## CITY of NOVI CITY COUNCIL

Agenda Item N<br>August 23, 2010

SUBJECT: Approval of 1) Traffic Control Order 10-44 for the implementation of a 25 mph speed limit on Crowe Drive, 2) Traffic Control Order 10-45 for the implementation of a 25 mph speed limit on Ingersol Drive (between Crowe Drive and Crescent Blvd), 3) Traffic Control Order 10-46 for the implementation of a 30 mph speed limit on Crescent Blvd, and 4) Traffic Control Order 10-47 for the implementation of a 30 mph speed limit on Town Center Drive, all located within Novi Town Center.

SUBMITTING DEPARTMENT: Department of Public Services, Engineering Division BK
CITY MANAGER APPROVAL:

## BACKGROUND INFORMATION:

A recent audit of the City's traffic control sign inventory identified a number of posted speed limits that lack traffic control orders for enforcement of the speed. The Uniform Traffic Code requires that traffic control orders, as issued by the traffic engineer and approved by the City Council, be on file for the enforcement of traffic control signs. As such, an engineering study was performed to establish a legal speed limit as required by the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) (see Birchler Arroyo study dated June 10, 2010). Speed limits are generally set using the 85th percentile speed, which is the speed at or below which 85 percent of the motorists drive on a given road when unaffected by slower traffic or poor weather.

The posted speed limit is currently 25 mph for all public streets within Novi Town Center. The proposed speed limit of 25 mph on both Crowe Drive and the public portion of Ingersol Drive, and the proposed 30 mph limit on Crescent Blvd and Town Center Drive represents existing driver behavior on these segments as demonstrated by the measured $85^{\text {th }}$ percentile speeds in the table below:

|  |  | Current <br> Road Segment <br> Posted <br> Speed Limit | $85^{\text {th }}$ <br> Percentile <br> Speed | Proposed Speed <br> Limit |
| :--- | :--- | :---: | :---: | :---: |
| Crowe Drive | Novi Road to Ingersol Drive | 25 | 24 | 25 (no change) |
| Ingersol Drive | Crescent Blvd to Crowe Drive | 25 | 27 | 25 (no change) |
| Crescent Blvd | Novi Road to Town Center Drive | 25 | 33 | 30 |
| Town Center <br> Drive | Crescent Blvd to 11 Mile Road | 25 | 33 | 30 |
|  | Grand River Ave to 11 Mile Road | 25 | 29 | 30 |

As discussed in the attached August 10, 2010 memo regarding the proposed speed limit changes, an increase in the posted speed to match the $85^{\text {th }}$ percentile speed does not significantly increase the $85^{\text {th }}$ percentile speed when the posted speed limit is increased. In reviewing the segments on which the speed limits were increased in 2009 , the $85^{\text {th }}$ percentile speed increased an average of 0.8 mph . In accordance with Department of Public Service's standard procedures, within one year after implementation of new speed limits, staff will collect speed samples to verify that the new posted speed limit continues to reflect the $85^{\text {th }}$ percentile speed.

The new speed limit signs would meet the federal retroreflectivity requirements and would be funded by the Traffic Control Sign Replacement Program as approved in the FY2010-11 budget.

RECOMMENDED ACTION: Approval of 1) Traffic Control Order 10-44 for the implementation of a 25 mph speed limit on Crowe Drive, 2) Traffic Control Order 10-45 for the implementation of a 25 mph speed limit on Ingersol Drive (between Crowe Drive and Crescent Blvd), 3) Traffic Control Order 10-46 for the implementation of a 30 mph speed limit on Crescent Blvd, and 4) Traffic Control Order 10-47 for the implementation of a 30 mph speed limit on Town Center Drive, all located within Novi Town Center.

|  | $\mathbf{1}$ | $\mathbf{2}$ | Y | N |
| :--- | :---: | :---: | :---: | :---: |
| Mayor Landry |  |  |  |  |
| Mayor Pro Tem Gatt |  |  |  |  |
| Council Member Crawford |  |  |  |  |
| Council Member Fischer |  |  |  |  |


|  | $\mathbf{1}$ | $\mathbf{2}$ | Y | N |
| :--- | :--- | :--- | :--- | :--- |
| Council Member Margolis |  |  |  |  |
| Council Member Mutch |  |  |  |  |
| Council Member Staudt |  |  |  |  |

CONTROL NUMBER: 10-44

PURSUANT TO CHAPTER NO. 33 OF THE CODE OF ORDINANCES OF THE CITY OF NOVI, MICHIGAN, SAME BEING THE UNIFORM TRAFFIC CODE FOR CITIES, TOWNSHIPS AND VILLAGES OF MICHIGAN AND IN THE INTEREST OF PUBLIC SAFETY AND CONVENIENCE THE FOLLOWING TRAFFIC CONTROL ORDER IS HEREBY ISSUED BY BRIAN COBURN, SENIOR CIVIL ENGINEER, DULY AUTHORIZED AS TRAFFIC ENGINEER, BY SEC. 33.141 OF THE AFORESAID CHAPTER.

ISSUANCE OF THIS TRAFFIC CONTROL ORDER WAS PRECEDED BY STUDY AND INVESTIGATION OF TRAFFIC CONDITIONS ON THE FOLLOWING PUBLIC ROAD OR ROADS IN THE CITY OF NOVI, MICHIGAN.

## CROWE DRIVE

AND AFTER SAID INVESTIGATION, IT IS HEREBY ORDERED AND DIRECTED THAT THE DEPARTMENT OF PUBLIC SERVICES ERECT AND MAINTAIN THE SPEED LIMIT SIGN (S) IN ACCORDANCE WITH THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AS REQUIRED BY SEC. 33.217 OF THE AFORESAID CHAPTER, SAID SIGNS TO GIVE NOTICE OF THE FOLLOWING DETERMINATION:

## SPEED LIMIT FOR CROWE DRIVE TO BE 25 MPH



Dated: August 16, 2010

## APPROVED BY CITY COUNCIL

TRAFFIC CONTROL ORDER NUMBER 10-44 HAVING BEEN PRESENTED TO THE COUNCIL OF THE CITY OF NOVI, MICHIGAN FOR STUDY AND APPROVAL, IS HEREBY APPROVED AND IT IS HEREBY ORDERED AND DIRECTED THAT THIS ORDER BE FILED IN THE OFFICE OF THE CITY CLERK AND A COPY THEREOF IN THE OFFICE OF THE CHIEF OF POLICE OF SAID CITY.

IT IS FURTHER ORDERED AND DIRECTED THAT THIS ORDER SHALL BECOME EFECTIVE UPON BEING FILED WITH THE CLERK AND UPON ERECTION OF ADEQUATE SIGNS GIVING NOTICE OF THE EXISTENCE OF AFORESAID,

## SPEED LIMIT FOR CROWE DRIVE TO BE 25 MPH

ADOPTED AT THE REGULAR MEETING OF CITY COUNCIL ON August 23, 2010.

By:
David Landry, Mayor

By:
Maryanne Cornelius, Clerk

## CITY OF NOVI <br> TRAFFIC CONTROL ORDER

ISSUANCE OF THIS TRAFFIC CONTROL ORDER WAS PRECEDED BY STUDY AND INVESTIGATION OF TRAFFIC CONDITIONS ON THE FOLLOWING PUBLIC ROAD OR ROADS IN THE CITY OF NOVI, MICHIGAN.

## INGERSOL DRIVE

AND AFTER SAID INVESTIGATION, IT IS HEREBY ORDERED AND DIRECTED THAT THE DEPARTMENT OF PUBLIC SERVICES ERECT AND MAINTAIN THE SPEED LIMIT SIGN (S) IN ACCORDANCE WITH THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AS REQUIRED BY SEC. 33.217 OF THE AFORESAID CHAPTER, SAID SIGNS TO GIVE NOTICE OF THE FOLLOWING DETERMINATION:

## SPEED LIMIT FOR INGERSOL DRIVE FROM CROWE DRIVE TO CRESCENT BLVD TO BE 25 MPH



Brian Coburn, P.E. - Traffic Engineer
Dated: August 16, 2010

## APPROVED BY CITY COUNCIL

TRAFFIC CONTROL ORDER NUMBER 10-45 HAVING BEEN PRESENTED TO THE COUNCIL OF THE CITY OF NOVI, MICHIGAN FOR STUDY AND APPROVAL, IS HEREBY APPROVED AND IT IS HEREBY ORDERED AND DIRECTED THAT THIS ORDER BE FILED IN THE OFFICE OF THE CITY CLERK AND A COPY THEREOF IN THE OFFICE OF THE CHIEF OF POLICE OF SAID CITY.

IT IS FURTHER ORDERED AND DIRECTED THAT THIS ORDER SHALL BECOME EFECTIVE UPON BEING FILED WITH THE CLERK AND UPON ERECTION OF ADEQUATE SIGNS GIVING NOTICE OF THE EXISTENCE OF AFORESAID,

## SPEED LIMIT FOR INGERSOL DRIVE FROM CROWE DRIVE TO CRESCENT BLVD TO BE 25 MPH

ADOPTED AT THE REGULAR MEETING OF CITY COUNCIL ON August 23, 2010.

By:
David Landry, Mayor

By:
Maryanne Cornelius, Clerk

## CITY OF NOVI <br> TRAFFIC CONTROL ORDER

SPEED PARKING OTHER
$\qquad$

DATE OF ORDER:

CONTROL NUMBER:

PURSUANT TO CHAPTER NO. 33 OF THE CODE OF ORDINANCES OF THE CITY OF NOVI, MICHIGAN, SAME BEING THE UNIFORM TRAFFIC CODE FOR CITIES, TOWNSHIPS AND VILLAGES OF MICHIGAN AND IN THE INTEREST OF PUBLIC SAFETY AND CONVENIENCE THE FOLLOWING TRAFFIC CONTROL ORDER IS HEREBY ISSUED BY BRIAN COBURN, SENIOR CIVIL ENGINEER, DULY AUTHORIZED AS TRAFFIC ENGINEER, BY SEC. 33.141 OF THE AFORESAID CHAPTER.

ISSUANCE OF THIS TRAFFIC CONTROL ORDER WAS PRECEDED BY STUDY AND INVESTIGATION OF TRAFFIC CONDITIONS ON THE FOLLOWING PUBLIC ROAD OR ROADS IN THE CITY OF NOVI, MICHIGAN.

## CRESCENT BLVD

AND AFTER SAID INVESTIGATION, IT IS HEREBY ORDERED AND DIRECTED THAT THE DEPARTMENT OF PUBLIC SERVICES ERECT AND MAINTAIN THE SPEED LIMIT SIGN (S) IN ACCORDANCE WITH THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AS REQUIRED BY SEC. 33.217 OF THE AFORESAID CHAPTER, SAID SIGNS TO GIVE NOTICE OF THE FOLLOWING DETERMINATION:

## SPEED LIMIT FOR CRESCENT BLVD TO BE 30 MPH



Brián Coburn, P.E. - Traffic Engineer
Dated: August 16, 2010

## APPROVED BY CITY COUNCIL

TRAFFIC CONTROL ORDER NUMBER 10-46 HAVING BEEN PRESENTED TO THE COUNCIL OF THE CITY OF NOVI, MICHIGAN FOR STUDY AND APPROVAL, IS HEREBY APPROVED AND IT IS HEREBY ORDERED AND DIRECTED THAT THIS ORDER BE FILED IN THE OFFICE OF THE CITY CLERK AND A COPY THEREOF IN THE OFFICE OF THE CHIEF OF POLICE OF SAID CITY.

