

**AGENDA**  
**TRAFFIC COMMITTEE MEETING**  
**SEPTEMBER 21, 2011 – 7:30 P.M.**  
**LOWER LEVEL CONFERENCE ROOM - TROY CITY HALL**  
**500 W. BIG BEAVER ROAD**

1. Roll Call
2. Minutes – June 15, 2011

**REGULAR BUSINESS**

3. Change YIELD sign to STOP sign Prescott at Milburn  
Requested by Sherwin DeLeon, 2130 Prescott
4. Change YIELD sign to STOP sign Brinston at Milburn  
Requested by Traffic Engineering
5. Request for 4-Way STOP control at Barclay at Holly  
Requested by Cindy Kaiser, 692 Barclay
6. Wattles Road, Coolidge to Livernois Speed Limit Changes  
Requested by Troy Police Department
7. Wattles Road, Adams to Beach Speed Limit Change  
Requested by Troy Police Department
8. Wattles Road, Beach to Coolidge Speed Limit Change  
Requested by Troy Police Department
9. Public Comment
10. Other Business
11. Adjourn

- cc: Item 3: Sherwin DeLeon, 2130 Prescott  
Residents within 300 feet of Prescott at Milburn
- Item 4: Residents within 300 feet of Brinston at Milburn
- Item 5: Cindy Kaiser, 692 Barclay  
Residents within 300 feet of Barclay at Holly
- Items 7 & 8: Residents within 300 feet of Wattles, Adams to Coolidge

Traffic Committee Members  
Lt. David Livingston, Police Department  
Lt. Eric Caloia, Fire Department  
William J. Huotari, Deputy City Engineer/Traffic Engineer

## TRAFFIC COMMITTEE

### MESSAGE TO VISITORS, DELEGATIONS AND CITIZENS

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

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

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

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

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

**REGULAR BUSINESS****3. Change YIELD sign to STOP sign at Prescott at Milburn**

Sherwin DeLeon of 2130 Prescott requests that the existing YIELD sign be changed to a STOP sign at the intersection of Prescott and Milburn. See attached report.

**4. Change YIELD sign to STOP sign at Brinston at Milburn**

Traffic Engineering requests that the existing YIELD sign be changed to a STOP sign at the intersection of Brinston and Milburn. See attached report.

**5. 4-Way STOP control at Barclay at Holly**

Cindy Kaiser of 692 Barclay requests that the existing intersection of Barclay at Holly be upgraded to 4-Way STOP control. See attached report.

**6. Wattles Road, Coolidge to Livernois Speed Limit Change**

At the direction of City Council, this proposed speed limit change was tabled to allow for TIA to restudy Wattles Road, from Adams to Coolidge. Since Wattles Road, from Coolidge to Livernois was previously considered along with Item 7 and 8 and approved under Traffic Committee Resolution # 2011-01-06, a new resolution is required to modify the previous resolution and set the speed limit at 45 mph. See attached report.

**7. Wattles Road, Adams to Beach Speed Limit Change**

At the direction of City Council, the Traffic Improvement Association (TIA) has restudied Wattles Road, from Adams to Beach to determine the proposed speed limit in accordance with Public Act 85. The study recommends that the speed limit be set at 40 mph. See attached report.

**8. Wattles Road, Beach to Coolidge Speed Limit Change**

At the direction of City Council, TIA has restudied Wattles Road, from Beach to Coolidge to determine the proposed speed limit in accordance with Public Act 85. The study recommends that the speed limit be set at 45 mph. See attached report.

**SUGGESTED RESOLUTIONS:****Item 3:**

- a. **RESOLVED**, that the Traffic Committee recommends changing the existing YIELD sign on southbound Milburn at Prescott to a STOP sign.
- b. **RESOLVED**, that the Traffic Committee recommends no changes at the intersection of Milburn at Prescott.

**Item 4:**

- a. **RESOLVED**, that the Traffic Committee recommends changing the existing YIELD sign on northbound Milburn at Brinston to a STOP sign.
- b. **RESOLVED**, that the Traffic Committee recommends no changes at the intersection of Milburn at Brinston

**Item 5:**

- a. **RESOLVED**, that the Traffic Committee recommends upgrading the intersection of Barclay at Holly to 4-Way STOP control.
- b. **RESOLVED**, that the Traffic Committee recommends no changes at the intersection of Barclay at Holly

**Item 6:**

- a. **WHEREAS**, Resolution #2011-01-06 set the speed limit of Wattles Road, from Adams to Livernois at 45 mph;

**WHEREAS**, City Council directed that a restudy of a portion of this section be performed, said section being Wattles Road, from Adams to Coolidge;

**THEREFORE, BE IT RESOLVED**, that Resolution #2011-01-06 is superseded and the speed limit of Wattles Road, from Coolidge to Livernois be set at 45 mph, based on results of an engineering study performed by TIA

**BE IT FURTHER RESOLVED**, that the speed limit of Wattles Road, from Adams to Beach and Wattles Road, from Beach to Coolidge be set by separate resolution.

- b. **RESOLVED**, that the Traffic Committee recommends no changes to the speed limit of Wattles Road, from Coolidge to Livernois.

**Item 7:**

- a. **RESOLVED**, that the Traffic Committee recommends that the speed limit on Wattles Road, from Adams to Beach Road, be set at 40 mph, based on results of an engineering study performed by TIA.
- b. **RESOLVED**, that the Traffic Committee recommends no changes to the speed limit on Wattles Road, from Adams to Beach.

**Item 8:**

- a. **RESOLVED**, that the Traffic Committee recommends that the speed limit of Wattles Road, from Beach to Coolidge, be set at 45 mph, based on results of an engineering study performed by TIA.
- b. **RESOLVED**, that the Traffic Committee recommends no changes to the speed limit on Wattles Road, from Beach to Coolidge.

**9. Public Comment**

**10. Other Business**

**11. Adjourn**

## TRAFFIC COMMITTEE MINUTES – JUNE 15, 2011

**DRAFT**

A regular meeting of the Troy Traffic Committee was held Wednesday, June 15, 2011 in the Lower Level Conference Room at Troy City Hall. Pete Ziegenfelder called the meeting to order at 7:30 p.m.

### 1. Roll Call

PRESENT: Sarah Binkowski  
Ted Halsey  
Richard Kilmer  
Pete Ziegenfelder

ABSENT: John Diefenbaker  
Jan Hubbell  
Gordon Schepke

Also present: Bill Huotari, Deputy City Engineer/Traffic Engineer  
Lt. David Livingston, Troy Police Dept.

And: Suzie Wanstreet, 1141 Provincial  
Nicole Gearty, 1066 Salma  
Lou Wassel, 1221 Rothwell

### 2. Minutes – March 16, 2011

#### RESOLUTION # 2011-06-09

Moved by Kilmer  
Seconded by Halsey

To approve the March 16, 2011 minutes as printed.

YES: All-4  
NO: None  
ABSENT: 3 (Diefenbaker, Hubbell, Schepke)

MOTION CARRIED

### REGULAR BUSINESS

### 3. Install STOP sign on Eastbound Rothwell at Provincial

Susie Wanstreet, 1141 Provincial, opposes the installation of a Stop sign on Provincial. Concerns stated are relative to speeding on Rothwell by residents living in the area. Lou Wassel, 1221 Rothwell, reiterated support for no changes at the intersection as well as concerns about speeding on Rothwell. Specifically during the a.m. and p.m. peak hours.

**Install STOP sign on Eastbound Rothwell at Provincial (continued)**

Lt. Livingston offered to place the radar trailer on site and to provide select enforcement of the area.

