



CITY of NOVI CITY COUNCIL

Agenda Item K
August 23, 2010

SUBJECT: Approval of 1) Traffic Control Order 10-39 for the implementation of a 35 mph speed limit on Meadowbrook Road between 12 Mile Road and 13 Mile Road, 2) Traffic Control Order 10-48 to rescind existing Traffic Control Order 98-12 for a permanent 25 mph speed limit adjacent to Meadowbrook Elementary School, and 3) Traffic Control Order 10-40 for the implementation of a 25 mph school speed limit on Meadowbrook Road from 500 feet north of the Meadowbrook Elementary School driveway to 200 feet south of the Meadowbrook Elementary School driveway on school days only during the periods of 8:27 AM to 8:57 AM and 4:00 PM to 4:30 PM.

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

CITY MANAGER APPROVAL: 

BACKGROUND INFORMATION:

A recent audit of the City's traffic control sign inventory identified a number of posted speed limits that lack traffic control orders for enforcement of the speed. The Uniform Traffic Code requires that traffic control orders, as issued by the traffic engineer and approved by the City Council, be on file for the enforcement of traffic control signs. As such, an engineering study was performed to establish a legal speed limit as required by the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) (see Birchler Arroyo study dated May 3, 2010). Speed limits are generally set using the 85th percentile speed, which is the speed at or below which 85 percent of the motorists drive on a given road when unaffected by slower traffic or poor weather.

The posted speed limit on Meadowbrook Road between 12 Mile Road and 13 Mile Road is currently 25 mph between Meadowbrook Elementary and 13 Mile Road and 30 mph south of the school to 12 Mile Road. There is not a traffic control order on file for the 30 mph posted speed on Meadowbrook Road between 12 Mile Road and Meadowbrook Elementary. A speed limit of 35 mph is proposed to represent existing driver behavior on this segment as demonstrated by the measured 85th percentile speeds and shown in the following table.

Segment	Current Posted Speed Limit	85 th Percentile Speed	Recommended Posted Speed Limit
12 Mile Road to Meadowbrook Elem	30	36	35
13 Mile Road to Meadowbrook Elem	25	36	35

The existing 25 mph speed limit near the school was established in 1998 at the request of the Superintendent of Schools at the time with the intent that it be in effect during school hours. However, the posted sign and the traffic control order did not reference specific

hours and is in effect all day, every day (see Birchler Arroyo report, attached). A review of the school zone was included in the speed study and the report continues to recommend a 25 mph zone adjacent to the school, during school hours. State law (MCL 257.627a, attached) allows the speed limit to be decreased by 15 mph from the posted speed (but set at not less than 25 mph) in a school zone for a period of 30 minutes to one hour before school and 30 minutes to one hour after school, when requested by the school superintendent. Staff has discussed the proposed school speed zones with Walled Lake Schools and the Superintendent has provided the enclosed August 16, 2010 letter.

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

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

RECOMMENDED ACTION: Approval of 1) Traffic Control Order 10-39 for the implementation of a 35 mph speed limit on Meadowbrook Road between 12 Mile Road and 13 Mile Road, 2) Traffic Control Order 10-48 to rescind existing Traffic Control Order 98-12 for a permanent 25 mph speed limit adjacent to Meadowbrook Elementary School, and 3) Traffic Control Order 10-40 for the implementation of a 25 mph school speed limit on Meadowbrook Road from 500 feet north of the Meadowbrook Elementary School driveway to 200 feet south of the Meadowbrook Elementary School driveway on school days only during the periods of 8:27 AM to 8:57 AM and 4:00 PM to 4:30 PM.

	1	2	Y	N
Mayor Landry				
Mayor Pro Tem Gatt				
Council Member Crawford				
Council Member Fischer				

	1	2	Y	N
Council Member Margolis				
Council Member Mutch				
Council Member Staudt				



Walled Lake Consolidated Schools

William A. Hamilton, Ed.D.
Superintendent of Schools

Educational Services Center
850 Ladd Road, Building D
Walled Lake, MI 48390
Phone: 248/956-2000
Fax: 248/956-2123

August 16, 2010

Brian T. Coburn, P.E.
Engineering Division, Department of Public Services
City of Novi
26300 Delwal Drive
Novi, MI 48375
bcoburn@cityofnovi.org

Subject: School Speed Zone on Meadowbrook Road, 12 Mile Road to 13 Mile Road

Dear Mr. Coburn,

We have been advised of the proposed speed limit changes on Meadowbrook Road between 12 and 13 Mile Roads, which includes the portion of roadway in front of Meadowbrook Elementary School.

