



TRAFFIC COMMITTEE AGENDA

May 18, 2022 – 7:30 P.M.

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

1. Roll Call
2. Approval of Minutes – April 20, 2022 Traffic Committee

PUBLIC HEARINGS

3. No Public Hearings

REGULAR BUSINESS

4. Request for Revisions to No Parking Signs – Torpey Road, east of Rochester Road
5. Request for No Parking Zone – Axtell Road at Bayberry Place Condominiums
6. Request for Traffic Control – Brooke Hollow Drive at Lamb Road
7. Request for Traffic Control – Eleanor Avenue at Rockfield Avenue
8. Request for Traffic Control – Carter Avenue at Virgilia Avenue
9. Request for Traffic Control – Oakcrest Drive at Highland Drive
10. Public Comment
11. Other Business
12. Adjourn

Copy to:

Item 4, 5, 6 & 7: Properties within 300'

Item 8: Jade Nason 237 Carter; Properties within 300'

Item 9: Heather Novetsky 1637 Oakcrest; Properties within 300'

Traffic Committee Members; Sgt. Brian Warzecha, Police Department; Lt. Chuck Roberts, 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 20, 2022 Traffic Committee

PUBLIC HEARING

3. No Public Hearings

REGULAR BUSINESS

4. Request for Revisions to No Parking Signs – Torpey Road, east of Rochester Road

Troy PSA Buckbee requested that the existing No Parking signs on the south side of Torpey Road be reviewed as the current language is confusing and is left open to interpretation.

The north side of Torpey Road is the fire hydrant side and is posted No Parking with no limitations and applies at all times. The south side is currently posted “NO PARKING EXCEPT SUNDAYS & HOLIDAYS”. “SUNDAYS” are evident but “HOLIDAYS” is open ended and up for interpretation.

The existing No Parking signs have been in place since the early 1980’s but background information for the reason behind the language included on the signs is not available in a review of records. Current “holidays” are difficult to ascertain due to the increasing number of holidays observed.

In order to remove the ambiguity, Troy Police Department requests that the existing No Parking signs on the south side of Torpey be modified to be consistent with the language used near other schools, such as the No Parking signs on Boyd (i.e. time limited based on arrival and dismissal times on School Days Only). No parking signs on Boyd are noted as “7:15 AM – 8:15 AM and 2:00 PM – 2:45 PM, SCHOOL DAYS ONLY” based on the International Academy (IA) arrival time of 7:45 AM and dismissal time of 2:35 PM.

Baker Middle School arrival time is 8:19 AM and dismissal time is 3:03 PM.

SUGGESTED RESOLUTIONS:

- a. RESOLVED, that the existing No Parking signs on the south side of Torpey Road, east of Rochester Road be **MODIFIED** to NO PARKING 7:45 AM – 8:45 AM and 2:30 PM – 3:30 PM, SCHOOL DAYS ONLY.
- b. RESOLVED, that **NO CHANGE** be made to the existing No Parking signs on the south side of Torpey Road, east of Rochester Road.

5. Request for No Parking Zone – Axtell Road at Bayberry Place Condominiums

Homestead Property Management is responsible for the Bayberry Place Condominiums on the east side of Axtell Road, north of Maple Road. The property management firm has received comments and concerns from their residents regarding vehicles parking on the east side of

Axtell, near the entrance/exit to the site. These parked vehicles create a hazardous condition by limiting visibility of oncoming traffic.

The west side of Axtell Road is posted No Parking at all times due to it being the fire hydrant side of the street.

SUGGESTED RESOLUTIONS:

- a. RESOLVED, that a No Parking zone be **ESTABLISHED** on the east side of Axtell Road between the entrance to Bayberry Place Condominiums and the sidewalk to Building No. 1890 to the south.
- b. RESOLVED, that **NO CHANGE** be made on the east side of Axtell Road near Bayberry Place Condominiums.

6. Request for Traffic Control – Brook Hollow Drive at Lamb Road

Traffic Committee member Kilmer requests that the intersection of Brook Hollow Drive at Lamb Road be reviewed for purposes of traffic control at the intersection. He stated that the lack of traffic control signage creates a hazardous situation for drivers and pedestrians.

SUGGESTED RESOLUTIONS:

- a. RESOLVED, that the intersection of Brook Hollow Drive at Lamb Road be **MODIFIED** from NO traffic control to a YIELD sign on the Brook Hollow Drive approach to the intersection.
- b. RESOLVED, that **NO CHANGE** be made at the intersection of Brook Hollow Drive at Lamb Road.

7. Request for Traffic Control – Eleanor Avenue at Rockfield Avenue

Traffic Committee member Kilmer requests that the intersection of Eleanor Avenue at Rockfield Avenue be reviewed for purposes of traffic control at the intersection. He stated that the lack of traffic control signage creates a hazardous situation for drivers and pedestrians.

SUGGESTED RESOLUTIONS:

- a. RESOLVED, that the intersection of Eleanor Avenue at Rockfield Avenue be **MODIFIED** from NO traffic control to a YIELD sign on the Rockfield Avenue approach to the intersection.
- b. RESOLVED, that **NO CHANGE** be made at the intersection of Eleanor Avenue at Rockfield Avenue.

8. Request for Traffic Control – Carter Avenue at Virgilia Avenue

Jade Nason of 237 Carter Avenue requests that the intersection of Carter Avenue at Virgilia

Avenue be reviewed for purposes of ALL-WAY STOP at the intersection. Virgilia Avenue is controlled by Stop signs on the northbound and southbound approaches to Carter Avenue.

Ms. Nason stated that the intersection to the south (Carter Avenue at Lange Avenue) is an ALL-WAY STOP and is a mirror image of Carter Avenue at Virgilia Avenue. She added that Carter Avenue at Virgilia Avenue is the bus stop location and she is concerned about the children in the road waiting for the bus.

SUGGESTED RESOLUTIONS:

- a. RESOLVED, that the intersection of Carter Avenue at Virgilia Avenue be **MODIFIED** from Stop control on the Virgilia Avenue approaches to ALL-WAY STOP control at the intersection of Carter Avenue at Virgilia Avenue.
- b. RESOLVED, that **NO CHANGE** be made at the intersection of Carter Avenue at Virgilia Avenue.

9. Request for Traffic Control – Oakcrest Drive at Highland Drive

Heather Novetsky of 1637 Oakcrest Drive requests that the intersection of Oakcrest Drive at Highland Drive be reviewed for purposes of traffic control. She states that the lack of traffic control is creating a hazardous condition. Ms. Novetsky added that the intersection is a bus stop and she is concerned about the children in the road waiting for the bus.

SUGGESTED RESOLUTIONS:

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

10. Public Comment

11. Other Business

12. Adjourn

A regular meeting of the Troy Traffic Committee was held Wednesday, April 20, 2022 in the Council Boardroom at Troy City Hall. Pete Ziegenfelder called the meeting to order at 7:30 p.m.

1. Roll Call

Present: Richard Kilmer
Cindy Nurak
Sunil Sivaraman
Abi Swaminathan
Cynthia Wilsher
Pete Ziegenfelder
Tyler Koralewski, Student Representative

Absent: Al Petrulis

Also present: Sgt. Brian Warzecha, Police Department
Ofc. Gail Parra, Police Department
Lt. Chuck Roberts, Fire Department
Hafsa Usman 2450 Avalon
Divya Jha 2952 Ashbury
Bill Huotari, City Engineer/Traffic Engineer

2. Minutes – March 16, 2022

Resolution # 2022-04-06
Moved by Kilmer
Seconded by Wilsher

To approve the March 16, 2022 minutes as printed.

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

MOTION CARRIED

PUBLIC HEARINGS

3. No Public Hearings

REGULAR BUSINESS

4. Request for Signage – Wattles Elementary School

At the October 20, 2021, the Traffic Committee recommended and City Council ultimately approved that a NO PARKING ZONE be posted for the west side of Ellenboro Avenue, between Trombley and Colebrook Avenue, from 8AM – 9AM and 3PM – 4PM, school days

only.

Since that time, Troy Police have continued to patrol and look for ways to improve the situation around Wattles Elementary.

Troy Police Officer G. Parra was assigned to assess traffic issues around Wattles Elementary School. Officer Parra has identified two internal processes Troy Police Department can continue to provide to help mitigate the issue:

- Traffic Safety Unit to provide intermittent enforcement.
- SROs/ School employees occasionally sending out reminders to parents/ families of Crossing Guard etiquette. Mary does an excellent job and tries her hardest, although 10% of the drivers do not listen or aren't paying attention to her.

Officer Parra has also identified and documented three signage and lane marking suggestions to implement:

1. Crosswalks and stop bars need to be repainted for the safety of pedestrians and so drivers can clearly see where their vehicles should or shouldn't be stopping/ standing/ parking.
2. Place a "DO NOT BLOCK DRIVEWAY" sign at 525 Colebrook and 554 Ellenboro. While at the school I was made aware of this consistent issue from these residents.
3. Add a sign stating "NO STOPPING/STANDING/PARKING FROM HERE TO CORNER" on the existing NO PARKING sign post on the east side of Ellenboro, north of Colebrook. A major problem and concern of the Wattles Crossing Guard is that she has parents blocking this corner while they are waiting (standing) to pick their children up from school. It also poses a problem for buses trying to turn left (south to east) coming from the school.

Item #1 is a maintenance item and will be addressed by DPW as weather allows.

Item #2 and Item #3 require review by the Traffic Committee.

As noted by Officer Parra, the street was never designed for the amount of traffic now caused by the elementary school. This is not unlike similar traffic issues that we have seen popup around schools built within dense residential areas in our city and others around us. It is unlikely we will be able to completely solve these traffic issues through any amount of enforcement or signage but we can, and should, ensure we are doing our part to mitigate them as best as possible, which we will continue to do.

One (1) email was received in support of the recommended measures.

Officer Parra was in attendance at the meeting and spent a week in this area reviewing traffic operations. There is heavy traffic during arrival and dismissal times. Driveways are blocked during these times with parents waiting to get into the school parking lot area to drop off or pick up students. Parents will also block the cross walk while waiting to pick up their student(s). There is a crossing guard, but she also has difficulties dealing with the traffic. Arrival and dismissal last about 10 minutes and the majority of the day the area operates

well. She did talk with several residents in the area when she was on site and discussed concerns and options that may help mitigate issues in the area.