IT IS FURTHER ORDERED AND DIRECTED THAT THIS ORDER SHALL BECOME EFECTIVE UPON BEING FILED WITH THE CLERK AND UPON ERECTION OF ADEQUATE SIGNS GIVING NOTICE OF THE EXISTENCE OF AFORESAID,

## SPEED LIMIT FOR CRESCENT BLVD TO BE 30 MPH

ADOPTED AT THE REGULAR MEETING OF
By: CITY COUNCIL ON August 23, 2010.

David Landry, Mayor

By:
Maryanne Cornelius, Clerk

## CITY OF NOVI <br> TRAFFIC CONTROL ORDER

$\qquad$ SPEED
PARKING
OTHER

DATE OF ORDER:

CONTROL NUMBER:
10-47

PURSUANT TO CHAPTER NO. 33 OF THE CODE OF ORDINANCES OF THE CITY OF NOVI, MICHIGAN, SAME BEING THE UNIFORM TRAFFIC CODE FOR CITIES, TOWNSHIPS AND VILLAGES OF MICHIGAN AND IN THE INTEREST OF PUBLIC SAFETY AND CONVENIENCE THE FOLLOWING TRAFFIC CONTROL ORDER IS HEREBY ISSUED BY BRIAN COBURN, SENIOR CIVIL ENGINEER, DULY AUTHORIZED AS TRAFFIC ENGINEER, BY SEC. 33.141 OF THE AFORESAID CHAPTER.

ISSUANCE OF THIS TRAFFIC CONTROL ORDER WAS PRECEDED BY STUDY AND INVESTIGATION OF TRAFFIC CONDITIONS ON THE FOLLOWING PUBLIC ROAD OR ROADS IN THE CITY OF NOVI, MICHIGAN.

## TOWN CENTER DRIVE

AND AFTER SAID INVESTIGATION, IT IS HEREBY ORDERED AND DIRECTED THAT THE DEPARTMENT OF PUBLIC SERVICES ERECT AND MAINTAIN THE SPEED LIMIT SIGN (S) IN ACCORDANCE WITH THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AS REQUIRED BY SEC. 33.217 OF THE AFORESAID CHAPTER, SAID SIGNS TO GIVE NOTICE OF THE FOLLOWING DETERMINATION:

## SPEED LIMIT FOR TOWN CENTER DRIVE TO BE 30 MPH



Bítan Coburn, P.E. - Traffic Engineer
Dated: August 16, 2010

## APPROVED BY CITY COUNCIL

TRAFFIC CONTROL ORDER NUMBER 10-47 HAVING BEEN PRESENTED TO THE COUNCIL OF THE CITY OF NOVI, MICHIGAN FOR STUDY AND APPROVAL, IS HEREBY APPROVED AND IT IS HEREBY ORDERED AND DIRECTED THAT THIS ORDER BE FILED IN THE OFFICE OF THE CITY CLERK AND A COPY THEREOF IN THE OFFICE OF THE CHIEF OF POLICE OF SAID CITY.

IT IS FURTHER ORDERED AND DIRECTED THAT THIS ORDER SHALL BECOME EFECTIVE UPON BEING FILED WITH THE CLERK AND UPON ERECTION OF ADEQUATE SIGNS GIVING NOTICE OF THE EXISTENCE OF AFORESAID.

SPEED LIMIT FOR TOWN CENTER DRIVE TO BE 30 MPH
By:
David Landry, Mayor
ADOPTED AT THE REGULAR MEETING OF CITY COUNCIL ON August 23, 2010.
$B y:$
Maryanne Cornelius, Clerk

August 2010 Speed Limits \& Selected 2008 Traffic Counts in the City of Novi

FROM:
SUBJECT:
DATE:


TO: ROB HAYES, P.E.; DIRECTOR OF PUBLIC SERVICES
BRIAN COBURN, P.E.; SENIOR CIVIL ENGINEER BTC
PROPOSED SPEED LIMIT CHANGES
AUGUST 10, 2010

This memo is a follow-up to my April 28, 2010 memo regarding speed limit evaluations. As you may recall, I conducted an audit of the city's speed limit signs and identified a number of installed signs that lack traffic control orders. The road segments that lack traffic control orders for the posted speed are as follows:

- Novi Road (12 Mile Road to 14 Mile Road)
- Meadowbrook Road (12 Mile Road to 13 Mile Road)
- 13 Mile Road (Meadowbrook Road to Haggerty Road)
- West Park Drive (12 Mile Road to West Road)
- Town Center Drive
- Crescent Blvd
- Crowe Drive
- Ingersol Drive

With the assistance of the Field Operations Division and our traffic consultant, Birchler Arroyo, we have collected speed samples and evaluated these segments to determine the appropriate speed limit. The speed studies for each segment are attached to this memo.

Legal Requirements for Speed Limits
The Uniform Traffic Code requires that traffic control orders, as issued by the traffic engineer and approved by the City Council, be on file for the enforcement of traffic control signs. As discussed in the Detroit News article attached to the April 28 memo, tickets issued for a speed limit that lacks a traffic control order could be successfully challenged by the motorist. Speed limits are governed by the Michigan Vehicle Code (MVC) and the Michigan Manual of Traffic Control Devices (MMUTCD). The MVC provides a standard "prima facie" speed based on the number of access points on a roadway. The MVC allows the local agency to adjust the speed limit based on a traffic engineering study. The MMUTCD requires an engineering study to determine the speed limit in accordance with established traffic engineering practices.

Generally, speed limits should be set so that the majority of drivers observe them voluntarily. Studies have shown that drivers generally operate their vehicles at speeds that are reasonable and proper, regardless of the posted speeds. Nationally, this is recognized as the 85th percentile speed, which is the speed at or below which 85 percent of the motorists drive on a given road unaffected by slower traffic or poor weather. It is generally accepted that when traffic deviates from the 85 th percentile speed, the probability of a traffic crash becomes greater. In addition to the 85th percentile speed, the MMUTCD recommends review of other road characteristics including pedestrian activity, road conditions, crash experience, 10 mph pace, and road side environment. Realistic speed limits should be set at no more than five miles per hour below or above the 85 th percentile speed based on these mitigating factors.

Public Perception of Speed Limits
It is usually difficult for the public to understand that even though the road may be posted at one speed, a great number of drivers may actually be driving faster based on their comfort level with the road. There is also a perception that when the posted speed limit is increased that it will result in even higher speeds. For example, if a road is posted at 30 mph and the $85^{\text {th }}$ percentile speed is 35 mph , there is a perception that if the posted speed limit is increased to 35 mph , drivers would increase their speed toward 40 mph . To demonstrate the impact of increasing the posted speeds, we have analyzed the speed limits that were changed in 2009. The table below compares the observed $85^{\text {th }}$ percentile speed on several road segments before the new speed limit was posted with the observed 85th percentile speed after the new speed limit was posted. While there was a notable increase on two segments of Beck Road and on Lewis Drive, there was no change in $85^{\text {th }}$ percentile speed for many of the segments. The average change is a 0.8 mph increase in speed.

|  |  |  |  | 85th percentile speed (mph) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Road | Segment | Original Posted Speed | New Posted Speed (2009) | Before New Posted Speed Limit | After New Posted Speed Limit | Change |
| 11 Mile Road | Town Center to Meadowbrook | 30 | 35 | 36 | 37 | +1 |
|  | Meadowbrook to Seeley | 30 | 35 | 39 | 39 | 0 |
| Cabot Drive | Lewis to 13 Mile | 25 | 35 | 38 | 38 | 0 |
|  | South of Lewis | 25 | 35 | 37 | 37 | 0 |
|  | North of 12 Mile (curves) | 25 | 30 | 34 | 34 | 0 |
| Lewis Drive | Haggerty to Cabot | 25 | 35 | 35 | 37 | +2 |
| Beck <br> Road | 11 Mile to Grand River | 40 | 45 | 47 | 47 | 0 |
|  | 10 Mile to 11 Mile | 40 | 45 | 45 | 49 | +4 |
|  | Nine Mile to 10 Mile | 40 | 45 | 48 | 46 | -2 |
|  | Eight Mile to Nine Mile | 40 | 45 | 47 | 49 | +2 |
| Average Change |  |  |  |  |  | +0.8 |

## Proposed Speed Limits

The enclosed studies demonstrate that the speed limits that are currently posted on the subject road segments are not being observed by the majority of drivers. Further, since the posted speeds lack traffic control orders or engineering studies to support the posted speed limits, they must be reviewed to establish legal speed limits. A summary of the proposed speed limits is shown in the table below, with the justification for each recommendation included in the enclosed studies.

| Road | Segment | Current Posted Speed Limit | $85^{\text {th }}$ Percentile Speed | Recommended Posted Speed Limit |
| :---: | :---: | :---: | :---: | :---: |
| Novi Road | 12 Mile to 1,640 feet south of 13 Mile | 40 | 47 | 45 |
|  | 1,640 feet south of 13 Mile to 13 Mile | 35 | 45 | 45 |
|  | 13 Mile Road to 14 Mile Road | 40 | 48 | 45 (*) |
| Meadowbrook Road | 12 Mile Road to Meadowbrook Elem | 30 | 36 | 35 |
|  | 13 Mile Road to Meadowbrook Elem | 25 | 36 | 35 (**) |
| 13 Mile Road | Meadowbrook Road to Haggerty Road | 40 | 46 | 45 |
| West Park Drive | 12 Mile Road to West Road | 40 | 47 | 45 |
| Crowe Drive | Novi Road to Ingersol Drive | 25 | 24 | 25 |
| Ingersol Drive | Crescent Blvd to Crowe Drive | 25 | 27 | 25 |
| Crescent Blvd | Novi Road to Town Center Drive | 25 | 33 | 30 |
| Town Center Drive | Crescent Blvd to 11 Mile Road | 25 | 33 | 30 |
|  | Grand River Ave to 11 Mile Road | 25 | 29 | 30 |

$\left(^{*}\right)$ A 30 mph school speed zone is proposed for this segment during school arrival and dismissal times
${ }^{(* *) A} 25 \mathrm{mph}$ school speed zone is proposed for this segment during school arrival and dismissal times

As noted in the table, there are two school speed zones proposed for implementation. The first is adjacent to Hickory Woods Elementary School on Novi Road. The posted speed limit is currently 40 mph at this location and there is no school speed zone at this time. The report recommends a school speed zone be set at 30 mph in the vicinity of the school property. The second school speed zone is proposed adjacent to Meadowbrook Elementary on Meadowbrook Road. The speed limit is currently set at 25 mph as a regular speed limit that is in effect all-day, every day. The report proposes the implementation of a school speed zone set at 25 mph in the vicinity of the school property. State law (MCL 257.627a) allows the speed limit to be decreased by 15 mph from the posted speed (but set at not less than 25 mph ) in a school zone for a period of 30 minutes to one hour before school and 30 minutes to one hour after school, when requested by the school superintendent. We have discussed the proposed school speed zones with Walled Lake Schools. They are supportive of the recommendations and intend to request the school speed zones as proposed.

## Public Notification

The majority of the segments being studied are located in nonresidential areas. Meadowbrook Road has the largest potential impact on the residents since there are several residential units along Meadowbrook Road in the existing 25 mph speed zone. A "Speed Limit Under Review" sign (as shown at right) has been installed at the north and south ends of the Meadowbrook Road segment (12 Mile Road to 13 Mile Road) to notify residents and motorists that the speed limit is being studied. We have received a few calls from residents who were primarily concerned with the speed limit near the school. Our staff has explained that a school speed zone is proposed which
 calmed their concerns.

