

AGENDA
TRAFFIC COMMITTEE MEETING
MARCH 21, 2012 – 7:30 P.M.
LOWER LEVEL CONFERENCE ROOM - TROY CITY HALL
500 W. BIG BEAVER ROAD

1. Roll Call
2. Minutes – February 15, 2012

REGULAR BUSINESS

3. Request for Intersection Control – Brunswick at Cadmus
Requested by Janel Karoumy, 6910 Brunswick
4. Request for Intersection Control – Wardlow at Ashbury
Requested by Weiping Shi, 2856 Ashbury
5. Request for Intersection Control – Vernmoor at Hurst
Requested by Al Hessell, 6880 Fredmoor
6. Request for Intersection Control – Fredmoor at Lovell
Requested by Al Hessell, 6880 Fredmoor
7. Public Comment
8. Other Business
9. Adjourn

- cc: Item 3: Janel Karoumy, 6910 Brunswick
Residents within 300 feet of Brunswick at Cadmus intersection
- Item 4: Weiping Shi, 2856 Ashbury
Residents within 300 feet of Wardlow at Ashbury
- Item 5: Al Hessell, 6880 Fredmoor
Residents within 300 feet of Vernmoor at Hurst
- Item 6: Al Hessell, 6880 Fredmoor
Residents within 300 feet of Fredmoor at Lovell

Traffic Committee Members
Lt. Robert Redmond & Sgt. Mike Szuminski, Police Department
Lt. Eric Caloia, Fire Department
William J. Huotari, Deputy City Engineer/Traffic Engineer

TRAFFIC COMMITTEE

MESSAGE TO VISITORS, DELEGATIONS AND CITIZENS

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

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

Janel Karoumy of 6910 Brunswick requested that the intersection of Brunswick at Cadmus be reviewed for the purpose of installing a Stop or Yield sign on southbound Brunswick at Cadmus. Ms. Karoumy states that traffic entering from South Boulevard does not yield or stop at the intersection before proceeding onto Cadmus creating a hazardous situation.

4. Request for Intersection Control – Wardlow at Ashbury

Weiping Shi of 2856 Ashbury requested that the intersection of Wardlow at Ashbury be reviewed for the purpose of installing a Stop or Yield sign on southbound Wardlow. Mr. Shi states that lack of traffic control at the intersection creates a hazardous situation.

5. Request for Intersection Control – Vernmoor at Hurst

Al Hessell of 6880 Fredmoor requested that the intersection of Vernmoor at Hurst be reviewed for the purpose of installing Stop signs on Vernmoor at Hurst (Stop signs exist currently on Hurst at the intersection). Mr. Hessell states that lack of Stop signs on Vernmoor creates a hazardous situation.

6. Request for Intersection Control – Fredmoor at Lovell

Al Hessell of 6880 Fredmoor requested that the intersection of Fredmoor at Lovell be reviewed for the purpose of installing Stop signs on Fredmoor at Lovell (Stop signs exist currently on Lovell at the intersection). Mr. Hessell states that lack of Stop signs on Vernmoor creates a hazardous situation.

SUGGESTED RESOLUTIONS:

Item 3:

- a. **RESOLVED**, that the Traffic Committee recommends that the intersection control at Brunswick and Cadmus be modified from “no traffic control” to a YIELD sign on the Brunswick Drive southbound approach to the intersection.
- b. **RESOLVED**, that the Traffic Committee recommends no changes at the intersection of Brunswick and Cadmus.

Item 4:

- a. **RESOLVED**, that the Traffic Committee recommends that the intersection control at Wardlow and Ashbury be modified from “no traffic control” to a YIELD sign on the Wardlow Court southbound approach to the intersection.
- b. **RESOLVED**, that the Traffic Committee recommends no changes at the intersection of Wardlow and Ashbury.

Item 5:

- a. **RESOLVED**, that the Traffic Committee recommends that the intersection control be modified at Vernmoor and Hurst, reassigning right-of-way to Hurst Drive by removing the Stop signs on Hurst Drive and instead placing Stop signs on the Vernmoor Drive approaches to the intersection.
- b. **RESOLVED**, that the Traffic Committee recommends no changes at the intersection of Vernmoor and Hurst.

Item 6:

- a. **RESOLVED**, that the Traffic Committee recommends that the intersection control be modified at Fredmoor and Lovell, reassigning right-of-way to Lovell Drive by removing the Stop signs on Lovell Drive and instead placing Stop signs on the Fredmoor Drive approaches to the intersection.
- b. **RESOLVED**, that the Traffic Committee recommends no changes at the intersection of Fredmoor and Lovell.

7. Public Comment**8. Other Business****9. Adjourn**

A regular meeting of the Troy Traffic Committee was held Wednesday, February 15, 2012 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
John Diefenbaker
Ted Halsey
Richard Kilmer
Al Petrulis
Pete Ziegenfelder

ABSENT: Gordon Schepke

Also present: Jim E. Tompert, 2106 Burdic
Bill Huotari, Deputy City Engineer/Traffic Engineer

2. Minutes – January 18, 2012

RESOLUTION # 2012-02-03

Moved by Halsey
Seconded by Diefenbaker

To approve the January 18, 2012 minutes as printed.

YES: All-6
NO: None
ABSENT: 1 (Schepke)
MOTION CARRIED

REGULAR BUSINESS

3. Discussion of Stop and Yield Signs

The traffic engineer and Traffic Committee members discussed the use of Stop and Yield signs for intersection control in accordance with the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) as well as past practices of the committee.

4. Request for Intersection Control – Burdic at Edith

Holly Pryor of 2106 Burdic requested that the intersection of Burdic and Edith be reviewed for the purpose of installing Stop signs. Ms. Pryor states that the lack of Stop signs at this intersection creates a hazardous situation.

Mr. Jim E. Tompert of 2106 Burdic was present at the meeting and discussed his concerns regarding the intersection and his support for installation of Stop signs. Mr. Tompert supplied pictures of the area and supplied petitions signed by four (4) residents who also support the installation of Stop signs.

Traffic Engineering also received an email in support of Stop signs at this location from Anne and William Giacalone of 2069 Burdic.

RESOLUTION # 2012-02-04

Moved by Halsey
Seconded by Binkowski

RESOLVED, that the Traffic Committee recommends that the intersection control at Burdic and Edith be modified from “no traffic control” to STOP signs on the Edith Street approaches to the intersection.

YES: All-6
NO: None
ABSENT: 1 (Schepke)
MOTION CARRIED

5. Public Comment

There were no public comments made beyond those comments made for the agenda item.

6. Other Business

Mr. Ziegenfelder requested that the landscaping in the southwest corner of Niagara and Caldwell or Niagara at Eagle be reviewed as it has the potential to obstruct drivers vision when in full bloom. Traffic Engineering will review.

Mr. Halsey reports rocks in the right-of-way at Kilmer and Trombley as well as on Ellenboro between Trombley and Colebrook. Traffic Engineering will review.

Mr. Halsey provided a request to review the morning arrival (8:40 am – 9:10 am) and evening dismissal (4:00 pm – 4:20 pm) at Wattles Elementary, specifically on Ellenboro between Trombley and Colebrook. Traffic Engineering will review.

7. Adjourn

The meeting adjourned at 8:05 p.m.

Pete Ziegenfelder, Chairperson

Bill Huotari, Recording Secretary



TRAFFIC COMMITTEE REPORT

March 1, 2012

TO: Traffic Committee

FROM: Bill Huotari, Deputy City Engineer/ Traffic Engineer

SUBJECT: Brunswick at Cadmus
Request for Stop or Yield Sign

Background:

This item was originally considered at the January 18, 2012 Traffic Committee meeting. The item was tabled to allow Traffic Engineering to discuss the request and recommendation with our consultant.

Janel Karoumy of 6910 Brunswick requested that the intersection of Brunswick at Cadmus be reviewed for the purpose of installing a Stop or Yield sign on southbound Brunswick at Cadmus. Ms. Karoumy states that traffic entering from South Boulevard does not yield or stop at the intersection before proceeding onto Cadmus creating a hazardous situation.

Traffic Engineering also received emails from Nikola Todorovski of 6909 Brunswick requesting that ALL WAY Stop sign control be placed at the intersection (copy attached).

The posted speed limit on both streets is 25 mph. Cadmus should be assigned right of way as it is the continuing road and Brunswick Drive terminates at Cadmus.

There have been no crashes recorded in the past three (3) years at the intersection.

The major sight distance obstructions at the intersection are the houses in the northern quadrants. The homes come into play when determining the safe approach speeds for the intersection. The safe approach speed was found to be greater than 10 mph on Brunswick, so a YIELD sign is the recommended treatment for the intersection.