Mr. Kilmer agreed with the officer. He has been out to the site as well and observed many children and parents walking. There are no sidewalks in this area.

Mr. Sivaraman has talked to residents in this area to discuss their concerns about traffic.

Resolution # 2022-04-07

Moved by Kilmer

Seconded by Wilsher

RESOLVED, that a “DO NOT BLOCK DRIVEWAY” sign be placed at 525 Colebrook and 554 Ellenboro and a “NO STOPPING/STANDING/PARKING HERE TO CORNER” sign be placed on the existing NO PARKING sign post on the east side of Ellenboro, north of Colebrook.

Yes: Kilmer, Nurak, Sivaraman, Swaminathan, Wilsher, Ziegenfelder

No: None

Absent: Petruilis

MOTION CARRIED

5. Request for Traffic Control – Avalon Drive at Cedar Crest Drive

Hafsa Usman of 2450 Avalon requests that the intersection of Avalon Drive at Cedar Crest Drive be reviewed for purposes of traffic control at the intersection. He stated that the lack of traffic control signage creates a hazardous situation for drivers and pedestrians.

One (1) email was received in support of traffic control at the intersection.

Ms. Usman was in attendance at the meeting at discussed that this is a dangerous intersection. There is no signage at the intersection. There are a lot of kids in the neighborhood who walk on the streets. This area also has school bus stops. It is near the entrance to Beaver Trail subdivision. There is limited visibility at the intersection due to the houses and especially when cars are parked in the driveway at the houses on the corner.

Divya Jha of 2952 Ashbury was also in attendance at the meeting. Ms. Jha supported the statements made. She reiterated that there are a lot of children walking on the road in the Avalon area. There are two school bus stops in the immediate area. Cars do not yield the right-of-way at the intersection and signs would help.

Mr. Kilmer made a motion for All-Way Stop that did not receive support.

Mr. Ziegenfelder added that he supports traffic control signs at an intersection and his preference is Stop signs.

Ms. Nurak stated that All-Way Stop at this intersection could create ambiguity. She stated that

a Yield sign would be appropriate as there is good visibility at this intersection.

Ofc. Parra discussed Stop vs Yield signs.

Mr. Ziegenfelder lives in the immediate area and believes that there should be signage at all intersections to assign right-of-way.

Resolution # 2022-04-08
Moved by Sivaraman
Seconded by Swaminathan

RESOLVED, that the intersection of Avalon Drive at Cedar Crest Drive be **MODIFIED** from NO traffic control to a STOP sign on the Cedar Crest Drive approach to the intersection.

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

MOTION CARRIED

6. Public Comment

There was no further public comment at the meeting.

7. Other Business

Mr. Kilmer discussed concerns about left turns from northbound Livernois to Town Center. Traffic Engineering will discuss with RCOC regarding future plans for traffic signal modernization.

Ms. Wilsher stated that the new Stop signs on Hickory have helped traffic in this area.

A general discussion regarding traffic and upcoming construction ensued.

8. Adjourn

The meeting adjourned at 8:26 PM.

Pete Ziegenfelder, Chairperson

William J. Huotari, City Engineer/Traffic Engineer



TRAFFIC COMMITTEE REPORT

May 2, 2022

TO: Traffic Committee

FROM: Bill Huotari, City Engineer/Traffic Engineer

SUBJECT: Request for Revisions to No Parking Signs – Torpey Road, E. of Rochester Road

Background:

Troy PSA Buckbee requested that the existing No Parking signs on the south side of Torpey Road be reviewed as the current language is confusing and is left open to interpretation.

The north side of Torpey Road is the fire hydrant side and is posted No Parking with no limitations and applies at all times.

The south side is currently posted “NO PARKING EXCEPT SUNDAYS & HOLIDAYS”. “SUNDAYS” are evident but “HOLIDAYS” is open ended and up for interpretation.

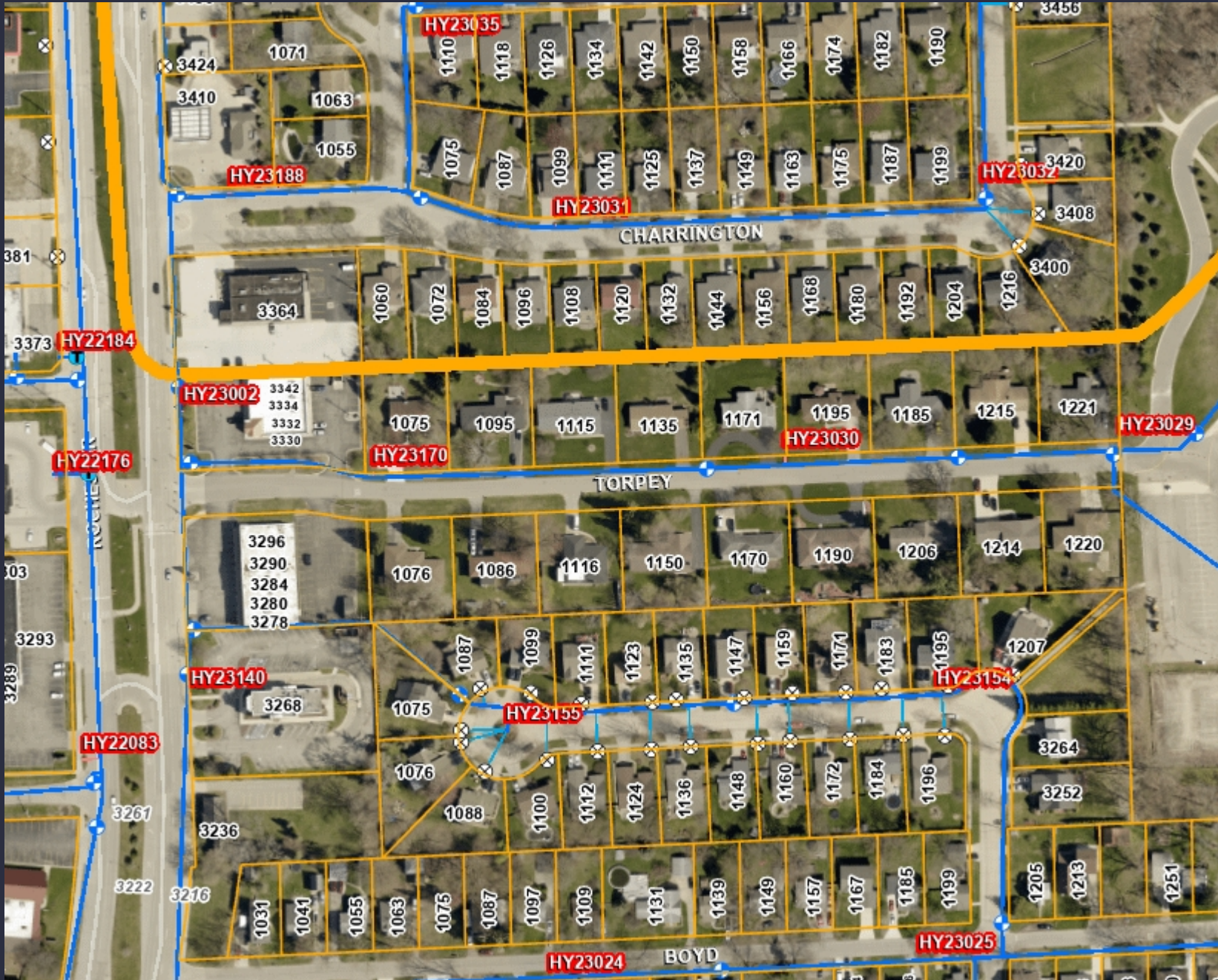
The existing No Parking signs have been in place since the early 1980’s but background information for the reason behind the language included on the signs is not available in a review of records. Current “holidays” are difficult to ascertain due to the increasing number of holidays observed.

In order to remove the ambiguity, Troy Police Department requests that the existing No Parking signs on the south side of Torpey Road be modified to be consistent with the language used near other schools, such as the No Parking signs on Boyd (i.e. time limited based on arrival and dismissal times on School Days Only).

No parking signs on Boyd are noted as “7:15 AM – 8:15 AM and 2:00 PM – 2:45 PM, SCHOOL DAYS ONLY” based on the International Academy (IA) arrival time of 7:45 AM and dismissal time of 2:35 PM.

Baker Middle School arrival time is 8:19 AM and dismissal time is 3:03 PM.

A recommendation would be to replace the existing No Parking signs with time limited No Parking zones of 7:45 AM – 8:45 AM and 2:30 PM – 3:30 PM, SCHOOL DAYS ONLY.



Legend:

- Fire Hydrant ID
- Water Valve
 - Pressure Reducing Valve
 - Air Release Valve
 - Isolation Valve
 - Gate Valve
 - Butterfly Valve
 - Tapping Sleeve and Valve
 - Blow Off Valve
 - Post Indicator Valve
 - Service Valve
 - Vault
- Water Main
 - Transmission Main
 - Proposed, Out of Service or Standby
 - Distribution Main
- Water Service Lead
 - Commerical
 - Private Leads
 - Fire Line
 - Hydrant
 - Residential
- Water Pressure Isolation Zone
- Water Pressure Reducing Valve

Notes:

Map Scale: 1=252
Created: May 2, 2022



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.



BOYD



TORPEY



TRAFFIC COMMITTEE REPORT

May 2, 2022

TO: Traffic Committee

FROM: Bill Huotari, City Engineer/Traffic Engineer

SUBJECT: Request for No Parking Zone – Axtell Road at Bayberry Place Condominiums

Background:

Homestead Property Management is responsible for the Bayberry Place Condominiums on the east side of Axtell Road, north of Maple Road. The property management firm has received comments and concerns from their residents regarding vehicles parking on the east side of Axtell Road, near the entrance/exit to the site.

These parked vehicles create a hazardous condition by limiting visibility of oncoming traffic.

The west side of Axtell Road is posted No Parking at all times due to it being the fire hydrant side of the street.

It is recommended that a No Parking zone be established on the east side of Axtell Road between the entrance to the Bayberry Place Condominiums and the sidewalk to Building No. 1890 to the south (a distance of approximately 40 feet).