Discussion ensued among Traffic Committee members, Traffic Engineer, Lt. Livingston and residents. Residents were informed that they could come back to Traffic Committee if issue persists.

**RESOLUTION # 2011-06-10**

Moved by Halsey  
Seconded by Binkowski

Recommend no changes at the intersection of Rothwell at Provincial.

YES: All-4  
NO: None  
ABSENT: 3 (Diefenbaker, Hubbell, Schepke)

MOTION CARRIED

4. **Public Comment**

No one wished to address the committee.

5. **Other Business**

Mr. Halsey observed that the Stop sign on the southeast corner of Hartland at Talbot or Kilmer is obstructed by a tree. The Traffic Engineer will investigate and resolve the issue.

6. **Adjourn**

The meeting adjourned at 8:03 p.m.

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Pete Ziegenfelder, Chairperson

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Bill Huotari, Recording Secretary



# **TRAFFIC COMMITTEE REPORT**

August 30, 2011

**TO:** Traffic Committee

**FROM:** Bill Huotari, Deputy City Engineer/ Traffic Engineer

**SUBJECT:** Milburn at Brinston and Milburn at Prescott  
Change Yield to Stop Sign

**Background:**

Sherwin DeLeon of 2130 Prescott requested that the existing YIELD sign on Milburn at Prescott be changed to a STOP sign. Traffic Engineering requested that the existing YIELD sign on Milburn at Brinston be changed to a STOP sign. Milburn connects to Brinston to the north and Prescott to the south.

The posted speed limit on all streets is 25 mph. Milburn is considered the local road at both intersections. Average daily traffic (ADT) on Brinston and Prescott exceed 1,000 while Milburn has an ADT of approximately 400. The volumes are well below the threshold levels for multi-way STOP sign warrants.

There has been one (1) crash recorded in the past 3 years at the Milburn/Brinston intersection.

There are sight distance obstructions at both intersection that come into play when determining the safe approach speed for the intersections. The safe approach speed was found to be less than 10 mph on the Milburn approach northbound to Brinston and greater than 10 mph on the Milburn approach southbound to Prescott.

The city requested that our traffic engineering consultant (OHM) review the request and provide a report of their findings and recommendations (copy attached).

**Recommendations:**

Staff concurs with our consultant's recommendation that the Brinston/Milburn intersection control be modified from a YIELD sign to a STOP sign on the Milburn northbound approach to the intersection.

It is not recommended to make any changes to the existing traffic control at the Milburn/Prescott intersection.



June 20, 2011

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

Subject: Traffic Control Recommendation for the intersections of Brinston Drive/Milburn Drive and Prescott Drive/Milburn Drive  
OHM JN: 0128-11-0030

Dear Mr. Huotari:

As requested, we have reviewed the Brinston Drive/Milburn Drive and Prescott Drive/Milburn Drive intersections to determine the proper traffic control. The subject locations are T-intersections located in the City of Troy, in a residential neighborhood located east of John R Road and south of Big Beaver Road. Brinston Drive and Prescott Drive are local streets running in the east-west direction. They are connected by a local street; Milburn Drive, which runs north-south forming T-intersections at both ends. Brinston Drive is to the north and Prescott Drive to the south. The speed limit on all streets is 25 mph. The existing traffic control at both intersections is a yield sign on the Milburn Drive approaches. Traffic on Brinston Drive and Prescott Drive is not required to stop. Reference the attachments for an 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 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 "multiway-STOP" or "all-way" STOP sign installation is discouraged. The multiway-STOP warrant requires the volumes of traffic per approach leg on intersecting roads to be approximately equal.

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.

### **Traffic Volumes**

Based on historical traffic data, Milburn Drive carries approximately 400 vehicles per day while Brinston Drive carries approximately 1200 vehicles per day. Traffic volumes along Prescott Drive were not available, but are expected to be fewer than 1000 vehicles per day. The MMUTCD indicates that multi-way STOP control could be warranted if there were at least 300 vehicles per hour from the major street approaches and 200 units (vehicles, pedestrians and bicycles) per hour from the minor street approaches for the same eight hours on an average day. Based on the traffic volumes alone, the option of multi-way STOP control does not meet warrants.

With the pedestrian and vehicular traffic added together (assuming less than 20 pedestrians per hour) this location is still far below warrant thresholds for multi-way STOP control. The historical traffic data is provided as an attachment to this letter. Pedestrian traffic has not been counted at the intersection.

### **Crash Analysis**

There was one (1) crash recorded in the past 3-years at the Brinston Drive/Milburn Drive intersection. The crash involved a vehicle traveling westbound running into a parked car. There were no crashes at the Prescott Drive/Milburn Drive intersection.

### **Approach Speeds**

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

### **Types of Highways**

Although Brinston Drive, Prescott Drive and Milburn Drive are considered local streets, Brinston Drive and Prescott Drive should be assigned right of way in these cases, as they are the continuing roads and Milburn Drive terminates at both Brinston Drive and Prescott Drive. Driver expectation is that the continuing road does not have to stop and the terminating road must at a minimum slow to make the turn.

### **Sight Distance**

The major sight distance obstructions at the intersections are the trees and landscaping in southeast quadrant of the Brinston Drive intersection and the homes in both the northwest and northeast quadrants of the Prescott Drive intersection. The obstructions and sight distance come into play when determining the safe approach speeds for the intersection. The safe approach speed is the speed at which a vehicle can approach an intersection and still stop in

time to avoid a collision with a vehicle on the cross street. Safe approach speeds are determined through calculations.

When the safe approach speed is found to be less than 10 mph for the minor road, a STOP sign is commonly used. In this case, the safe approach speed on Milburn Drive was found to be less than 10 mph at the Brinston Drive intersection and greater than 10 mph at the Prescott Drive intersection; therefore a STOP sign is the recommended treatment at Brinston Drive and the existing Yield sign is the recommended treatment at the Prescott Drive intersection. The safe approach speed calculation spreadsheets are attached for your reference.

**Recommendation**

OHM recommends that the Brinston Drive/Milburn Drive intersection control be modified from "yield control" to a STOP sign on the Milburn Drive northbound approach to the intersection. We recommend against modifying the intersection to multi-way STOP control. There are no changes required at the Prescott Drive/Milburn Drive intersection.

Sincerely,  
Orchard Hiltz & McCliment, Inc.



Steven M. Loveland, PE, PTOE  
Traffic Project Engineer

Attachments:

- Aerial and Intersection Photos
- Historical Count Data
- Safe Approach Speed Calculation Spreadsheets



# Attachments



Aerial Photograph  
Brinston Dr and Prescott Dr @ Milburn Dr



Milburn - looking north at Brinston



Milburn - looking northeast at Brinston



Brinston - looking west at Milburn



Brinston - looking southeast at Milburn



Prescott - looking east at Milburn



Prescott - looking west at Milburn



Prescott - looking northwest at Milburn



Milburn - looking south at Prescott

# Safe Approach Speed Calculation

Brinston at Milburn  
City of Troy, MI

Major = Brinston  
Local = Milburn

Date: 6/16/2011  
Analyst: S. Loveland

Measured:

- Width of Roads
  - Major: M = 28 (ft)
  - Local: L = 28 (ft)
- Distance to Obstruction (Pine Tree)
  - a = 15 (ft)
  - b = 41 (ft)
- Angle of Intersection
  - Delta = 90 (degrees)
- Major Rd Posted Speed Limit = 25 (mph)