The city requested that our traffic engineering consultant (OHM) re-review the request and their report and provide their findings and recommendations (copy attached). The Safe Approach Speed decreased from 14.0 mph to 13.9 mph using the most current calculation.

Recommendations:

Staff concurs with our consultant's recommendation that the intersection control be modified from "no traffic control" to a YIELD sign on the Brunswick Drive southbound approach to the intersection.

February 21, 2012



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 Brunswick Dr and Cadmus Dr
OHM JN: 0128-11-0070

Dear Mr. Huotari:

As requested, we have reviewed the Brunswick Drive/Cadmus Drive intersection to determine the proper traffic control. The subject intersection is a T-intersection located in the City of Troy, approximately 0.15 miles east of Rochester Road and 0.10 miles south of South Boulevard. Both Brunswick Drive and Cadmus Drive are local streets, with Brunswick Drive running in the north-south direction and Cadmus Drive running east-west. The speed limit on both streets is 25 mph. There is currently no traffic control on any of the approaches. 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 a YIELD sign is intended to assign the right-of-way at intersections where it is not usually necessary to stop before proceeding into the intersection. Conversely, the STOP sign is intended for use where it is usually necessary to stop before proceeding into the intersection. The following conditions should be fully evaluated to determine how the right-of-way should be assigned:

- Traffic Volumes: Normally, the heavier volume of traffic should be given the right-of-way.
- Approach Speeds: The higher speed traffic should normally be given the right-of-way.

- **Types of Highways:** When a minor highway intersects a major highway, it is usually desirable to control the minor highway.
- **Sight Distance:** Sight distance across the corners of the intersection is the most important factor and is critical in determining safe approach speeds.

Crash Analysis

Based on information obtained through Traffic Improvement Association of Michigan, there have been no crashes recorded in the past 3-years at the Brunswick Drive/Cadmus Drive intersection.

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 Brunswick Drive and Cadmus Drive are considered local streets, Cadmus Drive should be assigned right of way in this case, as it is the continuing road and Brunswick Drive terminates at Cadmus 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 intersection are the houses in the northern quadrants. The homes 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 Brunswick Drive was found to be greater than 10 mph; therefore a YIELD sign is the recommended treatment. The safe approach speed calculation spreadsheet is attached for your reference.

Recommendation

OHM recommends that the intersection control be modified from "no traffic control" to a YIELD sign on the Brunswick Drive southbound approach to the intersection.

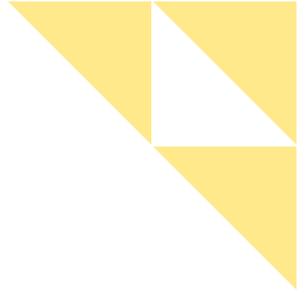
Sincerely,
Orchard Hiltz & McCliment, Inc.



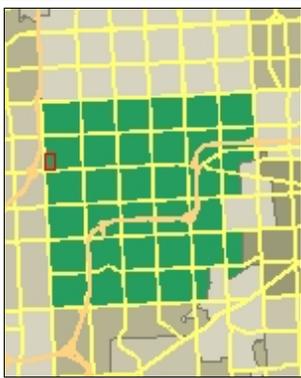
Steven M. Loveland, PE, PTOE
Traffic Project Engineer

Attachments:

- Aerial and Intersection Photos
- Safe Approach Speed Calculation Spreadsheet



Attachments



- Legend**
- Road Centerline**
- Major Road
 - Industrial Road
 - Local Road
- Ponds and Basins**
- Streams and Creeks**
- Parcels**
- Aerial Photos - 2010**
- Red: Band_1
 - Green: Band_2
 - Blue: Band_3

1:3,393

Notes
Brunswick at Cadmus request for Yield or Stop Sign

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.





Brunswick Dr looking Southwest



Cadmus Dr looking West



Brunswick Dr looking Southeast



Cadmus Dr looking East

Safe Approach Speed Calculation

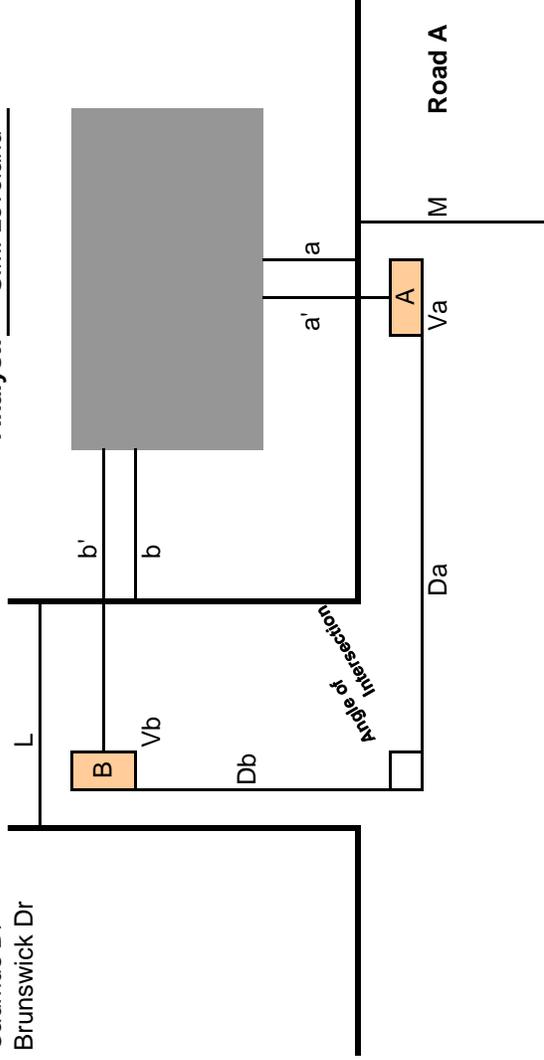
Cadmus at Brunswick
City of Troy

Road A = Cadmus Dr
Road B = Brunswick Dr

Date: 2/21/2012

Analyst: S.M. Loveland

- Measured:
- Width of Roads
 - Road A = 27 (ft)
 - Road B = 27 (ft)
 - Distance to Obstruction
 - a = 40 (ft)
 - b = 37 (ft)
 - Angle of Intersection
 - Delta = 90 (degrees)
 - Road A Posted Speed Limit = 25 (mph)



Assumed:

- Speed of Vehicle A = Posted Speed Limit on Road A + 5 (mph)
- Va = 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) C = 0 (ft)

Intermediate Calculations:

Da = 196
Db = 69.4

a' = 50.5
b' = 53.5

Based On $Da = (1.075 Va^2 / A) + 1.4667 Va t + C$
 $Db = \frac{a * Da}{(Da - b)}$

Calculated Safe Approach Speed for Vehicle Approaching on Road B	Vb = 13.9 (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 Road B based on safe approach speed :

YIELD Sign

William J Huotari

From: Nikola [todoron@gmail.com]
Sent: Tuesday, January 31, 2012 4:48 PM
To: William J Huotari
Subject: Brunswick intersection
Attachments: first_2.jpg; first_5.jpg; second_1.jpg

Hi William,

I would like to inform the you and the committee about a few incidents that occurred last week.

First,

By the looks of the pics labeled first_#, It looks as if a vehicle was turning from west cadmus onto north brunswick and it took a wide turn. During the wide turn, the was possibly an oncoming vehicle heading south on brunswick. Vehicle heading north had no choice but to veer left onto the lawn and take down the no parking sign.

Second,

Pics labeled second were taken a couple days later.

Another wide turn from cadmus to brunswick, just missing another no parking sign. See attached

Thank you,
-Nik

On Mon, Jan 16, 2012 at 4:12 PM, William J Huotari <HuotariWJ@troymi.gov> wrote:

> Nikola, thanks for your email. I will include a copy of the email and
> attached diagrams for review by the Traffic Committee.

>

> Sincerely,

>

> Bill Huotari, P.E.

> Deputy City Engineer/Traffic Engineer

> City of Troy

>

> -----Original Message-----

> From: Nikola [<mailto:todoron@gmail.com>]

> Sent: Monday, January 16, 2012 3:00 PM

> To: William J Huotari

> Subject: Brunswick intersection

>

> Hello,

> My name is Nikola Todorovski and I reside at 6909 Brunswick.

> I am the corner house and I see the daily reckless driving at the
> intersection.