Legend:

- Fire Hydrant ID
- Water Valve
 - Pressure Reducing Valve
 - Air Release Valve
 - Isolation Valve
 - Gate Valve
 - Butterfly Valve
 - Tapping Sleeve and Valve
 - Blow Off Valve
 - Post Indicator Valve
 - Service Valve
 - Vault
- Water Main
 - Transmission Main
 - Proposed, Out of Service or Standby
 - Distribution Main
- Water Service Lead
 - Commercial
 - Private Leads
 - Fire Line
 - Hydrant
 - Residential
- Water Pressure Isolation Zone
- Water Pressure Reducing Valve

Notes:

Map Scale: 1=126

Created: May 2, 2022



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.



YBERRY PLACE
CONDOMINIUM
248-643-9500





TRAFFIC COMMITTEE REPORT

May 4, 2022

TO: Traffic Committee

FROM: Bill Huotari, City Engineer/Traffic Engineer

SUBJECT: Request for Traffic Control – Brook Hollow Drive at Lamb Road

Background:

Traffic Committee member Kilmer requests that the intersection of Brook Hollow Drive at Lamb Road be reviewed for purposes of traffic control at the intersection. He stated that the lack of traffic control signage creates a hazardous situation for drivers and pedestrians.

The posted speed limit on both streets is 25 mph.

The intersection is currently uncontrolled.

Lamb Road is presumed to be the major road, while Brook Hollow Drive is considered the minor road as it terminates at Lamb Road. Both Lamb Road and Brook Hollow Drive serve as key routes throughout the neighborhood.

There were no crashes recorded in the past full five (5) years within a 250' radius of the intersection.

The major potential sight distance obstruction at the intersection for a motorist traveling northbound on Brook Hollow Drive would be the house corners on the southeast and southwest quadrants of the intersection.

The safe approach speed for northbound vehicles on Brook Hollow Drive is 13.4 mph due to the permanent sight distance obstruction from the house corners on the southwest and southeast quadrants.

OHM recommends implementing a YIELD sign on the Brook Hollow Drive approach to the intersection.

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

May 3, 2022

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

RE: Traffic Control Recommendation for
Lamb Drive at Brook Hollow Drive

Dear Mr. Huotari:

As requested, we have reviewed the intersection of Lamb Drive at Brook Hollow Drive to determine the proper traffic control. Lamb Drive at Brook Hollow 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 stop-controlled approaches. Attached are aerial and intersection photos.

Types of Roadways

Both Lamb Drive and Brook Hollow Drive are considered local streets. Brook Hollow Drive runs north to south providing direct access to the neighborhood. Lamb Drive runs east to west offering direct access to the neighborhood from Rochester Road.

The surrounding land use is entirely single-family residential. On-street parking is permitted on the north side of Lamb Drive east of Brook Hollow and on the east and west sides of Brook Hollow Drive. For the purpose of this analysis Lamb Drive is presumed to be the major road, while Brook Hollow Drive is considered the minor road as it terminates at Lamb Dr. Both Lamb Drive and Brook Hollow 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.



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).

Specifically, it is extremely unlikely that Lamb 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 Brook Hollow Drive is similarly unlikely to average at least 200 units for the concurrent 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.

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 Lamb Drive at Brook Hollow Drive for a motorist traveling northbound on Brook Hollow Drive would be the house corners on the southeast and southwest 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 less than 10 mph, 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 Brook Hollow Drive is 13.4 mph due to the permanent sight distance obstruction from the house corner on the southwest and southeast quadrants. Thus, based on the safe approach speed calculations, YIELD-control is the computed right-of-way control for Brook Hollow 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 YIELD-control would be appropriate for the minor street Brook Hollow Drive approach.

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



Sincerely,
OHM Advisors

Ife Ogundeji
Traffic Engineer

Attachments:

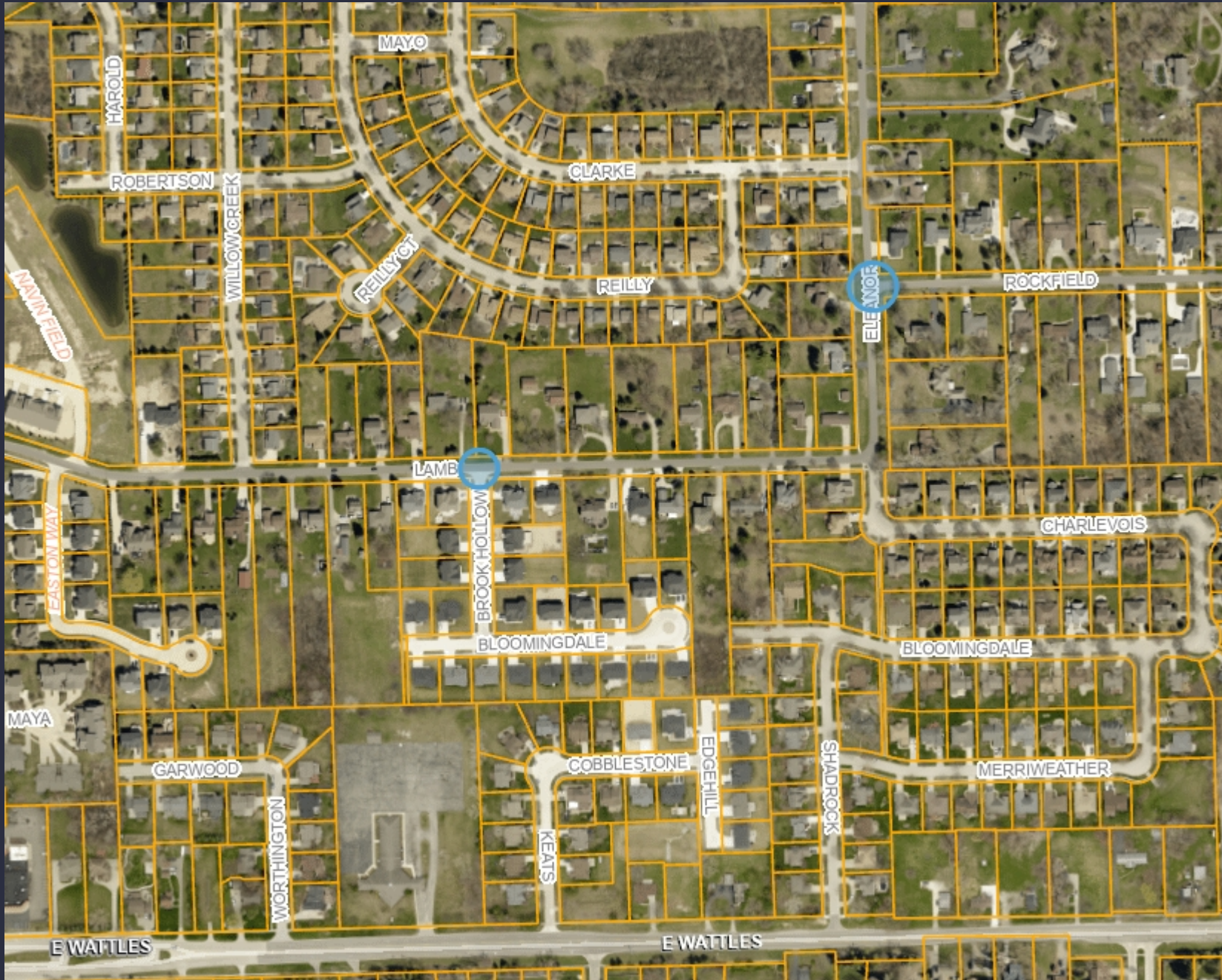
- Aerial Photo
- Safe Approach Speed Calculation Spreadsheet
- Intersection Photos
- Traffic Control Determination Reference Guide



GIS Online

Legend:

Road Centerline Text



Notes:

Map Scale: 1=504

Created: April 4, 2022



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.

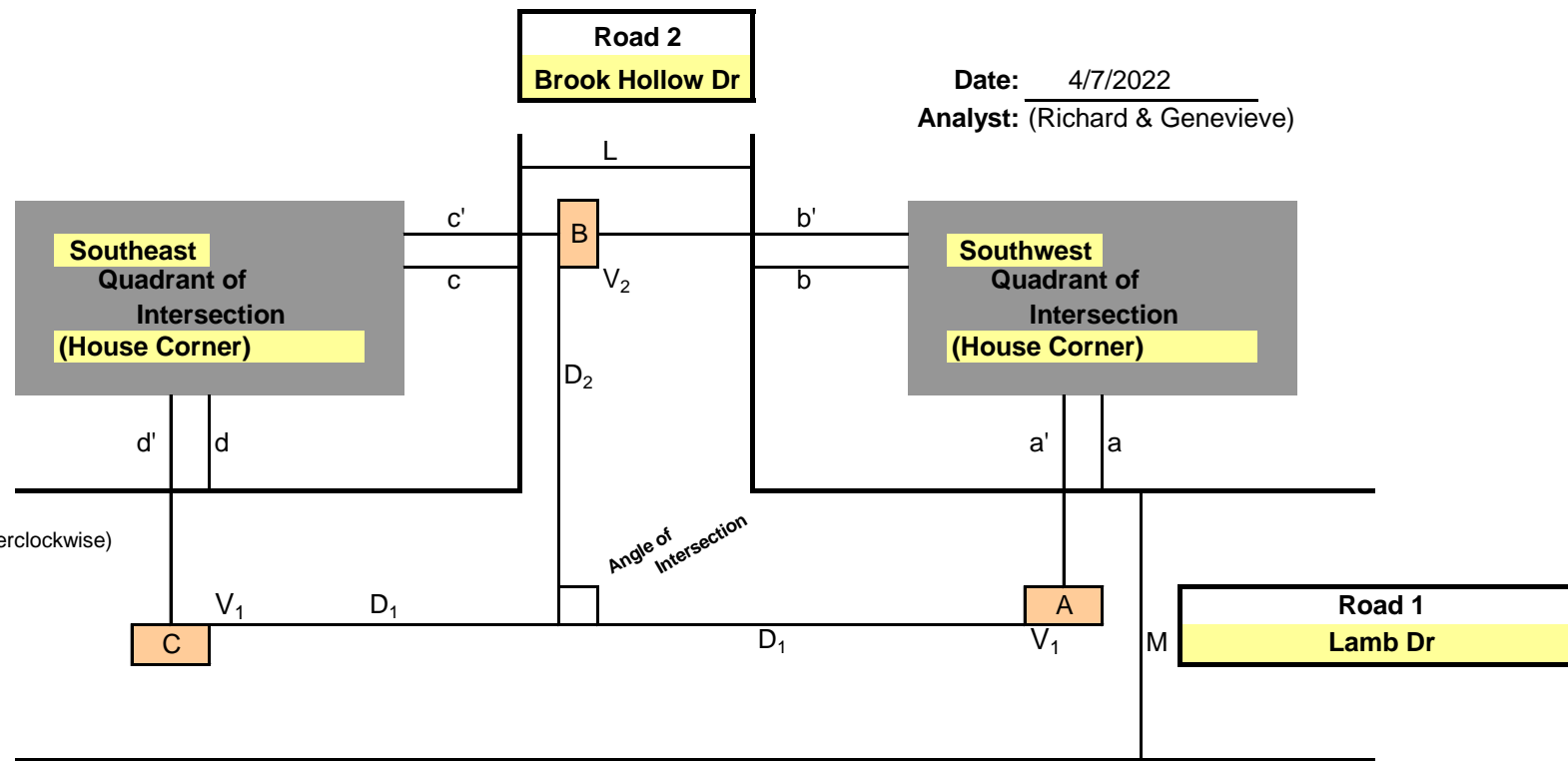
Safe Approach Speed Calculation

Lamb Dr and Brook Hollow Dr
City of Troy

Date: 4/7/2022
Analyst: (Richard & Genevieve)