We request a 25 mph school speed zone be designated on that portion of roadway in front of Meadowbrook Elementary School and that signage be installed to properly designate this school speed zone.

Thank you for your assistance and please contact me with any additional questions.

Sincerely,

A handwritten signature in black ink that reads 'William A. Hamilton'.

William A. Hamilton, Ed.D.
Superintendent of Schools

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 area calculations 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.

City Of Novi



0 45 90 180 270 360
Feet

Meadowbrook School Speed Zone



**CITY OF NOVI
TRAFFIC CONTROL ORDER**

 X SPEED
 PARKING
 OTHER

DATE OF ORDER: August 16, 2010
CONTROL NUMBER: 10-39

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

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

MEADOWBROOK ROAD

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

SPEED LIMIT FOR MEADOWBROOK ROAD BETWEEN 12 MILE ROAD AND 13 MILE ROAD TO BE 35 MPH EXCEPT FOR THE SCHOOL SPEED ZONE AS ESTABLISHED BY TCO 10-40.



Brian Coburn, P.E. - Traffic Engineer

Dated: August 16, 2010

APPROVED BY CITY COUNCIL

TRAFFIC CONTROL ORDER NUMBER 10-39 HAVING BEEN PRESENTED TO THE COUNCIL OF THE CITY OF NOVI, MICHIGAN FOR STUDY AND APPROVAL, IS HEREBY APPROVED AND IT IS HEREBY ORDERED AND DIRECTED THAT THIS ORDER BE FILED IN THE OFFICE OF THE CITY CLERK AND A COPY THEREOF IN THE OFFICE OF THE CHIEF OF POLICE OF SAID CITY.

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

SPEED LIMIT FOR MEADOWBROOK ROAD BETWEEN 12 MILE ROAD AND 13 MILE ROAD TO BE 35 MPH EXCEPT FOR THE SCHOOL SPEED ZONE AS ESTABLISHED BY TCO 10-40.

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

By: _____
David Landry, Mayor

By: _____
Maryanne Cornelius, Clerk

CITY OF NOVI
TRAFFIC CONTROL ORDER

 X SPEED
 PARKING
 OTHER

DATE OF ORDER: August 16, 2010

CONTROL NUMBER: 10-48

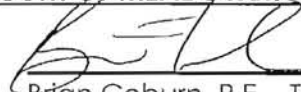
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MEADOWBROOK ROAD

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TO RESCIND TRAFFIC CONTROL ORDER 98-12 FOR 25 MPH SPEED LIMIT ON MEADOWBROOK RD BETWEEN 13 MILE ROAD AND A POINT 1/2 MILE SOUTH OF MEADOWBROOK ELEMENTARY SCHOOL



Brian Coburn, P.E. - Traffic Engineer

Dated: August 16, 2010

APPROVED BY CITY COUNCIL

TRAFFIC CONTROL ORDER NUMBER 10-48 HAVING BEEN PRESENTED TO THE COUNCIL OF THE CITY OF NOVI, MICHIGAN FOR STUDY AND APPROVAL, IS HEREBY APPROVED AND IT IS HEREBY ORDERED AND DIRECTED THAT THIS ORDER BE FILED IN THE OFFICE OF THE CITY CLERK AND A COPY THEREOF IN THE OFFICE OF THE CHIEF OF POLICE OF SAID CITY.

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

TO RESCIND TRAFFIC CONTROL ORDER 98-12 FOR 25 MPH SPEED LIMIT ON MEADOWBROOK RD BETWEEN 13 MILE ROAD AND A POINT 1/2 MILE SOUTH OF THE ELEMENTARY SCHOOL

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

By: _____
David Landry, Mayor

By: _____
Maryanne Cornelius, Clerk

**CITY OF NOVI
TRAFFIC CONTROL ORDER**

 X SPEED
 PARKING
 OTHER

DATE OF ORDER: August 16, 2010

CONTROL NUMBER: 10-40

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

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SCHOOL SPEED LIMIT ON MEADOWBROOK FROM 500 FEET NORTH OF THE MEADOWBROOK ELEMENTARY SCHOOL DRIVEWAY TO 200 FEET SOUTH OF SAID DRIVEWAY ON SCHOOL DAYS ONLY DURING THE PERIOD OF 8:27 AM TO 8:57 PM AND 4:00 PM TO 4:30 PM.



