



CITY of NOVI CITY COUNCIL

Agenda Item I
January 25, 2016

SUBJECT: Approval of Traffic Control Order 16-10 to set the speed limit on Nick Lidstrom Drive at 35 miles per hour.

SUBMITTING DEPARTMENT: Department of Public Services, Engineering Division *BTC*

RJA

CITY MANAGER APPROVAL: *[Signature]*

BACKGROUND INFORMATION:

For the past several years, DPS has been systematically replacing traffic control signs throughout the City to comply with new Federal regulations relating to visibility and lettering size that have been incorporated into the Michigan Manual of Uniform Traffic Control Devices (MMUTCD). As part of this sign replacement program, Engineering staff has been: reviewing each replacement to determine if the sign is still needed or if other signs should be added to improve safety, reviewing all regulatory signs to ensure that a traffic control order is on file, and for speed signs ensuring that a speed study is on file to support the posted speed. Traffic control orders are required by the Uniform Traffic Code (adopted by Section 33-51 of the Novi Ordinance) to enforce traffic control signs that have been installed on public streets. Additionally, the Uniform Traffic Code requires an engineering study to support regulatory signs and for setting speed limits.

Staff is currently reviewing the signage along Nick Lidstrom Drive and we were unable to find a traffic control order or study that established the posted 25 mile per hour speed limit. Consequently, the City's traffic consultant, AECOM, prepared the attached study and recommends a posted speed limit of 35 mph based on existing traffic. 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 report also recommends improved signage and an advisory speed of 10 miles per hour at the 90-degree bend in the road.

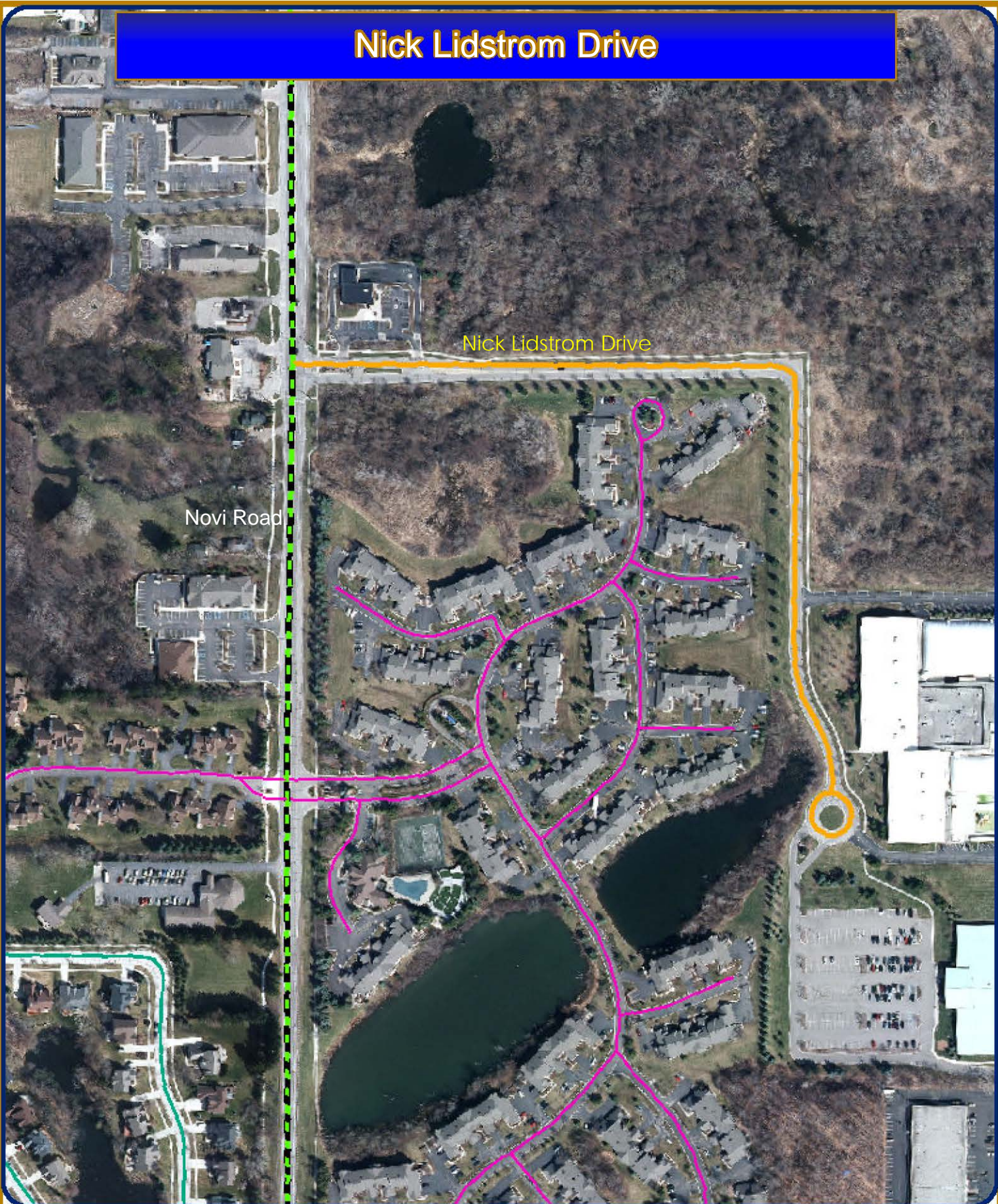
There is a residential development under construction on the north and east sides of Nick Lidstrom Drive (Ridgeview Villas of Novi). The expectation is that Nick Lidstrom Drive would function similar to other collector roads such as Nine Mile (west of Meadowbrook), Taft Road, and Meadowbrook Road (12-13 Mile), which would have a similar residential land use and similar width, with a posted 35 mile per hour speed limit. Staff would schedule a follow-up review of the speed limit that would be conducted one year after TCO implementation to ensure that the correct speed limit is still warranted at that time.

RECOMMENDED ACTION: Approval of Traffic Control Order 16-10 to set the speed limit on Nick Lidstrom Drive at 35 miles per hour.

	1	2	Y	N
Mayor Gatt				
Mayor Pro Tem Staudt				
Council Member Burke				
Council Member Casey				

	1	2	Y	N
Council Member Markham				
Council Member Mutch				
Council Member Wrobel				

Nick Lidstrom Drive



Novi Road

Nick Lidstrom Drive

MAP INTERPRETATION NOTICE

Map information depicted is not intended to replace or substitute for any official or primary source. This map was intended to meet National Map Accuracy Standards and use the most recent, accurate sources available to the people of the City of Novi. Boundary measurements and dimensions are approximate and should not be construed as survey measurements performed by a licensed Michigan Surveyor as defined in Michigan Public Act 132 of 1970 as amended. Please contact the City GIS Manager to confirm source and accuracy information related to this map.



1 inch = 376 feet



Map Print Date:
1/20/2016



City of Novi

Department of Public Services
26300 Lee BeGole Drive
Novi, MI 48375
cityofnovi.org

**CITY OF NOVI
TRAFFIC CONTROL ORDER**

 X SPEED
 PARKING
 OTHER

DATE OF ORDER: 1/15/2016

CONTROL NUMBER: 16-10


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, ENGINEERING MANAGER, DULY AUTHORIZED AS TRAFFIC ENGINEER, BY SEC. 33-51 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.

NICK LIDSTROM DRIVE

AND AFTER SAID INVESTIGATION, IT IS HEREBY ORDERED AND DIRECTED THAT THE DEPARTMENT OF PUBLIC SERVICES ERECT AND MAINTAIN THE 35 MPH SIGN (S) IN ACCORDANCE WITH THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AS REQUIRED BY SEC. 33-51 OF THE AFORESAID CHAPTER, SAID SIGNS TO GIVE NOTICE OF THE FOLLOWING DETERMINATION:

35 MPH SPEED LIMIT ON NICK LIDSTROM DRIVE



Brian Coburn, P.E. - Traffic Engineer
Dated: 1/15/2016

APPROVED BY CITY COUNCIL

TRAFFIC CONTROL ORDER NUMBER 16-10 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 THEROF IN THE OFFICE OF THE CHIEF OF POLICE OF SAID CITY.

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

35 MPH SPEED LIMIT ON NICK LIDSTROM DRIVE

ADOPTED AT THE REGULAR MEETING OF
CITY COUNCIL ON ,

By: _____
Robert J. Gatt, Mayor

By: _____
Maryanne Cornelius, Clerk

Memorandum

To	Brian Coburn, PE	Page	1
CC			
Subject	Nick Lidstrom Speed Study		
From	Matt Klawon, PE Maureen Peters, PE Sterling Frazier		
Date	June 15, 2015		

Introduction

The City of Novi has noticed a trend in speed limit violations and crashes along Nick Lidstrom Drive (previously named Arena Road) and has consulted AECOM to study the roadway to compare the posted speed limit to the actual operating speeds of freely flowing vehicles traveling on the roadway. Nick Lidstrom Drive intersects Novi Road from the east, approximately 1,000 feet south of 10 Mile Road. The intersection of Novi Road and Nick Lidstrom Drive is controlled by a traffic signal. The roadway serves as an access road for the Sports Club of Novi, Novi Ice Arena, Community Financial, and Novi Dog Park. Nearly 1,075 feet east of Novi Road exists a 90-degree curve on Nick Lidstrom Drive, which motorists must traverse in order to enter/exit the majority of the previously listed facilities. The current posted speed limit on Nick Lidstrom Drive is 25 miles per hour (mph). The objective of this evaluation is to provide the City of Novi with an engineering review of the current posted speed limit on Nick Lidstrom Drive.

Data Collection

Crash Data

AECOM gathered historic crash data along Nick Lidstrom Drive for the entirety of the segment. Data was extracted from the Traffic Improvement Association's (TIA) Traffic Crash Analysis Tool (TCAT) for a five-year time period of January 1, 2009 through December 31, 2014. Within this time period, five crashes occurred in the study area as shown in Table 1. It is speculated that at least two of the four crashes that occurred at the 90-degree curve could be attributed to high speed. UD-10 forms for each of the crashes listed are available in Appendix A.