Measured:

- Width of Roads
 - Road 1 = 26 (ft)
 - Road 2 = 28 (ft)
- Distance to Obstruction
 - a = 48 (ft)
 - b = 21 (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)
 - $V_1 = 30$ (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:

$D_1 = 196$	$a' = 54$
$D_{2A} = 66.5$	$b' = 37$
$D_{2C} = 78.9$	$c' = 54$
	$d' = 62$

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

13.4 (mph) [Based on Veh. A]
or $V_2 = 15.4$ (mph) [Based on Veh. C]

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

Threshold of Safe Approach Speed (AAA, FHWA & NSC)
to Recommend STOP Control 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**



Photograph No. 1: Brook Hollow Drive- Heading North
Date: 04/7/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 2: Brook Hollow Drive- Heading North looking left
Date: 04/7/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 3: Brook Hollow Drive- Heading North looking right
Date: 04/07/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 4: Lamb Drive- Heading West
Date: 04/07/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Apr 7, 2022 at 1:37:57 PM
1323 Lamb Rd
Troy MI 48085
United States

Photograph No. 5: Lamb Drive - Heading West and looking left
Date: 04/07/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Apr 7, 2022 at 1:45:57 PM
1263 Lamb Rd
Troy MI 48085
United States

Photograph No. 6: Lamb Drive - Heading East
Date: 04/7/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 7: Lamb Drive - Heading East and looking right
Date: 04/7/2022 **Photographer:** Richard Boateng & Genevieve Schneemann

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.*



TRAFFIC COMMITTEE REPORT

May 4, 2022

TO: Traffic Committee

FROM: Bill Huotari, City Engineer/Traffic Engineer

SUBJECT: Request for Traffic Control – Eleanor Avenue at Rockfield Avenue

Background:

Traffic Committee member Kilmer requests that the intersection of Eleanor Avenue at Rockfield Avenue be reviewed for purposes of traffic control at the intersection. He stated that the lack of traffic control signage creates a hazardous situation for drivers and pedestrians.

The posted speed limit on both streets is 25 mph.

The intersection is currently uncontrolled.

Eleanor Avenue is presumed to be the major road, while Rockfield Avenue is considered the minor road as it terminates at Eleanor Avenue.

There was one (1) crashes recorded in the past full five (5) years within a 250' radius of the intersection.

Traffic counts were not collected as part of the intersection study.

The major potential sight distance obstruction at the intersection for a motorist traveling westbound on Rockfield Avenue would be the house corners on the northeast and southeast quadrants of the intersection.

The safe approach speed for westbound vehicles on Rockfield Avenue is 18.7 mph due to the permanent sight distance obstruction from the house corners on the northeast and southeast quadrants.

OHM recommends implementing a YIELD sign on the Rockfield Avenue approach to the intersection.

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

May 3, 2022

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

RE: Traffic Control Recommendation for
Eleanor Drive at Rockfield Drive

Dear Mr. Huotari:

As requested, we have reviewed the intersection of Eleanor Drive at Rockfield Drive to determine the proper traffic control. Eleanor Drive at Rockfield 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 Eleanor Drive and Rockfield Drive are considered local streets. Eleanor Drive runs north to south providing indirect access to the neighborhood from John R Road by way of Hammon Drive. Rockfield Drive runs east to west providing access to Rockdale Court.

The surrounding land use is entirely single-family residential. On-street parking is permitted on the north side of Rockfield Drive and on the west side of Eleanor Drive. For the purpose of this analysis Eleanor Drive is presumed to be the major road, while Rockfield Drive is considered the minor road as it terminates at Eleanor Drive.

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 was one crash recorded in the past full five (5) years within a 250' radius of the intersection. The crash was a sideswipe type of crash which did not result in any injuries. This crash occurred when a vehicle travelling southbound on Eleanor Drive sideswiped a parked vehicle when turning left on Rockfield Drive. The crash history does not constitute a compelling case for modifying the existing controls.



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).

Specifically, it is extremely unlikely that Eleanor 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 Rockfield Drive is similarly unlikely to average at least 200 units for the same 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.

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 Eleanor Drive at Rockfield Drive for a motorist traveling westbound on Rockfield Drive would be the house corners on the northeast and southeast 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 less than 10 mph, 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 Rockfield Drive is 18.7 mph due to the permanent sight distance obstruction from the house corner on the northeast and southeast quadrants. Thus, based on the safe approach speed calculations, YIELD-control is the computed right-of-way control for Rockfield 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 YIELD-control would be appropriate for the minor street Rockfield Drive approach.

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



Sincerely,
OHM Advisors

A handwritten signature in blue ink, appearing to read 'Ife Ogundeji', located below the 'OHM Advisors' text.

Ife Ogundeji
Traffic Engineer

Attachments:

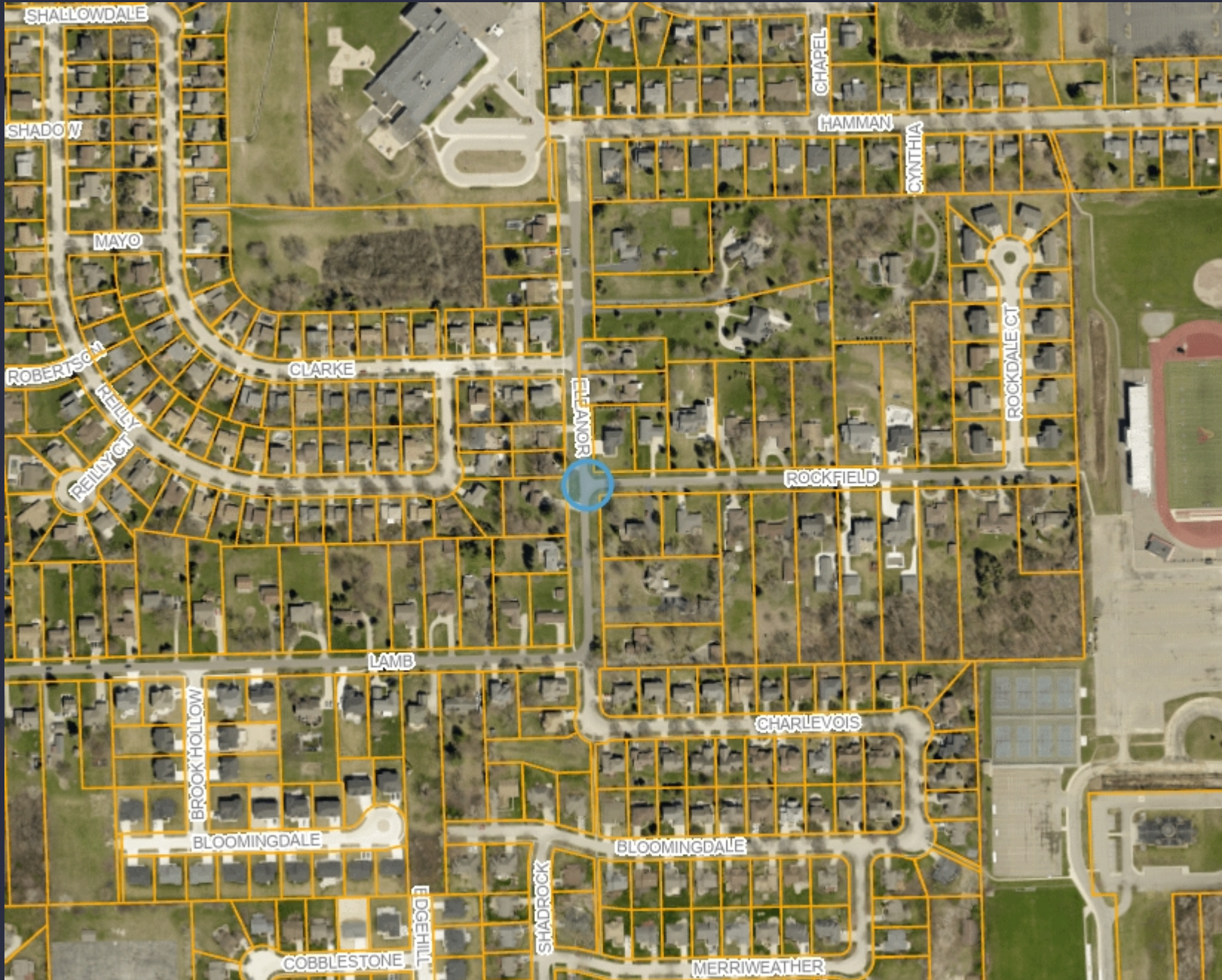
- Aerial Photo
- Safe Approach Speed Calculation Spreadsheet
- Intersection Photos
- Traffic Control Determination Reference Guide



GIS Online

Legend:

Road Centerline Text



Notes:

Map Scale: 1=504

Created: April 4, 2022



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.