>

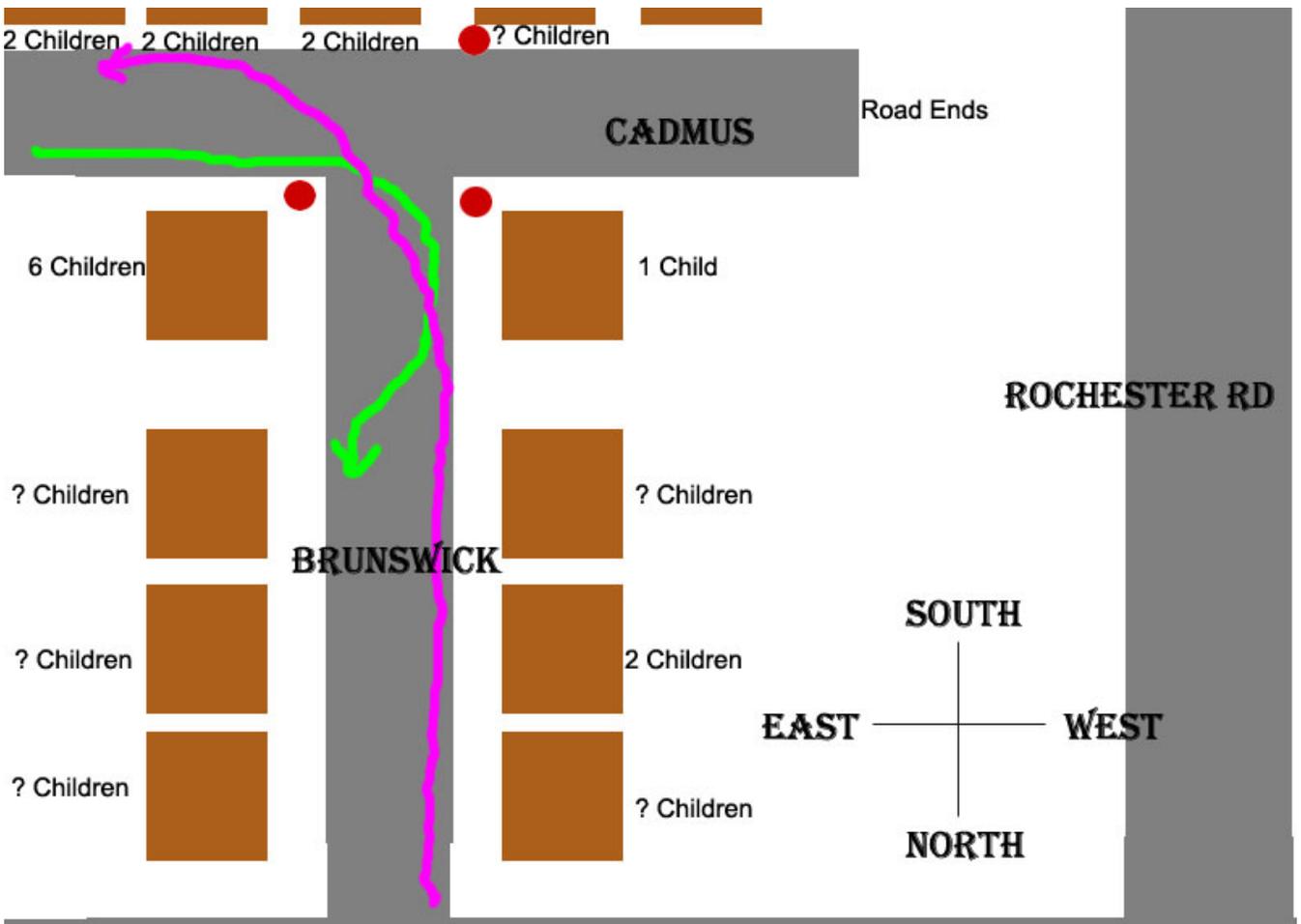
> I am happy to hear the Traffic Committee is going to review the
> intersection at Brunswick and Cadmus.

> This intersection is abused on a daily basis, especially by some
> younger adults who reside on east Cadmus from the attached neighborhood.

>

> I have noticed that this is a request for a yield sign. But we are

> going to need more than that.
> The oncoming traffic from South blvd on to Brunswick, needs to be
> slowed down by the time they reach Cadmus with a stop sign.
>
> The outgoing traffic from East Cadmus onto North Brunswick also need
> to be stopped with a stop sign.
>
> NOBODY yields and or stops at the intersection.
> I see the reckless driving everyday and it concerns us all for the
> everyone's safety.
>
> This has been an ongoing issue and we are all concerned about the
> children in the area.
> The children are out in the summer and winter playing around at the
> houses near the intersection.
> I have considered installing security cameras to capture the reckless
> driving at the intersection.
>
> Attached is a diagram with the intersection and the number children
> who live around it.
>
> The green arrow displays the average path of driver coming from east
> Cadmus on to Brunswick.
> Wide turns are being taken because they do not yield or stop prior to
> turning on to Brunswick.
>
> The bright pink arrow displays the average route coming from north
> Brunswick onto East Cadmus.
>
> My neighbor at at 6909, which is the house with 6 children, has had
> his beautiful potted plants at the corner which have been hit by
> vehicles numerous times.
>
> He has made an effort to install reflectors at the corner so people do
> not run anything over.
> See attached pic.
>
> Installing stops signs is a small price to pay for the safety of the
> children and residents living near the intersection.
>
> The city will and collect revenue from the reckless drivers at the
> intersection while promoting safe driving.
> It is a win for both parties.
>
> Thank you for taking the time to review and please feel free to
> contact me via email and or phone.
> -Nikola
>
> Phone: 248-812-9112
> Email: todoron@gmail.com
>
> *Confirm the arrival of this correspondence via email









TRAFFIC COMMITTEE REPORT

March 1, 2012

TO: Traffic Committee

FROM: Bill Huotari, Deputy City Engineer/ Traffic Engineer

SUBJECT: Wardlow at Ashbury
Request for Stop or Yield Sign

Background:

Weiping Shi of 2856 Ashbury requested that the intersection of Wardlow at Ashbury be reviewed for the purpose of installing a Stop or Yield sign on southbound Wardlow. Mr. Shi states that lack of traffic control at the intersection creates a hazardous situation.

The posted speed limit on both streets is 25 mph. Ashbury should be assigned right of way as it is the continuing road.

There have been no crashes recorded in the past three (3) years at the intersection.

The major sight distance obstructions at the intersection are the houses in the northern quadrants. The homes come into play when determining the safe approach speeds for the intersection. The safe approach speed was found to be greater than 10 mph on Wardlow Court, so a YIELD sign is the recommended treatment for the intersection.

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

Recommendations:

Staff concurs with our consultant's recommendation that the intersection control be modified from "no traffic control" to a YIELD sign on the Wardlow Court southbound approach to the intersection.

February 21, 2012



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 Wardlow Ct and Ashbury Dr
OHM JN: 0128-12-0010

Dear Mr. Huotari:

As requested, we have reviewed the Wardlow Court/Ashbury Drive intersection to determine the proper traffic control. The subject intersection is a T-intersection located in the City of Troy, approximately 0.10 miles west of Dequindre Road and 0.10 miles south of Wattles Road. Both Wardlow Court and Ashbury Drive are local streets, with Wardlow Court running in the north-south direction and Ashbury Drive running east-west. The speed limit on both streets is 25 mph. There is currently no traffic control on any of the approaches. 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 a YIELD sign is intended to assign the right-of-way at intersections where it is not usually necessary to stop before proceeding into the intersection. Conversely, the STOP sign is intended for use where it is usually necessary to stop before proceeding into the intersection. The following conditions should be fully evaluated to determine how the right-of-way should be assigned:

- Traffic Volumes: Normally, the heavier volume of traffic should be given the right-of-way.
- Approach Speeds: The higher speed traffic should normally be given the right-of-way.

- **Types of Highways:** When a minor highway intersects a major highway, it is usually desirable to control the minor highway.
- **Sight Distance:** Sight distance across the corners of the intersection is the most important factor and is critical in determining safe approach speeds.

Crash Analysis

Based on information obtained through Traffic Improvement Association of Michigan, there have been no crashes recorded in the past 3-years at the Wardlow Court/Ashbury Drive intersection.

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 Wardlow Court and Ashbury Drive are considered local streets, Ashbury Drive should be assigned right of way in this case, as it is the continuing road and Wardlow Court terminates at Ashbury 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 intersection are the houses in the northern quadrants. The homes 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 Wardlow Court was found to be greater than 10 mph; therefore a YIELD sign is the recommended treatment. The safe approach speed calculation spreadsheet is attached for your reference.

Recommendation

OHM recommends that the intersection control be modified from "no traffic control" to a YIELD sign on the Wardlow Court southbound approach to the intersection.

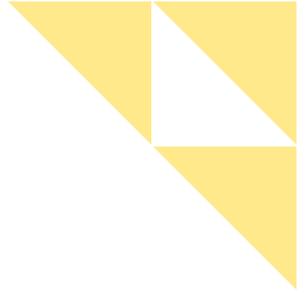
Sincerely,
Orchard Hiltz & McCliment, Inc.