## Implementation

We propose to prepare the traffic control orders for the speed limit recommendations from the studies for consideration by City Council on an upcoming agenda. Once approved by City Council, the new speed signs would be installed by Field Operations staff as recommended by the studies. The new signs would meet the federal retroreflectivity requirements and would be funded by the Traffic Control Sign Replacement Program as approved in the FY2010-11 budget.

[^0]Brian T. Coburn, P.E.
Engineering Div., Dept. of Public Services
City of Novi
26300 Delwal Drive
Novi, MI 48375
bcobum@cityainovi.org

## Subject: Speed Limit Study of City Streets in Novi Town Center Area

Dear Mr. Coburn:
Per your request, we have evaluated Crescent Boulevard, Town Center Drive, Crowe Drive, and Ingersol Drive (Crescent to Crowe) to determine appropriate speed limits (Figure 1). This letter reports our findings and recommendations.

## Recommendations

1. The speed limit on Crescent Boulevard and Town Center Drive should be 30 mph .
2. The speed limit on Ingersol Drive and Crowe Drive should be 25 mph .

## Background and Criteria

In establishing a speed limit, it is appropriate to determine and consider (1) the prima facie limit, (2) the "speed of vehicular traffic" (typically expressed as the $85^{\text {llh}}$-percentile speed), and (3) other traffic and roadway characteristics (per the Michigan Manual of Uniform Traffic Control Devices).

A portion of the Michigan Vehicle Code (MCL 257.627) establishes prima facie speed limits based on (1) whether or not the road runs through a business district, and (2) the number of access points (driveways or intersecting roadways) within each half mile of road. In a business district or where there are 60 or more access points per half mile, the prima facie limit is 25 mph . Outside a business district, the prima facie limit is 35 mph for $45-59$ access points per half mile and 45 mph for 30-44 access points per half mile.

Another portion of the law (MCL 257.628 ) indicates that a posted speed limit different than the prima facie limit may be determined based on an "engineering and traffic investigation." Relevant guidelines for such an investigation, found in Section 2B. 13 of the MMUTCD (approved jointly by the MDOT and the State Police), are as follows:
"When a speed limit is to be posted, it should be within ... 5 mph of the $85^{\text {th}}$-percentile of freeflowing traffic.
$\square$ Other factors that may be considered when establishing speed limits are the following:
A. Road characteristics, shoulder condition, grade, alignment, and sight distance;
B. The pace speed;
C. Roadside development and environment;
D. Parking practices and pedestrian activity;
E. Reported crash experience for at least a 12 -month period."


[^1]Figure 1. Novi Town Center Study Area

Speeci Limit Siudy of City' Sireets in novii Town Center Area, page 3

## Data Coliection and Analysis

Prima Facie Spoed' Limitit The iNichigan Vehicle Code defines a business district as "the territory contiguous to a highway [where] 50 percent or more of the frontage thereon for a distance of 300 feet or more is occupied by buildings in use for business" (MiCL 257.5, Sec. 5). All four of the street segments reviewed meet this definition. Hence, the prima facie speed limit on those segments is 25 mph .

Computed Comfortable Curve Spsed - Methodology recommended by the American Association of State Highway and Transportation Officials was used to compute the safe and comfortable speed on the five curves present among the subject street sections, based on curve radius, pavement cross slope, and the assumed maximum comfortable lateral friction coefficient for the computed speed (per AASHTO). Curve radii and pavement cross slopes were taken from construction plans provided by the City. Table 1 (below) summarizes the inputs and outputs of curve speed computations.

85 tho $_{0}$ Percentile Speed - At our request, City personnel conducted automated speed and volume sampling over 48-hour midweek periods. The five sampling locations are noted on Figures 1-6.

Tables 2 a and 2 b summarize the traffic statistics for Town Center Drive and the other subject road sections by location, direction, and day. The average daily traffic volumes are just over 3,500 vehicles on Town Center Drive; 5,100 vehicles on Crescent Boulevard; 2,100 vehicles on Ingersol Drive; and 1,600 vehicles on Crowe Drive. The $85^{\text {ll- }}$-percentile speeds are 29.3-32.5 mph on Town Center; 32.6 mph on Crescent; 27.4 mph on Ingersol; and 23.9 mph on Crowe.

Whether to round down or up from the $85^{\text {th }}$-percentile speed in selecting a speed limit depends not only on how close the statistic is to a 5 -mph multiple, but also on the driving environment and engineering judgment. Given the low prima facie speed limit (based on this being a business district), significant driveway traffic, limiting comfortable curve speeds (above), and documented crash experience (below), it appears appropriate on all subject streets to round down to the next lower 5 -mph interval below each of the observed $85^{\text {th }}$ speeds.

Crash Experience - At our request, the Traffic Improvement Association (TIA) searched its files for crashes occurring along Crescent, Town Center, Ingersol, and Crowe between 2004 and 2009, inclusive. Given the proximity of driveways and intersections, no attempt was made to exclude from the search crashes occurring within 200 ft of Novi Road or Grand River Avenue. All crashes, even intersection-related ones on Crescent Boulevard and Town Center Drive, were retrieved and reviewed.

The TIA data are appended to this report, and the 86 individual crashes are further summarized in Table A-1. Table 3 (following Tables 2a and 2b) shows the frequency distribution of crashes by street, relationship to intersection, and severity level. Key findings revealed by the various tables are as follows:
a After setting aside the 25 crashes attributable to the Crescent / Novi intersection, there were 30 other crashes along Crescent Boulevard in six years. Given the street's estimated 0.39-mile length, the non-intersection crash frequency was 12.8 per mile per year.
a In contrast, there were only five non-intersection crashes along Town Center Drive. Given this street's estimated 0.42 -mile length, its non-intersection crash frequency was 2.4 per mile per year, or less than $20 \%$ as great as the frequency along Crescent Boulevard.

- The higher crash frequency along Crescent Boulevard is likely due primarily to the higher traffic volumes, more heavily used driveways, and somewhat unusual boulevard-style design (which allows direct left turns in most but not all locations, and which lacks several left-turn pockets).

Table 1. Compuied Comforíable (AASHTO) Curve Speeds for City Streets in Novi Town Center Area.

| Curve | Road Centerline (from Plans) |  |  | At Center of Inside and Outside Through Lanes |  |  | Comiortable Speed (mph) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Curve Length (fi) | Deflection | Radius (fi) | Radius (it) | Cross Slope (fiflt ${ }^{1}$ | Laterai Friction |  |
| Crescent, 1st Curve East of Novi | 270 | $51.5{ }^{\circ}$ | 300 | 284 | + 0.02 | 0.20 | 31 |
|  |  |  |  | 316 | - 0.02 | 0.20 | 29 |
| Crescent, 2nd Curve East of Novi | 1,079 | $51.5{ }^{\circ}$ | 1,200 | 1171 | $\div 0.02$ | 0.14 | 53 |
|  |  |  |  | 1216 | - 0.02 | 0.14 | 47 |
| Ingersol, between Crescent and Crowe | 295 | $24.2{ }^{\circ}$ | 700 | 691 | +0.02 | 0.16 | 43 |
|  |  |  |  | 709 | - 0.02 | 0.16 | 39 |
| Town Center, 1st Curve South of 11 Nile | 130 | $18.7{ }^{\circ}$ | 400 | 371 | $\div 0.02$ | 0.18 | 33 |
|  |  |  |  | 416 | - 0.02 | 0.18 | 32 |
| Town Center, 2nd Curve South of 11 Mile | 219 | $31.4{ }^{\circ}$ | 400 | 371 | +0.02 | 0.18 | 33 |
|  |  |  |  | 416 | -0.02 | 0.18 | 32 |

1 The values listed here are minimal for drainage and not intended to superelevate or "bank" for driving comfort or speed maintenance purposes (indeed, there is "adverse" superelevation in the outside lane, as indicated by the minus sign).

## 



Figure 2. Crescent, Ingersol, and Crowe Near Novi Road

Figure 3. Crescent Boulevard Past Town Center's Main Parking Field


Figure 4. East Crescent Boulevard and North Town Center Drive


Figure 5. Town Center Drive, from 11 Mile Road to North


Figure 6. Town Center Drive, 11 Mile to Grand River

Table 2a. Summary of Speed Statistics for Town Center Drive

| Loc. | Dir. | Date | Sample Size | Speed (mph) |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Average | 85th \%tile | 10-mph Pace | \% in Pace |
| CrescentBlvdto11 Maile | NB | 6-08-10 (>12 pm) | 1317 | 26.6 | 32.6 | 25-35 | 64.6\% |
|  |  | 6-09-10 | 2132 | 26.8 | 33.0 | 25-35 | 61.7\% |
|  |  | 6-10-10 (<12 pm) | 659 | 27.2 | 33.6 | 25-35 | 62.9\% |
|  |  | Average Day | 2054 | 26.8 | 33.0 | 25-35 | 62.8\% |
|  | SB | 6-08-10 (>12 pm) | 965 | 26.1 | 31.8 | 20-30 | 66.0\% |
|  |  | 6-09-10 | 1704 | 25.8 | 32.3 | 20-30 | 58.8\% |
|  |  | 6-10-10 (<12 pm) | 620 | 24.7 | 31.5 | 20-30 | 52.5\% |
|  |  | Average Day | 1645 | 25.7 | 32.0 | 20-30 | 59.7\% |
|  | Both | Average Day | 3699 | 2.6 .3 | 32.5 | . | 61.4\% |
| 11 Mile <br> to <br> Grand <br> River | NB | $6-08-10$ ( $>12 \mathrm{pm}$ ) | 969 | 26.3 | 29.9 | 20-30 | 81.9\% |
|  |  | 6-09-10 | 1587 | 26.2 | 30.0 | 20-30 | 80.4\% |
|  |  | 6-10-10 (<12 pm) | 580 | 26.3 | 29.9 | 20-30 | 82.0\% |
|  |  | Average Day | 1568 | 26.2 | 30.0 | 20-30 | 81.2\% |
|  | SB | $6-08-10$ (>12 pm) | 1129 | 23.8 | 28.4 | 20-30 | 83.7\% |
|  |  | 6-09-10 | 1870 | 23.8 | 28.7 | 20-30 | 81.4\% |
|  |  | 6-10-10 (<12 pm) | 531 | 24.8 | 29.4 | 20-30 | 78.5\% |
|  |  | Average Day | 1765 | 24.0 | 28.7 | 20-30 | 81.7\% |
|  | Both | Average Day | 3333 | 25.0 | 29.3 | $20 \cdot 30$ | 81.4\% |