Table 1 - Crash history of Nick Lidstrom Drive for the last 5 years

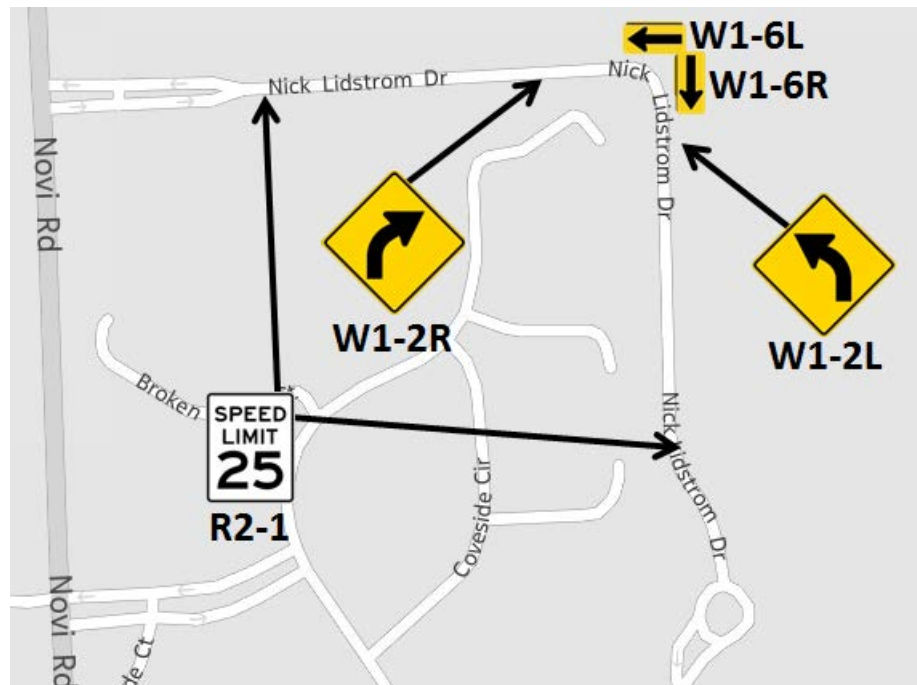
Crash ID	Crash Date	Crash Type	Crash Location	Comments
7267974	2/27/2009 6:46 PM	Other	Arena Road 100' E of Novi Road	Driver 1 began backing due to a vehicle backing in front of him. Driver 2 was stopped in the midst of the existing U-turn. Driver 1 backed into Driver 2.
8153726	9/26/2011 12:18 AM	Single Vehicle	Nick Lidstrom Drive 1,075' E of Novi Rd	Driver 1 was northbound on Nick Lidstrom Drive, approaching the 90-degree curve. Driver was going too fast to successfully navigate the left turn, lost control and drove into the curb on the north side of the roadway. Driver 1 drove over the curb then across the grass for several yards before veering back into the roadway.
8509362	12/1/2012 9:41 AM	Single Vehicle	Nick Lidstrom Drive 1,075' E of Novi Rd	Driver 1 was traveling northbound on Nick Lidstrom Drive approaching the 90-degree curve. Driver stated she was distracted and didn't see the curve approaching. Driver approached the curve at posted speed and realized she was going too fast around the curve. Driver attempted to brake, but the brakes did not work. The vehicle struck a tree on the right front, passenger side.
8796666	11/16/2013 9:43 PM	Rear End	Nick Lidstrom Drive 1,075' E of Novi Rd	Drivers 1 and 2 were exiting the sports complex on Nick Lidstrom Drive. Driver 2 started to make the 90-degree curve and slowed down. Driver 1 was not able to stop assured clear distanced and caused a rear end collision with Driver 2.
8818084	12/9/2013 1:12 PM	Sideswipe-Opposite	Nick Lidstrom Drive 1075' E of Novi Rd	Driver 2 was northbound on Nick Lidstrom Drive and was approaching the curve in the roadway. Driver 1 was driving around the curve in the roadway and failed to navigate the curve in the roadway. Driver 1 drove left of center and struck Driver 2's driver side front panel with its driver-side front end.

Field Review

Existing Conditions

There are speed limit signs on each of the east/west and north/south segments of Nick Lidstrom Drive, and two curve warning signs per direction of traffic (one upstream of the curve and one at the curve). The locations of each sign can be found in Figure 1.

Figure 1 - Existing signage of Nick Lidstrom Drive



Speed Data Collection

Vehicle speeds were recorded on Wednesday, June 3, 2015 from 4:00-5:45 PM using a radar gun. Speed data of vehicles were recorded randomly at two separate locations until a sample of 50 freely-flowing vehicles in each direction was obtained at both tangent locations, totaling a sample of 200 freely-flowing vehicles. The two locations where data were recorded are detailed as:

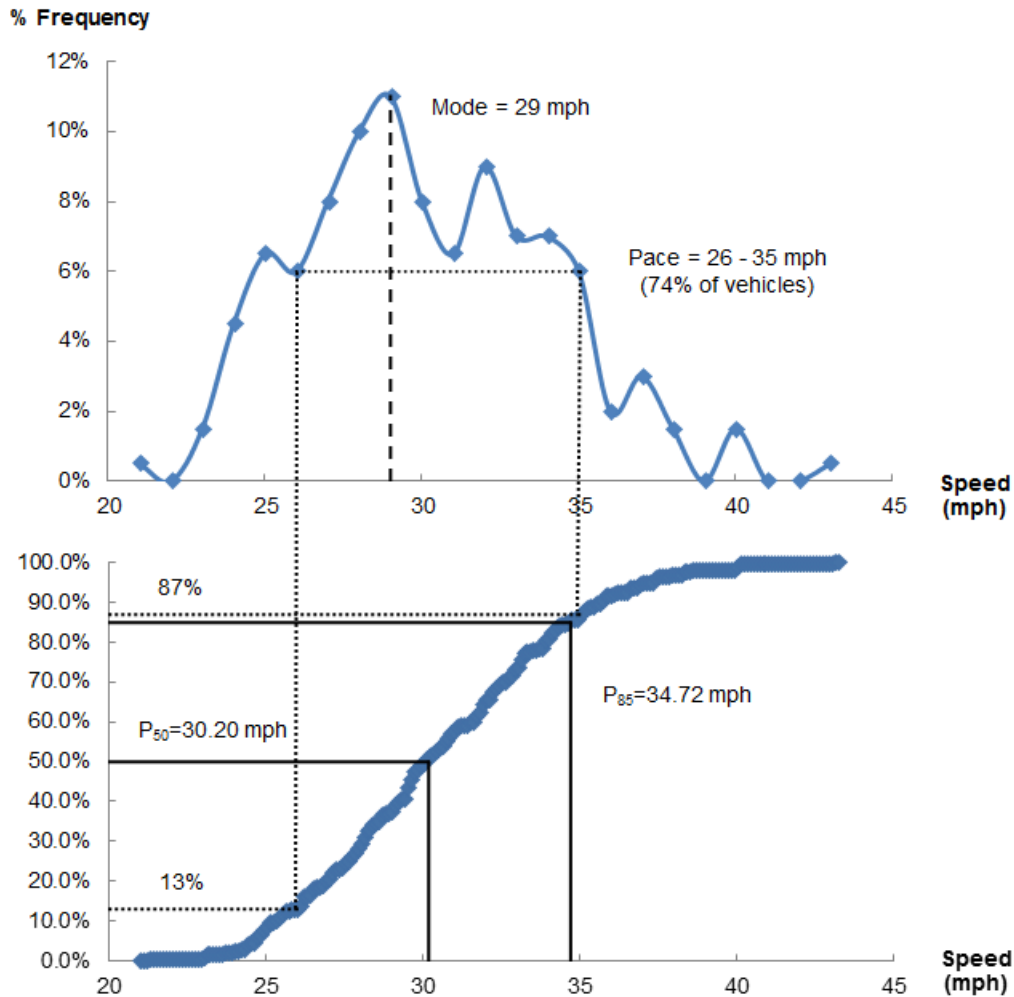
- Midpoint of the east/west tangent of roadway between Novi Road and the 90-degree turn
- Midpoint of the north/south tangent of roadway south of the 90-degree curve

A summary of the speed data can be found on the next two pages and raw speed data can be found in Appendix B:

Table 2 - Speed Data Summarized for All Directions of Travel

Direction:	All Directions
Number of Observed Vehicles	200
Average (μ) (mph)	30.57
85th Percentile (mph)	34.72
Std. Deviation (mph)	3.94
Median (mph)	30.20
Max (mph)	43.20
Min (mph)	21.30
Pace (mph)	26 to 35 (74%)
Percent Exceeding Speed Limit by 5mph	52.00%
Percent Exceeding Speed Limit by 10mph	14.50%
Precision (95% confidence)	E=.020
	$30.53 < \mu < 30.61$

Figure 2 - Frequency Distribution of Speeds for All Directions of Travel



Overall, the average vehicle speed on Nick Lidstrom Drive is 30.57 mph with an 85th percentile speed of 34.72 mph. The pace of vehicles can be defined as the 10 mph interval in which the highest percentage of vehicles are traveling. The pace for Nick Lidstrom Drive was calculated at 26-35 mph which encompassed 74% of total speed observations. The mode (29 mph) is the exact speed at which the most vehicles were traveling during the observation period. Of the 200 observations, it was calculated that 52% of vehicles were exceeding the posted speed limit by at least 5 mph.

Speed data summarized by location and by the inbound/outbound approach of the 90-degree curve can be found in Appendix C. As shown in the speed data in the appendices, the east/west tangent section yields higher speeds than the north/south tangent section. The difference in speed on the two tangential sections is assumed to be attributable to the length of each section as the east/west tangent is roughly 350 feet longer than the north/south tangent. The presence of the 90-degree curve in the roadway contributed to reducing vehicle speeds before/after the curve, however only for the eastbound direction. Based on an observation made in the field, southbound traffic outbound of the

curve would not significantly re-accelerate due to the need to complete an impending turning movement into one of the facilities at the end of the route. However, in the opposite direction, westbound traffic outbound of the curve increased their speed on average 3.30 mph upon completing the turning movement at the 90-degree curve.

Analysis and Recommendation

Based on the existing conditions, along with the collected data, it is recommended that the City consider one of the two following mitigation measures. Because the existing posted speed limit is not in alignment with standard practices for speed limit establishment, AECOM suggests that

1. The City introduce a speed limit of 35 mph to align with the observed 85th percentile speed, or
2. The City consider removing the posted speed limit altogether as the roadway is very short in length and dead ends.

Police enforcement will likely not lead to reduced speeds when enforcement is not present. Should the City desire to see a reduction of the 85th percentile speed of the roadway, the addition of traffic calming measures could be considered to more effectively reduce travel speeds consistently over time.

AECOM also recommends that the City replace the existing W1-2 signs with two W1-1 (R and L) as per MUTCD Section 2C.07.02. In addition to replacing the existing W1-2 signs, AECOM is recommending that an advisory speed plaque (sign W13-1P) of 10mph also be added to the signs. To attempt to further reduce speeds through the 90-degree bend, W1-8 R&L signs could be added to the outside radius of the turn; however, this is not considered to be necessary. For further reference, refer to Appendix D.