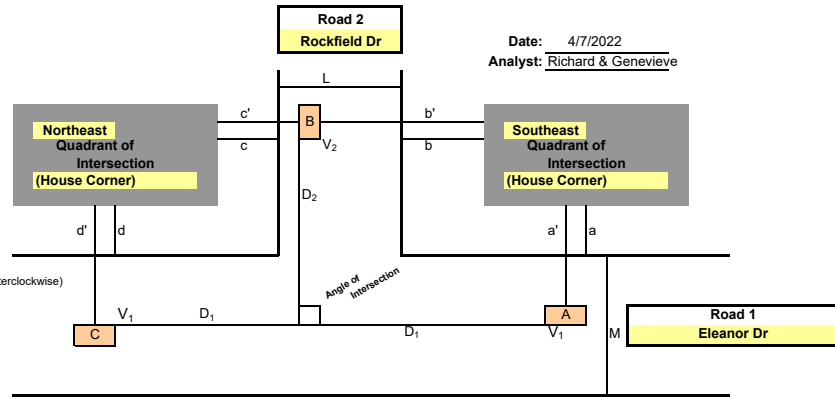
Safe Approach Speed Calculation

Eleanor Dr and Rockfield Dr
City of Troy

Date: 4/7/2022
Analyst: Richard & Genevieve

Measured:

- Width of Roads
 - Road 1 = 20 (ft)
 - Road 2 = 21 (ft)
- Distance to Obstruction
 - a = 80 (ft)
 - b = 93 (ft)
 - c = 66 (ft)
 - d = 50 (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:

D ₁ = 196	a' = 86
D _{2A} = 179	b' = 102
D _{2C} = 102.2	c' = 72
	d' = 58

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

Calculated Safe Approach Speed for Vehicle B
Approaching on Road 2

or V₂ = 28.1 (mph) [Based on Veh. A]
 or V₂ = 18.7 (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: **YIELD SIGN**



Photograph No. 1: Rockfield Drive- Heading West
Date: 04/7/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 2: Rockfield Drive- Heading West looking left
Date: 04/7/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 3: Rockfield Drive- Heading West looking right
Date: 04/07/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 4: Eleanor Drive- Heading North
Date: 04/07/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 5: Eleanor Drive - Heading North and looking right
Date: 04/07/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 6: Eleanor Drive - Heading South
Date: 04/7/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Apr 7, 2022 at 1:29:26 PM
4405 Eleanor Ave
Troy MI 48085
United States

Photograph No. 7: Eleanor Drive - Heading South and looking left
Date: 04/7/2022 **Photographer:** Richard Boateng & Genevieve Schneemann

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.*



TRAFFIC COMMITTEE REPORT

May 4, 2022

TO: Traffic Committee

FROM: Bill Huotari, City Engineer/Traffic Engineer

SUBJECT: Request for Traffic Control – Carter Avenue at Virgilia Avenue

Background:

Jade Nason of 237 Carter Avenue requests that the intersection of Carter Avenue at Virgilia Avenue be reviewed for purposes of ALL-WAY STOP at the intersection. Virgilia Avenue is controlled by Stop signs on the northbound and southbound approaches to Carter Avenue.

Ms. Nason stated that the intersection to the south (Carter Avenue at Lange Avenue) is an ALL-WAY STOP and is a mirror image of Carter Avenue at Virgilia Avenue. She added that Carter Avenue at Virgilia Avenue is the bus stop location and she is concerned about the children in the road waiting for the bus.

The same request by another resident was also made back in 2017. OHM reviewed the intersection and provided the included report that recommended no changes to the intersection. The resident at that time did not want to pursue the ALL-WAY STOP, so it was never brought forward to the Traffic Committee for consideration.

The posted speed limit on both streets is 25 mph. The intersection is currently controlled by Stop signs located on the north and south bounds of Virgilia Avenue.

Carter Avenue is presumed to be the major road, while Virgilia Avenue is considered the minor road. Both Avalon Drive and Cedar Crest Drive serve as key routes throughout the neighborhood.

There was one (1) crash recorded in the past full five (5) years within a 250' radius of the intersection.

The major potential sight distance obstruction at the intersection for a motorist traveling northbound on Virgilia Avenue would be the cars parked in the driveway on the southeast quadrant and house corner on the southwest quadrant of the intersection.

The safe approach speed for northbound vehicles on Virgilia Avenue is 5.7 mph due to the sight distance obstruction from the southeast quadrant of the intersection.

OHM recommends retaining the STOP controls on the Virgilia Avenue approaches to the intersection.

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

May 4, 2022

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

RE: Traffic Control Recommendation for
Carter Drive at Virgilia Drive

Dear Mr. Huotari:

As requested, we have reviewed the intersection of Carter Drive at Virgilia Drive to determine the proper traffic control. Carter Drive at Virgilia Drive is a 4-legged intersection located in the City of Troy. The speed limit on both streets under investigation is 25 mph. It is a two-way stop-controlled intersection with the stop signs located on the north and south bounds of Virgilia Drive. Attached are aerial and intersection photos.

Types of Roadways

Both Carter Drive and Virgilia Drive are considered local streets. Virgilia Drive runs north to south providing direct access to the neighborhood from W Wattles Road. Carter Drive runs east to west offering access to the neighborhood from the Livernois Road.

The surrounding land use is entirely single-family residential. On-street parking is permitted on the south side of Carter Drive and on west side of Virgilia Drive. There is no clear major versus minor street. However, for the purpose of analysis Carter Drive is presumed to be the major road, while Virgilia Drive is considered the minor road. Both Virgilia Drive and Carter 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 was one non-injury (property damage only) crash recorded in the past full five (5) years within a 250' radius of the intersection. The crash was an angle crash type and it occurred when a driver on the southbound Virgilia Drive ran the stop sign and struck another on the westbound of Carter Drive. The crash history does not constitute a compelling case for modifying the existing controls.



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).

Specifically, it is extremely unlikely that Carter 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 Virgilia Drive is similarly unlikely to average at least 200 units for the same 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.

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 Carter Drive at Virgilia Drive for a motorist traveling northbound on Virgilia Drive would be the cars parked in the driveway on the southeast quadrant and house corner on the southwest quadrant of the intersection. For a motorist traveling southbound on Virgilia Drive, the obstruction would be the cars parked in the driveway on the northwest quadrant and house corner in the northeast quadrant.

During the field visit, it was observed that vehicles were parked side-by-side in the driveway for the properties on the northwest & southeast quadrants. These vehicles are also observed parked side-by-side against the face of the garage in the Google Earth satellite and street view images. Reference the attachments for intersection photos.

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 less than 10 mph, a STOP sign is recommended. When the safe approach speed is found to be more than 10 mph, a YIELD sign is recommended. The safe approach speed for northbound vehicles on Virgilia Drive is 5.7 mph due to the sight distance obstruction from the southeast quadrant of the intersection. Safe approach speeds for the remaining approaches range from 11.2 mph to 14.5 mph. Thus, based on the safe approach speed calculations, STOP-control is the computed right-of-way control for Virgilia 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 Virgilia drive approach.



OHM recommends retaining the STOP controls on the Virgilia approaches. The intersection should be reevaluated if traffic volumes increase, or crashes begin to occur.

Sincerely,
OHM Advisors

Ife Ogundeji
Traffic Engineer

Attachments:

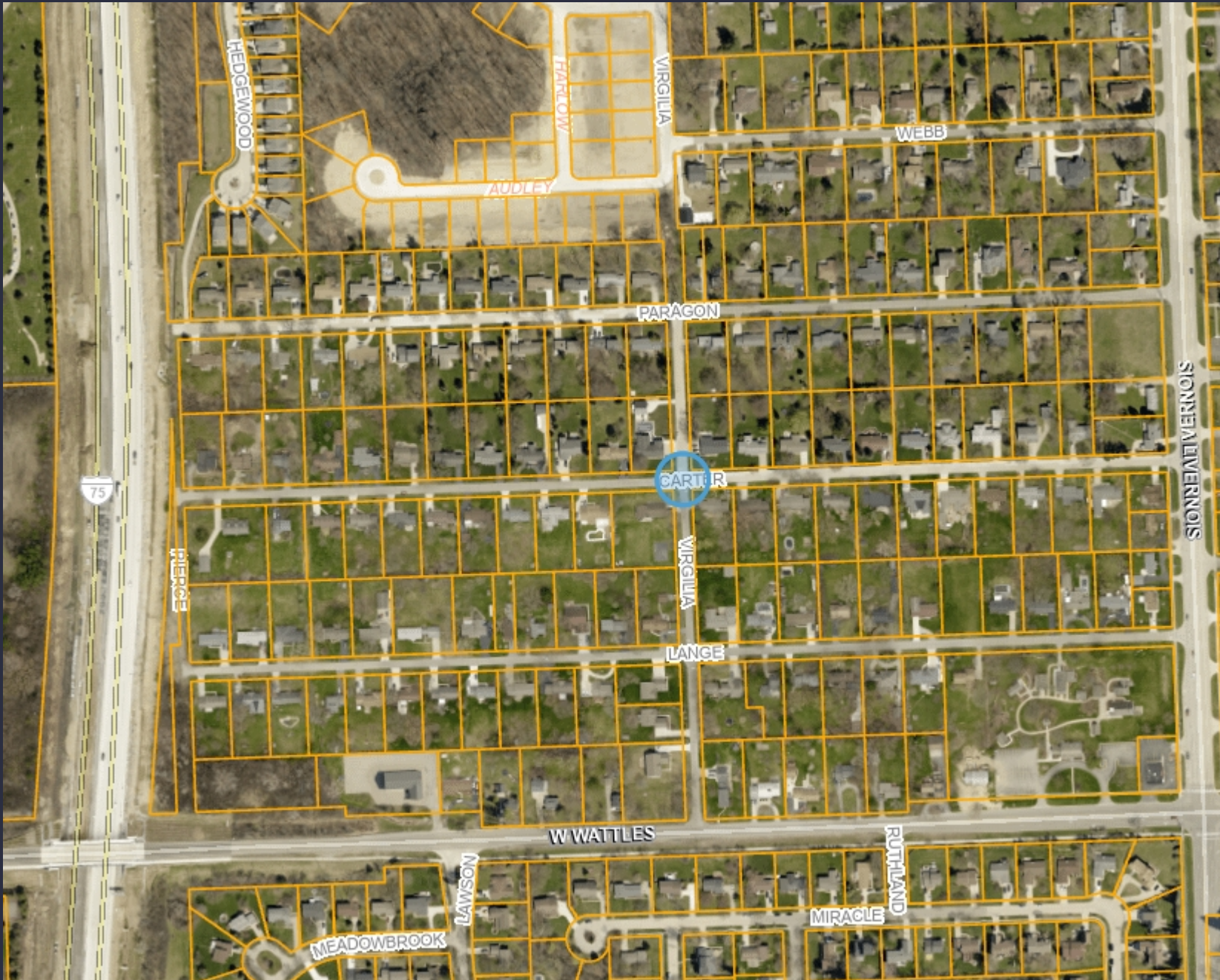
- Aerial Photo
- Safe Approach Speed Calculation Spreadsheet
- Intersection Photos
- Traffic Control Determination Reference Guide



GIS Online

Legend:

Road Centerline Text



Notes:

Map Scale: 1=504

Created: March 23, 2022




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.

