



CITY of NOVI CITY COUNCIL

Agenda Item G
July 11, 2016

SUBJECT: Approval of Traffic Control Order 16-27 to set the speed limit on Hudson Drive at 30 miles per hour.

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

CITY MANAGER APPROVAL: *[Signature]*

BACKGROUND INFORMATION:

Engineering staff worked with the City's traffic consultant, AECOM, to establish a speed limit on Hudson Drive in Beck North Corporate Park following an inquiry from the Police Department. Staff typically does not establish a legal speed limit in new office/industrial developments until there are enough occupied buildings and traffic to gather a speed sample that is statistically accurate. Consequently, the City's traffic consultant, AECOM, prepared the attached study and recommends a posted speed limit of 30 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 25 miles per hour at the bends in the road.

Upon approval of the traffic control orders, the new signs will be scheduled for installation by DPS' Field Operations Division.

RECOMMENDED ACTION: Approval of Traffic Control Order 16-27 to set the speed limit on Hudson Drive at 30 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				

**CITY OF NOVI
TRAFFIC CONTROL ORDER**

 X SPEED
 PARKING
 OTHER

DATE OF ORDER: 6/23/2016

CONTROL NUMBER: 16-27

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.

HUDSON

AND AFTER SAID INVESTIGATION, IT IS HEREBY ORDERED AND DIRECTED THAT THE DEPARTMENT OF PUBLIC SERVICES ERECT AND MAINTAIN THE 30 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:

30 MPH SPEED LIMIT ON HUDSON DRIVE



Brian Coburn, P.E. - Traffic Engineer
Dated: 6/23/2016

APPROVED BY CITY COUNCIL

TRAFFIC CONTROL ORDER NUMBER 16-27 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,

30 MPH SPEED LIMIT ON HUDSON DRIVE

ADOPTED AT THE REGULAR MEETING OF
CITY COUNCIL ON 6/27/2016 .

By: _____
Robert J. Gatt, Mayor

By: _____
Cortney Hanson, City Clerk

Memorandum

To	Brian Coburn, PE	Page	1
CC			
Subject	Hudson Drive Speed Study		
From	Matt Klawon, PE Maureen Peters, PE Marcelle Curtis		
Date	June 10, 2016		

Introduction

Hudson Drive is an industrial roadway with minor horizontal curves located within the City of Novi. The north-south roadway is approximately 2/3 mile in length, connecting West Road in the south to Cartier Drive in the north. The speed limit on the roadway is currently unposted. The objective of this study is to provide engineering review for the establishment of an appropriate posted speed limit on Hudson Drive.

Data Collection

Inquiries and Design

At the request of the City, AECOM reviewed a resident's request for the posting of speed limit signs along Hudson Drive. As part of the review, the as-built roadway design plans were reviewed to determine the design speed of the roadway. The provided as-built plans do not indicate the design speed; however, the plans indicate a proposed 25 mile per hour (mph) speed limit sign near the south end of Hudson Drive.

Crash Data

AECOM gathered crash data along the entire segment of Hudson Drive. Data was extracted from the Traffic Improvement Association's (TIA) Traffic Crash Analysis Tool (TCAT) for the five-year period of January 1, 2011 through December 31, 2015. Within this time period, two crashes occurred in the study area as shown in Table 1. Incident one involved a crash with an animal. Incident two involved a commercial vehicle turning from Cartier Drive onto Hudson Drive at a high speed. It can be concluded that neither of these incidents directly relate to speed control on Hudson Drive. UD-10 reports for each of the crashes listed are available in Appendix A.

Table 1. Crash History of Hudson Drive (2011 - 2015)

Crash ID	Crash Date	Crash Type	Crash Location	Comments
8544307	01/06/2013	Single Vehicle	Hudson Drive 1,500' N of West Road	A deer ran in front of vehicle 1. The deer was struck and ran off.
8791998	11/12/2013	Single Vehicle	Hudson Drive 15' S of Cartier Road	Vehicle 1, a commercial vehicle, turned left from eastbound Cartier Road onto southbound Hudson Drive at an excessive speed. Driver lost control and the vehicle overturned.