Figure 3 - Proposed Signing



Appendix A
UD-10 Crash Reports

STATE OF MICHIGAN TRAFFIC CRASH REPORT

OPR: MI-6362700

Department Name: Novi Police Dept

Incident Disposition: Open Closed

Reviewed: [Signature]

Crash Date Month: 02, Day: 27, Year: 2009		Crash Time Military: 1846		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"/> Angle <input type="radio"/> Rear End <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 checked="" type="radio"/> Other/Unknown		Special Circumstances <input type="radio"/> School Bus <input type="radio"/> Hit and Run <input type="radio"/> Fleeing Police <input type="radio"/> Local <input type="radio"/> State		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 checked="" type="radio"/> None of These <input type="radio"/> Signal <input 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 type="radio"/> Clear <input checked="" type="radio"/> Cloudy <input type="radio"/> Fog/Smoke <input type="radio"/> Rain <input type="radio"/> Severe Wind <input type="radio"/> Snow/Blowing Snow <input type="radio"/> Sleet/Hail <input type="radio"/> Other/Unknown		Light (Mark Only One) <input type="radio"/> Daylight <input type="radio"/> Dawn <input type="radio"/> Dusk <input type="radio"/> Dark-Lighted <input checked="" type="radio"/> Dark-Unlighted <input type="radio"/> Other/Unknown		Road Condition (Mark Only One) <input checked="" type="radio"/> Dry <input type="radio"/> Wet <input type="radio"/> Icy <input type="radio"/> Snowy <input type="radio"/> Muddy <input type="radio"/> Slushy <input type="radio"/> Debris <input type="radio"/> Other/Unknown		Area: 09, Total Lanes: 2 Speed Limit: 25, Posted: <input checked="" type="radio"/> Yes <input type="radio"/> No	
Construction Zone (if applicable) 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 type="radio"/> None											

Prefix: []		Road Name: ARENA				Divided Roadway: (N) (S) (E) (W)				Road Type: []		Suffix: []	
Distance: 30		<input checked="" type="radio"/> FT <input type="radio"/> MI		<input type="radio"/> North <input checked="" type="radio"/> East <input type="radio"/> South <input type="radio"/> West		<input type="radio"/> Beginning of Ramp <input type="radio"/> End of Ramp		Trailway: <input checked="" type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4		Access Control: <input checked="" type="radio"/> 2 <input type="radio"/> 3			
Prefix: []		Intersecting Road: NOVI				Divided Roadway: (N) (S) (E) (W)				Road Type: RD		Suffix: []	

Unit Number: 1		State: MI		Date of Birth: 05031959		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 checked="" type="radio"/> M <input type="radio"/> F		Total Occup: 01		Hazard Action: 11	
Unit Type: <input checked="" type="radio"/> MV <input type="radio"/> B <input type="radio"/> P <input type="radio"/> E (train)		City: NORTVILLE		State: MI		Zip: 48168		Injury: <input type="radio"/> K <input type="radio"/> A <input type="radio"/> B <input 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: <input type="radio"/> Yes <input checked="" type="radio"/> No		Airbag Deployed: <input type="radio"/> Yes <input checked="" type="radio"/> No		Citation issued: <input checked="" type="radio"/> IMPROPER BACKING		Hospital: []	
Alcohol: <input type="radio"/> Yes <input checked="" type="radio"/> No		Test Type: <input type="radio"/> 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: <input type="radio"/> Blood <input type="radio"/> Urine		Test Results: []		Ambulance: []	

Vehicle Description: CHEVROLET		Make: SILVERADO		Model: BLANK		Color: 200A		Year: 2009	
Location of Greatest Damage: 06		Extent of Damage: 0		Driveable: <input checked="" type="radio"/> Yes <input type="radio"/> No		Vehicle Type: <input type="radio"/> PA <input type="radio"/> VA <input checked="" type="radio"/> PU <input type="radio"/> ST		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: 1 2 3 4 5 6 7 8 9 10 11			

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	
Injury: <input type="radio"/> K <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> O		Airbag Deployed: <input type="radio"/> Yes <input type="radio"/> No		Not Equipped: <input type="radio"/> Yes <input 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		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		Date of Birth: []		Sex: <input type="radio"/> M <input type="radio"/> F		Position: []		Restraint: []		Hospital: []	

Age: []		Pos: []		Rest: []		Age: []		Pos: []		Rest: []		Damaged Property: []		Public: <input type="radio"/> Y <input type="radio"/> N	
----------	--	----------	--	-----------	--	----------	--	----------	--	-----------	--	-----------------------	--	---	--

SANITIZED

BACK

Unit Number: 2 State: MI Date of Birth: 06041984 License Type: O, CY, C, F, M, R Sex: M Total Occup: 01 Hazard Action: 00

NCS

Unit Type: MV Driver Condition: 2 City: Novi State: MI Zip: 48375

Interlock: No Alcohol: No Test Type: Field PBT Breath Blood Urine Test Results: Drugs: No Test Type: Blood Urine Test Results:

Vehicle Description: SAAB Make: SAAB Model: 4DR Color: SILVER Year: 2008

Location of Greatest Damage: 8 Extent of Damage: 1 Drivability: Yes

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

Injury: K, A, B, C, O Ejected/Trapped: No Airbag Deployed: No Citation Issued: No

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

Unit Reported on Front: Action Prior: 07 Sequence of Events: 17 Most Harmful: M, M, M

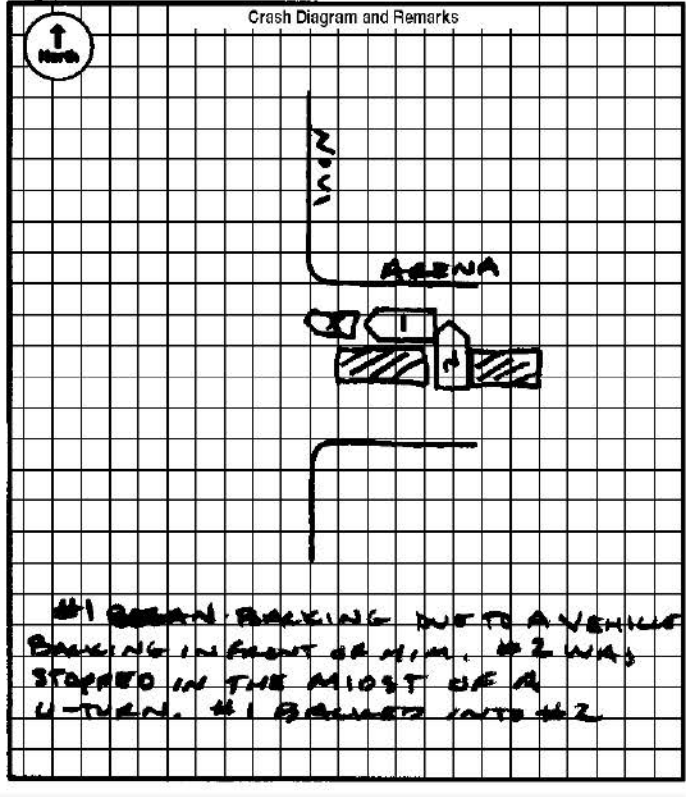
Unit Reported Above: Action Prior: 04/17 Most Harmful: M, M, M

Unit Number: City: State: Carrier Source: Papers, Vehicle, Log Book, Driver

Driver's CDL Type: A, C, B, None, H, P, T, N, S, X, Interstate, Intra (MI Only), CDL Restrictions: 28, 29, 30, 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 Cargo Body Type: 1-8 Hazardous Material: Placard, Cargo Spill, Class #



Investigated at Scene: (N)

Authority: 1949 PA 300, Sec.257 622
Compliance: Required MSP UD-10E
Penalty: \$100 and/or 90 days (Rev 11/2006)

External # **#####** Crash ID **8153726**

Page 01 of 01
Incident # ##### File Class C3145

STATE OF MICHIGAN TRAFFIC CRASH REPORT

ORI: MI 6362700		Department Name Novi Police Dept		Incident Disposition Closed			
Crash Date 09/26/2011		Crash Time 00:18	No. of Units 01	Crash Type Single Motor Vehicle	Special Circumstances <input type="checkbox"/> School Bus <input checked="" type="checkbox"/> None <input type="checkbox"/> Hit and Run <input type="checkbox"/> Deer <input type="checkbox"/> Fleeing Police	Special Checks <input type="checkbox"/> Fatal <input type="checkbox"/> Non-Traffic Area <input type="checkbox"/> ORV/Snowmobile	
County 63 - Oakland	Traffic Control None	Relation to Roadway On Road	Special Study	Weather Cloudy	Area 11 - NON-FRWY Curved roadway		
City/Twsp 62 - Novi	Construction Zone (if applicable) Type Lane Closed Activity		Light Dark-Unlighted	Road Condition Dry	Total Lanes 02	Speed Limit 25	Posted Yes

Prefix	Road Name NICK LIDSTROM	Road Type DR	Suffix	Divided Roadway
Distance 200 Feet E	Traffic Way 01 - Not physically divided		Access Control 01 - No access control	
Prefix	Intersecting Road NOVI	Road Type RD	Suffix	Divided Roadway

Unit Number 01	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) 02/22/1990 (21)	License Type <input checked="" type="checkbox"/> Operator <input type="checkbox"/> Chauffeur <input type="checkbox"/> Moped	Endorsements <input type="checkbox"/> Cycle <input type="checkbox"/> Farm <input type="checkbox"/> Recreation	Sex M	Total Occupants 01	Hazardous Action 01 - Speed too fast
Unit Type MV	Driver Information ##### NORTHVILLE, MI 48167-8935 (###) ###-####				Injury O	Position 01	Restraint 04	Hospital NONE	
Driver Condition <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 99				Interlock No	Ejected	Trapped	Airbag Deployed No	Ambulance NONE	
Alcohol <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Test Type <input type="checkbox"/> Field <input type="checkbox"/> PBT <input type="checkbox"/> Breath <input type="checkbox"/> Blood <input type="checkbox"/> Urine				Test Results		Drugs <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Test Type <input type="checkbox"/> Blood <input type="checkbox"/> Urine	Test Results		Citation Issued <input checked="" type="checkbox"/> Hazardous <input type="checkbox"/> Other
Vehicle Registration #####	State MI	Insurance / Policy # #####		Towed To/By #####		Special Vehicles 0	Private Trailer Type	Vehicle Defect	
VIN #####	Vehicle Description DODGE	Make DODGE	Model CHALLENGER	Color RED	Year 2010	Vehicle Type Passenger Car			
Location of Greatest Damage 02	First Impact 02	Extent of Damage 3	Driveable No	Vehicle Direction N	Vehicle Use 01 - Private	Action Prior 01 - Going Straight Ahead			
Sequence of Events (● indicates MOST harmful event)		First 01 - Loss of control		Second ● 34 - Curb		Third 04 - Ran off roadway-right		Fourth	

PASSENGERS	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance
Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital	
	Injury	Airbag Deployed	Ejected	Trapped	Ambulance	
Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital	
	Injury	Airbag Deployed	Ejected	Trapped	Ambulance	
Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital	
	Injury	Airbag Deployed	Ejected	Trapped	Ambulance	

Carrier Information		Carrier Source	GVWR	ICCMC	USDOT	MPSC	
		Driver's CDL Type	Endorsements <input type="checkbox"/> H <input type="checkbox"/> P <input type="checkbox"/> T <input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> X	CDL Exempt <input type="checkbox"/> Farm <input type="checkbox"/> Other	CDL Restrictions <input type="checkbox"/> 28 <input type="checkbox"/> 29 <input type="checkbox"/> 30 <input type="checkbox"/> 35 <input type="checkbox"/> 36		
Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth	Cargo Body Type	Medical Card	Hazardous Material <input type="checkbox"/> Placard <input type="checkbox"/> Cargo Spill	ID #	Class #

Owner Information ##### ORION TWP, MI 48359 (###) ###-####	Owner Information
--	-------------------

Person Advised of Damaged Traffic Control Contact Name: ##### Contact Date: ####/#### Contact Time: ##:##	Damaged Property	Public
	Owner & Phone	