Carter Dr & Virgilia Dr

Write a description for your map.

Legend

 Fee Advisors Network



Safe Approach Speed Calculation

Carter and Virgilia
City of Troy

Date: 3/24/2022
Analyst: (Richard & Genevieve)

Measured:

- Width of Roads
 - Road 1 = 22 (ft)
 - Road 2 = 22 (ft)
- Distance to Obstructions
 - a = 51 (ft) e = 45 (ft)
 - b = 34 (ft) f = 41 (ft)
 - c = 35 (ft) g = 11 (ft)
 - d = 35 (ft) h = 47 (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)

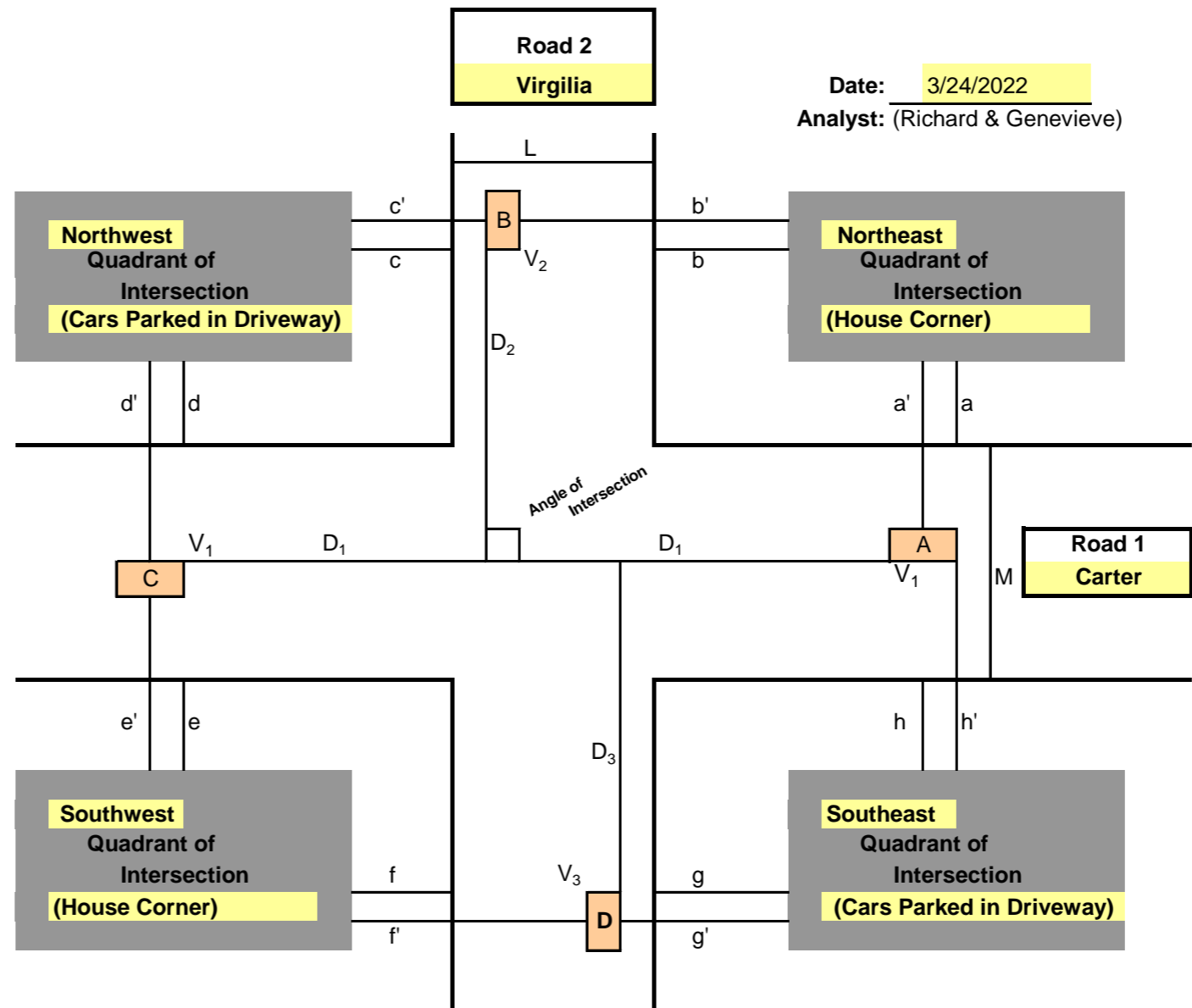
Calculated Safe Approach Speed for Vehicle B
Approaching on Road 2

- V₂ = 14.5 (mph) [Based on Veh. A]
- or V₂ = 11.2 (mph) [Based on Veh. C]

Calculated Safe Approach Speed for Vehicle D
Approaching on Road 2

- V₃ = 5.7 (mph) [Based on Veh. A]
- or V₃ = 13.8 (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:

- D₁ = 196 a' = 57 e' = 51
- D_{2A} = 73.5 b' = 44 f' = 51
- D_{2C} = 53.2 c' = 41 g' = 17
- D_{3A} = 24.0 d' = 45 h' = 57
- D_{3C} = 68.9

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: Carter Drive- Heading East
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 2: Carter Drive- Heading East looking left
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 3: Carter Drive- Heading East looking right
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 4: Carter Drive- Heading West
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 5: Carter Drive - Heading West and looking right
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 6: Carter Drive - Heading West looking left
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 7: Virgilia Drive - Heading North
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 8: Virgilia Drive - Heading North and looking left
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 9: Virgilia Drive - Heading North and looking right
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 10: Virgilia Drive - Heading South
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 11: Virgilia Drive - Heading South and looking right
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 12: Virgilia Drive - Heading South and looking left
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann

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.*

January 12, 2017

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

RE: Traffic Control Recommendation for Carter Avenue and Virgilia Avenue
OHM JN: 0128-17-0010

Dear Mr. Huotari:

As requested, we have reviewed the Carter Avenue at Virgilia Avenue intersection to determine whether a 4-way STOP should be implemented. The subject intersection is a 4-leg intersection located in the City of Troy approximately 900 feet north of W. Wattles Road and 1,350 feet west of Livernois Road. The speed limit on both streets is 25 mph. The intersection is presently a 2-way stop on the Virgilia Avenue approaches. 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 no crashes recorded in the past five (5) years at the intersection of Carter Avenue at Virgilia Avenue. The crash data does not constitute a compelling case for modifying the existing controls.

Types of Roadways & Minimum Volumes

Both Carter Avenue and Virgilia Avenue are considered local streets. On-street parking is permitted on the south side of Carter Drive and the west side of Virgilia Avenue in the vicinity of the intersection. Carter Avenue would be considered the main road as it is currently unrestricted at this intersection while Virgilia Avenue is stop controlled. Carter Avenue connects Livernois Road (minor arterial) to the single family residences and Virgilia Avenue connects W. Wattles Road to the single family residences. Both



streets end within in the neighborhood without connecting to any other major streets. Traffic counts were not collected in the vicinity of the intersection. Based on the residential nature and dead-end location, it is highly improbable that there are any daily hours in which Carter Avenue or Virgilia Avenue meet 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.

Sight Distance

The major potential sight distance obstruction at the intersection are houses in each quadrant of the intersection (see the attached approach pictures). 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 11.0 mph for northbound Virgilia Avenue based on a vehicle traveling westbound on Carter Avenue as a result of the sight obstruction from the house on the right side on approach to the intersection, therefore a YIELD sign is the recommended treatment. The safe approach speed calculation spreadsheet is attached for your reference.



Recommendation

OHM recommends that while the recommended intersection treatment is for YIELD signs on the Virgilia Avenue approaches to the intersection, the intersection remain under two-way STOP control. The intersection should continue to be monitored if traffic volumes increase or crashes begin to occur.

Sincerely,
Orchard, Hiltz & McCliment, Inc.