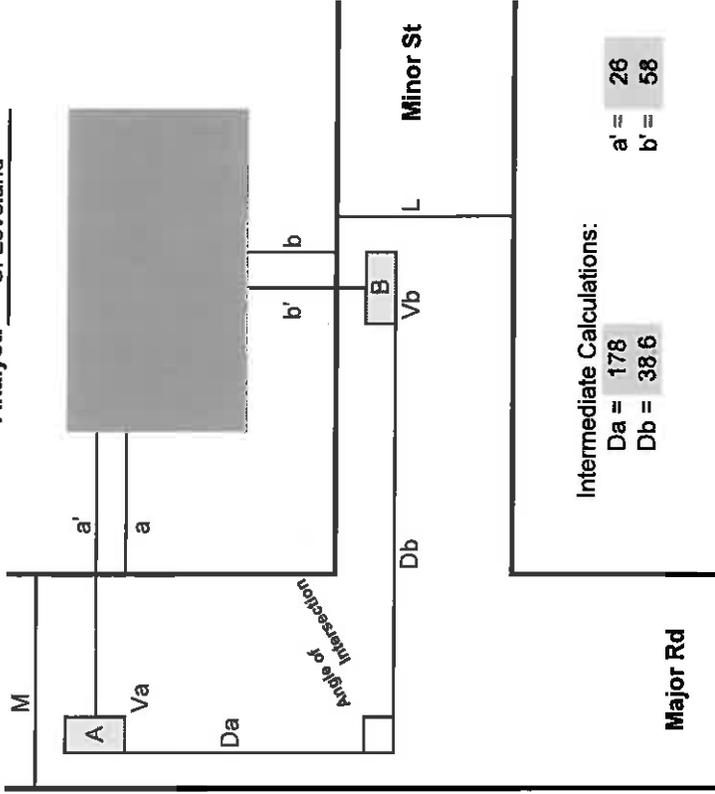
## Assumed:

- Speed of Vehicle A = Posted Speed Limit on Major Road + 5 (mph)
- Va = 30 (mph)
- Perception / Reaction Time (AASHTO) t = 2.0 (sec)
- Coefficient of friction (AASHTO) f = 0.40
- Clearance distance in excess of safe stopping distance (AAA) C = 15 (ft)

Calculated Safe Approach Speed for Vehicle Approaching on Local Rd	Vb = 6.7 (mph)
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Recommended ROW control for local street based on safe approach speed :

**STOP Sign**



## Intermediate Calculations:

Da = 178  
Db = 38.6  
a' = 26  
b' = 58

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

# Safe Approach Speed Calculation

Prescott at Milburn  
City of Troy, MI

Major = Prescott  
Local = Milburn

Date: 6/16/2011

Analyst: S. Loveland

Measured:

Width of Roads  
Major: M = 28 (ft)  
Local: L = 23 (ft)

Distance to Obstruction (Pine Tree)  
a = 36.5 (ft)  
b = 29.5 (ft)

Angle of Intersection  
Delta = 90 (degrees)

Major Rd Posted  
Speed Limit = 25 (mph)

Assumed:

Speed of Vehicle A = Posted Speed Limit  
on Major Road + 5 (mph)  
Va = 30 (mph)

Perception / Reaction Time (AASHTO)  
t = 2.0 (sec)

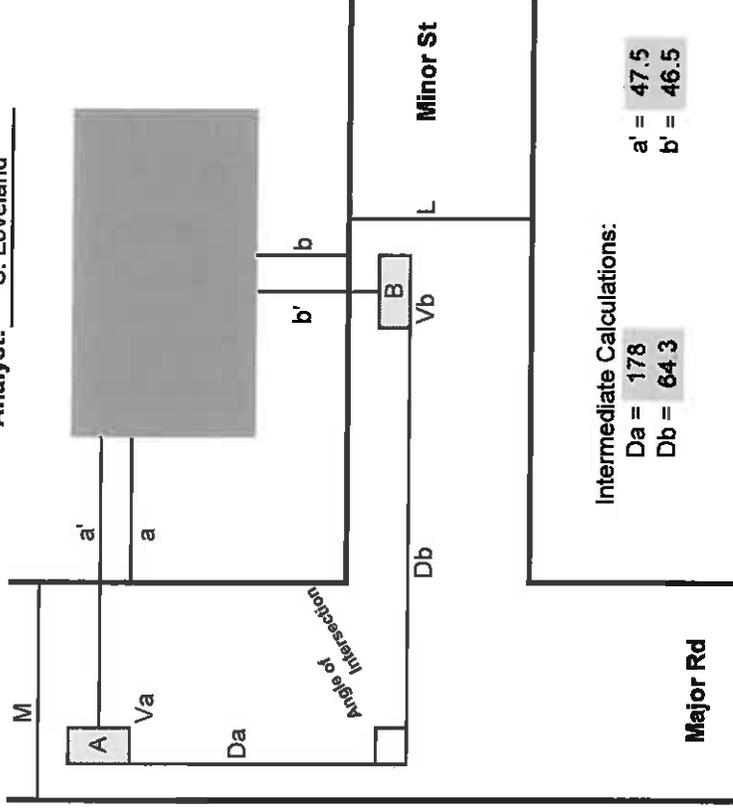
Coefficient of friction (AASHTO)  
f = 0.40

Clearance distance in excess of safe stopping distance (AAA)  
C = 15 (ft)

Calculated Safe Approach Speed for Vehicle Approaching on Local Rd	Vb = 12.4 (mph)
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Recommended ROW control for local street based on safe approach speed :

**YIELD Sign**



Intermediate Calculations:

Da = 178

Db = 64.3

a' = 47.5

b' = 46.5

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



## **TRAFFIC COMMITTEE REPORT**

August 29, 2011

**TO:** Traffic Committee

**FROM:** Bill Huotari, Deputy City Engineer/ Traffic Engineer

**SUBJECT:** Barclay at Holly  
Request for 4-way Stop Control

### **Background:**

Cindy Kaiser of 692 Barclay requested that the intersection of Barclay at Holly be modified to 4-way STOP control. There are currently STOP signs posted on the Holly drive approaches to the intersection.

The posted speed limit on both streets is 25 mph. Barclay drive is considered the major road at this intersection based on the traffic volumes. Average daily traffic (ADT) on Barclay is 580 with Holly Drive at 359. The volumes are well below the threshold levels for multi-way STOP sign warrants.

There has been one (1) crash recorded in the past 5 years at the intersection.

The major sight distance obstructions at the intersection are the tree and fence in the southwest quadrant. These obstructions come into play when determining the safe approach speed for the intersection. The safe approach speed was found to be less than 10 mph on Holly Drive; therefore the existing STOP signs are the recommended treatment.

Along Barclay Drive, adequate stopping sight distances are provided. Therefore, no changes are recommended for the Barclay Drive approaches to the intersection.

The city requested that our traffic engineering consultant (OHM) review the request and provide a report of their findings and recommendations (copy attached).

### **Recommendations:**

Staff concurs with our consultant's recommendation that the intersection control be kept as is with STOP signs on the Holly Drive approaches to the intersection.



July 15, 2011

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

Subject: Traffic Control Recommendation for the intersection of Barclay Drive and Holly Drive  
OHM JN: 0128-11-0040

Dear Mr. Huotari:

As requested, we have reviewed the Barclay Drive/Holly Drive intersection to determine the proper traffic control. The subject intersection is a 4-leg intersection located in the City of Troy, approximately 0.25 miles west of Rochester Road and 0.20 miles north of Wattles Road. Both Barclay Drive and Holly Drive are local streets, with Barclay Drive running in the east-west direction and Holly Drive running north-south. The speed limit on both streets is 25 mph. There are currently stop signs posted on the Holly Drive approaches to the intersection. Reference the attachments for an 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 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 "multiway-STOP" or "all-way" STOP sign installation is discouraged. The multiway-STOP warrant requires the volumes of traffic per approach leg on intersecting roads to be approximately equal.