SANITIZED

UNIT / DRIVER	Unit Number	Unit Known	State	Driver License Number	Date of Birth (Age)	License Type <input type="radio"/> Operator <input type="radio"/> Chauffer <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex	Total Occupants	Hazardous Action						
	Unit Type	Driver Information				Injury	Position	Restraint	Hospital							
	Driver Condition 01 02 03 04 05 06 07 08 09 099					Interlock	Ejected	Trapped	Airbag Deployed	Ambulance						
	Alcohol <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Refused <input type="radio"/> Not offered					Test Results			Citation Issued <input type="radio"/> Hazardous <input type="radio"/> Other							
	Test Type <input type="radio"/> Field <input type="radio"/> PBT <input type="radio"/> Breath <input type="radio"/> Blood <input type="radio"/> Urine					Drugs <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Blood <input type="radio"/> Urine			Test Results							
	Vehicle Registration	State	Insurance / Policy #			Towed To/By			Special Vehicles	Private Trailer Type	Vehicle Defect					
	VIN	Vehicle Description	Make	Model	Color	Year	Vehicle Type									
	Location of Greatest Damage	First Impact	Extent of Damage	Driveable	Vehicle Direction	Vehicle Use			Action Prior							
	Sequence of Events ● indicates MOST harmful event)				First			Second			Third			Fourth		

PASSENGERS	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital		
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital		
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital		
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance		

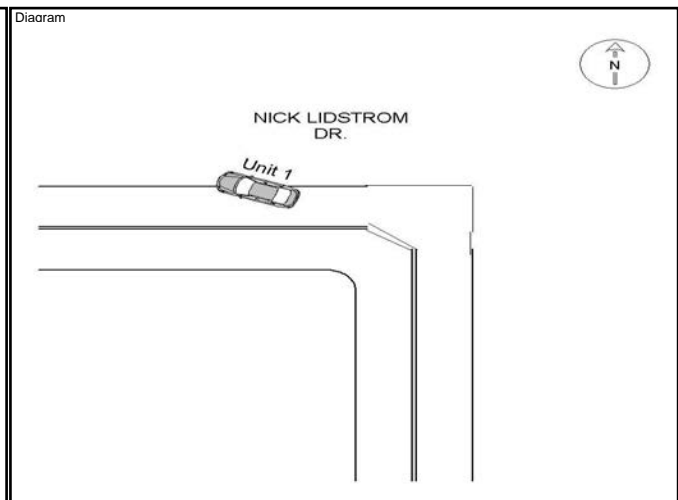
TRUCK / BUS	Carrier Information					Carrier Source	GVWR	ICCMC	USDOT	MPSC	
	Driver's CDL Type					Endorsements <input type="radio"/> H <input type="radio"/> P <input type="radio"/> T <input type="radio"/> N <input type="radio"/> S <input type="radio"/> X		CDL Exempt <input type="radio"/> Farm <input type="radio"/> Other	CDL Restrictions <input type="radio"/> 28 <input type="radio"/> 29 <input type="radio"/> 30 <input type="radio"/> 35 <input type="radio"/> 36		
	Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth		Cargo Body Type	Medical Card	Hazardous Material <input type="radio"/> Placard <input type="radio"/> Cargo Spill		ID #	Class #	

OWNERS	Owner Information					Owner Information				

WITNESS	Witness Information					Witness Information				

Investigated at Scene	Yes	Reported Date (Time) ##/##/#### (##:##)	1st Investigator Name (Badge) ##### (#####)	2nd Investigator Name (Badge) ##### (#####)	Photos By #####
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Narrative
DRIVER #1 WAS N/B ON NICK LIDSTROM DRIVE, APPROACHING SHARP LEFT TURN WHERE ROAD GOES FROM N-S TO E-W. DRIVER WAS GOING TOO FAST TO SUCCESSFULLY NEGOTIATE THE LEFT TURN, LOST CONTROL AND DROVE INTO CURB ON NORTH SIDE OF ROADWAY. VEHICLE #1 DROVE OVER THE CURB, THEN ACROSS GRASS FOR SEVERAL YARDS BEFORE VEERING BACK SOUTHWARD TO THE ROADWAY.



SANITIZED SANITIZED SANITIZED SANITIZED

Authority: 1949 PA 300, Sec.257 622
Compliance: Required MSP UD-10E
Penalty: \$100 and/or 90 days (Rev 11/2006)

External # 8509362
Crash ID 8509362

Page 01 of 01
Incident # File Class C3145

STATE OF MICHIGAN TRAFFIC CRASH REPORT

ORI: MI 6362700	Department Name Novi Police Dept					Incident Disposition Closed
Crash Date 12/01/2012	Crash Time 21:41	No. of Units 01	Crash Type Single Motor Vehicle	Special Circumstances <input type="checkbox"/> School Bus <input checked="" type="checkbox"/> None <input type="checkbox"/> Hit and Run <input type="checkbox"/> Deer <input type="checkbox"/> Fleeing Police	Special Checks <input type="checkbox"/> Fatal <input type="checkbox"/> Non-Traffic Area <input type="checkbox"/> ORV/Snowmobile	
County 63 - Oakland	Traffic Control None	Relation to Roadway Outside of shoulder/curb		Special Study	Weather Clear	Area 11 - NON-FRWY Curved roadway
City/Twsp 62 - Novi	Construction Zone (if applicable) Type		Lane Closed	Activity	Light Dark-Unlighted	Road Condition Dry
Total Lanes 02		Speed Limit 25		Posted Yes		

Prefix	Road Name NICK LIDSTROM	Road Type DR	Suffix	Divided Roadway
Distance 800 Feet E	Traffic Way 01 - Not physically divided		Access Control 01 - No access control	
Prefix	Intersecting Road NOVI	Road Type RD	Suffix	Divided Roadway

Unit Number 01	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) 02/27/1996 (16)	License Type <input checked="" type="checkbox"/> Operator <input type="checkbox"/> Chauffeur <input type="checkbox"/> Moped	Endorsements <input type="checkbox"/> Cycle <input type="checkbox"/> Farm <input type="checkbox"/> Recreation	Sex F	Total Occupants 01	Hazardous Action 00 - None	
Unit Type MV	Driver Information ##### ##### NORTHVILLE, MI 48168-3266 (###) ###-####			Injury 0	Position 01	Restraint 04	Hospital NONE			
Driver Condition <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 99				Interlock No	Ejected	Trapped	Airbag Deployed Yes	Ambulance NONE		
Alcohol <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Refused <input type="checkbox"/> Not offered Test Type <input type="checkbox"/> Field <input type="checkbox"/> PBT <input type="checkbox"/> Breath <input type="checkbox"/> Blood <input type="checkbox"/> Urine				Drugs <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Test Type <input type="checkbox"/> Blood <input type="checkbox"/> Urine			Citation Issued <input type="checkbox"/> Hazardous <input type="checkbox"/> Other			
Vehicle Registration #####	State MI	Insurance / Policy # #####		Towed To/By #####			Special Vehicles 0	Private Trailer Type	Vehicle Defect	
VIN #####	Vehicle Description FORD	Make	Model MUSTANG	Color WHITE	Year 2010	Vehicle Type Passenger Car				
Location of Greatest Damage 02	First Impact 02	Extent of Damage 4	Driveable No	Vehicle Direction W	Vehicle Use 01 - Private	Action Prior 01 - Going Straight Ahead				
Sequence of Events (● indicates MOST harmful event)		First 01 - Loss of control		Second 34 - Curb		Third ● 39 - Tree		Fourth		

PASSENGERS	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance
Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital	
	Injury	Airbag Deployed	Ejected	Trapped	Ambulance	
Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital	
	Injury	Airbag Deployed	Ejected	Trapped	Ambulance	

Carrier Information		Carrier Source	GVWR	ICCMC	USDOT	MPSC
		Driver's CDL Type	Endorsements <input type="checkbox"/> H <input type="checkbox"/> P <input type="checkbox"/> T <input type="checkbox"/> O N <input type="checkbox"/> S <input type="checkbox"/> X	CDL Exempt <input type="checkbox"/> Farm <input type="checkbox"/> Other	CDL Restrictions <input type="checkbox"/> 28 <input type="checkbox"/> 29 <input type="checkbox"/> 30 <input type="checkbox"/> 35 <input type="checkbox"/> 36	
Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth	Cargo Body Type	Medical Card	Hazardous Material <input type="checkbox"/> Placard <input type="checkbox"/> Cargo Spill	ID # Class #

OWNER'S	Owner Information ##### ##### NORTHVILLE, MI 48168-326 (###) ###-####	Owner Information
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Person Advised of Damaged Traffic Control	Damaged Property	Public
Contact Name: ##### Contact Date: ####/#### Contact Time: ##:##	TREE Owner & Phone ##### (###) ###-####	No

UNIT / DRIVER	Unit Number	Unit Known	State	Driver License Number	Date of Birth (Age)	License Type <input type="radio"/> Operator <input type="radio"/> Chauffer <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex	Total Occupants	Hazardous Action		
	Unit Type	Driver Information				Injury	Position	Restraint	Hospital			
	Driver Condition ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 99				Interlock	Ejected	Trapped	Airbag Deployed	Ambulance			
	Alcohol ○ Yes ○ No ○ Refused ○ Not offered				Test Results ○ Test Type ○ Field ○ PBT ○ Breath ○ Blood ○ Urine		Drugs ○ Yes ○ No		Test Results ○ Test Type ○ Blood ○ Urine		Citation Issued ○ Hazardous ○ Other	
	Vehicle Registration	State	Insurance / Policy #			Towed To/By			Special Vehicles	Private Trailer Type	Vehicle Defect	
	VIN		Vehicle Description		Make	Model	Color		Year	Vehicle Type		
Location of Greatest Damage	First Impact	Extent of Damage	Driveable	Vehicle Direction	Vehicle Use			Action Prior				
Sequence of Events ● (● indicates MOST harmful event)			First			Second			Third			Fourth

PASSENGERS	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital		
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital		
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital		
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance			
Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital			
				Injury	Airbag Deployed	Ejected	Trapped	Ambulance			

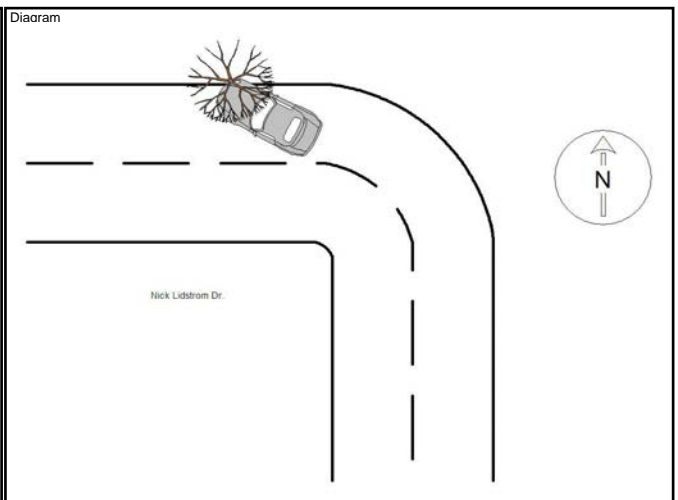
TRUCK / BUS	Carrier Information					Carrier Source	GVWR	ICCMC	USDOT	MPSC	
						Driver's CDL Type	Endorsements <input type="radio"/> H <input type="radio"/> P <input type="radio"/> T <input type="radio"/> N <input type="radio"/> S <input type="radio"/> X	CDL Exempt <input type="radio"/> Farm <input type="radio"/> Other	CDL Restrictions <input type="radio"/> 28 <input type="radio"/> 29 <input type="radio"/> 30 <input type="radio"/> 35 <input type="radio"/> 36		
	Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth			Cargo Body Type	Medical Card	Hazardous Material <input type="radio"/> Placard <input type="radio"/> Cargo Spill		ID #	Class #