Table 2b. Summary of Speed Statistics for Ot̂her Public Streets in Novi Town Center

| Loc. | Dir. | Date | $\begin{gathered} \text { Sample } \\ \text { Size } \end{gathered}$ | Speed (mph) |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Average | 85th \%tile | 10-mph Pace | \% in Pace |
| Crescent Blvd | EB | 6-08-10 (>12 pm) | 1432 | 28.3 | 33.2 | 25-35 | 74.0\% |
|  |  | 6-09-10 | 2282 | 29.0 | 33.9 | 25-35 | 76.1\% |
|  |  | 6-10-10 (<12 pm) | 709 | 29.6 | 34.2 | 25-35 | 78.4\% |
|  |  | Average Day | 2211 | 28.9 | 33.7 | 25-35 | 75.8\% |
|  | WB | 6-08-10 (>12 pm) | 2156 | 26.6 | 31.1 | 20-30 | 77.1\% |
|  |  | 6-09-10 | 2993 | 27.3 | 32.0 | 20-30 | 73.9\% |
|  |  | 6-10-10 (<12 pm) | 694 | 28.1 | 33.2 | 25-35 | 70.1\% |
|  |  | Average Day | 2922 | 27.1 | 31.8 | - | 74.6\% |
|  | Both | Average Day | 5133 | 27.9 | 32.6 | . | 75.1\% |
| Ingersol | NB | 6-08-10 (>12 pm) | 686 | 22.5 | 27.4 | 20-30 | 71.1\% |
|  |  | 6-09-10 | 948 | 22.8 | 28.0 | 20-30 | 73.2\% |
|  |  | 6-10-10 (<12 pm) | 205 | 23.1 | 27.9 | 20-30 | 76.5\% |
|  |  | Average Day | 920 | 22.7 | 27.8 | 20-30 | 72.8\% |
|  | SB | $6-08-10$ (>12 pm) | 880 | 21.3 | 26.3 | 20-30 | 68.7\% |
|  |  | 6-09-10 | 1261 | 21.9 | 27.4 | 20-30 | 72.4\% |
|  |  | 6-10-10 (<12 pm) | 294 | 23.0 | 28.2 | 20-30 | 73.8\% |
|  |  | Average Day | 1217 | 21.8 | 27.1 | 20-30 | 71.2\% |
|  | Both | Average Day | 2137 | 22.2 | 27.4 | 20-30 | 71.9\% |
| Crowe | EB | 6-08-10 (>12 pm) | 497 | 19.7 | 23.8 | 15-25 | 87.9\% |
|  |  | 6-09-10 | 828 | 20.3 | 24.2 | 15-25 | 87.5\% |
|  |  | 6-10-10 (<12 pm) | 323 | 21.1 | 24.6 | 15-25 | 84.5\% |
|  |  | Average Day | 824 | 20.3 | 24.2 | 15-25 | 87.0\% |
|  | WB | 6-08-10 (>12 pm) | 591 | 19.2 | 23.6 | 15-25 | 84.2\% |
|  |  | 6-09-10 | 735 | 19.3 | 23.7 | 15-25 | 84.6\% |
|  |  | 6-10-10 (<12 pm) | 161 | 19.6 | 24.1 | 15-25 | 78.8\% |
|  |  | Average Day | 744 | 19.3 | 23.7 | 15-25 | 83.8\% |
|  | Both | Average Day | 1568 | 19.8 | 23.9 | 15-25 | 85.5\% |

Table 3. Summary of Town Center Area Crashes, 200\&-20091

| Street | Number of Crashes |  | Number of All Crashes (\& Persons) by injury Severiity Level ${ }^{2}$ |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Intersection-Related | Non-Intersection-Related | F | A | B | C | No Injury |
| Crescent Blvd | 25 | 30 | 0 (0) | 1 (3) | 2 (3) | 6 (8) | 46 (129) |
| Town Center Dr | 17 | 5 | $0(0)$ | 0 (0) | 0 (0) | 7 (11) | 15 (47) |
| Ingersol Dr | 4 | 1 | $0(0)$ | $0(0)$ | $0(0)$ | 0 (0) | 5 (10) |
| Crowe Dr | 4 | 0 | $0(0)$ | 0 (0) | $0(0)$ | 2 (2) | 3 (7) |
| All of Above | 50 | 36 | $0(0)$ | 1 (3) | $2(3)$ | 15 (21) | 69 (193) |

${ }^{1}$ See more detailed summary in Table A-1, as well as "rav" tabular data from TIA, attached.
${ }^{2} \mathrm{~F}=$ fatal, $\mathrm{A}=$ incapacitating injury, $\mathrm{B}=$ non-incapacitating injury, and $\mathrm{C}=$ possible injury.

Speed I limit Stuciy of Cite' Streets in INovi Tom Center Area, page is
$\square \quad$ There were 17 crashes on Town Center Drive at it Nile (not counting intersection-related crashes occurring on 11 Mile). As discussed in our report of November 13, 2.009, the recommended installation of all-way STOP-sign control (since implemented) can be expected to significantly reduce the crash frequency at this location.
a A total of nine crashes occurred on the short sections of Ingersol and Crowe reviewed. Only one of these crashes did not involve an intersection.

## Conclusions and Recommendations

Based primarily on speed statistics, the speed limit on Ingersol and Crow Drives should be 25 mph , and the speed limit on Town Center Drive should be 30 mph . While the $85^{\text {th }}$-percentile speed on Crescent Boulevard would permit a speed limit of either 30 or 35 mph , the lower of these two choices is recommended given the street's design features, driveway traffic, and documented crash experience.

Sincerely,
BIRCHLER ARROYO ASSOCIATES, INC.


Rodney L. Arroyo, AICP Vice President

Williain A- Stimson
William A. Stimpson, P.E. Director of Traffic Engineering

Allachments

Table A-1. 2004-2009 Crash History for Non-Arterial Public Streets in Novi Town Center Area

| Year | Date | Time | Cross Road | Distance from Cross Road | Crash (Type or \#) |  |  |  |  |  | Crash Severity (\# Persons) |  |  |  |  | Possible Contributing Factors |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Angle | $\begin{aligned} & \text { Head } \\ & \text {-On } \end{aligned}$ | Sideswipe |  | RearEnd | SingleVehicle | Fatal | Personal Injury |  |  | $\begin{aligned} & \text { No } \\ & \text { injury } \end{aligned}$ |  |
|  |  |  |  |  |  |  | Opposite Direction | Same Direction |  |  |  | A | B | C |  |  |
| Crescent Boulevard |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2009 | 10-24 | $7 p$ | Ingersol | $5^{\prime} \mathrm{W}$. |  |  |  | EB |  |  |  |  |  |  | 2 | improper right turn; rain |
|  | 10-17 | $8 p$ | Town Cir | 300 W. |  |  | EB-WB |  |  |  |  |  |  |  | 3 | Failed io yield / atiempied left um? |
|  | 07-14 | $2 p$ | Novi Rd | $450{ }^{\prime} \mathrm{E}$. |  |  |  | EB |  |  |  |  |  |  | 3 | Failed to yield/ changing lanes |
|  | 04-14 | 2 p | Novi Rd | $10^{\prime} \mathrm{E}$. |  |  |  |  | WB |  |  |  |  |  | 2 | Unable to stop / leader slowed; rain |
|  | 02-26 | 8 a | Novi Rd | 528 E. |  |  |  |  |  | Lt. pole |  |  |  |  | 2 | Icy; EB "speed too slow" (?) |
|  | 02-25 | 12 p | Novi Rd | $20^{\prime} \mathrm{E}$. |  |  |  |  | WB |  |  |  |  |  | 2 | Unable to stop / leader slowed; wet |
| 2008 | 12-13 | $11 p$ | Novi Rd | $100^{\prime} \mathrm{E}$. |  |  |  |  | WB |  |  |  |  |  | 3 | Sleet/hail; unable to stop |
|  | 12-02 | $6 p$ | Novi Rd | 1320' E. |  |  |  |  | EB |  |  |  |  |  | 2 | Following lefit ium unable to siop |
|  | 09-05 | $5 p$ | ingersol | $400{ }^{\prime} \mathrm{E}$. | SBL-E8 |  |  |  |  |  |  |  |  |  | 3 | Improper use of crossover? |
|  | 08-05 | 10 p | Town Cir | 100 W . |  |  |  | EB |  |  |  |  |  |  | 2 | Failed to yield / changing lanes |
|  | 07-22 | 3 p | Town Cir | 275 ' E. |  |  |  |  |  | Fence |  |  |  |  | 1 | Hit fence al east end of road? |
|  | 03-24 | 1 p | Novi Rd | 10'E. |  |  |  |  | WB |  |  |  |  |  | 2 | Unable to stop / lead vehicle slowed |
|  | 02-22 | 11 a | Town Ctr | 100' E. |  |  |  | WB |  |  |  |  |  |  | 2 | Failed to yield / changing ianes |
|  | 02-11 | 4 p | Novi Rd | $25^{\prime} \mathrm{E}$. | WB-WB |  |  |  |  |  |  |  |  |  | 2 | Right turn into another vehicle |
|  | 01-26 | 7 p | Novi Rd | $50^{\prime} \mathrm{E}$. |  |  |  |  | WB |  |  |  |  |  | 4 | Unable to stop / lead vehicle slowed |
|  | 01-19 | 11a | Novi Rd | $30^{\prime} \mathrm{E}$. | WB-WB |  |  |  |  |  |  |  |  |  | 4 | Improper lane change |
|  | 01-11 | 8 p | Novi Rd | $25^{\prime} \mathrm{E}$. |  |  |  |  | WB |  |  |  |  |  | 2 | 3 vehicles? Wet; otherwise unknown |
| Subtotals, 2008-2009 |  |  |  |  | 3 | 0 | 1 | 4 | 7 | 2 | 0 | 0 | 0 | 0 | 40 | Unshaded = intersection-related |

Table A-1. 2004-2009 Crash History for Non-Arierial Public Streets in Hovi Town Center Area (cont'd)

| Year | Date | Time | Cross Road | $\begin{gathered} \text { Distance } \\ \text { from } \\ \text { Cross } \\ \text { Road } \end{gathered}$ | Crash (Type or \#) |  |  |  |  |  | Crash Severity (\# Persons) |  |  |  |  | Possible Contributing Factors |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Angle | Head -On | Sideswipe |  | RearEnd | SingleVehicle | Fatal | Personal Injury |  |  | $\begin{gathered} \text { No } \\ \text { Injury } \end{gathered}$ |  |
|  |  |  |  |  |  |  | Opposite Direction | Same Direction |  |  |  | A | B | c |  |  |


| Crescent́t Boulevard (conṫd) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2007 | 09-17 | $6 p$ | Ingersol | $15^{\prime} \mathrm{E}$. |  |  |  | EB |  |  |  |  |  |  | 5 | Faileci io yield / changing lanes |
|  | 05-26 | $6 p$ | Town Ctr | 300' W. | SBL-EB |  |  |  |  |  |  |  | 2 |  | 2 | Faileci to yield; rain |
|  | 05-15 | 7 p | Town Ctr | 15 ' W. |  |  |  |  | EB |  |  |  |  |  | 2 | Unable to stop (STOP sign); rain |
|  | 02-14 | 8 p | Novi Rd | 200' E. |  |  |  |  | WB |  |  |  |  | 1 | 2 | Icy; unable to stop (for signal?) |
|  | 01-12 | 1 p | Novi Rd | $10^{\prime} \mathrm{E}$. |  |  |  |  | WB |  |  |  |  |  | 2 | Unable to stop / lead vehicle slowed |
| 2006 | 12-23 | 11a | Town Cir | 900' W. |  | N-S |  |  |  |  |  |  |  |  | 2 | NB left turn hit SB crossover-through |
|  | 10-07 | 2 p | Novi Rd | $20^{\prime} \mathrm{E}$. |  |  |  |  | WB |  |  |  |  |  | 2 | Unable to stop / lead vehicle slowed |
|  | 08-13 | 12 p | Town Cir | 800' W. |  | N-S |  |  |  |  |  |  |  |  | 3 | LT failed io yield to WB through |
|  | 07-28 | 12p | Novi Rd | 1056' E. | SB-EB |  |  |  |  |  |  |  |  | 2 |  | Driveway vehicle failed to yield |
|  | 06-01 | $6 p$ | Novi Rd | $50^{\prime} \mathrm{E}$. |  |  |  |  | WB |  |  |  |  |  | 2 | Unable to stop / lead vehicle slowed |
| 2005 | 08-14 | 11 a | Novi Rd | $100{ }^{\prime} \mathrm{E}$. |  |  |  | EB |  |  |  |  |  |  | 2 | Atiemotec right turn from leil lane |
|  | 05-27 | 2 p | Novi Rd | $20^{\prime} \mathrm{E}$. | WB-WB |  |  |  |  |  |  |  |  |  | 4 | Right turn into another vehicle |
|  | 03-02 | 8 a | Town Ctr | $200{ }^{\prime} \mathrm{W}$. | NBL-EB |  |  |  |  |  |  |  |  | 1 | 1 | Driveway vehicle failed to yield |
|  | 01-29 | 1p | Town Ctr | 2001 W . | SBL-EB |  |  |  |  |  |  |  |  |  | 4 | Driveway vehicle failed to yield |
|  | 01-18 | 7 p | Novi Rd | $40^{\prime} \mathrm{E}$. |  |  |  |  | WB |  |  |  |  |  | 2 | Lead vehicle going "too slow" |
| Subtotals, 2005-2007 |  |  |  |  | 5 | 2 | 0 | 2 | 6 | 0 | 0 | 0 | 2 | 4 | 35 | Unshaded $=$ Intersection-reiated |

