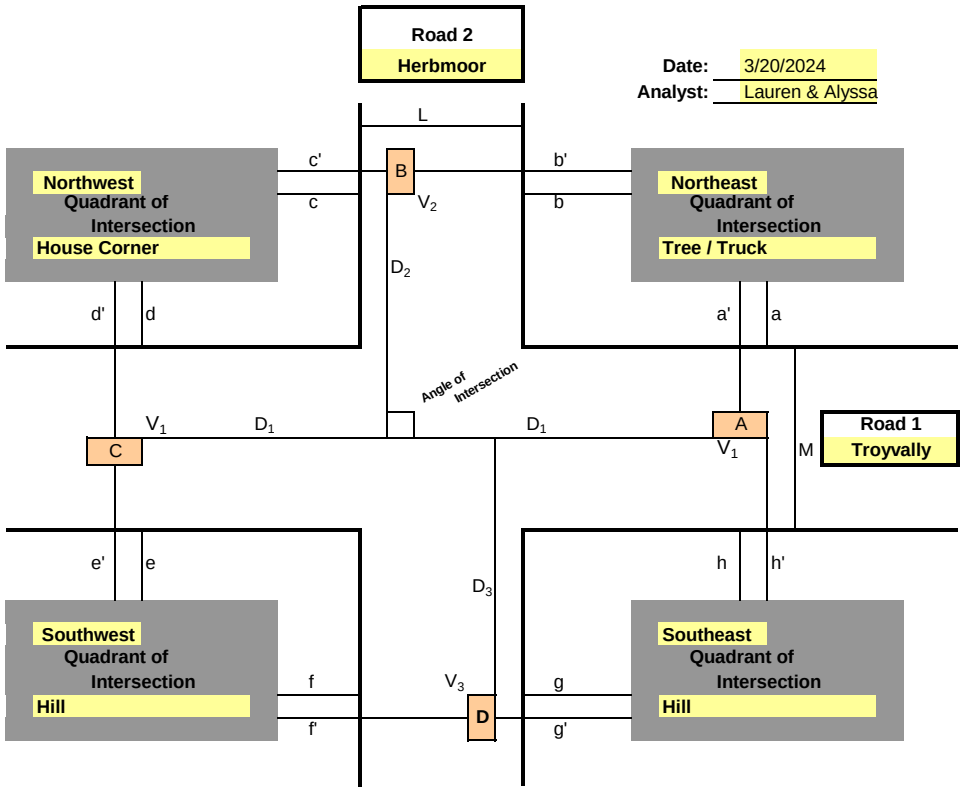
a =	59	(ft)	e=	88	(ft)
b =	15	(ft)	f=	53	(ft)
c =	64	(ft)	g=	30.5	(ft)
d =	43	(ft)	h=	14	(ft)

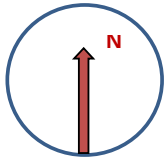
Angle of Intersection

Delta =	80	(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 =	15.2	(mph) [Based on Veh. A]
or V_2 =	18.5	(mph) [Based on Veh. C]

Calculated Safe Approach Speed for Vehicle D
Approaching on Road 2

V_3 =	9.5	(mph) [Based on Veh. A]
or V_3 =	24.3	(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.

Intermediate Calculations:

D_1=	196	a' =	65	e' =	94
D_{2A}=	77.6	b' =	29	f' =	67
D_{2C}=	100.8	c' =	70	g' =	36.5
D_{3A}=	43.3	d' =	57	h' =	28
D_{3C}=	146				

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 $D_{2C} = \frac{c' * D_1}{(D_1 - d')}$ or $D_{3A} = \frac{g' * D_1}{(D_1 - h')}$ or $D_{3C} = \frac{e' * D_1}{(D_1 - f')}$

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 : **STOP Sign**

Photograph No. 1: Herbmoor Drive - Heading North Looking Left
Date: 03/21/2024 **Photographer:** Lauren Hull

Photograph No. 2: Herbmoor Drive - Heading North
Date: 03/21/2024 **Photographer:** Lauren Hull

Photograph No. 3: Herbmoor Drive - Heading North Looking Right
Date: 03/21/2024 **Photographer:** Lauren Hull

Photograph No. 4: Troyvally Drive – Heading East Looking Left
Date: 03/21/2024 **Photographer:** Lauren Hull

Photograph No. 5: Troyvally Drive – Heading East
Date: 03/21/2024 **Photographer:** Lauren Hull

Photograph No. 6: Troyvally Drive – Heading East Looking Right
Date: 03/21/2024 **Photographer:** Lauren Hull

Photograph No. 7: Hermoor Drive - Heading South Looking Left
Date: 03/21/2024 **Photographer:** Lauren Hull

Photograph No. 8: Hermoor Drive - Heading South
Date: 03/21/2024 **Photographer:** Lauren Hull

Photograph No. 9: Hermoor Drive - Heading South Looking Right
Date: 03/21/2024 **Photographer:** Lauren Hull

Photograph No. 10: Troyvally Drive - Heading West Looking Left
Date: 03/21/2024 **Photographer:** Lauren Hull

Photograph No. 11: Troyvally Drive - Heading West
Date: 03/21/2024 **Photographer:** Lauren Hull

Photograph No. 12: Troyvally Drive - Heading West Looking Right
Date: 03/21/2024 **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.*