Brian Coburn, P.E. - Traffic Engineer

Dated: August 16, 2010

APPROVED BY CITY COUNCIL

TRAFFIC CONTROL ORDER NUMBER 10-40 HAVING BEEN PRESENTED TO THE COUNCIL OF THE CITY OF NOVI, MICHIGAN FOR STUDY AND APPROVAL, IS HEREBY APPROVED AND IT IS HEREBY ORDERED AND DIRECTED THAT THIS ORDER BE FILED IN THE OFFICE OF THE CITY CLERK AND A COPY THEREOF IN THE OFFICE OF THE CHIEF OF POLICE OF SAID CITY.

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

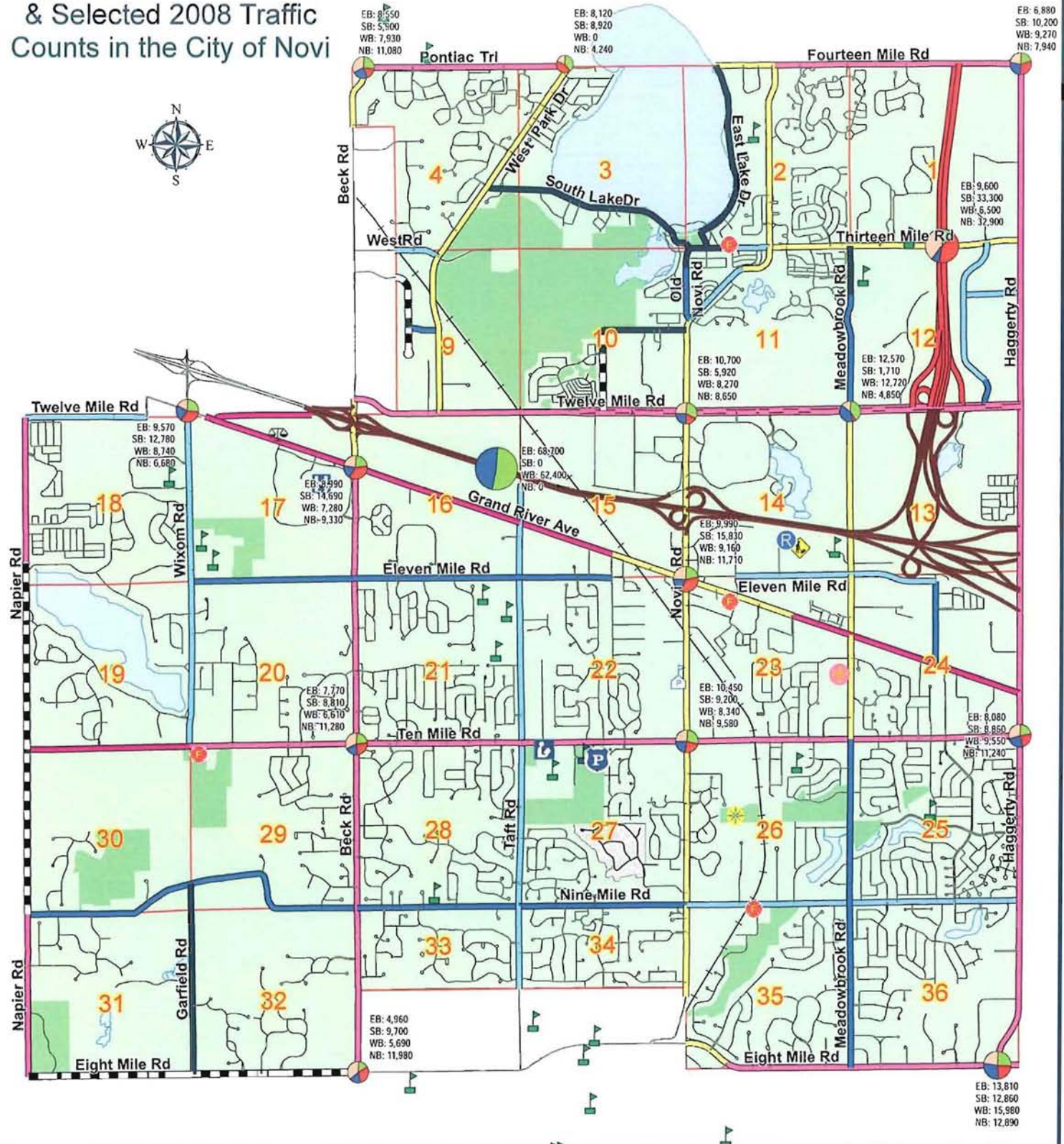
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ADOPTED AT THE REGULAR MEETING OF
CITY COUNCIL ON August 23, 2010.