Steven M. Loveland, PE, PTOE
Traffic Project Engineer

Attachments:

- Aerial and Intersection Photos
- Safe Approach Speed Calculation Spreadsheet

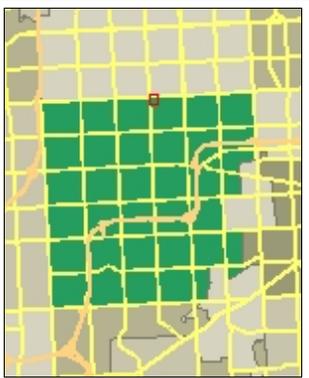


Attachments



Wardlow Ct @ Ashbury Dr

- Legend**
- Road Centerline
 - Major Road
 - Industrial Road
 - Local Road
 - Ponds and Basins
 - Streams and Creeks
 - Parcels
 - Aerial Photos - 2010
 - Red: Band_1
 - Green: Band_2
 - Blue: Band_3



1:2,242

Notes
Enter Map Description

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.





Wardlow looking southwest



Wardlow looking southeast



Ashbury looking east



Ashbury looking west

Safe Approach Speed Calculation

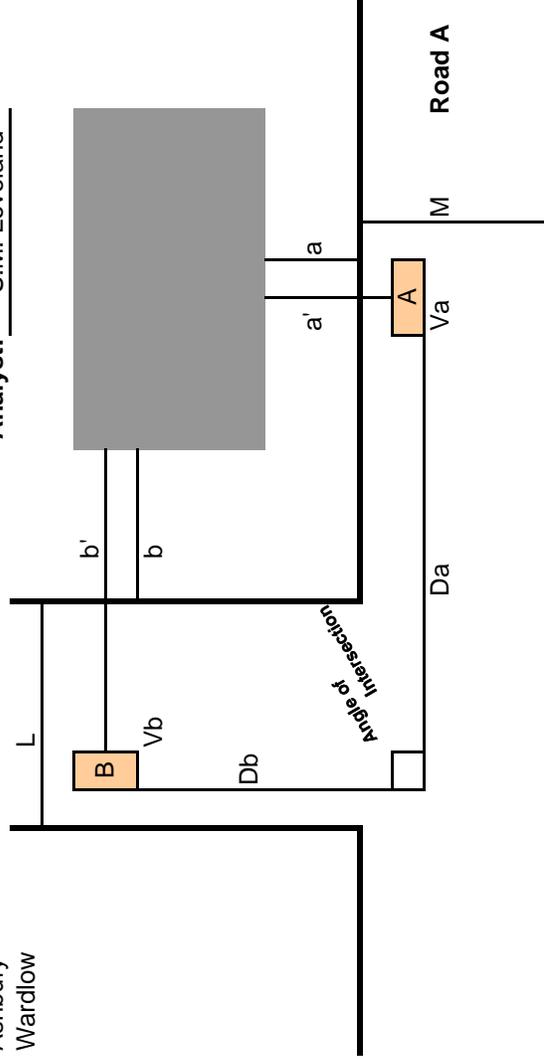
Ashbury at Wardlow
City of Troy

Road A = Ashbury
Road B = Wardlow

Date: 2/21/2012

Analyst: S.M. Loveland

- Measured:
- Width of Roads
 - Road A = 28 (ft)
 - Road B = 28 (ft)
 - Distance to Obstruction
 - a = 47.5 (ft)
 - b = 46.5 (ft)
 - Angle of Intersection
 - Delta = 90 (degrees)
 - Road A Posted Speed Limit = 25 (mph)



Assumed:

- Speed of Vehicle A = Posted Speed Limit on Road A + 5 (mph)
- Va = 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) C = 0 (ft)

Intermediate Calculations:

Da = 196
Db = 86.5

a' = 58.5
b' = 63.5

Based On $Da = (1.075 Va^2 / A) + 1.4667 Vat + C$
 $Db = \frac{a * Da}{(Da - b)}$

Calculated Safe Approach Speed for Vehicle Approaching on Road B
Vb = 16.5 (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 Road B based on safe approach speed :

YIELD Sign



TRAFFIC COMMITTEE REPORT

March 1, 2012

TO: Traffic Committee

FROM: Bill Huotari, Deputy City Engineer/ Traffic Engineer

SUBJECT: Vernmoor at Hurst
Request for Stop Sign

Background:

Al Hessell of 6880 Fredmoor requested that the intersection of Vernmoor at Hurst be reviewed for the purpose of installing Stop signs on Vernmoor at Hurst (Stop signs exist currently on Hurst at the intersection). Mr. Hessell states that lack of Stop signs on Vernmoor creates a hazardous situation. While there are concerns in this area with speeding, the primary reasons Mr. Hessell expressed to support his request were:

1. No sidewalks in this area
2. Curves along Vernmoor reduce visibility of the intersection
3. Crest of the hill reduces visibility of the intersection

The posted speed limit on both streets is 25 mph. Volumes on both streets are very similar, so there is latitude in choosing the orientation of traffic controls at the intersection. Vernmoor runs many blocks without having one of its intersections subject to Stop or Yield control. Traffic volumes, including pedestrian traffic, do not meet warrants for multi-way Stop control. Nearly every intersection in this area has some type of traffic control in place.

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

The major sight distance obstructions at the intersection are the evergreen trees in the southeast quadrant. There is also a large hill in the northwest quadrant and a small hill with a tree in the northeast quadrant. The tree on the southeast quadrant and sight distance are the primary factors used when determining the safe approach speeds for the intersection.

The safe approach speed was found to be less than 10 mph on Hurst, so the existing Stop signs are the recommended treatment. Stopping sight distance was examined along Vernmoor based on the hills north and south of intersection. Based on standards, adequate stopping sight distances are provided at the intersection.

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

Recommendations:

Staff concurs with our consultant's recommendation that the intersection control be modified, reassigning the right-of-way to Hurst Drive by removing the Stop signs on Hurst Drive and instead placing Stop signs on the Vernmoor Drive approaches. Additionally, it is recommended that temporary signs be placed to notify motorists that the intersection control has been changed.

February 9, 2012



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 Vernmoor Street & Hurst Drive
OHM JN: 0128-12-0020

Dear Mr. Huotari:

As requested, we have reviewed the Vernmoor Drive/Hurst Drive intersection to determine the proper traffic control. The subject intersection is a 4-leg intersection located in the City of Troy, approximately 0.4 miles west of Livernois Road and 0.55 miles north of W. Square Lake Road. Both Vernmoor Drive and Hurst Drive are local streets, with Hurst Drive running in the east-west direction and Vernmoor Drive running north-south. The speed limit on both streets is 25 mph. There are currently stop signs posted on the Hurst 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

The peak-hour for traffic volumes, that is, the one hour period during the day in which traffic volumes are greatest, typically occurs between 4-6 PM on weekdays. A one-hour turning movement traffic count was collected by OHM on Tuesday, February 7, from 5-6 PM. The counts indicate that the peak hour volumes along each road are 20 vehicles for Vernmoor Drive and 19 vehicles for Hurst Drive. There were no pedestrians observed during the count.

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 this location is still far below warrant thresholds for multi-way STOP control. The traffic count is provided as an attachment to this letter.

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 Vernmoor Street/ Hurst Street intersection. The crash occurred October 8, 2008, and 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 Roadway

Both Vernmoor Drive and Hurst Drive are considered local streets. However, the usual practice of determining which pair of approaches should be controlled is expressed in the guidance of the MMUTCD, and would have the control placed on the approaches of the less important road with a more major road. In this instance, the volumes for Vernmoor Drive and Hurst Drive are essentially equal, especially for the peak commuter periods, so there is latitude for professional judgement in choosing the orientation of the controls.

In reviewing the network of streets in the neighborhood and the patterns made by the other intersection controls, we note that Vernmoor Drive runs many blocks without having one of its intersections subject to a STOP or YIELD control. We deem it reasonable to recommend that the STOP control for this intersection be modified so that Vernmoor Drive is required to stop for Hurst Drive, instead of the existing placement.

Sight Distance

The major sight distance obstruction at the intersection is the evergreen trees with low-hanging branches in southeast quadrant. There is also a large hill in the northwest quadrant and a small hill with a tree in the northeast quadrant. The tree on the southeast quadrant and sight distance are the primary factor 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, a STOP sign is commonly used. In this case, the safe approach speed was found to be less than 10 mph; therefore two-way stop control is the recommended treatment. The safe approach speed calculation spreadsheet is attached for your reference.

Stopping sight distance was examined along Vernmoor Drive, as there are vertical curves located north and south of the intersection with Hurst 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, and a downhill grade of 6%, stopping sight distances should be at least 165 feet and 215 feet, respectively. Along Vernmoor Drive adequate stopping sight distances are provided, with over 350' from the crest of the hill to the intersection at Hurst Drive.

Recommendation

OHM recommends that the intersection control be modified, reassigning the right-of-way to Hurst Drive by removing the STOP signs on Hurst Drive, and instead placing STOP signs on the Vernmoor Drive approaches. We recommend against modifying the intersection to multi-way STOP control.