OWNERS	Owner Information	Owner Information

WITNESS	Witness Information	Witness Information

Investigated at Scene	Yes	Reported Date (Time) ##/##/#### (##:##)	1st Investigator Name (Badge) ##### (#####)	2nd Investigator Name (Badge) ##### (#####)	Photos By #####
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Narrative
VEHICLE 1 WAS TRAVELING NORTHBOUND ON NICK LIDSTROM DRIVE, APPROACHING THE 90 DEGREE CURVE TO GO WESTBOUND ON NICK LIDSTROM DRIVE TOWARD NOVI ROAD. DRIVER STATED SHE WAS DISTRACTED AND DID NOT SEE THE CURVE APPROACHING. DRIVER APPROACHED THE CURVE AT THE POSTED SPEED AND REALIZED SHE WAS GOING TO FAST TO GO AROUND THE CURVE. DRIVER ATTEMPTED TO SLAM ON THE BRAKES AND THE BRAKES DID NOT WORK. THE VEHICLE THEN STRUCK A TREE ON THE RIGHT FRONT SIDE, CAUSING EXTENSIVE DAMAGE ON THE RIGHT FRONT AND FRONT PASSENGER SIDE AREA. THE VEHICLE WAS NOT DRIVEABLE. THERE WERE NO INJURIES. THE TRUNK OF THE TREE WAS DAMAGED AS A RESULT OF THE ACCIDENT.



Authority: 1949 PA 300, Sec.257 622
Compliance: Required MSP UD-10E
Penalty: \$100 and/or 90 days (Rev 11/2006)

External # *****
Crash ID 8796666

Page 01 of 01
Incident # ***** File Class C3145

STATE OF MICHIGAN TRAFFIC CRASH REPORT

ORI: MI 6362700		Department Name Novi Police Department		Incident Disposition Closed	
Crash Date 11/16/2013		Crash Time 21:43	No. of Units 02	Crash Type Rear End	Special Circumstances <input type="checkbox"/> School Bus <input checked="" type="checkbox"/> None <input type="checkbox"/> Hit and Run <input type="checkbox"/> Deer <input type="checkbox"/> Fleeing Police
County 63 - Oakland		Traffic Control Stop sign	Relation to Roadway On Road	Special Study	Weather Clear
City/Twsp 62 - Novi		Construction Zone (if applicable) Type Lane Closed Activity		Light Dark-Unlighted	Road Condition Dry
		Total Lanes 02	Speed Limit 25	Posted Yes	

Prefix	Road Name NICK LIDSTROM	Road Type DR	Suffix	Divided Roadway
Distance 200 Feet E	Traffic Way 01 - Not physically divided		Access Control 01 - No access control	
Prefix	Intersecting Road NOVI	Road Type RD	Suffix	Divided Roadway

Unit Number 01	Unit Known Yes	State MI	Driver License Number *****	Date of Birth (Age) 03/03/1994 (19)	License Type <input checked="" type="checkbox"/> Operator <input type="checkbox"/> Chauffeur <input type="checkbox"/> Moped	Endorsements <input type="checkbox"/> Cycle <input type="checkbox"/> Farm <input type="checkbox"/> Recreation	Sex M	Total Occupants 01	Hazardous Action 12 - Unable to stop
Unit Type MV	Driver Information ***** NOVI, MI 48375-2341 (###) ###-####			Injury O	Position 01	Restraint 04	Hospital NONE		
Driver Condition <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 99				Interlock No	Ejected	Trapped	Airbag Deployed No	Ambulance NONE	
Alcohol <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Test Type <input type="checkbox"/> Field <input type="checkbox"/> PBT				Test Results <input type="checkbox"/> Refused <input checked="" type="checkbox"/> Not offered <input type="checkbox"/> Breath <input type="checkbox"/> Blood <input type="checkbox"/> Urine		Drugs <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Test Type <input type="checkbox"/> Blood <input type="checkbox"/> Urine		Citation Issued <input checked="" type="checkbox"/> Hazardous <input type="checkbox"/> Other	
Vehicle Registration *****	State MI	Insurance / Policy # *****		Towed To/By *****		Special Vehicles 0	Private Trailer Type	Vehicle Defect	
VIN *****	Vehicle Description FORD	Make FOCUS	Model BLACK	Year 2002	Vehicle Type Passenger Car				
Location of Greatest Damage 02	First Impact 02	Extent of Damage 1	Driveable Yes	Vehicle Direction N	Vehicle Use 01 - Private	Action Prior 01 - Going Straight Ahead			
Sequence of Events First <input checked="" type="checkbox"/> 17 - Motor veh in transport			Second		Third		Fourth		

PASSENGERS	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance
	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
		Injury	Airbag Deployed	Ejected	Trapped	Ambulance

Carrier Information		Carrier Source	GVWR	ICCMC	USDOT	MPSC
Driver's CDL Type		Endorsements <input type="checkbox"/> H <input type="checkbox"/> P <input type="checkbox"/> T <input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> X		CDL Exempt <input type="checkbox"/> Farm <input type="checkbox"/> Other	CDL Restrictions <input type="checkbox"/> 28 <input type="checkbox"/> 29 <input type="checkbox"/> 30 <input type="checkbox"/> 35 <input type="checkbox"/> 36	
Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth	Cargo Body Type	Medical Card	Hazardous Material <input type="checkbox"/> Placard <input type="checkbox"/> Cargo Spill	ID # Class #

Owner Information	Owner Information
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Person Advised of Damaged Traffic Control Contact Name: ***** Contact Date: ####/#### Contact Time: ##:##	Damaged Property	Public
	Owner & Phone	

SANITIZED

SANITIZED SANITIZED SANITIZED SANITIZED SANITIZED SANITIZED SANITIZED SANITIZED SANITIZED SANITIZED

Unit Number 02	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) 03/22/1995 (18)	License Type <input checked="" type="radio"/> Operator <input type="radio"/> Chauffeur <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex M	Total Occupants 01	Hazardous Action 00 - None	
Unit Type MV	Driver Information ##### NOVI, MI 48375-2357 (###) ###-####				Injury O	Position 01	Restraint 04	Hospital NONE		
Driver Condition <input checked="" type="radio"/> 1 <input 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 No	Ejected	Trapped	Airbag Deployed No	Ambulance NONE		
Alcohol <input type="radio"/> Yes <input checked="" type="radio"/> No Test Type <input type="radio"/> Field <input type="radio"/> PBT				Test Results <input type="radio"/> Refused <input checked="" type="radio"/> Not offered <input type="radio"/> Breath <input type="radio"/> Blood <input type="radio"/> Urine		Drugs <input type="radio"/> Yes <input checked="" type="radio"/> No Test Type <input type="radio"/> Blood <input type="radio"/> Urine		Citation Issued <input type="radio"/> Hazardous <input type="radio"/> Other		
Vehicle Registration #####	State MI	Insurance / Policy # #####			Towed To/By #####			Special Vehicles 0	Private Trailer Type	Vehicle Defect
VIN #####	Vehicle Description SATURN AURA		Make Model	Color SILVER		Year 2009	Vehicle Type Passenger Car			
Location of Greatest Damage 06	First Impact 06	Extent of Damage 2	Driveable No	Vehicle Direction N	Vehicle Use 01 - Private		Action Prior 01 - Going Straight Ahead			
Sequence of Events <input checked="" type="radio"/> 17 - Motor veh in transport				Second		Third		Fourth		

PASSENGERS	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital

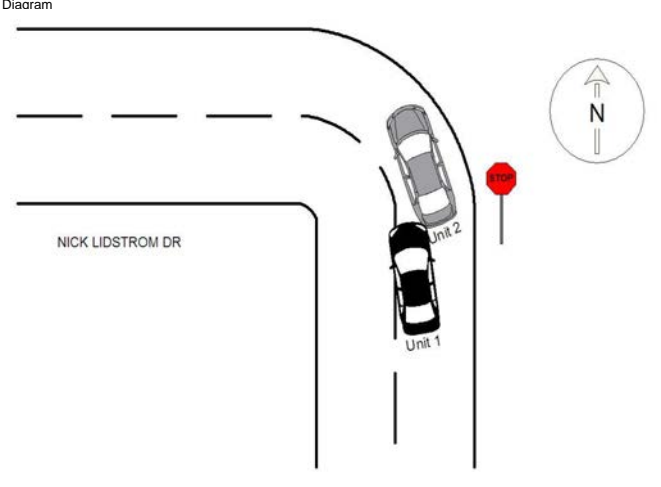
Carrier Information				Carrier Source GVWR	ICCMC	USDOT	MPSC		
Driver's CDL Type				Endorsements <input type="radio"/> H <input type="radio"/> P <input type="radio"/> T <input type="radio"/> N <input type="radio"/> S <input type="radio"/> X	CDL Exempt <input type="radio"/> Farm <input type="radio"/> Other	CDL Restrictions <input type="radio"/> 28 <input type="radio"/> 29 <input type="radio"/> 30 <input type="radio"/> 35 <input type="radio"/> 36			
Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth		Cargo Body Type	Medical Card	Hazardous Material <input type="radio"/> Placard <input type="radio"/> Cargo Spill		ID #	Class #

Owner Information				Owner Information			
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Witness Information				Witness Information			
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Investigated at Scene Yes	Reported Date (Time) ##/##/#### (##:##)	1st Investigator Name (Badge) ##### (#####)	2nd Investigator Name (Badge) ##### (#####)	Photos By #####
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Narrative
MV 1 AND MV 2 WERE EXITING THE SPORTS COMPLEX ON NICK LIDSTROM DR. MV 2 STARTED TO MAKE THE TURN AND SLOWED DOWN. MV 1 WAS NOT ABLE TO STOP ASSURED CLEAR DISTANCE AND CAUSED A REAR END COLLISION WITH MV 2.