Steve M. Loveland, PE, PTOE
Traffic Project Manager

Stephan Maxe, PE
Engineer

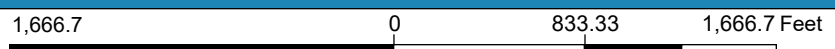
Attachments:

- Aerial and Intersection Photos
- Safe Approach Speed Calculation Spreadsheet



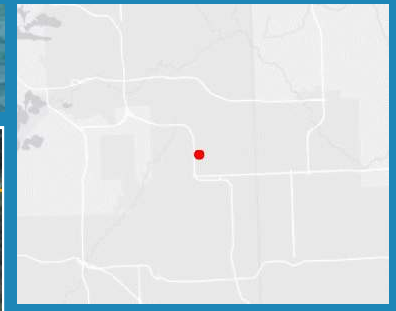
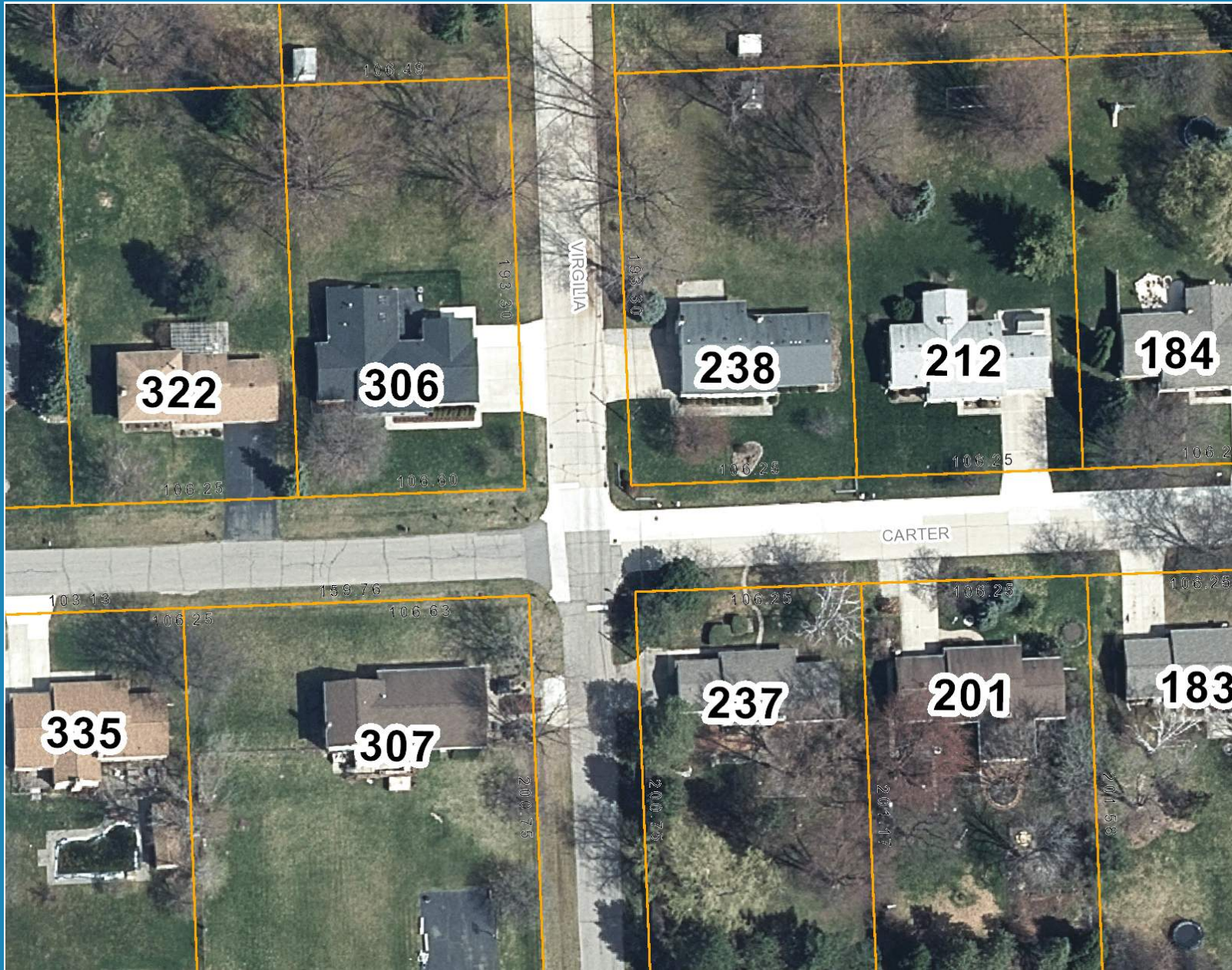
Legend
 Tax Parcel

Notes
 Location Aerial - Carter Avenue at Virgilia Avenue



WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
 THIS MAP IS NOT TO BE USED FOR NAVIGATION



Legend

 Tax Parcel

Notes

Detailed Aerial - Carter Avenue at Virgilia Avenue

188.0 0 94.00 188.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Safe Approach Speed Calculation

**Carter Ave and Virgilia Ave
City of Troy**

Date: 1/6/2017
Analyst: Stephan Maxe

Measured:

- Width of Roads
 - Road 1 = 22 (ft)
 - Road 2 = 22 (ft)
- Distance to Obstructions
 - a = 51 (ft) e = 45 (ft)
 - b = 34 (ft) f = 41 (ft)
 - c = 57 (ft) g = 28 (ft)
 - d = 35 (ft) h = 47 (ft)
- Angle of Intersection
 - Delta = 90 (degrees, measure counterclockwise)
- Road 1 Posted
 - Speed Limit = 25 (mph)

Assumed:

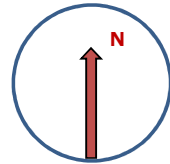
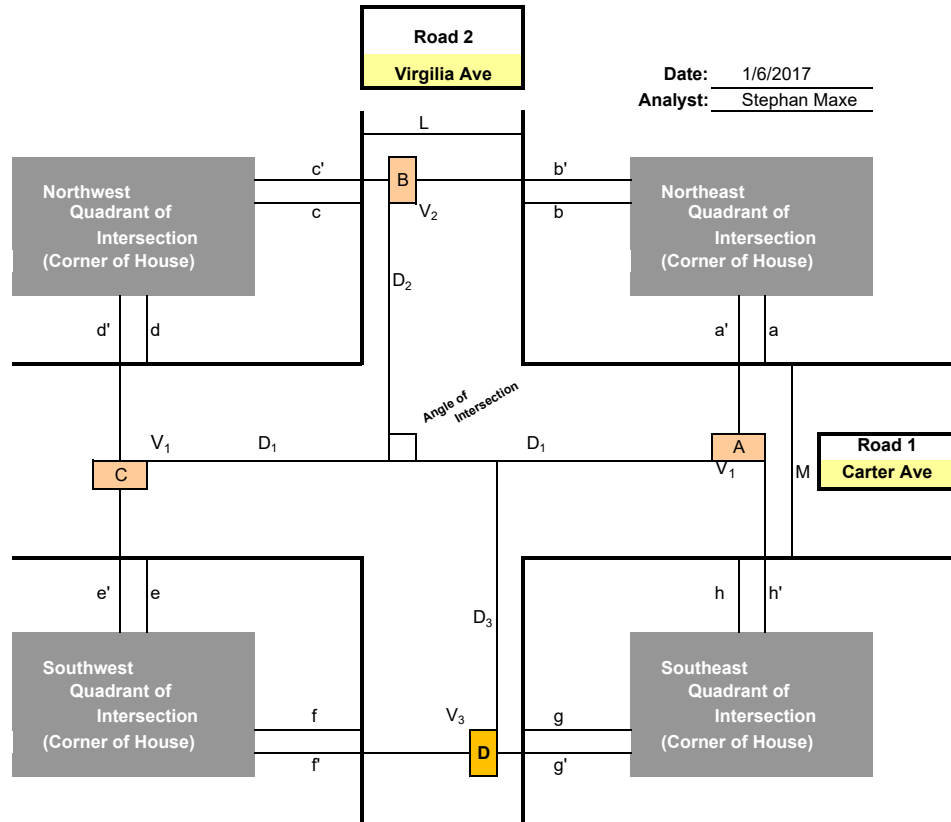
- Speed of Vehicle A = Speed of Vehicle C = Posted Speed Limit on Road 1
 - + 5 (mph)
 - V₁ = 30 (mph)
- Perception / Reaction Time (AASHTO)
 - t = 2.5 (sec)
- Deceleration rate (AASHTO)
 - A = 11.20
- Clearance distance in excess of safe stopping distance (AAA)
 - EC = 0 (ft)

Calculated Safe Approach Speed for Vehicle B

- Approaching on Road 2
 - TRUE V₂ = 15.2 (mph) [Based on Veh. A]
 - or V₂ = 16.5 (mph) [Based on Veh. C]

Calculated Safe Approach Speed for Vehicle D

- Approaching on Road 2
 - V₃ = 11.0 (mph) [Based on Veh. A]
 - or V₃ = 14.5 (mph) [Based on Veh. C]



Intermediate Calculations:

D ₁ = 196	a' = 59	e' = 53
D _{2A} = 78.1	b' = 48	f' = 55
D _{2C} = 86.6	c' = 65	g' = 36
D _{3A} = 52.2	d' = 49	h' = 61
D _{3C} = 73.6		

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 : YIELD Sign**



Virgilia Ave heading north



Virgilia Ave heading north and looking right



Virgilia Ave heading north and looking left



Carter Ave heading east



Carter Ave heading east and looking right



Carter Ave heading east and looking left



Virgilia Ave heading south



Virgilia Ave heading south looking right



Virgilia Ave heading south looking left



Carter Ave heading west



Carter Ave heading west looking right



Carter Ave heading west looking left



TRAFFIC COMMITTEE REPORT

May 4, 2022

TO: Traffic Committee

FROM: Bill Huotari, City Engineer/Traffic Engineer

SUBJECT: Request for Traffic Control – Oakcrest Drive at Highland Drive

Background:

Heather Novetsky of 1637 Oakcrest Drive requests that the intersection of Oakcrest Drive at Highland Drive be reviewed for purposes of traffic control. She states that the lack of traffic control is creating a hazardous condition. Ms. Novetsky added that the intersection is a bus stop and she is concerned about children waiting in the intersection for the bus.

The posted speed limit on both streets is 25 mph.

The intersection is currently uncontrolled.

Oakcrest Drive is presumed to be the major road, while Highland Drive is considered the minor road as it terminates at Oakcrest Drive.

There were no crashes recorded in the past full five (5) years within a 250' radius of the intersection.

Traffic counts were not collected as part of the intersection study.

The major potential sight distance obstruction at the intersection for a motorist traveling southbound on Highland Drive would be the house corners on the northeast and fence on the northwest quadrants of the intersection.

The safe approach speed for southbound vehicles on Highland Drive is 7.1 mph due to the permanent sight distance obstruction from the house corner on the northeast quadrant and the fence on the northwest quadrant.

OHM recommends implementing a STOP sign on the Highland Drive approach to the intersection.

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

May 3, 2022

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

RE: Traffic Control Recommendation for
Oakcrest Drive at Highland Drive

Dear Mr. Huotari:

As requested, we have reviewed the intersection of Oakcrest Drive at Highland Drive to determine the proper traffic control. Oakcrest Drive at Highland 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 Oakcrest Drive and Highland Drive are considered local streets. Highland Drive runs north to south while Oakcrest runs east to west, both offering connectivity throughout the neighborhood

The surrounding land use is entirely single-family residential. On-street parking is permitted on the south side of Oakcrest and on the east side of Highland Drive. For the purpose of this analysis Oakcrest Drive is presumed to be the major road, while Highland Drive is considered the minor road as it terminates at Oakcrest Drive. Both Highland Drive and Oakcrest 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), which 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.