Prior to reversing the location of the STOP signs, OHM recommends that the City of Troy notify local residents of the upcoming change. Additionally, measures should be taken to enhance conspicuity of the new STOP signs, such as installing a "New Traffic Pattern Ahead" (W23-2) sign in advance of the intersection, and mounting a "NEW" sign plaque (W16-15p) above the regulatory sign. These additional signs should be removed when the change is no longer considered to be new, or within 2 months.

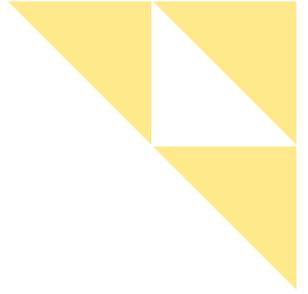
Sincerely,
Orchard Hiltz & McCliment, Inc.



Sara Merrill, PE, PTOE
Traffic Engineer

Attachments:

- Aerial and Intersection Photos
- Traffic Count
- Crash Data
- Safe Approach Speed Calculation Spreadsheet
- Enhanced conspicuity signs



Attachments



Vernmoor looking north



Vernmoor looking south



Hurst looking east



Hurst looking west



Vernmoor looking north (from crest of hill)



Vernmoor looking south (from crest of hill)



Project: Troy ROW Review
 Location: Vernmoor & Hurst
 Weather: Overcast, 30-degrees
 Collected By: OHM (SM)

File Name : Vernmoor-Hurst
 Site Code : 00000000
 Start Date : 2/7/2012
 Page No : 1

Groups Printed- All vehicles

Start Time	VERNMOOR From North					HURST From East					VERNMOOR From South					HURST From West					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
05:00 PM	0	1	0	0	1	1	0	0	0	1	2	2	0	0	4	0	1	0	0	1	7
05:15 PM	0	3	2	0	5	0	1	0	0	1	0	3	0	0	3	0	2	1	0	3	12
05:30 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	2	2	0	4	7
05:45 PM	0	1	0	0	1	0	0	0	0	0	2	1	0	0	3	0	2	2	0	4	8
Total	0	5	2	0	7	1	1	0	0	2	7	6	0	0	13	0	7	5	0	12	34
Grand Total	0	5	2	0	7	1	1	0	0	2	7	6	0	0	13	0	7	5	0	12	34
Apprch %	0	71.4	28.6	0		50	50	0	0		53.8	46.2	0	0		0	58.3	41.7	0		
Total %	0	14.7	5.9	0	20.6	2.9	2.9	0	0	5.9	20.6	17.6	0	0	38.2	0	20.6	14.7	0	35.3	

STATE OF MICHIGAN TRAFFIC CRASH REPORT

ORI: MI-6378400

Department Name: Troy Police Dept

Incident Disposition: Open Closed
Review: *WJ #307*

Crash Date: 10/08/2008
Crash Time: 1621
No. of Units: 02

County: 63
City/Twp: 84
Traffic Control: None of These Stop Sign Yield Sign
Relation to Roadway: On Road Median Shoulder Outside of Shoulder/Curb Gore Other/Unknown

Construction Zone (if applicable):
Type: Const./Maint. Utility
Lane Closed: Yes No
Activity: On Road Off Road None

Crash Type:
 Single Motor Vehicle
 Head On
 Head On-Left Turn
 Angle
 Rear End
 Rear End-Left Turn
 Rear End-Right Turn
 Sideswipe-Same
 Sideswipe-Opposite
 Other/Unknown

Special Circumstances: None
 School Bus Hit and Run Floeing Police
 Local State
Weather (Mark Only One): Clear Cloudy Fog/Smoke Rain
 Severe Wind Snow/Blowing Snow Sleet/Hail Other/Unknown
Light (Mark Only One): Daylight Dawn Dusk Dark-Lighted Dark-Unlighted Other/Unknown
Road Condition (Mark Only One): Dry Wet Icy Snowy Muddy Slushy Debris Other/Unknown

Special Checks:
 Fatal (Report All)
 Corrected Copy
 Replace (Entire Report)
 Delete (Entire Report)
 Non-Traffic Area
 ORV/Snowmobile
Area: 07
Total Lanes: 2
Speed Limit: 25
Posted: Yes No

Road Name: VERNMOOR
Road Type: ST
Divided Roadway: (N) (S) (E) (W)

Distance: 10
Trafficway: 2, 3, 4
Access Control: 2, 3

Intersecting Road: HURST
Road Type: ST
Divided Roadway: (N) (S) (E) (W)

Unit Number: 1
State: MI
Date of Birth: 09/26/1945
License Type: O CY C F M R
Sex: M F
Total Occup: 01
Hazard Action: 03

Unit Type: MV
Injury: K A B C O
Position: 01
Restraint: 04
Hospital: Yes No
Ambulance: Yes No

Driver Condition: 2, 3, 4, 5, 6, 7, 8, 9, 99
Interlock: Yes No
Alcohol: Yes No
Test Type: Field PBT Breath Blood Urine
Drugs: Yes No
Test Type: Blood Urine

Vehicle Description: FORD
Make: KNOWER
Color: BLK
Year: 2004
Injury: K A B C O
Airbag Deployed: Yes No Not Equipped

Location of Greatest Damage: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
First Impact: 03
Extent of Damage: 2
Driveable: Yes No
Vehicle Type: PA VA PU ST
 CY MO GC SM
Vehicle Direction: North South East West
Special Vehicles: 1, 2, 3, 4, 5, 6
Private Trailer Type: 1, 2, 3, 4, 5, 6, 7
Vehicle Defect: 1, 2, 3, 4, 5, 6
Vehicle Use: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

Date of Birth:
Sex: M F
Position:
Restraint:
Hospital:
Ambulance:
Ejected: Yes No
Trapped: Yes No

Date of Birth:
Sex: M F
Position:
Restraint:
Hospital:
Ambulance:
Ejected: Yes No
Trapped: Yes No

Age: Pos: Rest:

Age: Pos: Rest:

Damaged Property

Public: Y N

SANITIZED

Unit Number **2** State **HI**
NCS
 Unit Type
 MV
 B
 P
 E (train)
 City **TROY** State **HI** Zip **98098**
 Driver Condition 2 3 4 5 6 7 8 9 99
 Interlock Yes No
 Alcohol Yes No Test Type Field PBT Breath Blood Urine Test Results
 Drugs Yes No Test Type Blood Urine Test Results

Date of Birth **11/17/95**
 License type
 O CY M
 C F F
 M R
 Sex M F
 Total Occup **01** Hazard Action **00**
 Injury K A B C O
 Position **01** Restraint **04**
 Ejected Yes No
 Trapped Yes No
 Airbag Deployed Yes No
 Citation Issued
 Hazardous Other

Forward Original To: Michigan State Police, Traffic Crash Reporting Section, 7150 Harris Drive, Lansing, MI 48913

Vehicle Description **Toyota Corolla Silver 2003**
 Vehicle type PA VA PU ST
 CY MO GC SM
 OR Other Truck/Bus
 Vehicle Direction North South East West
 Special Vehicles 1 2 3
 4 5 6
 Private Trailer type 1 2 3 4 5 6 7
 Vehicle Defect 1 2 3 4 5 6
 Vehicle Use 2 3 4 5 6 7 8 9 10 11
 Location of Greatest Damage
 First Impact **01** Extent of Damage **3** Drivable Yes No
 Injury K A B C O Airbag Deployed Yes No Not Equipped

Date of Birth
 Sex M F
 Position Restraint Hospital
 Ambulance
 Ejected Trapped
 Yes No
 Yes No
 Date of Birth
 Sex M F
 Position Restraint Hospital
 Ambulance
 Ejected Trapped
 Yes No
 Yes No
 Age Pos. Rest.
 Age Pos. Rest.