Field Review

Existing Conditions

Currently, there are no speed limit signs posted along Hudson Drive. A yield sign is located at the northbound approach of Hudson Drive at Cartier Drive. The intersection of Hudson Drive and West Road maintains southbound Hudson Drive traffic via stop-control. A form of traffic calming currently exists in the northbound direction of travel near Nadlan Drive. A radar speed sign alerting drivers to their current speed has been placed at the driveway across from Peary Drive, as shown in Figure 1.

Figure 1. Northbound Radar Speed Sign Across from Peary Drive



There is a significant amount of pedestrian traffic in the street due to the absence of sidewalks. Groups of pedestrians or single pedestrians were observed walking in the roadway on multiple

occasions. Several large trucks were also observed utilizing the roadway. Street lights do not exist along Hudson Drive, but adjacent business parking facilities are lighted.

Four (4) cul-de-sac roadways intersect Hudson Drive. Nadlan Drive is the northernmost cul-de-sac and intersects Hudson Drive from the east and is yield controlled. The remaining three cul-de-sacs, Peary Court (from the east), Ryan Court (from the west), and Desoto Court (from the east) are stop controlled. Northbound and southbound traffic is maintained on a 34 foot wide roadway; minor roadway curvature and sign specifics are displayed in Figure 2.

Figure 2. Existing Signing along Hudson Drive



Speed Profile

A speed profile was developed to assess the threshold for the highest comfortable rate of travel along the corridor. Northbound and southbound test runs were conducted along Hudson Drive on Monday, May 23, 2016 using PC-Travel software. Five (5) round-trip runs were completed to generate an operating speed profile along Hudson Drive. Overall speed profile for northbound travel was 31.2 mph and southbound travel was 31.8 mph. Detailed statistics by run and speed/distance profiles for all completed runs are contained in Appendix B.

Speed Data Collection

Vehicle speeds were recorded on Tuesday, May 24, 2016 and Wednesday, May 25, 2016 using pneumatic road tubes. Speed data of vehicles were recorded for 48 hours at two separate locations along Hudson Drive. The two locations where data were recorded are detailed as:

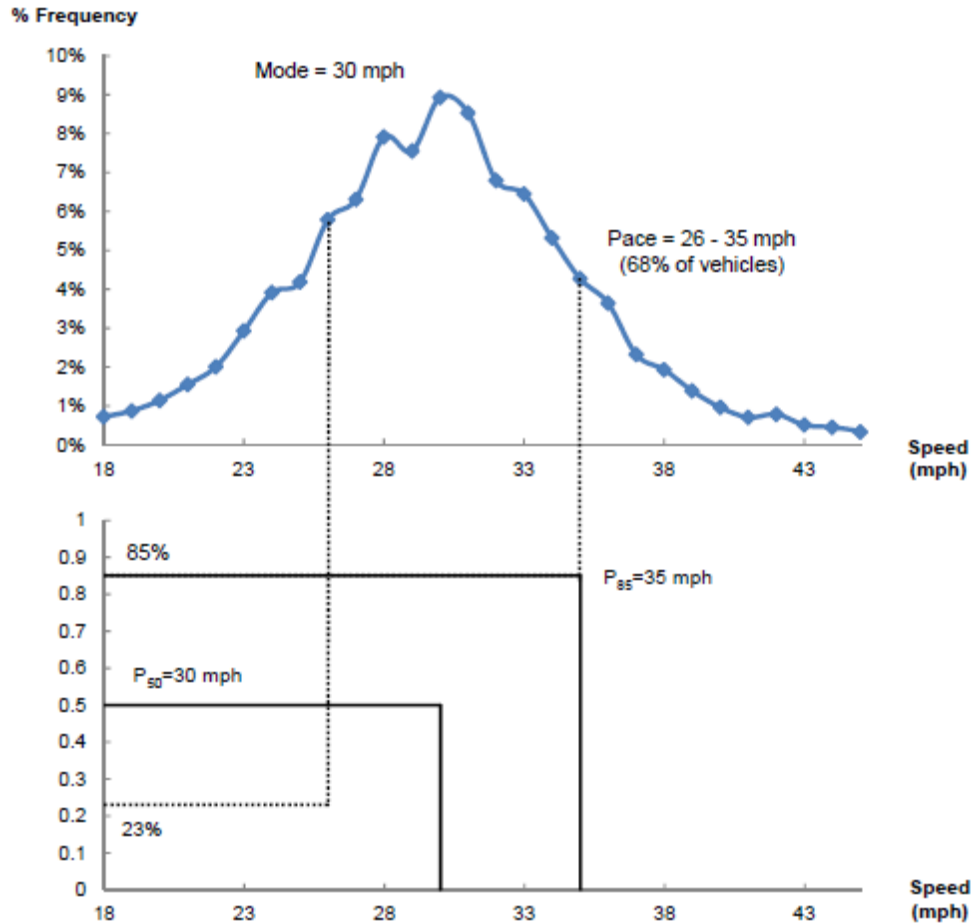
- Hudson Drive between Desoto Court and Ryan Court
- Hudson Drive south of Nadlan Drive