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.

### **Traffic Volumes**

24-Hour traffic volumes were collected by OHM. The counts indicate the average daily traffic (ADT) on Barclay Drive to be 580 with Holly Drive at 359. The highest peak hour volumes along each road are 50 for Barclay Drive and 35 on Holly Drive. The MMUTCD indicates that multi-way STOP control could be warranted if there were at least 300 vehicles per hour from the major street approaches and 200 units (vehicles, pedestrians and bicycles) per hour from the minor street approaches for the same eight hours on an average day. Based on the peak hour volumes alone, the option of multi-way STOP control does not meet warrants.

With the pedestrian and vehicular traffic added together (assuming up to 20 pedestrians per hour) this location is still far below warrant thresholds for multi-way STOP control. All traffic counts are provided as an attachment to this letter. Pedestrian traffic has not been counted at the intersection.

### **Crash Analysis**

Based on information obtained through Traffic Improvement Association of Michigan, there was one (1) crash recorded in the past 5-years at the Barclay Drive/Holly Drive intersection. The crash was classified as "angle" with one of the vehicles failing to yield.

### **Approach Speeds**

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

### **Types of Highways**

Although both Barclay Drive and Holly Drive are considered local streets, Barclay Drive is considered the major road at this intersection based on the traffic volumes. The road with the heavier volume of traffic, Barclay Drive, should be given the right-of-way.

### **Sight Distance**

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

When the safe approach speed is found to be less than 10 mph for the minor road, a STOP sign is commonly used. In this case, the safe approach speed on Holly Drive was found to be less than 10 mph; therefore the existing STOP signs are the recommended treatment. The safe approach speed calculation spreadsheet is attached for your reference.

Stopping sight distance was examined along Barclay Drive, as there are horizontal curves located east and west of the intersection with Holly Drive. According to the Federal Highway Administration, stopping sight distances should be provided based on the design speed of the road. For design speeds of 25 mph and 30 mph, stopping sight distances should be at least 155 feet and 200 feet, respectively. Along Barclay Drive adequate stopping sight distances are provided, with over 200' of straightaway from the curves to the intersection at Holly Drive.

**Recommendation**

OHM recommends that the intersection control be kept as is with STOP signs on the Holly Drive approaches to the intersection. We recommend against modifying the intersection to multi-way STOP control.

Sincerely,  
Orchard Hiltz & McCliment, Inc.



Steven M. Loveland, PE, PTOE  
Traffic Project Engineer

Attachments:

- Aerial and Intersection Photos
- Traffic Counts
- Crash Data
- Safe Approach Speed Calculation Spreadsheet



# **Attachments**



Aerial Photograph  
Barclay Dr @ Holly Dr



Holly - Looking North



Barclay - Looking West



Barclay - Looking East



Holly - Looking South

# Orchard, Hiltz & McCliment, Inc.

24 Hour Count  
Barclay Drive at Holly Drive  
East Leg - Barclay Drive

34000 Plymouth Road  
Livonia, MI 48150

734.222.6711

Site Code: 000000000003  
Station ID:

Latitude: 0' 0.000 Undefined

Start Time	Mon 11-Jul-11	Tue 12-Jul-11	Wed 13-Jul-11	Thu 14-Jul-11	Fri 15-Jul-11	Average Day	Sat 16-Jul-11	Sun 17-Jul-11	Week Average
12:00 AM	*	*	*	*	7	7	*	*	7
01:00	*	*	*	*	2	2	*	*	2
02:00	*	*	*	*	9	9	*	*	9
03:00	*	*	*	*	2	2	*	*	2
04:00	*	*	*	*	0	0	*	*	0
05:00	*	*	*	*	3	3	*	*	3
06:00	*	*	*	*	16	16	*	*	16
07:00	*	*	*	*	25	25	*	*	25
08:00	*	*	*	*	41	41	*	*	41
09:00	*	*	*	*	30	30	*	*	30
10:00	*	*	*	*	35	42	*	*	42
11:00	*	*	*	*	18	18	*	*	18
12:00 PM	*	*	*	*	23	23	*	*	23
01:00	*	*	*	*	29	29	*	*	29
02:00	*	*	*	*	45	45	*	*	45
03:00	*	*	*	*	39	39	*	*	39
04:00	*	*	*	*	40	40	*	*	40
05:00	*	*	*	*	40	40	*	*	40
06:00	*	*	*	*	36	36	*	*	36
07:00	*	*	*	*	38	38	*	*	38
08:00	*	*	*	*	43	43	*	*	43
09:00	*	*	*	*	22	22	*	*	22
10:00	*	*	*	*	24	24	*	*	24
11:00	*	*	*	*	6	6	*	*	6
Day Total	0	0	0	453	170	580	0	0	580
% Avg. WKDay	0.0%	0.0%	0.0%	78.1%	29.3%	100.0%	0.0%	0.0%	
% Avg. Week	0.0%	0.0%	0.0%	78.1%	29.3%	100.0%	0.0%	0.0%	
AM Peak Vol.				10:00	08:00	10:00			10:00
				50	41	42			42
PM Peak Vol.				14:00	14:00	14:00			14:00
				45	45	45			45
Grand Total	0	0	0	453	170	580	0	0	580

ADT Not Calculated

# Orchard, Hiltz & McCliment, Inc.

24 Hour Count  
 Barclay Drive at Holly Drive  
 West Leg (Barclay Drive)

34000 Plymouth Road  
 Livonia, MI 48150  
 734.522.6711

Site Code: 000000000001  
 Station ID:

Latitude: 0' 0.000 Undefined

Start Time	Mon 11-Jul-11	Tue 12-Jul-11	Wed 13-Jul-11	Thu 14-Jul-11	Fri 15-Jul-11	Average Day	Sat 16-Jul-11	Sun 17-Jul-11	Week Average
12:00 AM	*	*	*	*	1	1	*	*	1
01:00	*	*	*	*	2	2	*	*	2
02:00	*	*	*	*	5	5	*	*	5
03:00	*	*	*	*	1	1	*	*	1
04:00	*	*	*	*	0	0	*	*	0
05:00	*	*	*	*	1	1	*	*	1
06:00	*	*	*	*	6	6	*	*	6
07:00	*	*	*	*	10	10	*	*	10
08:00	*	*	*	*	23	23	*	*	23
09:00	*	*	*	*	15	15	*	*	15
10:00	*	*	*	*	16	20	*	*	20
11:00	*	*	*	*	*	16	*	*	16
12:00 PM	*	*	*	*	*	14	*	*	14
01:00	*	*	*	*	*	23	*	*	23
02:00	*	*	*	*	*	32	*	*	32
03:00	*	*	*	*	*	22	*	*	22
04:00	*	*	*	*	*	22	*	*	22
05:00	*	*	*	*	*	23	*	*	23
06:00	*	*	*	*	*	23	*	*	23
07:00	*	*	*	*	*	30	*	*	30
08:00	*	*	*	*	*	14	*	*	14
09:00	*	*	*	*	*	11	*	*	11
10:00	*	*	*	*	*	11	*	*	11
11:00	*	*	*	*	*	2	*	*	2
<b>Day Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>268</b>	<b>80</b>	<b>327</b>	<b>0</b>	<b>0</b>	<b>327</b>
% Avg. WKDay	0.0%	0.0%	0.0%	82.0%	24.5%				
% Avg. Week	0.0%	0.0%	0.0%	82.0%	24.5%	100.0%	0.0%	0.0%	
AM Peak Vol.				10:00	08:00	08:00			08:00
PM Peak Vol.				14:00	23	23			23
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>268</b>	<b>80</b>	<b>327</b>	<b>0</b>	<b>0</b>	<b>327</b>