Unit Reported on Front

Action Prior	First	Second	Third	Fourth
10/17				
Most Harmful	<input checked="" type="radio"/>	<input type="radio"/> (M)	<input type="radio"/> (M)	<input type="radio"/> (M)

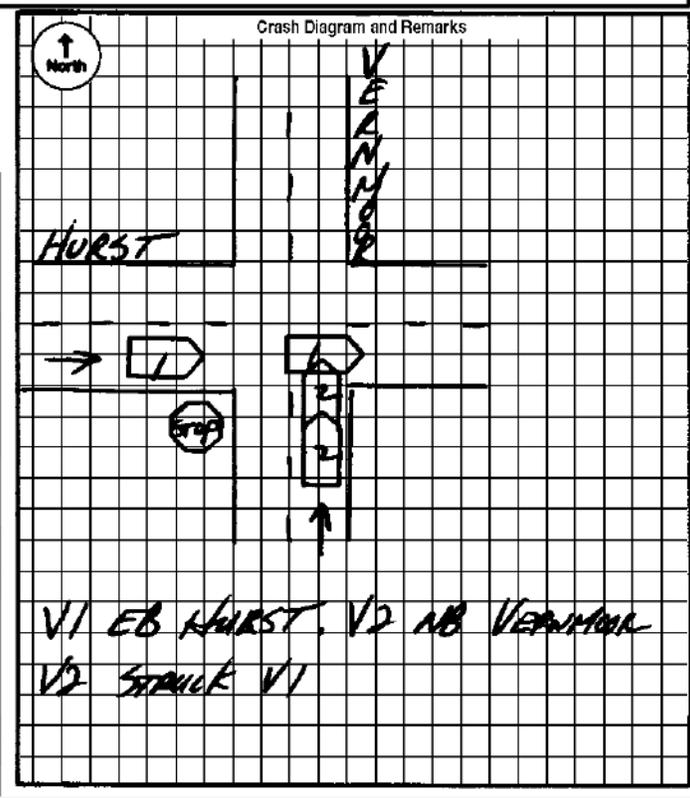
Unit Reported Above

Action Prior	First	Second	Third	Fourth
01/17				
Most Harmful	<input checked="" type="radio"/>	<input type="radio"/> (M)	<input type="radio"/> (M)	<input type="radio"/> (M)

Unit Number
 City _____ State _____
 Zip _____ GVWR/GCWR _____
 Carrier Source
 Papers Vehicle Log Book Driver
 Driver's CDL Type
 A C H P T
 B None N S X
 Interstate CDL Restrictions 28 29 30
 Intra (MI Only)
 CDL Exempt Farm Other
 Vehicle Type AS AL BS CX
 AA AT BB BX Other
 AH AX BH CH
 AN AY BN CP
 AP AZ BP CS
 Medical Card Y N
 Hazardous Material Placard Cargo Spill
 Class #
 Type & Axes Per Unit

First	Second	Third	Fourth

 Cargo Body Type 1 2 3 4 5 6 7 8
 ID #
 Investigated at Scene (N)



Safe Approach Speed Calculation

Vernmoor Dr at Hurst Dr
City of Troy MI

Road A = Vernmoor Dr
Road B = Hurst Dr

Date: 2/8/2012
Analyst: S.B. Dearing

Measured:

Width of Roads

Road A = 26 (ft)

Road B = 26 (ft)

Distance to Obstruction

a = 23 (ft)

b = 26 (ft)

Angle of Intersection

Delta = 90 (degrees)

Road A Posted

Speed Limit = 25 (mph)

Assumed:

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

Va = 30 (mph)

Perception / Reaction Time (AASHTO)

t = 2.0 (sec)

Coefficient of friction (AASHTO)

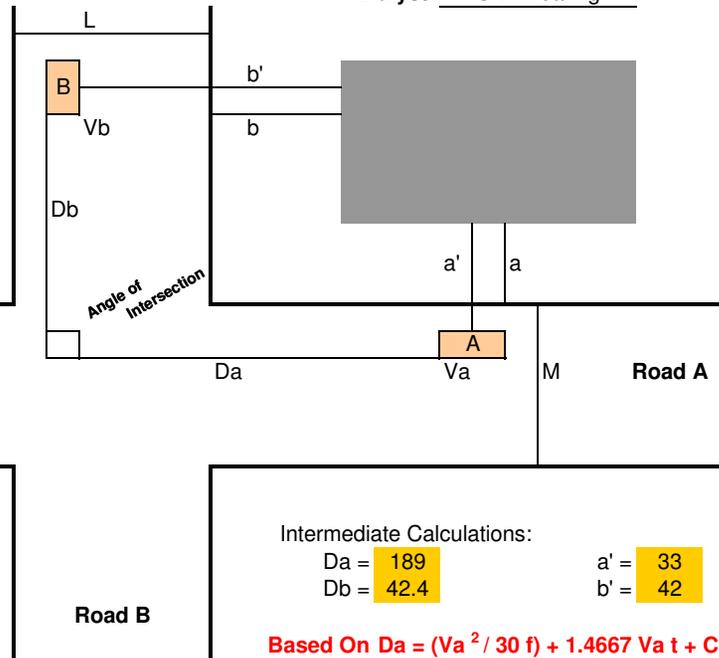
f = 0.35

Clearance distance in excess of safe stopping distance (AAA)

C = 15 (ft)

Calculated Safe Approach Speed for Vehicle
Approaching on Road B

Vb = 7.5 (mph)



For Wet Pavement:

Va	f
20	0.4
25	0.38
30	0.35
35	0.34
40	0.32
45	0.31
50	0.3
55	0.3

Intermediate Calculations:

Da = 189 a' = 33

Db = 42.4 b' = 42

Based On $Da = (Va^2 / 30 f) + 1.4667 Va t + C$

$Db = \frac{a * Da}{(Da - b)}$

Notes: Enter field measurements in yellow highlighted area.

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

Calculated by spreadsheet

Recommended ROW control

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



**NEW
TRAFFIC
PATTERN
AHEAD**

NEW



TRAFFIC COMMITTEE REPORT

March 1, 2012

TO: Traffic Committee

FROM: Bill Huotari, Deputy City Engineer/ Traffic Engineer

SUBJECT: Fredmoor at Lovell
Request for Stop Sign

Background:

Al Hessell of 6880 Fredmoor requested that the intersection of Fredmoor at Lovell be reviewed for the purpose of installing Stop signs on Fredmoor at Lovell (Stop signs exist currently on Lovell at the intersection). Mr. Hessell states that lack of Stop signs on Vernmoor creates a hazardous situation. While there are concerns in this area with speeding, the primary reasons Mr. Hessell expressed to support his request were:

1. No sidewalks in this area
2. Curves along Fredmoor reduce visibility of the intersection
3. Crest of the hill reduces visibility of the intersection

The posted speed limit on both streets is 25 mph. Volumes on both streets are very similar, so there is latitude in choosing the orientation of traffic controls at the intersection. Fredmoor runs many blocks without having one of its intersections subject to Stop or Yield control. Traffic volumes, including pedestrian traffic, do not meet warrants for multi-way Stop control. Nearly every intersection in this area has some type of traffic control in place.

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

The major sight distance obstructions at the intersection are the landscape bed with evergreen trees in the northeast quadrant. There are also hills on the northwest and southwest quadrants. The trees on the northeast quadrant and sight distance are the primary factors used when determining the safe approach speeds for the intersection.

The safe approach speed for the intersection was found to be less than 10 mph on Fredmoor, so Stop signs at the intersection are the recommended treatment.

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

Recommendations:

Staff concurs with our consultant's recommendation that the intersection control be modified, reassigning the right-of-way to Lovell Drive by removing the Stop signs on Lovell Drive and instead placing Stop signs on the Fredmoor Drive approaches. Additionally, it is recommended that temporary signs be placed to notify motorists that the intersection control has been changed.

February 9, 2012



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 Fredmor Drive & Lovell Drive
OHM JN: 0128-12-0020

Dear Mr. Huotari:

As requested, we have reviewed the Fredmor Drive/Lovell 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 Livernois Road and 0.35 miles south of W. South Road. Both Fredmor Drive and Lovell Drive are local streets, with Lovell Drive running in the east-west direction and Fredmor Drive running north-south. The speed limit on both streets is 25 mph. There are currently stop signs posted on the Lovell 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.
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- 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.
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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.

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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

The peak-hour for traffic volumes, that is, the one hour period during the day in which traffic volumes are greatest, typically occurs between 4-6 PM on weekdays. A one-hour turning movement traffic count was collected by OHM on Tuesday, February 7, from 4-5 PM. The counts indicate that the peak hour volumes along each road are 25 vehicles for Fredmoor Drive and 29 vehicles for Lovell Drive. There was also 1 pedestrian observed during the count.

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With the pedestrian and vehicular traffic added together this location is still far below warrant thresholds for multi-way STOP control. The traffic count is provided as an attachment to this letter.

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 Fredmoor Drive/ Lovell Drive intersection. The crash occurred August 13, 2007, and 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 Roadway

Both Fredmoor Drive and Lovell Drive are considered local streets. However, the usual practice of determining which pair of approaches should be controlled is expressed in the guidance of the MMUTCD, and would have the control placed on the approaches of the less important road with a more major road. In this instance, the volumes for Lovell Drive and Fredmoor Drive are essentially equal, especially for the peak commuter periods, so there is latitude for professional judgement in choosing the orientation of the controls.

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When the safe approach speed is found to be less than 10 mph, a STOP sign is commonly used. In this case, the safe approach speed was found to be less than 10 mph; therefore two-way stop control is the recommended treatment. The safe approach speed calculation spreadsheet is attached for your reference.