SANITIZED

Authority: 1949 PA 300, Sec.257 622
Compliance: Required MSP UD-10E
Penalty: \$100 and/or 90 days (Rev 11/2006)

External # 8818084
Crash ID 8818084

Page 01 of 01
Incident # File Class C3145

STATE OF MICHIGAN TRAFFIC CRASH REPORT

ORI: MI 6362700	Department Name Novi Police Department			Incident Disposition Closed	
Crash Date 12/09/2013	Crash Time 13:12	No. of Units 02	Crash Type Sideswipe-Opposite	Special Circumstances <input type="checkbox"/> School Bus <input checked="" type="checkbox"/> None <input type="checkbox"/> Hit and Run <input type="checkbox"/> Deer <input type="checkbox"/> Fleeing Police	Special Checks <input type="checkbox"/> Fatal <input type="checkbox"/> Non-Traffic Area <input type="checkbox"/> ORV/Snowmobile
County 63 - Oakland	Traffic Control None	Relation to Roadway On Road	Special Study	Weather Cloudy	Area 10 - NON-FRWY Straight roadway
City/Twsp 62 - Novi	Construction Zone (if applicable) Type	Lane Closed	Activity	Light Daylight	Road Condition Wet
Total Lanes 02	Speed Limit 25	Posted Yes			

Prefix	Road Name NICK LIDSTROM	Road Type DR	Suffix	Divided Roadway
Distance 450 Feet E	Traffic Way 01 - Not physically divided	Access Control 01 - No access control		
Prefix	Intersecting Road NOVI	Road Type RD	Suffix	Divided Roadway

Unit Number 01	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) 12/11/1992 (20)	License Type <input checked="" type="checkbox"/> Operator <input type="checkbox"/> Chauffeur <input type="checkbox"/> Moped	Endorsements <input type="checkbox"/> Cycle <input type="checkbox"/> Farm <input type="checkbox"/> Recreation	Sex M	Total Occupants 03	Hazardous Action 06 - Drove left of center
Unit Type MV	Driver Information ##### ANN ARBOR, MI 48104-6167 (###) ###-####			Injury O	Position 01	Restraint 04	Hospital NONE		
Driver Condition <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 99				Interlock No	Ejected	Trapped	Airbag Deployed No	Ambulance NONE	
Alcohol <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Test Type <input type="checkbox"/> Field <input type="checkbox"/> PBT <input type="checkbox"/> Breath <input type="checkbox"/> Blood <input type="checkbox"/> Urine				Test Results		Drugs <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Test Type <input type="checkbox"/> Blood <input type="checkbox"/> Urine		Citation Issued <input checked="" type="checkbox"/> Hazardous <input type="checkbox"/> Other	
Vehicle Registration #####	State MI	Insurance / Policy # #####		Towed To/By #####		Special Vehicles 0	Private Trailer Type	Vehicle Defect	
VIN #####	Vehicle Description TOYOTA	Make CAMRY	Model CLAY	Color CLAY	Year 2000	Vehicle Type Passenger Car			
Location of Greatest Damage 08	First Impact 08	Extent of Damage 1	Driveable Yes	Vehicle Direction SE	Vehicle Use 01 - Private	Action Prior 01 - Going Straight Ahead			
Sequence of Events First 01 - Loss of control			Second 02 - Cross centerline/median		Third 17 - Motor veh in transport		Fourth		

PASSENGERS	Passenger Information ##### CANTON, MI 48187-331 (###) ###-####	Date of Birth (Age) 08/29/1994 (19)	Sex M	Position 06	Restraint 04	Hospital NONE
	Injury O	Airbag Deployed Not Equipped	Ejected	Trapped	Ambulance NONE	
	Passenger Information ##### ANN ARBOR, MI 48108 (###) ###-####	Date of Birth (Age) 01/23/1995 (18)	Sex F	Position 03	Restraint 04	Hospital NONE
	Injury O	Airbag Deployed Not Equipped	Ejected	Trapped	Ambulance NONE	
	Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital
	Injury	Airbag Deployed	Ejected	Trapped	Ambulance	
Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital	
Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital	
Injury	Airbag Deployed	Ejected	Trapped	Ambulance		
Passenger Information	Date of Birth (Age)	Sex	Position	Restraint	Hospital	
Injury	Airbag Deployed	Ejected	Trapped	Ambulance		

Carrier Information		Carrier Source GVWR	ICCMC	USDOT	MPSC
Driver's CDL Type		Endorsements <input type="checkbox"/> H <input type="checkbox"/> P <input type="checkbox"/> T <input type="checkbox"/> O <input type="checkbox"/> S <input type="checkbox"/> X	CDL Exempt <input type="checkbox"/> Farm <input type="checkbox"/> Other	CDL Restrictions <input type="checkbox"/> 28 <input type="checkbox"/> 29 <input type="checkbox"/> 30 <input type="checkbox"/> 35 <input type="checkbox"/> 36	
Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth	Cargo Body Type	Medical Card	Hazardous Material <input type="checkbox"/> Placard <input type="checkbox"/> Cargo Spill
ID #	Class #				

Owner Information	Owner Information
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Person Advised of Damaged Traffic Control Contact Name: ##### Contact Date: ####/#### Contact Time: ##:##	Damaged Property	Public
Owner & Phone		

UNIT / DRIVER	Unit Number 02	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) 01/23/1938 (75)	License Type <input checked="" type="radio"/> Operator <input type="radio"/> Chauffeur <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex F	Total Occupants 01	Hazardous Action 00 - None		
	Unit Type MV	Driver Information ##### BRIGHTON, MI 48116-4709 (###) ###-####				Injury O	Position 01	Restraint 04	Hospital NONE			
	Driver Condition <input checked="" type="radio"/> 1 <input 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 No	Ejected	Trapped	Airbag Deployed No	Ambulance NONE		
	Alcohol Test Type <input type="radio"/> Field <input type="radio"/> No <input type="radio"/> Refused <input type="radio"/> PBT <input type="radio"/> Not offered <input type="radio"/> Breath <input type="radio"/> Blood <input type="radio"/> Urine					Drugs Test Type <input type="radio"/> No <input type="radio"/> Other <input type="radio"/> Urine					Citation Issued <input type="radio"/> Hazardous <input type="radio"/> Other	
	Vehicle Registration #####	State MI	Insurance / Policy # #####			Towed To/By #####			Special Vehicles 0	Private Trailer Type	Vehicle Defect	
	VIN #####	Vehicle Description FORD		Make FUSION	Model FUSION	Color RED	Year 2013	Vehicle Type Passenger Car				
	Location of Greatest Damage 10	First Impact 08	Extent of Damage 1	Driveable Yes	Vehicle Direction N	Vehicle Use 01 - Private		Action Prior 01 - Going Straight Ahead				
	Sequence of Events <input checked="" type="radio"/> 17 - Motor veh in transport					Second	Third	Fourth				

PASSENGERS	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital
	Passenger Information				Date of Birth (Age)	Sex	Position	Restraint	Hospital

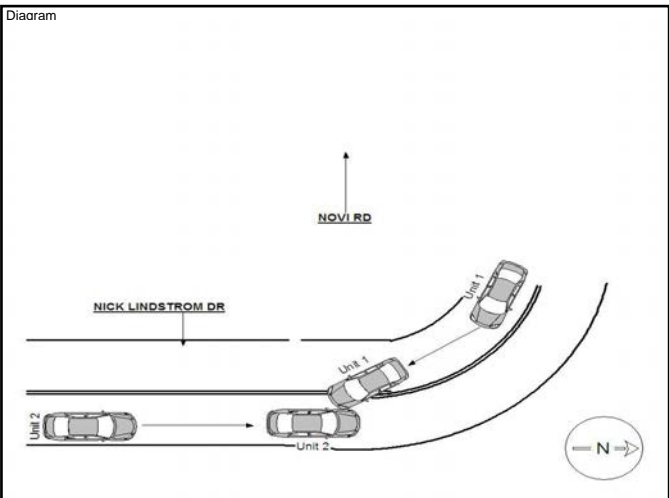
TRUCK / BUS	Carrier Information					Carrier Source GVWR	ICCMC	USDOT	MPSC
	Driver's CDL Type					Endorsements <input type="radio"/> H <input type="radio"/> P <input type="radio"/> T <input type="radio"/> N <input type="radio"/> S <input type="radio"/> X	CDL Exempt <input type="radio"/> Farm <input type="radio"/> Other	CDL Restrictions <input type="radio"/> 28 <input type="radio"/> 29 <input type="radio"/> 30 <input type="radio"/> 35 <input type="radio"/> 36	
	Interstate/Intrastate	Vehicle Type	Type & Axle Per Unit First Second Third Fourth		Cargo Body Type	Medical Card	Hazardous Material <input type="radio"/> Placard <input type="radio"/> Cargo Spill	ID #	Class #

OWNERS	Owner Information				Owner Information			

WITNESS	Witness Information				Witness Information			

Investigated at Scene Yes	Reported Date (Time) ##/##/#### (##:##)	1st Investigator Name (Badge) ##### (#####)	2nd Investigator Name (Badge) ##### (#####)	Photos By #####
------------------------------	--	--	--	--------------------

Narrative
VEHICLE 2 WAS DRIVING ON N/B NICK LINDSTROM DR AND WAS APPROACHING THE CURVE IN THE ROADWAY, WHICH WOULD TURN N/B INTO W/B. VEHICLE 1 WAS DRIVING AROUND THE CURVE IN THE ROADWAY FROM E/B NICK LINDSTROM TO S/B AND FAILED TO NAVIGATE THE CURVE IN THE ROADWAY. AT THIS TIME, VEHICLE 1 DROVE LEFT OF CENTER AND STRUCK VEHICLE #2'S DRIVERSIDE FRONT PANEL WITH ITS DRIVERSIDE FRONTEND. VEHICLE #1'S FRONTEND ALSO STRUCK VEHICLE #2'S REAR DRIVERSIDE PANEL. DRIVER OF VEHICLE #1 STATED THAT HE DIDN'T REALIZE THE CURVE WAS THAT SHARP AND, WHEN HE HAD APPLIED HIS BRAKES, HE SLIDE LEFT OF CENTER.



Appendix B
Raw Speed Data

Location: E/W Tangent Section Nick Lidstrom Dr			
Date:	6/3/2015	Begin Time: 5:00	End Time: 5:45
EB Observation #:	Speed (mph):	WB Observation #:	Speed (mph):
1	37.5	1	32.9
2	32.3	2	29.6
3	35.6	3	35.4
4	33.6	4	40.1
5	27.2	5	27.6
6	31.2	6	40.2
7	33.4	7	36.2
8	36.3	8	29.2
9	33.3	9	32.3
10	36.7	10	34.2
11	35.1	11	34.2
12	37	12	35.9
13	33.8	13	30.8
14	35.9	14	28.2
15	31.2	15	29.8
16	34.5	16	27.5
17	31.6	17	30.3
18	28.3	18	29.6
19	33.1	19	31
20	40.1	20	34
21	28.3	21	33.2
22	30	22	26.6
23	29.6	23	27.3
24	25	24	34.1
25	29.2	25	32
26	35.1	26	35.3
27	38.7	27	26.3
28	30.2	28	27
29	35.1	29	37.5
30	27	30	34.4
31	29.8	31	29.6
32	26.6	32	30.3
33	35.8	33	29.1
34	34.3	34	26.2
35	38.4	35	37.6
36	33	36	30.5
37	34.2	37	31
38	31.3	38	29.9
39	34	39	30.4
40	27.9	40	31.8
41	38	41	33.3
42	27.7	42	28.6
43	35.8	43	32
44	36.7	44	28
45	34.4	45	31.8
46	31.9	46	28.8
47	32.4	47	32.1
48	37.1	48	29.3
49	32.5	49	32.8
50	33.2	50	28.2