A summary of the speed data and frequency distribution is displayed in Table 2 and Figure 3. Raw speed data can be found in Appendix C.

Table 2. Speed Data Summarized for All Directions of Travel

	All Observations
Number of Observations	6,504
Average (μ) (mph)	30.05
85th Percentile (mph)	35.00
Std. Deviation	5.01
Median (mph)	30
Pace	26 to 35 mph

Figure 3. Frequency Distribution for All Directions of Travel



Overall, the average vehicle speed on Hudson Drive is 30.05 mph with an 85th percentile speed of 35 mph.

Directional speed data can be found in Appendix D.

Existing Curvature

Many of the existing horizontal curves throughout the roadway were designed with a radius of 230 feet. According to Exhibit 3-16 of the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*, the design speed of these curves is approximately 27mph.

Analysis and Recommendation

The speed data collected indicated the following:

- The 85th percentile speed is 35 miles per hour.

- Overall operating speed from test runs for northbound travel was 31.2 mph and southbound travel was 31.8 mph.

Considering the existing roadway geometry and speed data collected, a posted speed limit of 30 mph is recommended. Although the speed data shows that the 85th percentile speed, which is commonly used in setting speed limits, is 35 mph, other factors influence the decision to recommend 30 mph as the posted speed limit, including:

- The radii of the closely spaced horizontal curves generally could only be comfortably traversed at 25 mph or less by a passenger vehicle.
- The presence of large trucks.
- The presence of pedestrians within the roadway.

Curve warning signs with an advisory speed plaque of 25 mph are recommended at the locations depicted in Figure 4. The curve warning signs should be placed in advance of the curves based on MDOT standards. Speed limit signs (R2-1) would be recommended for placement at the following locations:

Northbound Signs

- 100 feet north of West Road
- Midblock between Peary Ct and Nadlan Ct

Southbound Signs

- 100 feet south of Cartier Drive
- South of Peary Ct

The existing radar speed sign located across from Peary Ct should be relocated to the proposed speed limit sign located midblock between Peary Ct and Nadlan Ct. The radar speed sign relocation is denoted by an asterisk in Figure 4.

The City could consider constructing sidewalks along one or both sides of the roadway and a marked crosswalk in order to provide safe passage to pedestrians utilizing the roadway. Further study of pedestrian traffic would be required to determine a suitable location for the crosswalk.

Figure 4: Proposed regulatory and warning signing locations along Hudson Drive (not to scale)



Appendix A

UD-10 Crash Reports

SANITIZED

Authority: 1949 PA 300, Sec.257.622
Compliance: Required MSP UD-10E
Penalty: \$100 and/or 90 days (Rev 11/2006)

External # **#####** Crash ID **8544307**

Page 01 of 01
Incident # ##### File Class C3148

STATE OF MICHIGAN TRAFFIC CRASH REPORT

ORI: MI 6362700		Department Name Novi Police Dept			Incident Disposition Closed		Reviewer MAY (00814)		
Crash Date 01/06/2013	Crash Time 11:58	No. of Units 01	Crash Type Single Motor Vehicle	Special Circumstances <input type="checkbox"/> School Bus <input type="checkbox"/> None <input checked="" type="checkbox"/> Deer <input type="checkbox"/> Hit and Run <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 Snow/Blowing Snow	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