Table A-i. 2004-2009 Crash History for Non-Arterial Public Streets in Novi Town Center Area (con̂́d)

| Year | Date | Time | Cross Road | Distance from Cross Road | Crash (Type or \#) |  |  |  |  |  | Crash Severity (\# Persons) |  |  |  |  | Possible Contributing Factors |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Angle | Head -On | Sideswipe |  | RearEnd | SingleVehicle | Fatal | Personal Injury |  |  | $\begin{aligned} & \text { No } \\ & \text { injury } \end{aligned}$ |  |
|  |  |  |  |  |  |  | Opposite Direction | Same Direction |  |  |  | A | B | C |  |  |

Crescent Boulevard (cont'd)

| 2004 | 12-28 | $5 p$ | Town Ctr | $300{ }^{\prime} \mathrm{W}$. |  | NBL-SB |  |  |  |  |  |  | 2 | Improper lane use in turning left |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 12-18 | $2 p$ | Town Ctr | 100' W. |  |  |  | EB |  |  |  |  | 2 | Snow; unable lo stop (STOP sign) |
|  | 12-17 | 2 p | Town Cl | 5001 W . | SBL-EB |  |  |  |  | 3 |  |  | 2 | Failed to yield to "speeding" vehicle |
|  | 12-01 | 9 p | Novi Rd | $20^{\prime} \mathrm{E}$. |  |  |  | WB |  |  |  |  | $1 ?$ | Apparently hit-and-run |
|  | 11-27 | 40 | Novi Rd | 300'E. | SB-EB |  |  |  |  |  | 1 |  | 2 | Failed to yield; rain |
|  | 11-19 | 8 p | Novi Rd | $15^{\prime} \mathrm{E}$. |  |  |  | WB |  |  |  |  | 4 | Unable to stop; rain |
|  | 10-18 | $2 p$ | Novi Rd | $0 '$ |  |  |  | WB |  |  |  |  | 2 | Unable to stop as lead vehicle did |
|  | 10-05 | 9 p | Novi Rd | $20^{\prime} \mathrm{E}$. |  |  |  | WB |  |  |  |  | 2 | Unable to stop / lead vehicle siowed |
|  | 10-02 | $8 p$ | Town Ctr | $200^{\prime} \mathrm{W}$. | SBL-NB |  |  |  |  |  |  |  | 3 | Improper atiempt to turn left |
|  | 10-01 | 6a | Novi Rd | $0^{\prime}$ | WB-WB |  |  |  |  |  |  |  | 2 | Miotorcycle unable to stop |
|  | 09-25 | 11 a | Town Ctr | $15^{\prime} \mathrm{N}$. | WB-NB |  |  |  |  |  |  |  | 2 | WB vehicle disregarded STOP sign |
|  | 09-03 | Unk. | Town Ctr | $20^{\prime} \mathrm{E}$. |  |  |  |  | EB |  |  | 1 | 2 | Ran oif road for unknown reason |
|  | 08-27 | 12 p | Town Ctr | $200^{\prime} \mathrm{W}$. | SB-WB |  |  |  |  |  |  |  | 4 | Driveway vehicle faiied to yield |
|  | 08-12 | 4 p | Town Ctr | 1320' W. | WB-W/B |  |  |  |  |  |  |  | 3 | Improper right iurn |
|  | 08-04 | 3 p | Ingersol | $0^{\prime}$ |  |  |  | EB |  |  |  |  | 2 | Changing lanes, clipped RT vah.: rain |
|  | 07-28 | $6 p$ | Town Ctr | $300 \cdot \mathrm{~W}$. |  |  |  | WB |  |  |  |  | $1 ?$ | Passing, clipped vehicle in left lane |
|  | 06-26 | 11 a | Ingersol | $100{ }^{\prime} \mathrm{E}$. |  |  | WB |  |  |  |  |  | 2 | Improper stari-up / failed to yield |
|  | 05-08 | 3 p | Novi Rd | $100{ }^{\prime} \mathrm{E}$. |  |  |  | WB |  |  |  | 1 | 4 | Unable to stop / lead vehicle slowed |
|  | 04-15 | 8 a | Novi Rd | $0^{\prime}$ | WB-NB |  |  |  |  |  |  |  | 2 | WB vehicle violated red signal |

Table A-1. 2004-2009 Crash History for Non-Arterial Public Streets in Novi Town Center Area (cont'd)

| Year | Date | Time | Cross Road | $\begin{gathered} \text { Distance } \\ \text { from } \\ \text { Cross } \\ \text { Road } \end{gathered}$ | Crash (Type or \#) |  |  |  |  |  | Crash Severity (\# Persons) |  |  |  |  | Possible Contributing Factors |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Angle | Head -On | Sideswipe |  | RearEnd | SingleVehicle | Fatal | Personal Injury |  |  | $\begin{gathered} \text { No } \\ \text { Injury } \end{gathered}$ |  |
|  |  |  |  |  |  |  | Opposite <br> Direction | Same Direction |  |  |  | A | B | C |  |  |
| Crescent Boulevard (conťd) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2004 | 03-27 | $5 p$ | Novi Rd | $1320^{\circ} \mathrm{E}$. | WB-WB |  |  |  |  |  |  |  |  |  | 2 | Right tum apparently swung vide |
|  | 03-20 | $6 p$ | Town Cir | 200' W. | EBL-EB |  |  |  |  |  |  |  |  |  | 2 | Improper attempt to tum leff |
|  | 01-21 | $6 p$ | Novi Rd | $0^{\prime}$ |  |  |  |  | WB |  |  |  |  |  | 4 | Snow; unable to stop |
|  | 01-04 | 11a | Novi Rd | $30^{\circ} \mathrm{E}$. |  |  |  |  | WB |  |  |  |  | 2 | 1 | Unable to stop as lead vehicle did |
|  | Subtotals, 2004 |  |  |  | 10 | 0 | 1 | 1 | 10 | 1 | 0 | 3 | 1 | 4 | 53 | Unshaded = intersection-related |
| Totals, 2004-2009 |  |  |  |  | 18 | 2 | 2 | 7 | 23 | 3 | 0 | 3 | 3 | 8 | 129 |  |
| Town Center Drive |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2009 | 04-20 | $4 p$ | 11 Mile | $60^{\circ} \mathrm{N}$. | EB-SB |  |  |  |  |  |  |  |  |  | 2 | Driveway vehicle failed io yield; rein |
| 2008 | 12-19 | 9 a | Gr. River | $75^{\prime} \mathrm{N}$. |  |  |  |  | NB |  |  |  |  |  | 2 | Snow; improper backing |
|  | 09-30 | $8 p$ | 11 Mile | $800^{\prime} \mathrm{N}$. |  |  | SB-NB |  |  |  |  |  |  |  | 2 | SB vehicle drove left of center |
|  | 04-13 | 10 a | 11 Mile | $10^{\prime} \mathrm{W}$. | EB-NB |  |  |  |  |  |  |  |  | 3 |  | Snow; EB vehicle failed to yield |
| 2007 | 12-20 | 4 p | 11 Mile | $15^{\prime} \mathrm{E}$. | EB-SB |  |  |  |  |  |  |  |  |  | 2 | EB vehicle failed to yield |
|  | 06-30 | 7 p | 11 Mile | $40^{\prime} \mathrm{S}$. |  |  |  |  |  | Sign |  |  |  |  | 1 | WB left-turn hit SB Keep Right sign |
| 2006 | 11-13 | 8 a | Crescent | $20^{\prime} \mathrm{S}$. |  |  | EBR-NB |  |  |  |  |  |  |  | 6 | RT swung wide and hit NB LT |
|  | 04-24 | 1 p | 11 Mile | $5{ }^{\prime} \mathrm{N}$. | EB-NB |  |  |  |  |  |  |  |  |  | 2 | $E B$ vehicle failed to yield |
|  | 01-06 | 10 a | Crescent | 450' S. |  |  |  | SB |  |  |  |  |  |  | 2 | Improper lane change |
| 2005 | 12-16 | 1 p | 11 Mile | $0^{\prime}$ |  |  |  |  | WB |  |  |  |  |  | 3 | Snow; vehicle \#2 unable to stop |
|  | 10-18 | 4 p | 11 Mile | $10^{\prime} \mathrm{S}$. | EB-NB |  |  |  |  |  |  |  |  | 1 | 1 | EB vehicle failed to yield |
|  | 08-15 | 9 p | 11 Mile | $0^{\prime}$ | EB-NB |  |  |  |  |  |  |  |  |  | 3 | EB vehicle disregarded STOP sign |

Table A-1. 2008-2009 Crash History for Non-Arterial Public Streets in Novi Town Center Area (cont'ol)