By: _____
David Landry, Mayor

By: _____
Maryanne Cornelius, Clerk

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



Map Author: Christopher Blough, GIS Manager
 Date: August 16, 2010
 Project: Speed Limits and Selected 2008 Traffic Counts
 Version #: 1.0

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 area calculations 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.

Map Legend

<p>Traffic Counts</p> <p>Traffic Volume is Proportionate to Size of Pie = 270,000 ADT</p> <p> ■ Eastbound Traffic ■ Southbound Traffic ■ Westbound Traffic ■ Northbound Traffic </p>	<p>Posted Speed Limits</p> <p> — Expressway/Ramp — Unposted (55 MPH) — 55 — 50 — 45 — 40 — 35 — 30 — 25 — Residential 25 </p> <p> + Railroad ■ Parks </p>
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City of Novi
 Geographic Information Services
 Department of Information Technology
 45175 W Ten Mile Rd
 Novi, MI 48375
 cityofnovi.org

1 inch = 4,400 feet

MICHIGAN VEHICLE CODE (EXCERPT)
Act 300 of 1949

257.627a "Regularly scheduled school session," "school," and "school zone" defined; prima facie speed limit in school zone; signs; applicability of section to walkway; location of school; school in session year-round.

Sec. 627a. (1) As used in this section and section 629:

(a) "Regularly scheduled school session" means that part of a day of student instruction that is followed by a break for lunch or by a final dismissal of the student body for that day.

(b) "School" means an educational institution operated by a local school district or by a private, denominational, or parochial organization. School does not include an educational institution that the department of education determines has its entire student population in residence at the institution.

(c) "School zone" means school property on which a school building is located and the area adjacent to the school property that is designated by the signs required under subsection (2). Except as otherwise provided in subsection (5), the school zone extends not more than 1,000 feet from the property line of the school in each direction.

(2) Except as provided in subsection (4), the prima facie speed limit in a school zone, which shall be in force not less than 30 minutes but not more than 1 hour before the first regularly scheduled school session until school commences and from dismissal until not less than 30 minutes but not more than 1 hour after the last regularly scheduled school session, and during a lunch period when students are permitted to leave the school, shall be 25 miles an hour, if permanent signs designating the school zone and the speed limit in the school zone are posted at the request of the school superintendent. The signs shall conform to the Michigan manual of uniform traffic control devices.

(3) This section does not apply to a limited access highway or to that portion of a street or highway over which a pedestrian overhead walkway is erected, if the walkway is adjacent to school property and is designed and located so as to be used, and is being used, as the principal means by which students of a school that has property adjacent to the walkway travel to and from the school.

(4) Local authorities may increase or decrease the prima facie speed limit within a school zone under their jurisdiction pursuant to section 629.

(5) Notwithstanding the requirements for a school zone as defined in subsection (1)(c), if a school is located in an area that requires school children to cross a state trunk line highway or county highway that has a speed limit of 35 miles per hour or more to attend that school, the school superintendent may submit a request to the state transportation commission, county road commission, or local authority having jurisdiction over the roadway, as applicable, for a school crossing as permitted under section 613a. If, based on the traffic engineering studies, the road authority determines the need for a lower speed limit, the road authority may designate the crossing as a school zone. Before submitting a request, the school superintendent shall have completed a school route plan as prescribed by section 7A-1 of the Michigan manual of uniform traffic control devices.