LOCATION	Prefix	Road Name HUDSON	Road Type DR	Suffix	Divided Roadway
	Distance 1,500 Feet N	Traffic Way 01 - Not physically divided		Access Control 01 - No access control	
	Prefix	Intersecting Road WEST	Road Type RD	Suffix	Divided Roadway

UNIT / DRIVER	Unit Number 01	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) 07/02/1990 (22)	License Type <input checked="" type="checkbox"/> Operator <input type="checkbox"/> Cycle <input type="checkbox"/> Farm <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 ##### WIXOM, MI 48393-1811 (###) ###-####				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 No	Ambulance NONE				
	Alcohol <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Refused <input type="checkbox"/> Not offered				Test Results		Drugs <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Test Results		Citation Issued <input type="checkbox"/> Hazardous <input type="checkbox"/> Other			
	Test Type <input type="checkbox"/> Field <input type="checkbox"/> PBT <input type="checkbox"/> Breath <input type="checkbox"/> Blood <input type="checkbox"/> Urine				Vehicle Registration #####		State MI	Insurance / Policy # #####	Towed To/By #####		Special Vehicles 0	Private Trailer Type	Vehicle Defect
	VIN #####		Vehicle Description SATURN		Make ION	Model	Color SILVER	Year 2007	Vehicle Type Passenger Car				
	Location of Greatest Damage 02	First Impact 02	Extent of Damage 1	Driveable Yes	Vehicle Direction S	Vehicle Use 01 - Private	Action Prior 01 - Going Straight Ahead						
	Sequence of Events First <input checked="" type="checkbox"/> 20 - Animal				Second	Third	Fourth						
	<p>(● indicates MOST harmful event)</p>												

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="checkbox"/> H <input type="checkbox"/> P <input type="checkbox"/> T <input type="checkbox"/> S <input type="checkbox"/> O <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 #	

OWNERS	Owner Information				Owner Information				
	Person Advised of Damaged Traffic Control				Damaged Property				Public

Contact Name: #####	Damaged Property		Public
Contact Date: #####	Owner & Phone		
Contact Time: ##:##			

SANITIZED SANITIZED SANITIZED SANITIZED 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 <input 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	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		Drugs <input type="radio"/> Yes <input type="radio"/> No		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				Test Results		Test Type <input type="radio"/> Blood <input type="radio"/> Urine				
	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		

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	

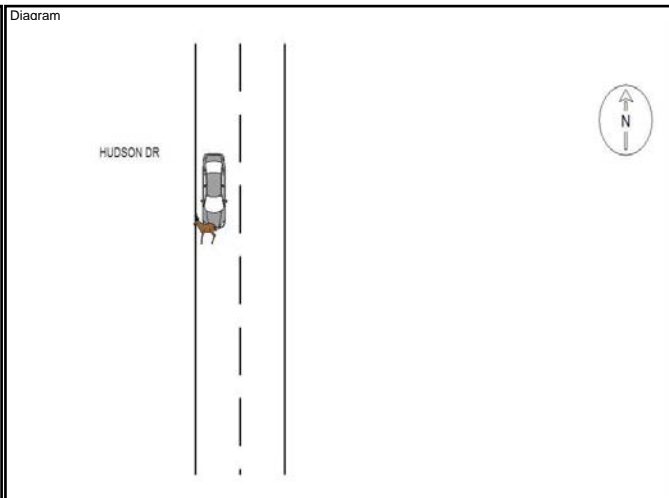
TRUCK / BUS	Carrier Information				Carrier Source	GVWR	ICCMC	USDOT	MPSC	
					Driver's CDL Type	Endorsements <input type="radio"/> H <input type="radio"/> P <input type="radio"/> T <input type="radio"/> N <input type="radio"/> S <input type="radio"/> X	CDL Exempt <input type="radio"/> Farm <input type="radio"/> 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
A DEER RAN OUT IN FRONT OF VEHICLE #1. THE DEER WAS STRUCK AND THEN RAN OFF. NO FURTHER INFO.