Recommendation

OHM recommends that the intersection control be modified, reassigning the right-of-way to Lovell Drive by removing the STOP signs on Lovell Drive, and instead placing STOP signs on the Fredmoor Drive approaches. We recommend against modifying the intersection to multi-way STOP control.

Prior to reversing the location of the STOP signs, OHM recommends that the City of Troy notify local residents of the upcoming change. Additionally, measures should be taken to enhance conspicuity of the new STOP signs, such as installing a "New Traffic Pattern Ahead" (W23-2) sign in advance of the intersection, and mounting a "NEW" sign plaque (W16-15p) above the regulatory sign. These additional signs should be removed when the change is no longer considered to be new, or within 2 months.

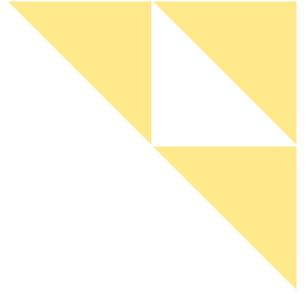
Sincerely,
Orchard Hiltz & McCliment, Inc.



Sara Merrill, PE, PTOE
Traffic Engineer

Attachments:

- Aerial and Intersection Photos
- Traffic Count
- Crash Data
- Safe Approach Speed Calculation Spreadsheet
- Enhanced conspicuity signs



Attachments



Fredmoor looking north



Fredmoor looking south



Lovell looking east



Lovell looking west



Project: Troy ROW Review
 Location: Fredmoor & Lovell
 Weather: Overcast, 30-degrees
 Collected By: OHM (SM)

File Name : Fredmoor-Lovell
 Site Code : 00000000
 Start Date : 2/7/2012
 Page No : 1

Groups Printed- All vehicles

Start Time	FREDMOOR From North					LOVELL From East					FREDMOOR From South					LOVELL From West					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
04:00 PM	0	4	0	0	4	3	2	0	0	5	0	1	0	0	1	0	2	0	1	3	13
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04:45 PM	0	4	0	0	4	1	5	2	0	8	1	2	2	0	5	0	1	0	0	1	18
Total	2	11	0	0	13	4	12	6	0	22	1	5	6	0	12	2	5	0	1	8	55
Grand Total	2	11	0	0	13	4	12	6	0	22	1	5	6	0	12	2	5	0	1	8	55
Apprch %	15.4	84.6	0	0		18.2	54.5	27.3	0		8.3	41.7	50	0		25	62.5	0	12.5		
Total %	3.6	20	0	0	23.6	7.3	21.8	10.9	0	40	1.8	9.1	10.9	0	21.8	3.6	9.1	0	1.8	14.5	

STATE OF MICHIGAN TRAFFIC CRASH REPORT

File Class

ORI: MI-6378400

Department Name: Troy Police Dept

Incident Disposition: Open Closed
Reviews: *SM 3/08*

Crash Date Month Day Year 08/13/2007		Crash Time Military 0853		No. of Units 02	Crash Type <input type="radio"/> Single Motor Vehicle <input type="radio"/> Head On <input type="radio"/> Head On-Left Turn <input type="radio"/> Rear End <input checked="" type="radio"/> Angle <input type="radio"/> Rear End-Left Turn <input type="radio"/> Rear End-Right Turn <input type="radio"/> Sideswipe-Same <input type="radio"/> Sideswipe-Opposite <input type="radio"/> Other/Unknown		Special Circumstances <input checked="" type="radio"/> None <input type="radio"/> Deer <input type="radio"/> School Bus <input type="radio"/> Hit and Run <input type="radio"/> Local <input type="radio"/> State <input type="radio"/> Severe Wind <input type="radio"/> Snow/Blowing Snow <input type="radio"/> Sleet/Hail <input type="radio"/> Rain <input type="radio"/> Other/Unknown		Special Checks <input type="radio"/> Fatal (Report All) <input type="radio"/> Corrected Copy <input type="radio"/> Replace (Entire Report) <input type="radio"/> Delete (Entire Report) <input type="radio"/> Non-Traffic Area <input type="radio"/> ORV/Snowmobile			
County 63	Traffic Control <input type="radio"/> None of These <input type="radio"/> Signal <input checked="" type="radio"/> Stop Sign <input type="radio"/> Yield Sign		Relation to Roadway (Location of First Impact) <input type="radio"/> Shoulder <input type="radio"/> Outside of Shoulder/Curb <input checked="" type="radio"/> On Road <input type="radio"/> Median <input type="radio"/> Gore <input type="radio"/> Other/Unknown		Weather (Mark Only One) <input checked="" type="radio"/> Clear <input type="radio"/> Cloudy <input type="radio"/> Fog/Smoke <input type="radio"/> Rain <input type="radio"/> Daylight <input type="radio"/> Dawn <input type="radio"/> Dusk <input type="radio"/> Snowy <input type="radio"/> Muddy <input type="radio"/> Slushy <input type="radio"/> Debris <input type="radio"/> Other/Unknown		Light (Mark Only One) <input checked="" type="radio"/> Daylight <input type="radio"/> Dark-Lighted <input type="radio"/> Dark-Unlighted <input type="radio"/> Other/Unknown		Area 07	Total Lanes 2	Speed Limit 25	Posted <input type="radio"/> Yes <input checked="" type="radio"/> No
Construction Zone (if applicable) (Mark One From Each Group) Type: <input type="radio"/> Const./Maint. <input type="radio"/> Utility Lane Closed: <input type="radio"/> Yes <input checked="" type="radio"/> No Activity: <input type="radio"/> On Road <input type="radio"/> Off Road <input checked="" type="radio"/> None			Road Name Prefix: W Road Name: LOVELL Distance: 0.1 Divided Roadway: <input type="radio"/> N <input type="radio"/> S <input type="radio"/> E <input type="radio"/> W Road Type: ST Suffix:		Road Name Prefix: F Road Name: FREDMOOR Distance: 0.1 Divided Roadway: <input type="radio"/> N <input type="radio"/> S <input type="radio"/> E <input type="radio"/> W Road Type: ST Suffix:		Road Name Prefix: Road Name: Distance: Divided Roadway: <input type="radio"/> N <input type="radio"/> S <input type="radio"/> E <input type="radio"/> W Road Type: Suffix:		Road Name Prefix: Road Name: Distance: Divided Roadway: <input type="radio"/> N <input type="radio"/> S <input type="radio"/> E <input type="radio"/> W Road Type: Suffix:		Road Name Prefix: Road Name: Distance: Divided Roadway: <input type="radio"/> N <input type="radio"/> S <input type="radio"/> E <input type="radio"/> W Road Type: Suffix:	

Unit Number 1	State MI	Date of Birth 06091966	License Type <input checked="" type="radio"/> O <input type="radio"/> CY <input type="radio"/> C <input type="radio"/> F <input type="radio"/> M <input type="radio"/> R	Sex <input type="radio"/> M <input checked="" type="radio"/> F	Total Occup 04	Hazard Action 04
Unit Type <input checked="" type="radio"/> MV <input type="radio"/> B <input type="radio"/> P <input type="radio"/> E (train)	City Troy	State MI	Zip 48068	Injury <input type="radio"/> K <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> O	Position 01	Restraint 04
Driver Condition <input checked="" type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 99	Interlock <input type="radio"/> Yes <input checked="" type="radio"/> No	Refused <input type="radio"/> Yes <input checked="" type="radio"/> No	Not offered (Submit Results To FINE When Available)	Airbag Deployed <input type="radio"/> Yes <input checked="" type="radio"/> No	Citation Issued Hazardous Other 721756	Hospital N/A
Alcohol <input type="radio"/> Yes <input checked="" type="radio"/> No	Test Type Field <input type="radio"/> PBT <input type="radio"/> Breath <input type="radio"/> Blood <input type="radio"/> Urine	Test Results	Drugs <input type="radio"/> Yes <input checked="" type="radio"/> No	Test Type Blood <input type="radio"/> Urine	Test Results	Ambulance N/A

Vehicle Description TOYOTA	Make TOYOTA	Model RAV4	Color WHITE	Year 2007
Location of Greatest Damage 0 1 2 3 4 5 6 7 8 9 10 11 12 01	Extent of Damage 4	Driveable <input type="radio"/> Yes <input checked="" type="radio"/> No	Vehicle Type <input checked="" type="radio"/> PA <input type="radio"/> CY <input type="radio"/> OR <input type="radio"/> VA <input type="radio"/> MO <input type="radio"/> Other <input type="radio"/> PU <input type="radio"/> GC <input type="radio"/> Truck/Bus <input type="radio"/> ST <input type="radio"/> SM	Vehicle Direction <input type="radio"/> North <input type="radio"/> South <input checked="" type="radio"/> East <input type="radio"/> West
Special Vehicles 1 2 3 4 5 6	Private Trailer Type 1 2 3 4 5 6 7	Vehicle Defect 1 2 3 4 5 6	Vehicle Use <input checked="" type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11	