| Year | Date | Time | Cross Road | Distance from Cross Road | Crash (Type or \#) |  |  |  |  |  | Crash Severity (\# Persons) |  |  |  |  | Possible Contributing Factors |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Angle | Head -On | Sideswipe |  | RearEnd | SingleVehicle | Fatal | Personal Injury |  |  | $\begin{aligned} & \text { No } \\ & \text { Injury } \end{aligned}$ |  |
|  |  |  |  |  |  |  | Opposite Direction | Same Direction |  |  |  | A | B | C |  |  |
| Town Center Drive (conted) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2005 | 05-20 | 11 a | 11 Mile | $10^{\prime} \mathrm{S}$. | EB-SB |  |  |  |  |  |  |  |  | 2 | 1 | EB vehicle failed to yield |
|  | 01-05 | 4 p | Gr. River | $15^{\prime} \mathrm{N}$. |  |  |  |  | SB |  |  |  |  |  | 2 | Snow; "speeding" |
| 2004 | 12-11 | 5 p | 11 Mile | 15'W. |  | E-W |  |  |  |  |  |  |  | 1 | 3 | WB failed to yield; SB also involved |
|  | 12-02 | 12 p | Gr. River | 0' |  |  |  |  | SB |  |  |  |  |  | 2 | Improper backing |
|  | 10-22 | 3 p | 11 Mile | $5^{\prime} \mathrm{E}$. | EB-NB |  |  |  |  |  |  |  |  |  | 2 | EB vehicle failed to yield |
|  | 09-30 | $6 p$ | 11 Mile | $10^{\prime} \mathrm{N}$. | WB-SB |  |  |  |  |  |  |  |  | 1 | 1 | WB vehicle failed to yield |
|  | 09-15 | 6 a | Gr. River | $25^{\prime} \mathrm{N}$. |  |  |  |  |  | Miedian |  |  |  |  | 1 | Swerved around object in roac |
|  | 08-22 | 11 a | 11 Mile | $0^{\prime}$ | EB-NB |  |  |  |  |  |  |  |  | 2 | 2 | EB vehicle failed to yield |
|  | 07-28 | 3 p | 11 Mile | $10^{\prime} \mathrm{N}$. | EB-NB |  |  |  |  |  |  |  |  |  | 3 | $E B$ vehicle failed to yield |
|  | 07-19 | $1 p$ | 11 Mile | $10^{\prime} \mathrm{E}$. | EB-NB |  |  |  |  |  |  |  |  | 1 | 4 | EB vehicle failed to yield |
| Totals, 2004-2009 |  |  |  |  | 12 | 1 | 2 | 1 | 4 | 2 | 0 | 0 | 0 | 11 | 47 | Unshaded $=$ Intersection-related |
| Ingersol Drive (Crescent-Crowe) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| '08-9 | No reported crashes these two years |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2007 | 10-20 | 1 p | Crowe | 1'S. | EB-SB |  |  |  |  |  |  |  |  |  | 3 | EB vehicle failed to yield |
| 2006 | 05-27 | 10 | Crescent | 100 S. |  |  |  |  |  | Animal |  |  |  |  | 1 | To avoid ped, hit dog being walked? |
| 2005 | 12-15 | 12 p | Crowe | $5^{\prime} \mathrm{N}$. | NBL-SB |  |  |  |  |  |  |  |  |  | 2 | Snow; SB cited as "unable to stop" |
| 2004 | 06-29 | 2 p | Crowe | $0^{\prime}$ | EB-SB |  |  |  |  |  |  |  |  |  | 2 | "Improper left turn" |
|  | 01-09 | 1 p | Crescent | $100{ }^{\prime} \mathrm{S}$. | WB-NB |  |  |  |  |  |  |  |  |  | 2 | Driveway vehicle failed to yield |
| Totals, 2004-2009 |  |  |  |  | 4 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 10 | Unshaded = Intersection-related |

Table A-1. 2004-2009 Crash History for Non-Arterial Public Stireets in Novi Town Center Area (cont'ó)

| Year | Date | Time | Cross Road | Distance from Cross Road | Crash (Type or \#) |  |  |  |  |  | Crash Severity (\# Persons) |  |  |  |  | Possible Contributing Factors |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Angle | $\begin{gathered} \text { Head } \\ \text {-On } \end{gathered}$ | Sideswipe |  | RearEnd | SingleVehicle | Fatal | Personal Injury |  |  | $\begin{aligned} & \text { No } \\ & \text { injury } \end{aligned}$ |  |
|  |  |  |  |  |  |  | Opposite Direction | Same Direction |  |  |  | A | B | C |  |  |
| Crowe Drive |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2009 | 08-01 | 11 a | Novi Rd | 2'E. |  |  |  |  | EB |  |  |  |  |  | 2 | V\#1 failed to stop when V\#2 did |
| 2008 | 08-20 | 9 p | Novi Rd | 10' W? |  |  |  |  |  | Bicycle |  |  |  | 1 | ? | Unclear how vehicle and bike hit |
|  | 02-13 | 2 p | Novi Rd | $10^{\prime} \mathrm{E}$ |  |  |  |  | WB |  |  |  |  |  | 2 | Wet; unable to stop |
| 2007 | No reported crashes for this year |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2006 | 05-08 | 5 p | Novi Rd | 5' E . |  |  |  |  | WB |  |  |  |  |  | 3 | V\#2 disregarded sign / stopped V\#\#1 |
| '04-5 | No reported crashes these two years |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Totals, 2004-2009 |  |  |  |  | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 1 | 7 | Unshaded $=$ Intersection-related |



| \#3 Location: W CRESCENT (0.25) 1320 feet E of NOVI |  | Crash ID: 5598040 |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Crash Date: 03/27/2004 | Day: Sat | Hour: 5 pm | Weather: clear | Roadway: dry | Light: day |
| Injuries K: 0 | Inj A: 0 | $\operatorname{lnj} \mathrm{~B}: 0$ | Inj C: 0 | Inj $0: 2$ | How: angle |
| CVT: Novi | Area: |  | HBD: N | Drugs: N | Complaint No: 0418000 |


| Unit No | Veh Dir | Action Prior | Event 1 | Event 2 | Event 3 | Event 4 | Haz Action | Veh Type | Damage |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | W | right turn | veh in transpt | none | none | none | imprp lane use | pickup | lfffront |
| 2 | W | left turn | veh in transpt | none | none | none | none | car | rtside |

UD-10: 041101492

| \#4 Location: CRESCENT DR (0.31) 200 feet W of TOWN CENTER |  |  |  |  |  |  |  |  |  | Crash ID: 5599409 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 03/20/2004 |  |  | Day: Sat |  | Hour: 6pm | Weather: clear |  | Roadway: dry |  | Light: dark/ldd |  |  |
| Injuries K |  |  | Inj A | 0 | $\operatorname{lnj} \mathrm{B}: 0$ | Inj C: |  | Inj 0: 2 |  | How | angle |  |
| CVT: Novi |  |  | Area | fwy | median | HBD: |  | Drugs: |  | Com | laint No: 0 | 46781 |
| Unit No | Veh Dir | Actio | rior |  | nt 1 | Event 2 | Event 3 | Event 4 | Haz |  | Veh Type | Damage |
|  | E | left tu |  |  | in transpt | none | none | none | imprp | ssing | car | Iftside |
| 2 | E | start | rdwy | veh | in transpt | none | none | none | none |  | car | ttront |

UD-10: 041102846


\#15 Location: W CRESCENT (0.00) 20 feet E of N NOVI
Crash Date: 10/05/2004
Injuries K: 0





| \#34 Location: CRESCENT BLVD (0.00) 10 feet E of NOVI RD |  |  |  |  |  |  |  |  | Crash ID: 6569790 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 01/12/2007 Injuries K: 0 <br> CVT: Novi |  | Day: Fri Hour: 1 pm $\operatorname{Inj} \mathrm{A}: 0 \quad \operatorname{Inj} \mathrm{~B}: 0$ <br> Area: inter other |  |  | Weather: cloudy $\ln \mathrm{C}: 0$ <br> HBD: N |  | Roadway: dry Inj 0: 2 Drugs: N |  | Light: day <br> How: rr-end <br> Complaint No: 072797 |  |
| Unit No Veh Dir <br> 1 W <br> 2 W | Act <br> go s <br> slop | Prior <br> ght road |  | nt 1 <br> in transpt <br> in Iranspt | Event 2 <br> none <br> none | Event 3 <br> none <br> none | Event 4 <br> none <br> none | Haz Action unable to stop none | Veh Type pickup car | Damage ctrfront ctrrear |
| UD-10: 075409244 |  |  |  |  |  |  |  |  |  |  |

\#35 Location: CRESCENT DR (0.04) 200 feet E of NOVI RD
Crash Date: 02/14/2007
Injuries K: 0


| \#42 Location: CRESCENT RD (0.00) 25 feet E of NOVI RD |  |  |  |  |  |  |  |  | Crash ID: 6929764 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 02/11/2008 |  |  | Day: Mon | Hour: 4pm | Weather: clear |  | Roadway: dry |  | Light: day |  |  |
| Injuries K |  |  | $\operatorname{Inj}$ A: 0 | Inj B: 0 | $\operatorname{Inj} \mathrm{C}: 0$ |  | Inj 0: 2 |  | How | ngle |  |
| CVT: Novi |  |  | Area: inter | Other | HBD: N |  | Drugs: |  | Com | aint No: 800 | 06925 |
| Unit No | Veh Dir | Actio | ior Ev | Event 1 | Event 2 | Event 3 | Event 4 | Haz A | ion | Veh Type | Damage |
|  | W | right t |  | in transpt | none | none | none | imprp | ne use | car | tifron |
|  | W | slow/s | pon rd ve | eh in transpt | none | none | none | none |  | car | Iftfront |

UD-10: 080089187






| Crash Type |  |
| :---: | :---: |
| c）ums | $1 \%$ ！ |
| 0 | uncoded |
| 3 | single |
| 1 | head－on |
| 1 | head－on／lt |
| 18 | angle |
| 17 | rr－end |
| 0 | rr－end／lt |
| 6 | rr－end／it |
| 6 | ss－same |
| 2 | ss－opp |
| 1 | unknown |
|  |  |


| Light Conditions |  |
| :---: | :---: |
| conlit Myes |  |
| 0 | uncoded |
| 38 | day |
| 0 | dawn |
| 1 | dusk |
| 14 | dark／ld |
| 1 | dark／unltd |
| 1 | unknown |
| （192） | \％$\%$ |


| Weather |  |
| :---: | :---: |
| －5．Mns | （1\％） |
| 0 | uncoded |
| 27 | clear |
| 18 | cloudy |
| 0 | fog／smoke |
| 7 | rain |
| 1 | snow |
| 0 | wind |
| 1 | sleet／hail |
| 1 | unknown |
| 10．al | 66） |


| Road Condition |  |
| :---: | :---: |
| H0リn | Wre |
| 0 | uncoded |
| 40 | dry |
| 10 | wel |
| 2 | icy |
| 2 | snowy |
| 0 | muddy |
| 0 | slushy |
| 0 | debris |
| 1 | unknown |
| 10， | B6） |


| Vehicle Type |  |
| :---: | :---: |
|  | 19\％${ }^{\text {a }}$ |
| 1 | uncoded |
| 83 | car |
| 0 | other |
| 2 | truck／bus |
| 5 | van |
| 10 | pickup |
| 6 | sm truck |
| 1 | motorcycle |
| 0 | moped |
| 0 | go－cart |
| 0 | snowmobile |
| 0 | off－rd veh |
|  |  |


| Crashes By Month |  |
| :---: | :---: |
| 由०川 | （1988 |
| 8 | January |
| 5 | February |
| 4 | March |
| 2 | April |
| 4 | May |
| 2 | June |
| 4 | July |
| 6 | August |
| 4 | Seplember |
| 7 | October |
| 2 | November |
| 7 | December |
| （6）has | 6\％ |


| Hazardous Action |  | Unit Type |  |
| :---: | :---: | :---: | :---: |
| 601 | Lye | coll | 1998 |
| 49 | none | 0 | uncoded |
| 1 | speeding | 108 | vehicle |
| 0 | imprp／no signal | 0 | pedestrian |
| 0 | imprp backing | 0 | bicyclist |
| 19 | unable to stop | 0 | engineer |
| 0 | other | 1001 |  |
| 8 | unknown |  |  |
| 0 | reckls driving |  |  |
| 1 | negl driving |  |  |
| 2 | spd too slow |  |  |
| 17 | failed to yeild |  |  |
| 2 | disrgd traffic cntrl |  |  |
| 0 | wrong way |  |  |
| 1 | left of center |  |  |
| 1 | imprp passing |  |  |
| 4 | imprp lane use |  |  |
| 3 | impro turn |  |  |
| Trase 108 |  |  |  |

## Crash Severity

|  | FATAL | A | B | C | No In $]$ | Total |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Persons | 0 | 3 | 3 | 8 | 208 | 222 |
| Crashes | 0 | 1 | 2 | 6 | 46 | 55 |

Alcohol in Crashes

|  | FATAL | P1 | PD | Total |
| :--- | :--- | :--- | :--- | :--- |
| Drinking | 0 | 0 | 0 | 0 |
| Not Drinking | 0 | 9 | 46 | 55 |
| Total | 0 | 9 | 46 | 55 |