Start Time	Mon	Tue	Wed	Thu	Fri	Average Day	Sat	Sun	Week Average
12:00 AM	*	*	*	*	1	1	*	*	1
01:00	*	*	*	*	2	2	*	*	2
02:00	*	*	*	*	5	5	*	*	5
03:00	*	*	*	*	1	1	*	*	1
04:00	*	*	*	*	0	0	*	*	0
05:00	*	*	*	*	1	1	*	*	1
06:00	*	*	*	*	6	6	*	*	6
07:00	*	*	*	*	10	10	*	*	10
08:00	*	*	*	*	23	23	*	*	23
09:00	*	*	*	*	15	15	*	*	15
10:00	*	*	*	*	16	20	*	*	20
11:00	*	*	*	*	*	16	*	*	16
12:00 PM	*	*	*	*	*	14	*	*	14
01:00	*	*	*	*	*	23	*	*	23
02:00	*	*	*	*	*	32	*	*	32
03:00	*	*	*	*	*	22	*	*	22
04:00	*	*	*	*	*	22	*	*	22
05:00	*	*	*	*	*	23	*	*	23
06:00	*	*	*	*	*	23	*	*	23
07:00	*	*	*	*	*	30	*	*	30
08:00	*	*	*	*	*	14	*	*	14
09:00	*	*	*	*	*	11	*	*	11
10:00	*	*	*	*	*	11	*	*	11
11:00	*	*	*	*	*	2	*	*	2
<b>Day Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>268</b>	<b>80</b>	<b>327</b>	<b>0</b>	<b>0</b>	<b>327</b>
% Avg. WKDay	0.0%	0.0%	0.0%	82.0%	24.5%				
% Avg. Week	0.0%	0.0%	0.0%	82.0%	24.5%	100.0%	0.0%	0.0%	
AM Peak Vol.				10:00	08:00	08:00			08:00
PM Peak Vol.				14:00	23	23			23
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>268</b>	<b>80</b>	<b>327</b>	<b>0</b>	<b>0</b>	<b>327</b>

ADT Not Calculated

# Orchard, Hiltz & McCliment, Inc.

24 Hour Count  
 Barclay Drive at Holly Drive  
 North Leg (Holly Drive)

34000 Plymouth Road  
 Livonia, MI 48150  
 734.522.6711

Site Code: 4  
 Station ID:

Latitude: 0' 0.000 Undefined

Start Time	Mon 11-Jul-11	Tue 12-Jul-11	Wed 13-Jul-11	Thu 14-Jul-11	Fri 15-Jul-11	Average Day	Sat 16-Jul-11	Sun 17-Jul-11	Week Average
12:00 AM	*	*	*	*	0	0	*	*	0
01:00	*	*	*	*	0	0	*	*	0
02:00	*	*	*	*	0	0	*	*	0
03:00	*	*	*	*	0	0	*	*	0
04:00	*	*	*	*	0	0	*	*	0
05:00	*	*	*	*	1	1	*	*	1
06:00	*	*	*	*	3	3	*	*	3
07:00	*	*	*	*	7	7	*	*	7
08:00	*	*	*	*	8	8	*	*	8
09:00	*	*	*	*	21	21	*	*	21
10:00	*	*	*	*	15	15	*	*	15
11:00	*	*	*	17	*	17	*	*	17
12:00 PM	*	*	*	9	*	9	*	*	9
01:00	*	*	*	11	*	11	*	*	11
02:00	*	*	*	14	*	14	*	*	14
03:00	*	*	*	15	*	15	*	*	15
04:00	*	*	*	9	*	9	*	*	9
05:00	*	*	*	15	*	15	*	*	15
06:00	*	*	*	13	*	13	*	*	13
07:00	*	*	*	11	*	11	*	*	11
08:00	*	*	*	11	*	11	*	*	11
09:00	*	*	*	10	*	10	*	*	10
10:00	*	*	*	4	*	4	*	*	4
11:00	*	*	*	2	*	2	*	*	2
Day Total	0	0	0	141	55	196	0	0	196
% Avg. WKDay	0.0%	0.0%	0.0%	71.9%	28.1%				
% Avg. Week	0.0%	0.0%	0.0%	71.9%	28.1%	100.0%	0.0%	0.0%	
AM Peak Vol.				11:00	09:00				09:00
				17	21	21			21
PM Peak Vol.				15:00					15:00
				15		15			15
Grand Total	0	0	0	141	55	196	0	0	196
ADT	Not Calculated								

# Orchard, Hiltz & McCliment, Inc.

34000 Plymouth Road  
Livonia, MI 48150  
734-322-6711

24 Hour Count  
Barclay Drive at Holly Drive  
South Leg (Holly Drive)

Site Code: 000000000002  
Station ID:

Latitude: 0' 0.000 Undefined

Start Time	Mon 11-Jul-11	Tue 12-Jul-11	Wed 13-Jul-11	Thu 14-Jul-11	Fri 15-Jul-11	Average Day	Sat 16-Jul-11	Sun 17-Jul-11	Week Average
12:00 AM	*	*	*	*	4	4	*	*	4
01:00	*	*	*	*	0	0	*	*	0
02:00	*	*	*	*	1	1	*	*	1
03:00	*	*	*	*	1	1	*	*	1
04:00	*	*	*	*	0	0	*	*	0
05:00	*	*	*	*	3	3	*	*	3
06:00	*	*	*	*	6	6	*	*	6
07:00	*	*	*	*	22	22	*	*	22
08:00	*	*	*	*	24	24	*	*	24
09:00	*	*	*	*	23	23	*	*	23
10:00	*	*	*	27	35	31	*	*	31
11:00	*	*	*	24	*	24	*	*	24
12:00 PM	*	*	*	15	*	15	*	*	15
01:00	*	*	*	18	*	18	*	*	18
02:00	*	*	*	25	*	25	*	*	25
03:00	*	*	*	22	*	22	*	*	22
04:00	*	*	*	25	*	25	*	*	25
05:00	*	*	*	27	*	27	*	*	27
06:00	*	*	*	22	*	22	*	*	22
07:00	*	*	*	14	*	14	*	*	14
08:00	*	*	*	19	*	19	*	*	19
09:00	*	*	*	15	*	15	*	*	15
10:00	*	*	*	13	*	13	*	*	13
11:00	*	*	*	5	*	5	*	*	5
Day Total	0	0	0	271	119	359	0	0	359
% Avg. WKDay	0.0%	0.0%	0.0%	75.5%	33.1%				
% Avg. Week	0.0%	0.0%	0.0%	75.5%	33.1%	100.0%	0.0%	0.0%	
AM Peak Vol.				10:00	10:00	10:00			10:00
PM Peak Vol.				17:00	17:00	17:00			17:00
Grand Total	0	0	0	271	119	359	0	0	359

ADT Not Calculated



Traffic Improvement Association

**Crash Detail Report**

Request #: 0008957

Printed By: Rachel John

Printed On: 7/15/2011

CRASH_ID:	232880
LOCATION:	Holly Dr AT Barclay Dr
STAT_YEAR:	3-Year
FROM_DATE:	1/1/2006
TO_DATE:	12/31/2010

#1 Location: BARCLAY (0.19) 5 feet NE of Holly Dr Crash ID: 7024705  
 Crash Date: 06/09/2008 Day: Mon Hour: 3pm Weather: clear Roadway: dry Light: day  
 Injuries K: 0 Inj A: 0 Inj B: 0 Inj C: 0 Inj O: 2 How: angle  
 CVT: Troy Area: inter other HBD: N Drugs: N Complaint No: 0820419

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1		go straight	veh in transpt	none	none	none	failed to yield	car	lftside
2		go straight	veh in transpt	none	none	none	none	car	rtfront