Date of Birth	Sex <input type="radio"/> M <input checked="" type="radio"/> F	Position 06	Restraint 04	Hospital N/A
Ambulance N/A				
Ejected <input type="radio"/> Yes <input type="radio"/> No				
Trapped <input type="radio"/> Yes <input type="radio"/> No				
Airbag Deployed <input type="radio"/> Yes <input checked="" type="radio"/> No				

Date of Birth	Sex <input type="radio"/> M <input type="radio"/> F	Position	Restraint	Hospital
Ambulance				
Ejected <input type="radio"/> Yes <input type="radio"/> No				
Trapped <input type="radio"/> Yes <input type="radio"/> No				
Airbag Deployed <input type="radio"/> Yes <input type="radio"/> No				

Age 6	Pos. 7	Rest. 04
Age 1	Pos. 4	Rest. 06

Damaged Property	Public <input type="radio"/> Y <input type="radio"/> N
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SANITIZED

Unit Number 2 State MI

Date of Birth 02/17/1959

License Type: O, C, M, CY, F, R, Sex: M, F, Total Occup: 02, Hazard Action: 00

NCS

Unit Type: MV, B, P, E (train), City: Troy, State: MI, Zip: 48098

Driver Condition: 1, 2, 3, 4, 5, 6, 7, 8, 9, 99, Interlock: Yes, No, Refused, Not offered, Alcohol: Yes, No, Test Type: Field, PBT, Breath, Blood, Urine, Test Results, Drugs: Yes, No, Test Type: Blood, Urine, Test Results

Injury: K, A, B, C, O, Position: 01, 04, Restraint: Yes, No, Hospital: Troy, BEAUMONT, Ambulance: ALLIANCE, Ejected/Trapped: Yes, No, Airbag Deployed: Yes, No, Citation Issued: Hazardous, Other

Vehicle Description: CHEVROLET IMPALA, Make: CHEVROLET, Model: IMPALA, Color: WHITE, Year: 2003

Location of Greatest Damage: 07, 03, Vehicle Type: PA, VA, PU, ST, CY, MO, GC, SM, OR, Other, Truck/Bus, Vehicle Direction: North, South, East, West, Special Vehicles: 1, 2, 3, 4, 5, 6, Private Trailer Type: 1, 2, 3, 4, 5, 6, 7, Vehicle Defect: 1, 2, 3, 4, 5, 6, Vehicle Use: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

Unit 2: Date of Birth: 07/09/1947, Sex: F, Position: 03, Restraint: 04, Hospital: Troy, BEAUMONT, Ambulance: ALLIANCE, Ejected/Trapped: Yes, No

Unit 3: Date of Birth: [Blank], Sex: M, Position: [Blank], Restraint: [Blank], Hospital: [Blank], Ambulance: [Blank], Ejected/Trapped: Yes, No

Age, Pos, Rest. [Blank]

Unit Reported on Front: Action Prior, Sequence of Events (First, Second, Third, Fourth), Most Harmful

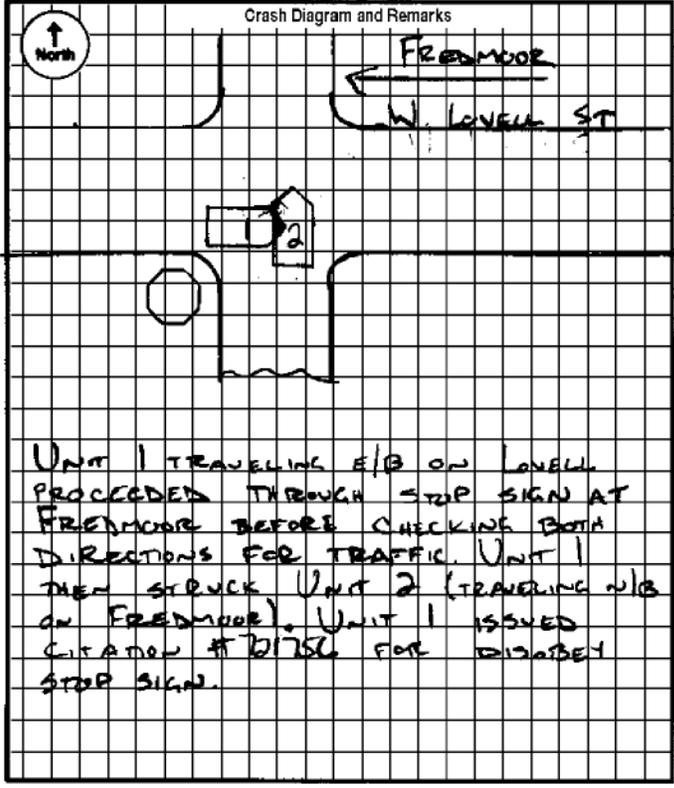
Unit Reported Above: Action Prior, Sequence of Events (First, Second, Third, Fourth), Most Harmful

Unit Number, City, State, Zip, GVWR/GCWR, Carrier Source: Papers, Vehicle, Log Book, Driver

Driver's CDL Type: A, C, H, P, T, B, None, N, S, X, Interstate, CDL Restrictions: 28, 29, 30, Intra (MI Only), CDL Exempt: Farm, Other

Vehicle Type: AS, AL, BS, CX, AA, AT, BB, BX, Other, AH, AX, BH, CH, AN, AY, BN, CP, AP, AZ, BP, CS, Medical Card: Y, N, Hazardous Material: Placard, Cargo Spill, Class #

Type & Axles Per Unit, Cargo Body Type, ID #, Investigated at Scene



Forward Original To: Michigan State Police, Traffic Crash Reporting Section, 7150 Harris Drive, Lansing, MI 48913

Safe Approach Speed Calculation

Lovell Dr at Fredmoor Dr
City of Troy MI

Road A = Lovell Dr
Road B = Fredmoor Dr

Date: 2/8/2012

Analyst: S.B. Dearing

Measured:

Width of Roads

Road A = 26 (ft)

Road B = 26 (ft)

Distance to Obstruction

a = 19 (ft)

b = 12 (ft)

Angle of Intersection

Delta = 90 (degrees)

Road A Posted

Speed Limit = 25 (mph)

Assumed:

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

Va = 30 (mph)

Perception / Reaction Time (AASHTO)

t = 2.0 (sec)

Coefficient of friction (AASHTO)

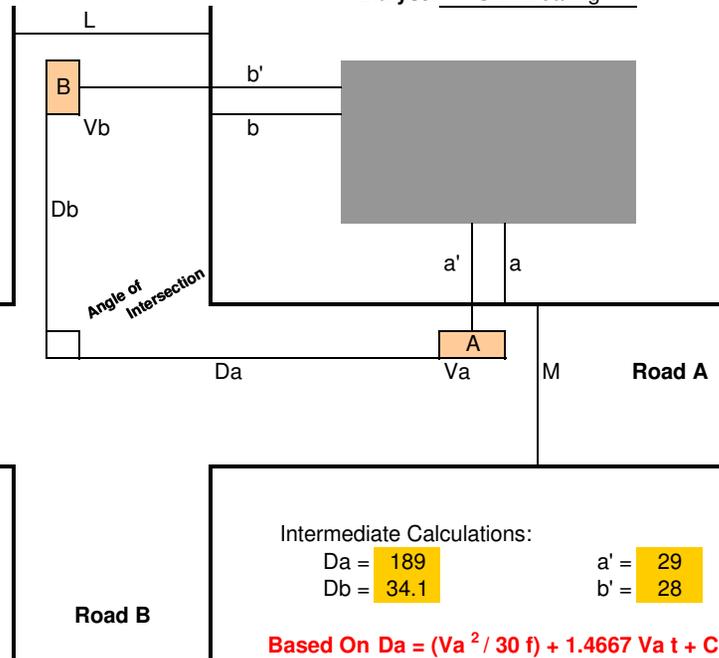
f = 0.35

Clearance distance in excess of safe stopping distance (AAA)

C = 15 (ft)

Calculated Safe Approach Speed for Vehicle
Approaching on Road B

Vb = 5.5 (mph)



For Wet Pavement:

Va	f
20	0.4
25	0.38
30	0.35
35	0.34
40	0.32
45	0.31
50	0.3
55	0.3

Intermediate Calculations:

Da = 189 a' = 29

Db = 34.1 b' = 28

Based On $Da = (Va^2 / 30 f) + 1.4667 Va t + C$

$Db = \frac{a * Da}{(Da - b)}$

Notes: Enter field measurements in yellow highlighted area.

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

Calculated by spreadsheet

Recommended ROW control

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



**NEW
TRAFFIC
PATTERN
AHEAD**

NEW