(6) Notwithstanding the 25-mile-per-hour prima facie speed limit established by subsection (2), the prima facie speed limit for any street in a school zone that has sidewalks along at least 1 side of the street, which shall be in force during the same periods that a 25-mile-per-hour speed limit provided by subsection (2) would otherwise be effective, shall be set at the limit requested by the superintendent of schools with jurisdiction over the school within the school zone, but this limit shall neither be more than 15 miles per hour below the regularly posted speed limit for that street nor less than 25 miles per hour. Permanent signs designating the school zone and the speed limit in the school zone shall be posted. These signs shall conform to the Michigan manual of uniform traffic control devices.

(7) If appropriate, the school superintendent may request that a sign be erected in the school zone indicating that a school is in session year-round. A sign erected under this subsection shall be posted on the same signpost as the school zone sign and immediately below the school zone sign. The sign shall read "Year-Round School" and shall conform to the Michigan manual of uniform traffic control devices.

History: Add. 1978, Act 42, Imd. Eff. Mar. 7, 1978;—Am. 1979, Act 21, Eff. Mar. 27, 1980;—Am. 1980, Act 222, Imd. Eff. July 18, 1980;—Am. 1996, Act 574, Imd. Eff. Jan. 16, 1997;—Am. 2000, Act 110, Imd. Eff. May 22, 2000;—Am. 2005, Act 88, Imd. Eff. July 20, 2005.

MEMORANDUM



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

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

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

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

Legal Requirements for Speed Limits

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

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

Public Perception of Speed Limits

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

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

Proposed Speed Limits

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

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

(*)A 30 mph school speed zone is proposed for this segment during school arrival and dismissal times

(**)A 25 mph school speed zone is proposed for this segment during school arrival and dismissal times

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

Public Notification

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



Implementation

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

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

May 3, 2010

Brian T. Coburn, P.E.
Engineering Div., Dept. of Public Services
City of Novi
26300 Delwal Drive
Novi, MI 48375
bcoburn@cityofnovi.org



Subject: Speed Limit Study of Meadowbrook Road, 12 Mile Road to 13 Mile Road

Dear Mr. Coburn:

Per your request, we have evaluated the above road segment to determine an appropriate general speed limit, a potentially different school speed limit (near Meadowbrook Elementary), and the possible need for curve warning and/or advisory speed signs. This letter reports our findings and recommendations.

Recommendations

1. The overall speed limit for Meadowbrook between 12 Mile and 13 Mile should be set at 35 mph.
2. The Superintendent of the Walled Lake Consolidated School District should be advised of the proposed speed limit change and asked whether or not the District wishes to retain the existing 25 mph limit near Meadowbrook Elementary (with signing changes to ensure proper posting).

Background

Prior to the first paving of this road section (Figure 1) in the summer of 1998, the City's intention was to post an overall speed limit of 30 mph. In January of that year, however, the Superintendent of the Walled Lake Consolidated Schools placed a "formal request for the speed limit on Meadowbrook Road from Thirteen Mile south past the Meadowbrook Elementary School, which we recently opened, to be changed to 25 miles per hour during school hours." In response, City Council approved Traffic Control Orders 98-11 and 98-12 (copy attached), which required the installation of 25-mph speed limit signs on Meadowbrook Road "between Thirteen Mile and a point one-half mile south of the Elementary school." No hour limitations were mentioned.

While the existing speed limit signs meet the original objectives – setting a 30-mph overall limit and a 25-mph limit near the school – the exact nature of those signs is problematic, as follows:

- Southbound from 13 Mile, there is no posted speed limit for about the first 450 ft (Figure 2). Good traffic engineering practice is to post the applicable speed limit within 100-200 ft of the corner.
- The first southbound speed limit sign has a "SCHOOL" plate above but no hours of applicability. As such, this assembly is inconsistent with the then-applicable *Michigan Manual of Uniform Traffic Control Devices* (Section 7B-11), the current *MMUTCD* (same section), and – if legally construed as a school speed limit – current State law (MCL 257.627a) as well.
- Northbound, the above non-standard assembly is located (only) at a point immediately south of the driveway for the church adjacent to the school (Figure 3). This point is clearly not "one-half mile south of the Elementary School"; if it were, it would be too far in advance to properly define a school speed zone (current law limits the advance distance to 1,000 ft).