UD-10: 080290561

**Crash Type**

Count	Type
0	uncoded
0	single
0	head-on
0	head-on/lt
1	angle
0	rr-end
0	rr-end/lt
0	rr-end/rt
0	ss-same
0	ss-opp
0	unknown
<b>Totals: 1</b>	

**Light Conditions**

Count	Type
0	uncoded
1	day
0	dawn
0	dusk
0	dark/lt
0	dark/unitd
0	unknown
<b>Totals: 1</b>	

**Weather**

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

**Road Condition**

Count	Type
0	uncoded
1	dry
0	wet
0	icy
0	snowy
0	muddy
0	slushy
0	debris
0	unknown
<b>Totals: 1</b>	

**Vehicle Type**

Count	Type
0	uncoded
2	car
0	other
0	truck/bus
0	van
0	pickup
0	sm truck
0	motorcycle
0	moped
0	go-cart
0	snowmobile
0	off-rd veh
<b>Totals: 2</b>	

**Crashes By Month**

Count	Type
0	January
0	February
0	March
0	April
0	May
1	June
0	July
0	August
0	September
0	October
0	November
0	December
<b>Totals: 1</b>	

**Hazardous Action**

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

**Unit Type**

Count	Type
0	uncoded
2	vehicle
0	pedestrian
0	bicyclist
0	engineer
<b>Totals: 2</b>	

**Crash Severity**

	FATAL	A	B	C	No Inj	Total
Persons	0	0	0	0	2	2
Crashes	0	0	0	0	1	1

**Alcohol in Crashes**

	FATAL	PI	PD	Total
Drinking	0	0	0	0
Not Drinking	0	0	1	1
Total	0	0	1	1

**Crashes per Hour by Day**

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

# Safe Approach Speed Calculation

Barclay Dr & Holly Dr  
City of Troy, MI

Major = Barclay Dr  
Local = Holly Dr

Date: 7/14/2011

Analyst: S. Loveland

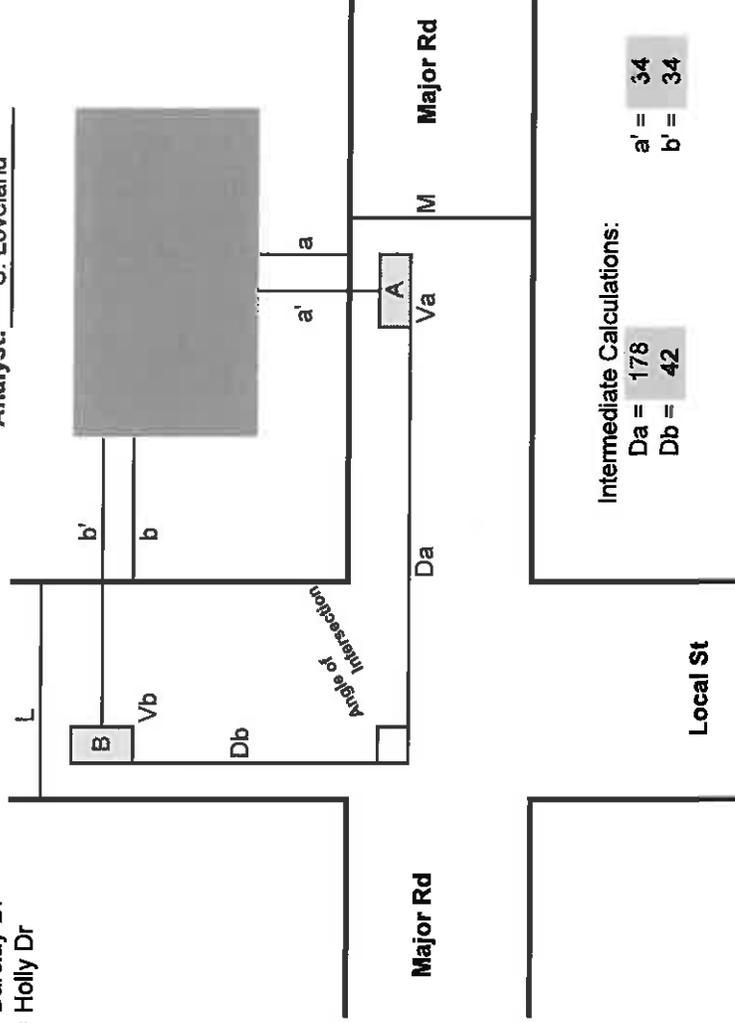
Measured:

Width of Roads  
Major: M = 28 (ft)  
Local: L = 28 (ft)

Distance to Obstruction  
a = 23 (ft)  
b = 17 (ft)

Angle of Intersection  
Delta = 90 (degrees)

Major Rd Posted  
Speed Limit = 25 (mph)



## Assumed:

Speed of Vehicle A = Posted Speed Limit  
on Major Road + 5 (mph)  
Va = 30 (mph)

Perception / Reaction Time (AASHTO)  
t = 2.0 (sec)

Coefficient of friction (AASHTO)  
f = 0.40

Clearance distance in excess of safe stopping distance (AAA)  
C = 15 (ft)

## Intermediate Calculations:

Da = 178  
Db = 42  
a' = 34  
b' = 34

Calculated Safe Approach Speed for Vehicle  
Approaching on Local Rd  
Vb = 7.6 (mph)

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 local street

based on safe approach speed :

**STOP Sign**



## **TRAFFIC COMMITTEE REPORT**

August 30, 2011

**TO:** Traffic Committee

**FROM:** Dave Livingston, Special Operations/Lieutenant  
Bill Huotari, Deputy City Engineer/Traffic Engineer

**SUBJECT:** Major Road Speed Limit  
Wattles, Coolidge to Livernois

### **Background:**

At the direction of City Council, the proposed speed limit change on Wattles Road, from Adams to Livernois was tabled to allow for the Traffic Improvement Association (TIA) to restudy Wattles Road, from Adams to Coolidge.

Traffic Committee Resolution #2011-01-06 approved a 45 mph speed limit on Wattles Road, from Adams to Livernois. Due to the fact that changes are proposed to the section of Wattles Road, from Adams to Beach a new resolution is required for the Coolidge to Livernois segment. A copy of TIA's original report is attached which discusses the study that was previously completed.

Proposed speed limit changes on Wattles Road, from Adams to Beach and Wattles Road, from Beach to Coolidge are presented as separate items based on the restudy by TIA of these segments.

### **Recommendations:**

Staff concurs with TIA's recommendation that the speed limit on Wattles Road, from Coolidge to Livernois be posted at 45 mph.

### **Legal Considerations:**

Public Act 85 requires municipalities in Michigan to conduct studies to set proper speed limits. The access point method or engineering studies are both allowed under this law. The modified speed limit becomes effective when a Traffic Control Order (TCO) has been signed, a copy of the same has been filed with the City Clerk and the signs have been installed.

**TRAFFIC IMPROVEMENT ASSOCIATION**

261 E. MAPLE ROAD • BIRMINGHAM, MICHIGAN 48009

PHONE: (248) 334-4971 • FAX: (248) 530-0006

www.tiaml.us

"QUALITY TRAFFIC SAFETY SERVICES SINCE 1967"

January 4, 2011

David Livingston  
Lieutenant  
Troy Police Department  
500 W. Big Beaver Road  
Troy Michigan 48084

Dear Lt. Livingston:

At your request the Traffic Improvement Association (TIA) studied several streets in the City of Troy to determine, by engineering study, what the speed limit should be on these streets. The need for the speed limit studies is to update the speed limit traffic control orders that the city enacted on various city streets in the 1960's through the 1980's, when Troy was still a developing city. In 2006 the state legislature enacted Public Act 85 of 2006 in which the law governing the establishment of speed limits was changed. PA 85 of 2006 revised the language on business district, removed the language on residence district and added the use of access points as an alternative method to conducting an engineering study to establish speed limits. The speed limit studies being conducted for the city are a result of the revised law based on PA 85 of 2006. It should also be noted that speed limits are being reviewed on only city streets as part of this study. Establishing speed limits on roads under the jurisdiction of either the Road Commission for Oakland County (RCOC) or the Michigan Department of Transportation (MDOT) is the responsibility of each of those agencies and the Michigan State Police with the city having no authority to establish speed limits on those roads.