End Time: 5:45 PM

5:42 PM

Location: N/S Tangent Section Nick Lidstrom Dr			
Date:	6/3/2015	Begin Time: 4:00	End Time: 5:00
NB Observation #:	Speed (mph):	SB Observation #:	Speed (mph):
1	28.7	1	28.8
2	29.6	2	25.2
3	31.6	3	26.3
4	23.7	4	24
5	33.2	5	27.8
6	29.6	6	29.3
7	24.7	7	34.8
8	32	8	29.4
9	29.7	9	33.3
10	32.6	10	30.6
11	32.3	11	32.6
12	29.7	12	25.1
13	34	13	28.5
14	27.1	14	26.5
15	25.7	15	26.3
16	31.8	16	28.1
17	31.9	17	26.3
18	27.9	18	25.1
19	34	19	28.1
20	28.8	20	30.2
21	33	21	27.3
22	24.7	22	30.1
23	28.9	23	25.6
24	32	24	26.9
25	29.7	25	30.9
26	30	26	29.2
27	26.7	27	27.8
28	37	28	28
29	30.8	29	25.9
30	33.2	30	26.6
31	28.2	31	34.7
32	25.2	32	25.7
33	23.1	33	27.2
34	30.6	34	32.1
35	32.3	35	23
36	24.4	36	29.8
37	21.3	37	28.1
38	35.3	38	25
39	29.7	39	25.5
40	25.4	40	24.9
41	33	41	29.8
42	24.8	42	35.2
43	28.5	43	26.3
44	31.1	44	24.4
45	27.6	45	28.4
46	24.3	46	24.6
47	43.2	47	30.9
48	32.4	48	27.2
49	32.8	49	30.7
50	28.3	50	25.5

End Time: 5:00pm

4:51pm

Appendix C
Directional Speed Data

EB/WB Tangent Location			
Direction:	EB	WB	Combined EB and WB
Number of Observed Vehicles	50	50	100
Average (mph)	33.02	31.48	32.25
85th Percentile (mph)	36.7	34.99	35.95
Std. Deviation (mph)	3.56	3.43	3.57
Median (mph)	33.4	30.9	32.2
Max (mph)	40.1	40.2	40.2
Min (mph)	25	26.2	25
Percent Exceeding Speed Limit by 5mph	78.00%	60.00%	69.00%
Percent Exceeding Speed Limit by 10mph	34.00%	16.00%	25.00%
EB/WB Tangent Location			
Direction:	EB	WB	Combined EB and WB
Number of Observed Vehicles	50	50	100
Average (mph)	33.02	31.48	32.25
85th Percentile (mph)	36.7	34.99	35.95
Std. Deviation (mph)	3.56	3.43	3.57
Median (mph)	33.4	30.9	32.2
Max (mph)	40.1	40.2	40.2
Min (mph)	25	26.2	25
Percent Exceeding Speed Limit by 5mph	78.00%	60.00%	69.00%
Percent Exceeding Speed Limit by 10mph	34.00%	16.00%	25.00%
Vehicles Traveling Inbound to the 90 Degree Curve			
Direction:	NB	WB	Combined NB and WB
Number of Observed Vehicles	50	50	100
Average	29.72	31.48	30.6
85th Percentile	33	34.99	34.02
Std. Deviation	4	3.43	3.81
Median	29.7	30.9	30.4
Max	43.2	40.2	43.2
Min	21.3	26.2	21.3
Percent Exceeding Speed Limit by 5mph	46.00%	60.00%	53.00%
Percent Exceeding Speed Limit by 10mph	6.00%	16.00%	11.00%
Vehicles Traveling Outbound of the 90 Degree Curve			
Direction:	EB	SB	Combined SB and EB
Number of Observed Vehicles	50	50	100
Average	33.02	28.07	30.55
85th Percentile	36.7	30.83	35.12
Std. Deviation	3.56	2.92	4.08
Median	33.4	27.8	30.1
Max	40.1	35.2	40.1
Min	25	23	23
Percent Exceeding Speed Limit by 5mph	78.00%	24.00%	51.00%
Percent Exceeding Speed Limit by 10mph	34.00%	2.00%	18.00%

Appendix D
Applicable MUTCD Sections

- 04 *Minimum spacing between warning signs with different messages should be based on the estimated PRT for driver comprehension of and reaction to the second sign.*
- 05 *The effectiveness of the placement of warning signs should be periodically evaluated under both day and night conditions.*

Option:

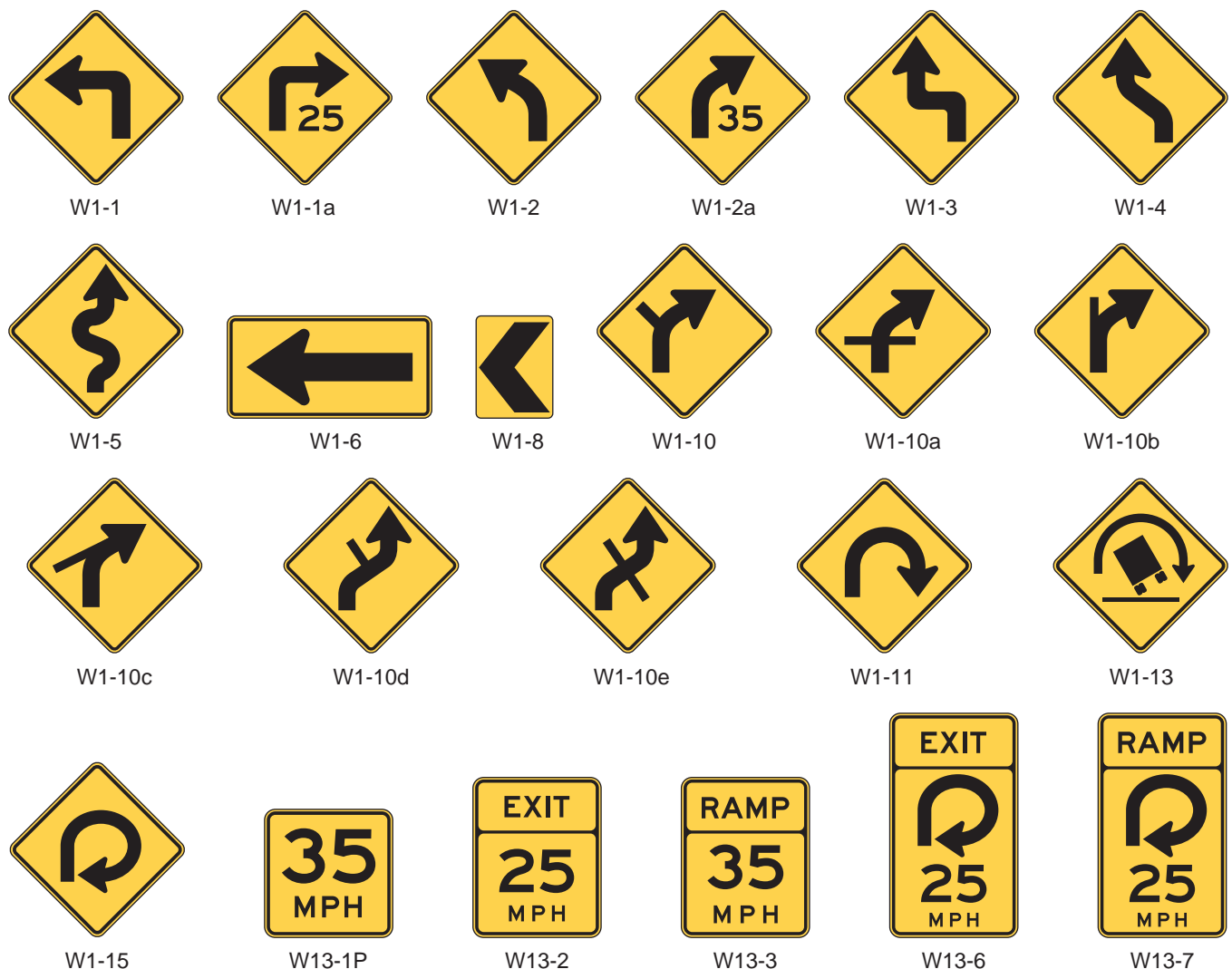
- 06 Warning signs that advise road users about conditions that are not related to a specific location, such as Deer Crossing or SOFT SHOULDER, may be installed in an appropriate location, based on engineering judgment, since they are not covered in Table 2C-4.

Section 2C.06 Horizontal Alignment Warning Signs

Support:

- 01 A variety of horizontal alignment warning signs (see Figure 2C-1), pavement markings (see Chapter 3B), and delineation (see Chapter 3F) can be used to advise motorists of a change in the roadway alignment. Uniform application of these traffic control devices with respect to the amount of change in the roadway alignment conveys a consistent message establishing driver expectancy and promoting effective roadway operations. The design and application of horizontal alignment warning signs to meet those requirements are addressed in Sections 2C.06 through 2C.15.

Figure 2C-1. Horizontal Alignment Signs and Plaques



Note: Turn arrows and reverse turn arrows may be substituted for the curve arrows and reverse curve arrows on the W1-10 series signs where appropriate.

Standard:

02 **In advance of horizontal curves on freeways, on expressways, and on roadways with more than 1,000 AADT that are functionally classified as arterials or collectors, horizontal alignment warning signs shall be used in accordance with Table 2C-5 based on the speed differential between the roadway's posted or statutory speed limit or 85th-percentile speed, whichever is higher, or the prevailing speed on the approach to the curve, and the horizontal curve's advisory speed.**

Option:

03 Horizontal Alignment Warning signs may also be used on other roadways or on arterial and collector roadways with less than 1,000 AADT based on engineering judgment.

Section 2C.07 Horizontal Alignment Signs (W1-1 through W1-5, W1-11, W1-15)

Standard:

01 **If Table 2C-5 indicates that a horizontal alignment sign (see Figure 2C-1) is required, recommended, or allowed, the sign installed in advance of the curve shall be a Curve (W1-2) sign unless a different sign is recommended or allowed by the provisions of this Section.**

02 **A Turn (W1-1) sign shall be used instead of a Curve sign in advance of curves that have advisory speeds of 30 mph or less (see Figure 2C-2).**

Guidance:

03 *Where there are two changes in roadway alignment in opposite directions that are separated by a tangent distance of less than 600 feet, the Reverse Turn (W1-3) sign should be used instead of multiple Turn (W1-1) signs and the Reverse Curve (W1-4) sign should be used instead of multiple Curve (W1-2) signs.*

Option:

04 A Winding Road (W1-5) sign may be used instead of multiple Turn (W1-1) or Curve (W1-2) signs where there are three or more changes in roadway alignment each separated by a tangent distance of less than 600 feet.

05 A NEXT XX MILES (W7-3aP) supplemental distance plaque (see Section 2C.55) may be installed below the Winding Road sign where continuous roadway curves exist for a specific distance.

06 If the curve has a change in horizontal alignment of 135 degrees or more, the Hairpin Curve (W1-11) sign may be used instead of a Curve or Turn sign.

07 If the curve has a change of direction of approximately 270 degrees, such as on a cloverleaf interchange ramp, the 270-degree Loop (W1-15) sign may be used instead of a Curve or Turn sign.