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). Specifically, it is unlikely that Oakcrest Dr meets and sustains the 300 vehicles per hour threshold for a minimum of 8 hours. Similarly, the combined vehicular, pedestrian, and bicycle volumes entering from Highland Drive are similarly unlikely to average at least 200 units for the same 8 hours as Oakcrest Dr.

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.

Sight Distance

The major potential sight distance obstruction at the intersection of Oakcrest Drive at Highland Drive for a motorist traveling southbound on Highland Drive would be the house corner on the northeast and fence on the 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 less than 10 mph, 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 Highland Drive is 7.1 mph due to the permanent sight distance obstruction from the house corner on the northeast quadrant and the fence on the northwest quadrant. Thus, based on the safe approach speed calculations, STOP-control is the computed right-of-way control for Highland approach. The safe approach speed calculation spreadsheet for the intersection is attached for reference.



Recommendation

The preceding analysis did not find that any criteria were met for all-way STOP-control. The safe approach speed calculations suggested STOP-control would be appropriate for the Highland Drive approach.

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

Sincerely,
OHM Advisors

Ife Ogundeji
Traffic Engineer

Attachments:

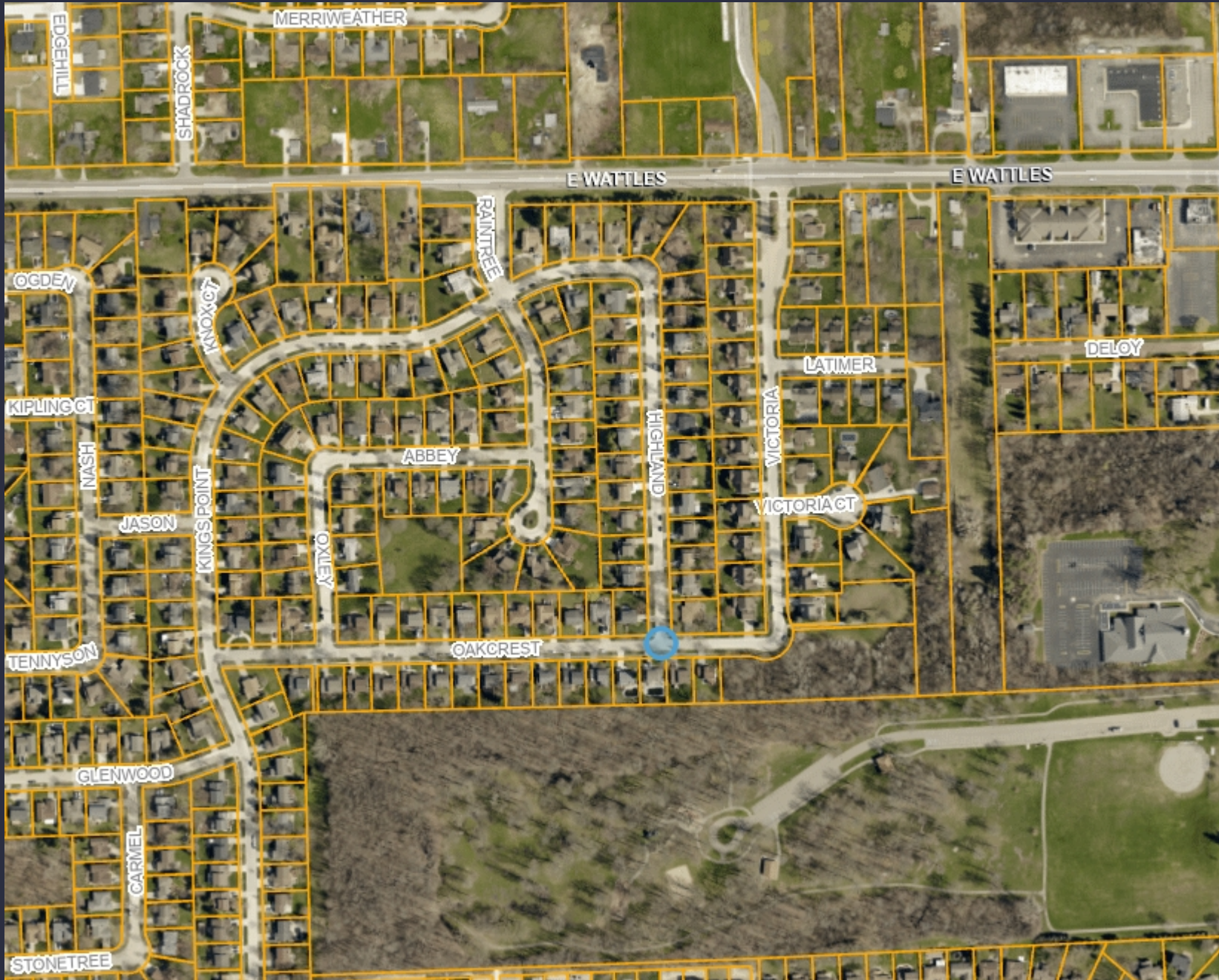
- Aerial Photo
- Safe Approach Speed Calculation Spreadsheet
- Intersection Photos
- Traffic Control Determination Reference Guide



GIS Online

Legend:

Road Centerline Text



Notes:

Map Scale: 1=504
Created: March 17, 2022



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.

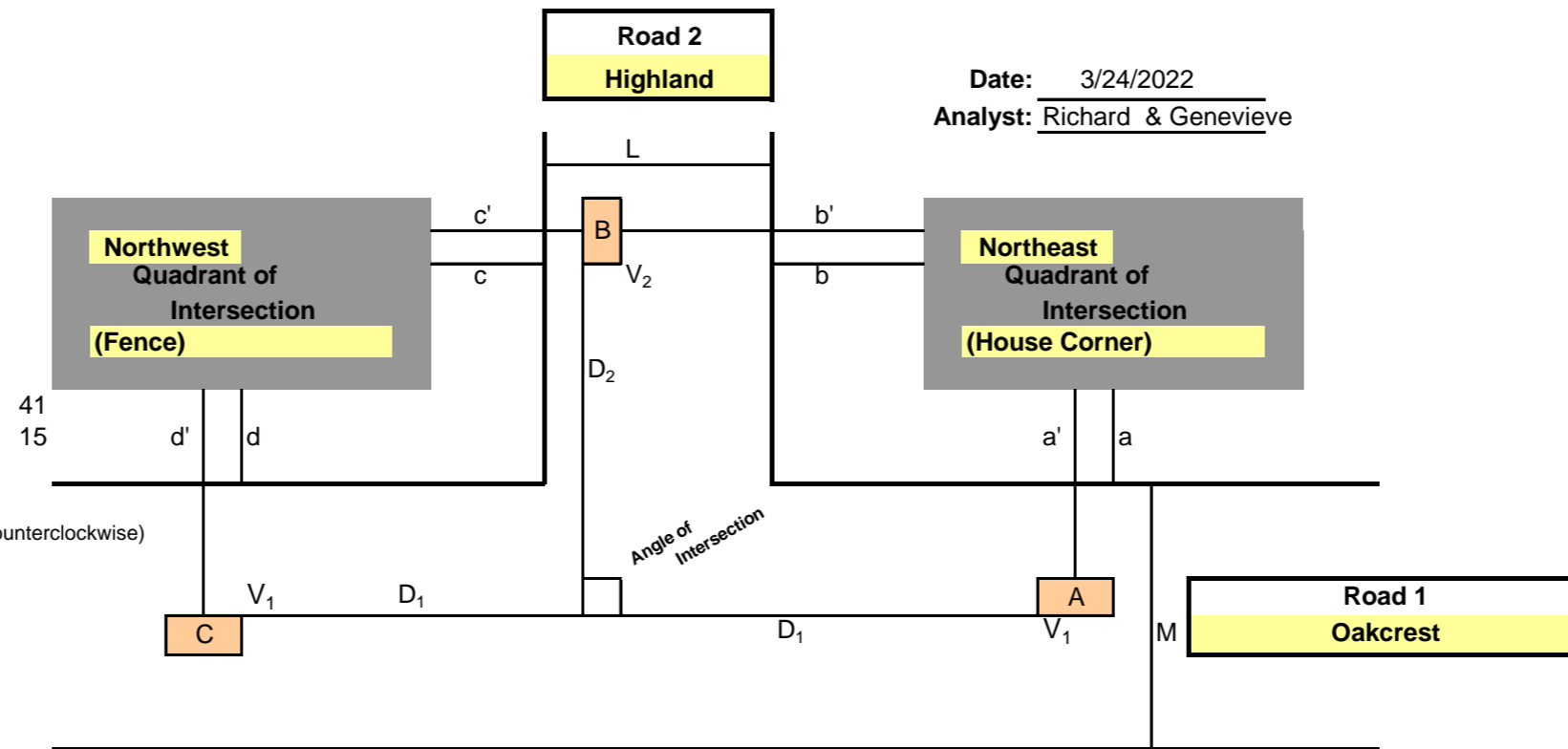
Safe Approach Speed Calculation

Oakcrest and Highland
City of Troy

Date: 3/24/2022
Analyst: Richard & Genevieve

Measured:

- Width of Roads
 - Road 1 = 28 (ft)
 - Road 2 = 28 (ft)
- Distance to Obstruction
 - a = 47 (ft)
 - b = 41 (ft)
 - c = 15 (ft)
 - d = 47 (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} = 74.7
- D_{2C} = 30.9
- a' = 53
- b' = 57
- c' = 21
- d' = 63

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

- 14.7 (mph) [Based on Veh. A]
- or V₂ = 7.1 (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: Highland Drive- Heading South
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 2: Highland Drive- Heading South looking left
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 3: Highland Drive- Heading South looking right
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 4: Oakcrest- Heading West
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 5: Oakcrest Drive - Heading West and looking right
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 6: Oakcrest Drive - Heading East
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann



Photograph No. 7: Oakcrest Drive - Heading East and looking left
Date: 03/24/2022 **Photographer:** Richard Boateng & Genevieve Schneemann

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.*