Local Authorities/Cities receive their authority for establishing speed limits from the "Uniform Traffic Code for Cities, Townships and Villages" dated November, 2003. The section specified for this by the Michigan State Police is section "R 28.1153 Rule 153. Traffic-control orders." This section gives the traffic engineer/chief of police the right to exercise the authority in the Act and this code to regulate traffic by the issuance of traffic-control orders that shall specify the rules and regulations adopted or established by him or her. It also states that all traffic control orders issued by the traffic engineer, whether temporary or permanent, shall be in accordance with standard and accepted engineering practices as adopted in "R 28.1126. Duties of traffic engineer." R 28.1126 also states that all duties carried out by the traffic engineer shall be in accordance with standard and accepted engineering practices as found in the Traffic Engineering Handbook, Fifth Edition, which is adopted by reference in these rules.

The Traffic Engineering Handbook 5<sup>th</sup> Edition was developed by the Institute of Transportation Engineers (ITE). In the handbook it states that the following items are part of the process to develop speed zones:

- Prevailing vehicles speeds,
- Physical features of the roadway,

- Traffic control characteristics
- Crash experience, and
- Conditions not readily apparent to the driver.

The Traffic Engineering Handbook also states: "Typically, prevailing speeds are the primary determinant of the speed zone, with adjustments applied as judged appropriate for the remaining factors." The handbook also states that the MUTCD (Manual of Uniform Traffic Control Devices) indicates that the traffic and engineering investigation for a speed zone should consider the following:

- Road surface characteristics, shoulder condition, grade, alignment and sight distance;
- The 85<sup>th</sup> percentile speed and pace speed;
- Roadside development and culture as well as roadside friction;
- Safe speed for curve or hazardous locations within the zone;
- Parking practices and pedestrian activity; and
- Reported crash experience for a recent 12-mo period.

The primary measure computed from spot speed data for establishing speed zones is the 85<sup>th</sup> percentile speed of free-flowing traffic. The 85<sup>th</sup> percentile speed is that speed at which 85 percent of free-flowing vehicles are traveling at or below. Use of the 85<sup>th</sup> percentile speed is based on the theory that the large majority of drivers are reasonable and prudent, do not want to have a crash, and desire to reach their destination in the shortest time possible. The speed limit is then generally set at the nearest 5-mph increment at or below the 85<sup>th</sup> percentile speed. Another part of the speed study that is looked at is the pace, which is the 10-mph speed range representing the speeds of the largest percentage of vehicles. The upper limit of this pace is also a good indicator of an appropriate maximum speed limit. The following traffic control features should be identified as part of the speed zoning procedure. Control Features include:

- Crosswalks,
- Traffic signals,
- Parking characteristics/restrictions, and
- Turning restrictions.

The engineering studies done in regard to establishing speed limits on the requested streets included a speed study, a field review of each street and a review of the crashes on each street. Attached to this letter are the results of the studies of each street with the speed limit that should be considered to be posted on each street based on the engineering study. The basis for each of the suggested speed limits is the 85<sup>th</sup> percentile speed. The following are the streets that were studied and the suggested speed limits that should be considered to be implemented through the Traffic Control Order process:

1. Coolidge Highway from South Boulevard to South City Limit.
  - a. South Boulevard to Square Lake Road—45 MPH.
  - b. Square Lake Road to Long Lake Road—45 MPH.
  - c. Long Lake Road to Wattles—45 MPH.
  - d. Wattles to Big Beaver—45 MPH.

- e. Big Beaver to Derby—40 MPH.
- f. Derby to Maple Road— 40 MPH. On this section of Coolidge Highway southbound Coolidge Highway is under jurisdiction of Birmingham and the establishment of the speed limit will need to be coordinated with the City of Birmingham.
- g. Maple Road to South City Limit—40 MPH.
- 2. Rochester Road from Stephenson Highway to Elmwood/Badder.
  - a. Stephenson Highway to Maple Road—45 MPH.
  - b. Maple Road to Elmwood/Badder—45 MPH.
- 3. Square Lake Road from Adams Road to Dequindre Road.
  - a. Adams Road to Coolidge Highway—45 MPH.
  - b. Coolidge Highway to Crooks Road—45 MPH.
  - c. Crooks Road to Livernois Road—45 MPH.
  - d. Livernois Road to Rochester Road—45 MPH.
  - e. Rochester Road to John R Road—45 MPH.
  - f. John R Road to Dequindre Road—45 MPH.
- 4. Wattles Road from Adams Road to Livernois Road.
  - a. Adams Road to Coolidge Highway—45 MPH.
  - b. Coolidge Highway to Crooks Road—45 MPH.
  - c. Crooks Road to Livernois Road—45 MPH.

Another method of determining speed limits in the State of Michigan is using the access point method found in Section 257.627 Speed Limits in the Michigan Vehicle Code. This section of the Michigan Vehicle Code allows the alternate method of access points to determine a speed limit on a road. The access point method for determining speed limits is:

- (c) 25 miles per hour on all highways or parts of highways within the boundaries of land platted under the land division act, 1967 PA 288, MCL 560.101 to 560.293, or the condominium act, 1978 PA 59, MCL 559.101 to 559.276, unless a different speed is fixed and posted.
- (d) 25 miles per hour on a highway segment with 60 or more vehicular access points within 1/2 mile.
- (e) 35 miles per hour on a highway segment with not less than 45 vehicular access points but no more than 59 vehicular access points within 1/2 mile.
- (f) 45 miles per hour on a highway segment with not less than 30 vehicular access points but no more than 44 vehicular access points within 1/2 mile.

Although this is an acceptable method to establish speed limits, the use of this method would result in the speed limit being 55 MPH on 14 sections of streets and 45 MPH on 4 sections of streets. This method, therefore, is not suggested to be used to establish the speed limits on streets in Troy.

Other issues were addressed as part of this review: reviewing horizontal curves for advisory speeds (see attached) in accordance with the Michigan MUTCD (MMUTCD) and determining if there is a need to change the School Speed Limits (see attached) on applicable sections of streets

where school speed limits exist.

1. As part of the study the horizontal curves on the various roads were reviewed in regard to the need for the addition/revision of advisory speeds. This review is done because changes in conditions, such as roadway geometrics (horizontal curve versus a straight section of road), might affect the speed at which that section of road can be driven versus a straight section of road. The method to advise the driver of this advisory speed is the posting of an Advisory Speed Panel sign under the curve/turn sign. The traditional method of determining an advisory speed for a horizontal curve is the use of the ball-bank indicator. The 2009 MUTCD (language will be adopted in the 2011 MMUTCD) has the following criteria for this method:
  1. 16 degrees of ball-bank for speeds of 20 mph or less
  2. 14 degrees of ball-bank for speeds of 25 to 30 mph
  3. 12 degrees of ball-bank for speeds of 35 mph and higher

The 16, 14, and 12 degrees of ball-bank criteria are comparable to the current AASHTO horizontal curve design guidance. The review for advisory speeds on the various sections of road showed that, based on the ball-bank indicator readings, the following should be done:

- The advisory speed on the curve/turn on southbound Rochester Road at Stephenson Highway should be changed from 25 MPH to 20 MPH.
  - The advisory speed on the curve/turn on Rochester Road west of Stephenson Highway should be changed to 40 MPH when the speed limit is raised to 45 MPH.
  - The advisory speed of 40 MPH should be added for the curves on Square Lake Road east and west of Crooks Road when the speed limit is raised to 45 MPH.
2. In regard to school speed limits the only location on the streets being studied that has a school speed limit is on Square Lake Road east of Rochester Road at Troy Union Elementary School. Although the school speed limit should remain at 25 MPH due to no sidewalks east of the school, the electronic school speed limit signs will need to be changed to reflect the new 45 MPH speed limit. The estimated cost to change the signs is \$8,000, although a more detailed cost estimate should be obtained from RCOC.