Guidance:

08 *When the Hairpin Curve sign or the 270-degree Loop sign is installed, either a One-Direction Large Arrow (W1-6) sign or Chevron Alignment (W1-8) signs should be installed on the outside of the turn or curve.*

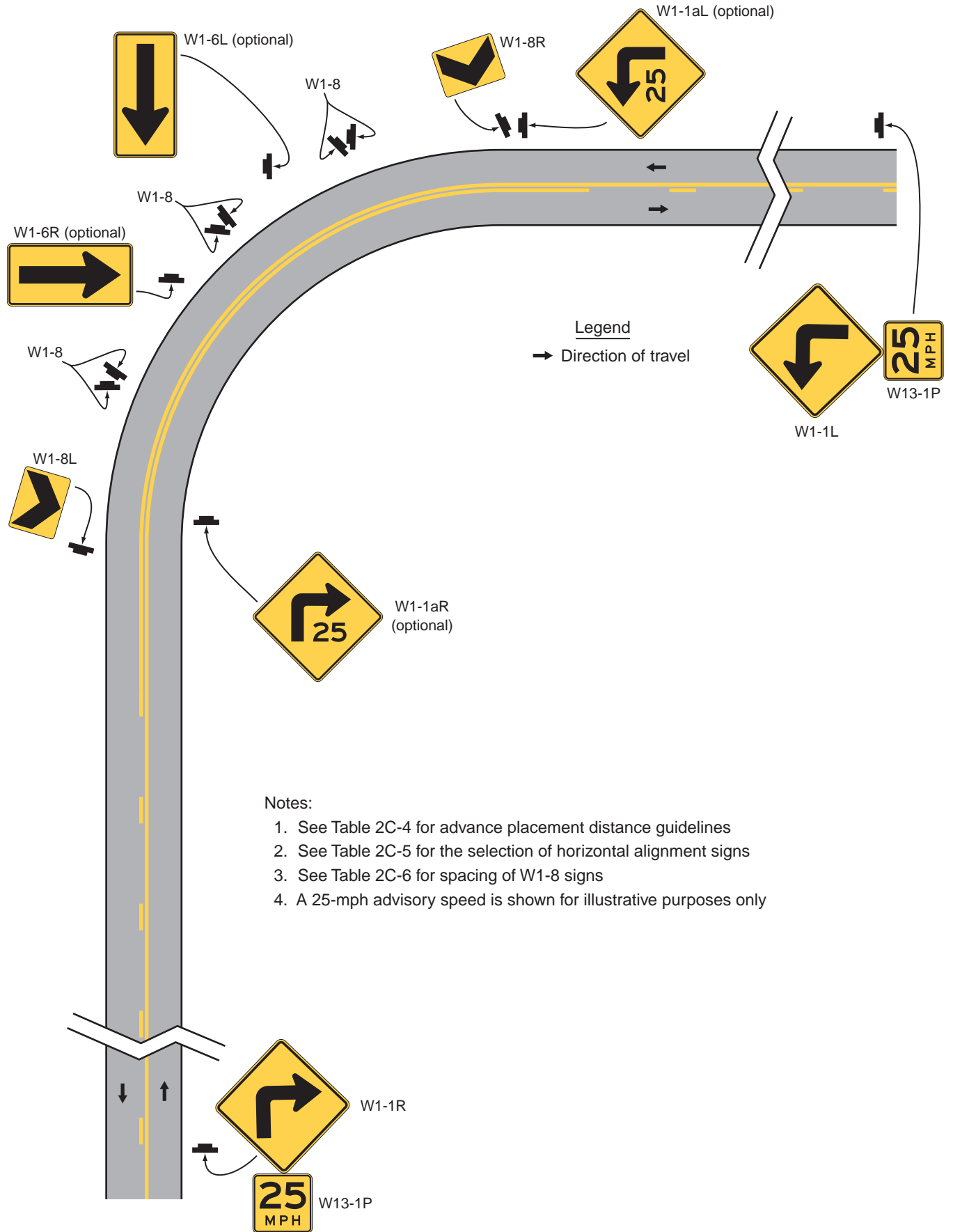
Table 2C-5. Horizontal Alignment Sign Selection

Type of Horizontal Alignment Sign	Difference Between Speed Limit and Advisory Speed				
	5 mph	10 mph	15 mph	20 mph	25 mph or more
Turn (W1-1), Curve (W1-2), Reverse Turn (W1-3), Reverse Curve (W1-4), Winding Road (W1-5), and Combination Horizontal Alignment/Intersection (W10-1) (see Section 2C.07 to determine which sign to use)	Recommended	Required	Required	Required	Required
Advisory Speed Plaque (W13-1P)	Recommended	Required	Required	Required	Required
Chevrons (W1-8) and/or One Direction Large Arrow (W1-6)	Optional	Recommended	Required	Required	Required
Exit Speed (W13-2) and Ramp Speed (W13-3) on exit ramp	Optional	Optional	Recommended	Required	Required

Note: Required means that the sign and/or plaque shall be used, recommended means that the sign and/or plaque should be used, and optional means that the sign and/or plaque may be used.

See Section 2C.06 for roadways with less than 1,000 ADT.

Figure 2C-2. Example of Warning Signs for a Turn



Notes:

1. See Table 2C-4 for advance placement distance guidelines
2. See Table 2C-5 for the selection of horizontal alignment signs
3. See Table 2C-6 for spacing of W1-8 signs
4. A 25-mph advisory speed is shown for illustrative purposes only

Section 2C.08 Advisory Speed Plaque (W13-1P)**Option:**

01 The Advisory Speed (W13-1P) plaque (see Figure 2C-1) may be used to supplement any warning sign to indicate the advisory speed for a condition.

Standard:

02 **The use of the Advisory Speed plaque for horizontal curves shall be in accordance with the information shown in Table 2C-5. The Advisory Speed plaque shall also be used where an engineering study indicates a need to advise road users of the advisory speed for other roadway conditions.**

03 **If used, the Advisory Speed plaque shall carry the message XX MPH. The speed displayed shall be a multiple of 5 mph.**

04 **Except in emergencies or when the condition is temporary, an Advisory Speed plaque shall not be installed until the advisory speed has been determined by an engineering study.**

05 **The Advisory Speed plaque shall only be used to supplement a warning sign and shall not be installed as a separate sign installation.**

06 **The advisory speed shall be determined by an engineering study that follows established engineering practices.**

Support:

07 Among the established engineering practices that are appropriate for the determination of the recommended advisory speed for a horizontal curve are the following:

- A. An accelerometer that provides a direct determination of side friction factors
- B. A design speed equation
- C. A traditional ball-bank indicator using the following criteria:
 1. 16 degrees of ball-bank for speeds of 20 mph or less
 2. 14 degrees of ball-bank for speeds of 25 to 30 mph
 3. 12 degrees of ball-bank for speeds of 35 mph and higher

08 The 16, 14, and 12 degrees of ball-bank criteria are comparable to the current AASHTO horizontal curve design guidance. Research has shown that drivers often exceed existing posted advisory curve speeds by 7 to 10 mph.

Guidance:

09 *The advisory speed should be determined based on free-flowing traffic conditions.*

10 *Because changes in conditions, such as roadway geometrics, surface characteristics, or sight distance, might affect the advisory speed, each location should be evaluated periodically or when conditions change.*

Section 2C.09 Chevron Alignment Sign (W1-8)**Standard:**

01 **The use of the Chevron Alignment (W1-8) sign (see Figures 2C-1 and 2C-2) to provide additional emphasis and guidance for a change in horizontal alignment shall be in accordance with the information shown in Table 2C-5.**

Option:

02 When used, Chevron Alignment signs may be used instead of or in addition to standard delineators.

Standard:

03 **The Chevron Alignment sign shall be a vertical rectangle. No border shall be used on the Chevron Alignment sign.**

04 **If used, Chevron Alignment signs shall be installed on the outside of a turn or curve, in line with and at approximately a right angle to approaching traffic. Chevron Alignment signs shall be installed at a minimum height of 4 feet, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way.**

Guidance:

05 *The approximate spacing of Chevron Alignment signs on the turn or curve measured from the point of curvature (PC) should be as shown in Table 2C-6.*

06 *If used, Chevron Alignment signs should be visible for a sufficient distance to provide the road user with adequate time to react to the change in alignment.*

Standard:

07 **Chevron Alignment signs shall not be placed on the far side of a T-intersection facing traffic on the stem approach to warn drivers that a through movement is not physically possible, as this is the function of a Two-Direction (or One-Direction) Large Arrow sign.**

08 **Chevron Alignment signs shall not be used to mark obstructions within or adjacent to the roadway, including the beginning of guardrails or barriers, as this is the function of an object marker (see Section 2C.63).**

Table 2C-6. Typical Spacing of Chevron Alignment Signs on Horizontal Curves

Advisory Speed	Curve Radius	Sign Spacing
15 mph or less	Less than 200 feet	40 feet
20 to 30 mph	200 to 400 feet	80 feet
35 to 45 mph	401 to 700 feet	120 feet
50 to 60 mph	701 to 1,250 feet	160 feet
More than 60 mph	More than 1,250 feet	200 feet

Note: The relationship between the curve radius and the advisory speed shown in this table should not be used to determine the advisory speed.

Section 2C.10 Combination Horizontal Alignment/Advisory Speed Signs (W1-1a, W1-2a)

Option:

01 The Turn (W1-1) sign or the Curve (W1-2) sign may be combined with the Advisory Speed (W13-1P) plaque (see Section 2C.08) to create a combination Turn/Advisory Speed (W1-1a) sign or combination Curve/Advisory Speed (W1-2a) sign (see Figure 2C-1).

02 The combination Horizontal Alignment/Advisory Speed sign may be used to supplement the advance Horizontal Alignment warning sign and Advisory Speed plaque based upon an engineering study.

Standard:

03 **If used, the combination Horizontal Alignment/Advisory Speed sign shall not be used alone and shall not be used as a substitute for a Horizontal Alignment warning sign and Advisory Speed plaque at the advance warning location. The combination Horizontal Alignment/Advisory Speed sign shall only be used as a supplement to the advance Horizontal Alignment warning sign. If used, the combination Horizontal Alignment/Advisory Speed sign shall be installed at the beginning of the turn or curve.**

Guidance:

04 *The advisory speed displayed on the combination Horizontal Alignment/Advisory Speed sign should be based on the advisory speed for the horizontal curve using recommended engineering practices (see Section 2C.08).*

Section 2C.11 Combination Horizontal Alignment/Intersection Signs (W1-10 Series)

Option:

01 The Turn (W1-1) sign or the Curve (W1-2) sign may be combined with the Cross Road (W2-1) sign or the Side Road (W2-2 or W2-3) sign to create a combination Horizontal Alignment/Intersection (W1-10 series) sign (see Figure 2C-1) that depicts the condition where an intersection occurs within or immediately adjacent to a turn or curve.

Guidance:

02 *Elements of the combination Horizontal Alignment/Intersection sign related to horizontal alignment should comply with the provisions of Section 2C.07, and elements related to intersection configuration should comply with the provisions of Section 2C.46. The symbol design should approximate the configuration of the intersecting roadway(s). No more than one Cross Road or two Side Road symbols should be displayed on any one combination Horizontal Alignment/Intersection sign.*

Standard:

03 **The use of the combination Horizontal Alignment/Intersection sign shall be in accordance with the appropriate Turn or Curve sign information shown in Table 2C-5.**

Section 2C.12 One-Direction Large Arrow Sign (W1-6)

Option:

01 A One-Direction Large Arrow (W1-6) sign (see Figure 2C-1) may be used either as a supplement or alternative to Chevron Alignment signs in order to delineate a change in horizontal alignment (see Figure 2C-2).

02 A One-Direction Large Arrow (W1-6) sign may be used to supplement a Turn or Reverse Turn sign (see Figure 2C-2) to emphasize the abrupt curvature.