Appendix B

Hudson Drive Speed Profile

AECOM
Hudson Drive
NB Speed Profile

Study Name : **Hudson Drive_NB_Speed Profile**
Study Date : **5/23/2016**
Page No. : **1**

Detailed Statistics By Run

Average Speed (MPH) by Section

Hudson Drive Speed-NB-001
Hudson Drive Speed-NB-002
Hudson Drive Speed-NB-003
Hudson Drive Speed-NB-004
Hudson Drive Speed-NB-005

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5
1	0	West Road					
2	356	Desoto Court	19.0	21.0	21.8	22.3	24.1
3	314	Ryan Court	29.5	30.4	31.1	31.6	31.6
4	487	Peary Court	32.2	33.9	34.0	35.4	34.2
5	1368	Nadlan Court	32.9	35.2	33.6	34.5	31.9
6	604	Cartier Drive	31.3	34.5	33.1	33.8	32.4
Totals	3129		29.6	31.8	31.2	32.2	31.0

AECOM
Hudson Drive
SB Speed Profile

Study Name : **Hudson Drive_SB_Speed Profile**
Study Date : **5/23/2016**
Page No. : **1**

Detailed Statistics By Run

Average Speed (MPH) by Section

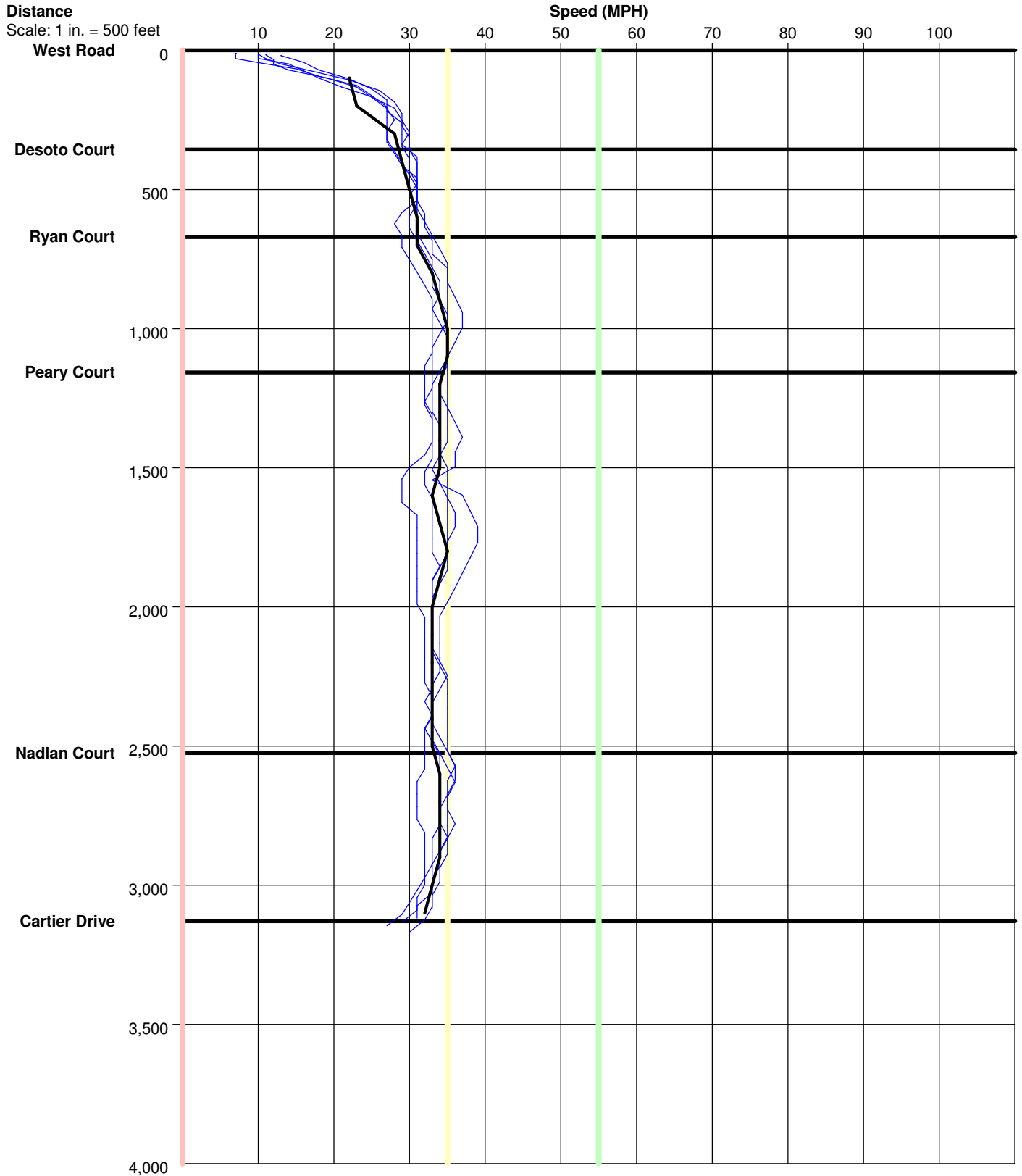
*Hudson Drive Speed-SB-001
Hudson Drive Speed-SB-002
Hudson Drive Speed-SB-003
Hudson Drive Speed-SB-004
Hudson Drive Speed-SB-005*