## Crashes per Hour by Day




| \#2 Location: TOWN CENTER DR (0.12) 10 feet E of ELEVEN MILE RD |  |  |  |  |  |  |  | Crash ID: 5727634 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 07/19/2004 |  | Day: Mon | Hour: 1pm | Weather: clear |  | Roadway: dry |  | Light: day |  |  |
| Injuries K: 0 |  | $\operatorname{Inj}$ A: 0 | $\operatorname{Inj} \mathrm{B}$ : 0 | Inj C: 1 |  | Inj 0: 4 |  | How: angle |  |  |
| CVT: Novi |  | Area: w/l intersection |  | HBD: N |  | Drugs: N |  | Complaint No: 0438564 |  |  |
| Unit No | Veh Dir A | rior Eve |  | Event 2 | Event 3 | Event 4 | Haz |  | Veh Type | Damage |
| 1 | E go |  | transpt | none | e |  | failed |  | car | ttront |
|  | N go st | aight veh | in transpt | none | none | none | none |  | car | ctriront |

UD-10: 041235781

| \#3 Location: N8 TOWN CENTER DR N (0.12) 0 feet X of 11 MILE RD |  |  |  |  |  |  | Crash ID: 5796368 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 08/22/2004 |  |  | Day: Sun | Hour: 11am | Weather: clear |  | Roadway: dry |  | Light: day |  |  |
| Injuries K |  |  | Inj A: 0 | $\operatorname{Inj} \mathrm{B}$ : 0 | Inj C: |  | Inj 0: |  | How | angle |  |
| CVT: Novi |  |  | Area: w/i in | ntersection | HBD: |  | Drugs |  | Com | plaint No: 0 | 444361 |
| Unit No | Veh Dir | Acti | Prior | $t 1$ | Event 2 | Event 3 | Event 4 | Haz | on | Veh Type | Damage |
|  | E |  | rdwy | in transpt |  | none | none | failed |  |  |  |
| 2 | N | go st |  | in transpt | none | none | none | none |  | car | ctrfront |

UD-10; 041308384

| \#4 Location: S TOWN CENTER (0.13) 10 feet N of 11MILE |  |  |  |  |  |  |  |  | Crash ID: 5832938 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 09/30/2004 |  |  | Day: Thu | Hour: 6pm | Weather: clear |  | Roadway: dry |  | Light: dusk |  |  |
| Injuries K: 0 |  |  | $\operatorname{Inj} \mathrm{A}: 0$ | $\operatorname{Inj} \mathrm{B}$ : 0 | InJ C: 1 |  | Inj 0: 1 |  | How: angle |  |  |
| CVT: Novi |  |  | Area: w/i intersection |  | HBD: N |  | Drugs: N |  | Complaint No: 0451805 |  |  |
| Unit No | Veh Dir | Act | Prior Ev | 1 | Event 2 | Event 3 | Event 4 | Haz |  | Veh Type | Damage |
|  | W |  |  | transpt |  |  |  | failed |  |  | clifront |
| 2 | S | go str |  | in transpt | none | none | none | none |  | car | Ifiside |

## UD-10: 041345433



| \#10 Location: S TOWN CENTER DR (0.12) 10 feet SW of 11 MILE RD |  |  |  |  |  |  |  | Crash ID: 6058375 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 05/20/2005 Injuries K: 0 |  |  | Day: Fri Hour: 11am $\operatorname{Inj} A: 0 \quad \operatorname{lnj} B: 0$ |  |  | VVeather: clear Inj C: 2 |  | Roadway: dry Inj 0: 1 |  | Light: day |  |  |
|  |  |  | How | angle |  |  |  |  |  |
| CVT: Novi |  |  |  |  |  | Area: w/i intersection |  |  | HBD: N |  | Drugs: N |  | Complaint No: 0525637 |  |  |
| Unit No | Veh Dir | Acti | Prior |  | ent 1 | Event 2 | Event 3 | Event 4 | Haz A | on | Veh Type | Damage |
| 1 | E |  |  |  | in transpt | none | none | none | failed | eild | car | Iffiront |
| 2 | S | go s |  |  | in transpt | none | none | none | none |  | car | riside |


| \#11 Location: TOWN CENTER DR (0.12) 0 feet $X$ of 11 MILE RD |  |  |  |  | Crash ID: 6097191 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 08/15/2005 | Day: Mon | Hour: 9pm | Weather: clear | Roadway: dry | Light: dark/td |
| Injuries K: 0 | Inj A: 0 | $\operatorname{Inj} \mathrm{B}$ : 0 | Inj C: 0 | Inj 0: 3 | How: angle |
| CVT: Novi | Area: |  | HBD: N | Drugs: N | Complaint No: 0543365 |


| Unit No | Veh Dir Action Prior | Event 1 | Event 2 | Event 3 | Event 4 | Haz Action | Veh Type Damage |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | E | go straight | veh in transpt | none | none | none | disrgd traffic cntrl | sm truck | ctrfront |
| 2 | N | go straight | veh in transpt | none | none | none | none | sm truck | lftfront |

UD-10: 055624436



| \#14 Location: TOWN CENTER (0.34) 450 feet S of CRESCENT |  |  |  |  |  |  |  |  | Crash ID: 6239042 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 01/06/2006 Injuries K: 0 |  | Day: Fri Hour: 10am <br> $\operatorname{lnj} A: 0 \quad \operatorname{lnj} \mathrm{~B}: 0$ <br> Area: straight |  |  | Weather: cloudy Inj C: 0 |  | Roadway: dry Inj 0: 2 |  | Light: day How: ss-same |  |
| Unit No Veh Dir <br> 1 S <br> 2 S |  | Prior lanes ght |  | vent 1 <br> h in transpt <br> $h$ in transpt | Event 2 <br> none <br> none | Event 3 <br> none <br> none | Event 4 <br> none <br> none | Haz Action failed to yeild none | Veh Type van car | Damage itfront Iftside |
| UD-10: 061004789 |  |  |  |  |  |  |  |  |  |  |


| \#15 Location: TOWNCENTER DR (0.12) 5 feet N of 11 MILE RD |  |  |  |  |  |  |  |  |  | Crash ID: 6325351 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 04/24/2006 |  |  | Day: Mon |  | Howr: 1pm | Weather: cloudy |  | Roadway: dry |  | Light: day |  |  |
| Injuries K |  |  | Inj A: 0 |  | Inj B: 0 | Inj C: 0 |  | Inj 0: 2 |  | How: angle |  |  |
| CVT: Novi |  |  | Area: w/i intersection |  |  | HBD: N |  | Drugs: N |  | Complaint No: 0626688 |  |  |
| Unit No | Veh Dir |  | Prior |  | $t 1$ | Event 2 | Event 3 | Event 4 | Haz A |  | Veh Type | Damage |
| 1 | E |  | ght |  | in transpt | none | none | none | failed | yeild | van | ctrifont |
| 2 | N | go st |  |  | in transpt | none | none | none | none |  | car | Iftside |

UD-10: 061086945


| Unit No Veh Dir Action Prior Event 1 | Event 2 | Event 3 | Event 4 Haz Action Veh Type Damage |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | W | left lurn | curb hwy traffic sign post | none none imprpturn car | Iftront |


| \#18 Location: TOWN CENTER (0.12) | 15 feet E of ELEVEN MILE |  | Crash ID: 6871023 |  |
| :--- | :--- | :--- | :--- | :--- |
| Crash Date: 12/20/2007 | Day: Thu | Hour: 4 pm | Weather: clear | Roadway: dry |
| Injuries K: 0 | Inj A: 0 | Inj B: 0 | Lnj C: 0 | Inj $0: 2$ |


| Unit No | Veh Dir | Action Prior | Event 1 | Event 2 | Event 3 | Event 4 | Haz Action | Veh Type | Damage |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | $E$ | start on rdwy | veh in transpt | none | none | none | failed to yeild | car | ctrfront |
| 2 | $S$ | go straight | veh in transpt | none | none | none | none | car | rtfront |

UD-10: 070428760

| \#19 Location: TOWN CENTER ST (0.12) 10 feet W of 11 MILE RD |  |  |  |  |  |  |  | Roadway: wet |  | Crash ID: 6984431 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 04/13/2008 |  |  | Day: Sun |  | Hour: 10am | Weather: snow |  |  |  | Light: day |  |  |
| Injuries K: 0 |  |  | Inj A: 0 |  | Inj B: 0 | Inj C: 3 |  | Inj 0; 0 |  | How: angle |  |  |
| CVT: Novi |  |  | Area: straight |  |  | HBD: N |  | Drugs: N |  | Complaint No: 80017253 |  |  |
| Unit No | Veh Dir | Act | Prior |  | nt 1 | Event 2 | Event 3 | Event 4 | Haz | on | Veh Type | Damage |
| 1 | N |  | ght |  | in transpt | none | none | none | none |  |  | ctrfront |
| 2 | E |  |  |  | in transpt | none | none | none | failed | yeild | car | rffront |

UD-10: ©80204744

| \#20 Location: TOWN CENTER RD (0.28) 800 feel N of 11 MILE RD |  |  |  |  |  |  |  |  | Crash | D: 7108336 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Date: 09/30/2008 Injurles K: 0 |  |  | Day: Tue Hour: 8 pm Inj A: $0 \quad$ Inj B: 0 <br> Area: straight | Weather: cloudy <br> InJ C: 0 <br> HBD: Y |  | Roadway: dry <br> Inj 0: 2 <br> Drugs: N |  | Light: dark/ld <br> How: ss-opp <br> Complaint No: 80052426 |  |  |
| Unit No <br> 1 <br> 2 | $\begin{aligned} & \text { Veh Dir } \\ & \mathrm{S} \\ & \mathrm{~N} \end{aligned}$ | Actlon Prior go straight go straight | Event 1 <br> veh in transpt veh in transpt | Event 2 <br> none <br> none | Event 3 <br> none <br> none | Event 4 <br> none <br> none | Haz A <br> left of none | ction center | Veh Type <br> car <br> car | Damage <br> Iftside <br> Iftside |
| UD-10: 080472562 |  |  |  |  |  |  |  |  |  |  |
| \#21 Location: NB TOWNCENTER (0.01) 75 feet N of GRANDRIVER AVE |  |  |  |  |  |  |  | Crash ID: 7200433 |  |  |
| Crash Dat Injuries CVT: Novi | $\begin{aligned} & \text { te: } 12 / 19 / 2 \\ & : 0 \end{aligned}$ | Day: Fri Hour <br> Inj A: 0 Inj B <br> Area: straight |  | Weather: <br> Inj C: 0 <br> HBD: N |  | Roadway: snowy <br> In 0: 2 |  | Light: How: Comp | day unknown lalnt No: 80 | 069348 |
| $\begin{aligned} & \text { Unit No } \\ & 1 \\ & 2 \end{aligned}$ | Veh Dir <br> N <br> N | Action Prior <br> backing <br> go straight | Event 1 <br> veh in transpt ran off road/r | ent 2 <br> ne <br> in trans | Event <br> none <br> none | 3 Event 4 none | Haz Action imprp backing unknown |  | Veh Type truck/bus car | Damage ctrrear ctrifont |
| UD-10: 080669467 |  |  |  |  |  |  |  |  |  |  |
| \#22 Location: TOWN CENTER (0.13) 60 feet N of 11 MILE RD |  |  |  |  |  |  |  | Crash ID: 7301128 |  |  |
| Crash Date: 04/20/2 <br> Injuries K: 0 <br> CVT: Novi |  | Day: Mon Hour: 4pm <br> $\operatorname{Inj} \mathrm{A}: 0 \quad \operatorname{lnj} \mathrm{~B}: 0$ <br> Area: straight |  | Weather <br> Inj C: 0 <br> HBD: N |  |  | Roadway <br> Inj 0: 2 <br> Drugs: N | : wet | Light: day How: angle |  |  |
| Unit No <br> 1 <br> 2 | Veh Dir <br> E <br> S | Action Prior go straight go straight | Event 1 veh in transpt veh in transpt | Event 2 <br> none <br> none | Event 3 <br> none <br> none | Event 4 <br> none <br> none | Haz Action <br> failed to yeild none |  | Veh Type car van | Damage Ifffront ctrfront |
| UD-10: 090197922,090197922 |  |  |  |  |  |  |  |  |  |  |