If you have any questions, please feel free to contact me.

Sincerely,



David F. Allyn, P.E.  
Traffic Engineer

Attachments

C: William Huotari



## **TRAFFIC COMMITTEE REPORT**

August 30, 2011

**TO:** Traffic Committee

**FROM:** Dave Livingston, Special Operations/Lieutenant  
Bill Huotari, Deputy City Engineer/Traffic Engineer

**SUBJECT:** Major Road Speed Limit  
Wattles, Adams to Beach and Wattles, Beach to Coolidge

### **Background:**

At the direction of City Council, the proposed speed limit change on Wattles Road, from Adams to Livernois was tabled to allow for the Traffic Improvement Association (TIA) to restudy Wattles Road, from Adams to Coolidge. This segment was further broken down to ½ mile segments of Adams to Beach and Beach to Coolidge.

Sight distance checks were performed on several driveways west of Beach Road based on residents input concerning limited sight distance. The sight distance checks along with the hill on Wattles Road west of Beach played a primary role in recommending a 40 mph speed limit for this segment.

The segment of Wattles Road, from Beach to Coolidge however does not have special geometric circumstances, so the 85<sup>th</sup> percentile speed of 45 mph is also the recommended posted speed limit.

A copy of TIA's restudy of Wattles Road, from Adams to Coolidge is attached.

### **Recommendations:**

Staff concurs with TIA's recommendation that the speed limit on Wattles Road, from Adams to Beach be posted at 40 mph.

Staff also concurs with TIA's recommendation that the speed limit on Wattles Road, from Beach to Coolidge be posted at 45 mph.

### **Legal Considerations:**

Public Act 85 requires municipalities in Michigan to conduct studies to set proper speed limits. The access point method or engineering studies are both allowed under this law. The modified speed limit becomes effective when a Traffic Control Order (TCO) has been signed, a copy of the same has been filed with the City Clerk and the signs have been installed.



## TRAFFIC IMPROVEMENT ASSOCIATION

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"QUALITY TRAFFIC SAFETY SERVICES SINCE 1967"

June 21, 2011

David Livingston  
Lieutenant  
Troy Police Department  
500 W. Big Beaver Road  
Troy, Michigan 48084

Dear Lt. Livingston:

After TIA completed speed limit studies on several streets in the City of Troy, you requested that TIA redo the speed study that was conducted on Wattles Road from Adams to Coolidge and check the speeds for the two sections from Adams to Beach and from Beach to Coolidge. You also requested that we review the sight distance for several driveways on Wattles Road west of Beach Road, due to residents' concern of limited sight distance.

The speed studies (see attached) were done on April 11-April 13, 2011. The results of the speed studies are as follows:

- **Wattles Road from Adams to Beach:**

Eastbound	85 <sup>th</sup> percentile:	46 MPH
	10 MPH Pace:	38-47 MPH
	Percent of Vehicles over 35 MPH	92.2 %
Westbound	85 <sup>th</sup> percentile:	47 MPH
	10 MPH Pace:	38-47 MPH
	Percent of Vehicles over 35 MPH	95.0 %
Total	85 <sup>th</sup> percentile:	46 MPH
	10 MPH Pace:	38-47 MPH
	Percent of Vehicles over 35 MPH	93.7 %
  
- **Wattles Road from Beach to Coolidge**

Eastbound	85 <sup>th</sup> percentile:	45 MPH
	10 MPH Pace:	36-45 MPH
	Percent of Vehicles over 35 MPH	92.2 %
Westbound	85 <sup>th</sup> percentile:	45 MPH
	10 MPH Pace:	36-45 MPH
	Percent of Vehicles over 35 MPH	84.1 %
Total	85 <sup>th</sup> percentile:	45 MPH
	10 MPH Pace:	36-45 MPH
	Percent of Vehicles over 35 MPH	84.0 %

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The review of the sight distance for several of the drives west of Beach Road showed the following:

House Address	Drive Location	Location 3.5 Feet to 3.5 Feet	Sight Distance	Design Speed for Advisory
2653	0	597	597	50
2625	116	614	498	40
2601 W Dr.	146	633	487	40
2601 E Dr.	226	678	452	40
2551	362	819	457	40
2527 W Dr.	381	944	563	50
2626 W Dr.	0	521	521	45
2626 E Dr.	93	555	462	40

Sight Distance	Design Speed
555	50
500	45
445	40
390	35

As part of the study the typical 3-year crash data for 2008-2010 (see attached) was checked for Wattles from Beach westerly to Butternut Hill to see what the crash experience has been. The review of the crashes shows there were no driveway related crashes during the 2008-2010 timeframe. The crash data for 2000-2010 (see attached) was also checked and again no driveway related crashes are shown in the data.

The primary measure computed from spot speed data for establishing speed zones is the 85<sup>th</sup> percentile speed of free-flowing traffic. The 85<sup>th</sup> percentile speed is that speed at which 85 percent of free-flowing vehicles are traveling at or below. Use of the 85<sup>th</sup> percentile speed is based on the theory that the large majority of drivers are reasonable and prudent, do not want to have a crash, and desire to reach their destination in the shortest time possible. The speed limit is then generally set at the nearest 5-mph increment at or below the 85<sup>th</sup> percentile speed. However, other factors such as sight distance and road alignment can be taken into account when establishing a speed limit.

As stated in the original letter, another method of determining speed limits in the State of Michigan is using the access point method found in Section 257.627 Speed Limits in the

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Livingston  
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Michigan Vehicle Code. This section of the Michigan Vehicle Code allows the alternate method of access points to determine a speed limit on a road. Based on the access point method the speed limit on Wattles Road from Adams Road to Beach Road would be 45 MPH and from Beach Road to Coolidge Highway would be 45 MPH.

Although the 85<sup>th</sup> percentile speed on Wattles Road from Adams Road to Beach Road is 46 MPH it is recommended that the City consider posting the speed limit on this section of Wattles Road at 40 MPH and install "Hidden Driveways" with advisory "40 MPH" warning signs for westbound traffic. The recommendation for the 40 MPH speed limit is based on the hill on Wattles Road west of Beach Road and the available sight distance measured for the various driveways in this area.

Based on the previous study on Wattles Road from Adams to Coolidge, the new speed study that was taken that shows the 85<sup>th</sup> percentile speed to be 45 MPH on Wattles from Beach to Coolidge and there being no special geometric circumstances on this section of Wattles Road to justify a speed limit less than the 85<sup>th</sup> percentile speed, it is recommended that the City post this section of Wattles Road at 45 MPH.

If you have any questions concerning the study please feel free to contact me by email ([dallyn@tierni.us](mailto:dallyn@tierni.us)) or by phone (248-334-4971).

Sincerely,



David F. Allyn, P.E.  
Traffic Engineer

C: William Huotari

Attachments