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5
1	0	Cartier Drive					
2	786	Nadlan Court	27.4	28.6	29.8	31.3	27.9
3	1390	Peary Court	32.3	32.5	32.0	36.8	34.6
4	484	Ryan Court	32.9	34.5	34.3	36.6	37.3
5	339	Desoto Court	31.6	28.0	26.5	31.1	32.3
6	123	West Road	31.0	30.5	25.7	29.3	28.7
Totals	3122		30.8	31.1	30.8	34.1	32.4

AECOM
Hudson Drive
NB Speed Profile

Study Name : **Hudson Drive_NB_Speed Profile**
Study Date : **5/23/2016**
Page No. : **2**

Speed/Distance Profiles of All Runs



AECOM

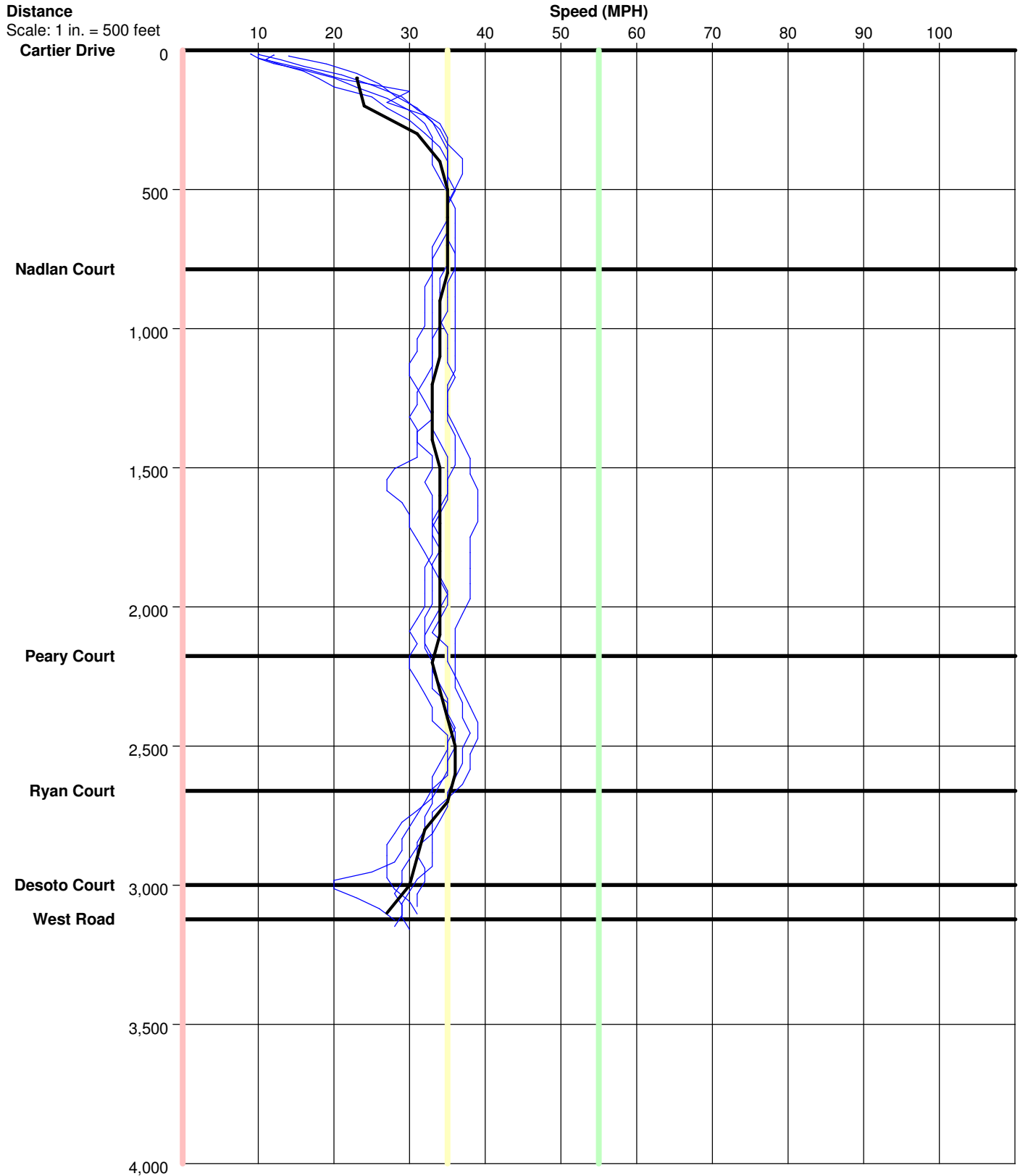
Hudson Drive
SB Speed Profile

Study Name : Hudson Drive_SB_Speed Profile

Study Date : 5/23/2016

Page No. : 2

Speed/Distance Profiles of All Runs



Appendix C

Raw Speed Data

Speed Frequency Distribution Table				
Speed	Frequency	% Frequency	Cumulative Frequency	Cumulative %
18	48	0.74%	48	0.74%
19	58	0.89%	106	1.63%
20	76	1.17%	182	2.80%
21	103	1.58%	285	4.38%
22	133	2.04%	418	6.43%