Crash Type

| O-M | Wh: |
| :---: | :---: |
| 0 | uncoded |
| 2 | single |
| 1 | head-on |
| 0 | head-on/lt |
| 12 | angle |
| 2 | rr-end |
| 0 | rr-end/lt |
| 0 | rr-end/rt |
| 1 | ss-same |
| 2 | ss-opp |
| 2 | unknown |
| (1) ${ }^{\text {a }}$ |  |

## Vehicle Type

| ColMI: | lypl |
| :--- | :--- |
| 0 | uncoded |
| 34 | car |
| 0 | other |
| 2 | truck/bus |
| 4 | van |
| 1 | pickup |
| 2 | sm truck |
| 0 | motorcycle |
| 0 | moped |
| 0 | go-cart |
| 0 | snowmobile |
| 0 | off-rd veh |
| 100 anim |  |

Light Conditions

| ค.!\| | 192: |
| :---: | :---: |
| 0 | uncoded |
| 16 | day |
| 1 | dawn |
| 1 | dusk |
| 4 | dark/ld |
| 0 | dark/unltd |
| 0 | unknown |
| (1.) ${ }^{\text {a }}$ | $2 \cdot$ |

Weather

| c.ent | 1\%\% |
| :---: | :---: |
| 0 | uncoded |
| 11 | clear |
| 6 | cloudy |
| 0 | fog/smoke |
| 1 | rain |
| 4 | snow |
| 0 | wind |
| 0 | sleet/hail |
| 0 | unknown |
| mats | 2 |

Road Condition


## Unit Type

| colm: | uype |
| :--- | :--- |
| 0 | uncoded |
| 43 | vehicle |
| 0 | pedestrian |
| 0 | bicyclist |
| 0 | engineer |
| Robils | 48 |

## Crash Severify

|  | FATAL | A | B | C | Noinj | Toral |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Persons | 0 | 0 | 0 | 11 | 47 | 58 |
| Crashes | 0 | 0 | 0 | 7 | 15 | 22 |

Alcohol in Crashes

|  | FATAL | Pl | PD | Total |
| :--- | :--- | :--- | :--- | :--- |
| Drinking | 0 | 0 | 1 | $\frac{1}{14}$ |
| $\left.\begin{array}{llll}\text { Not Dinking } & 0 & \frac{7}{7} & 15 \\ \hline \text { Total } & 0 & & \frac{21}{22}\end{array}\right]$ |  |  |  |  |

## Crashes per Hour by Day

|  |  |  | [140\%*/ |  | 1inth lety | trothe: |  |  | $1.1 i^{\text {in }}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 |
| $3 \mathrm{a}-4 \mathrm{a}$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $4 \mathrm{a}-5 \mathrm{a}$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $5 a-6 a$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6a-7a | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 7a-8a | 0 | 0 | 0 | 0 | 0 | . 0 | 0 | 0 | 0 |
| $8 \mathrm{~b}-9 \mathrm{a}$ | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 9a-10a | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 10a-11a | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2. |
| 11a-12p | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 |
| 12p-1p | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 1p-2p | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 3 |
| $2 p-3 p$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $3 p-4 p$ | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| $4 p-5 p$ | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 4 |
| $5 p-6 p$ | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| $6 p-7 p$ | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 7p-8p | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| $8 p-9 p$ | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| $9 p-10 p$ | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 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 |
| (bisil |  | - | $\because$ | 8 | $6$ | 4 | $\cdots$ | 1) | 撔 |




| Crash Type |  |
| :---: | :---: |
| c.unt | Iyse |
| 0 | uncoded |
| 1 | single |
| 0 | head-on |
| 0 | head-on/lt |
| 4 | angle |
| 0 | rr-end |
| 0 | rr-end/lt |
| 0 | rr-end/rt |
| 0 | ss-same |
| 0 | ss-opp |
| 0 | unknown |
| 10, ${ }^{\text {a }}$ ( 5 |  |

## Vehicle Type

| ¢0.1n: | Type |
| :---: | :---: |
| 0 | uncoded |
| 5 | car |
| 0 | other |
| 0 | truck/bus |
| 1 | van |
| 1 | pickup |
| 2 | sm truck |
| 0 | motorcycle |
| 0 | moped |
| 0 | go-cart |
| 0 | snowmobile |
| 0 | off-rd veh |
| 10:als |  |

Light Conditions

| sollin | 12e: |
| :---: | :---: |
| 0 | uncoded |
| 5 | day |
| 0 | dawn |
| 0 | dusk |
| 0 | dark/lid |
| 0 | dark/unild |
| 0 | unknown |
| 10, |  |


| Weather |  |
| :---: | :---: |
| somil | (19\%10 |
| 0 | uncoded |
| 3 | clear |
| 1 | cloudy |
| 0 | fog/smoke |
| 0 | rain |
| 1 | snow |
| 0 | wind |
| 0 | sleethail |
| 0 | unknown |
| 10:aly | 5) |


| Road Condition |  |
| :---: | :---: |
| 0.0.19 | mpe |
| 0 | uncoded |
| 4 | dry |
| 0 | wet |
| 0 | icy |
| 1 | snowy |
| 0 | muddy |
| 0 | slushy |
| 0 | debris |
| 0 | unknown |
| 10amer |  |

Crashes By Month

| ตoln? | -7\% |
| :---: | :---: |
| 1 | January |
| 0 | February |
| 0 | March |
| 0 | April |
| 1 | May |
| 1 | June |
| 0 | July |
| 0 | August |
| 0 | September |
| 1 | October |
| 0 | November |
| 1 | December |
| (10) ${ }^{\text {ala }}$ | 8 |


| Hazardous Action |  |
| :---: | :---: |
| $60110 \%$ | (1) ${ }^{\text {a }}$ |
| 4 | none |
| 0 | speeding |
| 0 | imprp/no signal |
| 0 | imprp backing |
| 1 | unable to stop |
| 0 | other |
| 1 | unknown |
| 0 | reckls driving |
| 0 | negl driving |
| 0 | spd too slow |
| 2 | failed to yeild |
| 0 | disrgd traffic entri |
| 0 | wrong way |
| 0 | left of center |
| 0 | imprp passing |
| 0 | imprp lane use |
| 1 | impro turn |
| 70aler : |  |

Unit Type

| GOリn: | 17\%9 |
| :---: | :---: |
| 0 | uncoded |
| 9 | vehicle |
| 0 | pedestrian |
| 0 | bicyclist |
| 0 | engineer |
| (10) | 9 |

## Crash Severity

|  | FATAL | $A$ | $B$ | $C$ | No inj | Total |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Persons | 0 | 0 | 0 | 0 | 10 | 10 |
| Crashes | 0 | 0 | 0 | 0 | 5 | 5 |

## Alcohol in Crashes

|  | FATAL | $\|P\|$ | $\mid P D$ | Tôal |
| :--- | :--- | :--- | :--- | :--- |
| Drinking | 0 | 0 | 0 | 0 |
| Not Drinking | 0 | 0 | 5 | 5 |
| Total | 0 | 0 | 5 | 5 |

Crashes per Hour by Day



| Crash Type |  |
| :--- | :--- |
| 0 | uncoded |
| 1 | single |
| 0 | head-on |
| 0 | head-on/lt |
| 0 | angle |
| 3 | rr-end |
| 0 | rr-end/ll |
| 0 | rr-end/rt |
| 0 | ss-same |
| 0 | ss-opp |
| 0 | unknown |
| 1 inill |  |


| Light Conditions |  |
| :--- | :--- |
| 3 | uncoied |
| 3 | day |
| 0 | dawn |
| 0 | dusk |
| 0 | dark/lid |
| 0 | dark/unltd |
| 1 | unknown |


| Weather |  |
| :--- | :--- |
| 0 | uncocied |
| 3 | clear |
| 0 | cloudy |
| 0 | fog/smoke |
| 0 | rain |
| 0 | snow |
| 9 | sleet/hail |
| 0 | unknown |
| 1 |  |

## Road Condltion



| Hazardous Action |  |
| :---: | :---: |
| $\therefore$ - ${ }^{\text {a }}$ | M:--1 |
| 4 | none |
| 0 | speeding |
| 0 | imprp/no signal |
| 0 | imprp backing |
| 1 | unable to stop |
| 0 | other |
| 2 | unknown |
| 0 | reckls driving |
| 0 | negl driving |
| 0 | spd too slow |
| 0 | failed to yeild |
| 1 | disrgo traffic entrl |
| 0 | wrong way |
| 0 | left of center |
| 0 | imprp passing |
| 0 | impro lane use |
| 0 | imprp turn |
| (1.) i.tial : |  |

## Unit Type



| Vehicle Type |  |
| :--- | :--- |
| 1 | uncoded |
| 5 | car |
| 0 | other |
| 0 | truck/bus |
| 0 | van |
| 2 | pickup |
| 0 | sm truck |
| 0 | motorcycle |
| 0 | moped <br> 0 |
| 0 | go-cart |
| 0 | snowmobile |
| off-rd veh |  |
| min:l |  |


| Crashes By Month |  |
| :--- | :--- |
| 0 | January |
| 1 | February |
| 0 | March |
| 0 | April |
| 1 | May |
| 0 | June |
| 0 | July |
| 2 | August |
| 0 | September |
| 0 | October |
| 0 | November |
| 0 | December |
| $1, y i n$. | 1 |

## Crash Severity

|  | FATAL | $A$ | $B$ | $C$ | No inj | Total |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Persons | 0 | 0 | 0 | 1 | 7 | 8 | 8 |
| Crashes | 0 | 0 | 0 | 1 | 3 | 4 |  |

Alcohol in Crashes

|  | FATAL | PI | $\mid P D$ | Toíal |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Drinking | 0 | $\frac{0}{1}$ | 0 | 0 |
| Not Drinking | 0 | $\frac{3}{1}$ | 4 |  |
| Total | 0 | $\frac{3}{3}$ | 4 |  |

## Crashes per Hour by Day

| 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 |
| $3 \mathrm{a}-4 \mathrm{a}$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $4 a-5 a$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $5 a-6 a$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $6 a-7 a$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7a-8a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $8 a-9 a$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $9 \mathrm{a}-10 \mathrm{a}$ | 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 | 1 | 0 | 1 |
| 12p-1p | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $1 p-2 p$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2p-3p | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| $3 p-4 p$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $4 p-5 p$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $5 p-6 p$ | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| $6 p-7 p$ | 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 |
| $9 p-10 p$ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 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 |
| Triall | (1) | 1 | 1) | 3 | () $\square$ | (t) | 1 | 1) | 4 |


[^0]:    cc: David Molloy, Public Safety Director/Police Chief Matt Wiktorowski, Field Operations Senior Manager Terry Whitfield, Police Department

[^1]:    Red bar $=$ Speedlvolume sampling location, 6/8-10/10.