23	194	2.98%	612	9.41%
24	259	3.98%	871	13.39%
25	277	4.26%	1148	17.65%
26	383	5.89%	1531	23.54%
27	418	6.43%	1949	29.96%
28	524	8.06%	2473	38.02%
29	500	7.69%	2973	45.70%
30	591	9.09%	3564	54.79%
31	565	8.69%	4129	63.47%
32	450	6.92%	4579	70.39%
33	427	6.56%	5006	76.96%
34	352	5.41%	5358	82.37%
35	283	4.35%	5641	86.72%
36	241	3.70%	5882	90.42%
37	154	2.37%	6036	92.79%
38	128	1.97%	6164	94.76%
39	92	1.41%	6256	96.17%
40	64	0.98%	6320	97.16%
41	47	0.72%	6367	97.88%
42	52	0.80%	6419	98.68%
43	34	0.52%	6453	99.20%
44	30	0.46%	6483	99.66%
45	22	0.34%	6505	100.00%

% Frequency = Frequency / N

Cumulative % Frequency = Cumulative Frequency / N

Appendix D

Directional Speed Data

Northbound Vehicles	
Direction:	NB
Number of Observations	2958
Average Speed (mph)	30.08
85th Percentile	34
Std. Deviation	5.37
Median	30

Southbound Vehicles	
Direction:	SB
Number of Observations	3546
Average Speed (mph)	30.02
85th Percentile	36
Std. Deviation	4.68
Median	30