Figure 1. Meadowbrook Road Between 12 Mile and 13 Mile



Figure 2. Meadowbrook Road, 13 Mile South to Meadowbrook Elementary



Figure 3. Meadowbrook Road, First Section South of School

Criteria

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

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

Another portion of the law (MCL 257.628) indicates that a posted speed limit different than the prima facie limit may be determined based on an "engineering and traffic investigation." Relevant guidelines for such an investigation, found in Section 2B.13 of the *MMUTCD* (approved jointly by the MDOT and the State Police), are as follows:

- "When a speed limit is to be posted, it should be within ... 5 mph of the 85th-percentile of free-flowing traffic.
- Other factors that may be considered when establishing speed limits are the following:
 - A. Road characteristics, shoulder condition, grade, alignment, and sight distance;
 - B. The pace speed;
 - C. Roadside development and environment;
 - D. Parking practices and pedestrian activity;
 - E. Reported crash experience for at least a 12-month period."

Finally, a school zone speed limit less than the regularly posted speed limit may be posted if requested by the school superintendent and within certain constraints set by law (MCL 257.627a). The reduced limit:

- May be no less than 15 mph below the regular speed limit nor less than 25 mph.
- Must be limited in its application to three specific time periods: 30-60 minutes before the first regularly scheduled school session until school commences; dismissal until 30-60 minutes after the last regularly scheduled school session; and during a lunch period if students are permitted to leave the school.

Data Collection and Analysis

Prima Facie Speed Limit – Our review of recent-vintage aerial photos (Figures 1-6) found an average of 9.5 access points per half mile for Meadowbrook between 12 and 13 Mile Road. This access-point frequency is well below any of the ranges specified in MCL 257.627; hence, the prima facie speed limit is 55 mph.

Computed Comfortable Curve Speed – Methodology recommended by the American Association of State Highway and Transportation Officials was used to compute the safe and comfortable speed in each direction of travel on the two northerly (of the three similar) horizontal curves based on curve radius, pavement cross slope (or superelevation), and the assumed maximum comfortable lateral friction coefficient for the computed speed (per AASHTO). Curve radii and road cross slopes were estimated by Birchler Arroyo Associates. Table 1 summarizes the inputs and outputs of the curve speed computations.



Figure 4. Meadowbrook Road, Third Section South of 13 Mile



Figure 5. Meadowbrook Road, Fourth Section South of 13 Mile



Figure 6. Meadowbrook Road, Fifth Section South of 13 Mile

Table 1. Computed Comfortable (AASHTO) Curve Speeds for Meadowbrook Road

Curve	West Right-of-Way Line (from Plat)			At Center of Inside and Outside Lane			Comfortable Speed (mph)
	Curve Length (ft)	Deflection	Computed Radius (ft)	Radius (ft)	Cross Slope ¹	Lateral Friction	
1 st South of School	192	15.88°	692	737	+ 0.015 (est.)	0.150	43
				713	- 0.015 (est.)	0.160	40
At Burroughs	255	18.99°	768	723	+ 0.012	0.155	42
				747	- 0.015	0.160	40

¹ The values listed here are minimal for drainage and not intended to superelevate or "bank" for driving comfort or speed maintenance purposes (indeed, there is "adverse" superelevation in the outside lane, as indicated by the minus sign). According to the American Association of State Highway and Transportation Officials, the sharpest curve "without superelevation" (of the type present here) has a 736-ft centerline radius for a design speed of 40 mph (see Exhibit 3-16 in *A Policy on Geometric Design for Highways and Streets*, AASHTO, 2004). Given the radii estimated here, it is reasonable to conclude, therefore, that the design speed for these curves – and by extension, the overall road – is effectively 40 mph.

85th-Percentile Speed – At our request, City personnel conducted automated speed and volume sampling over 48-hour midweek periods. The two sampling locations are marked in red on Figures 1,4, and 5.

Table 2 summarizes the traffic statistics by location, direction, and day. Key findings are as follows:

- Traffic volumes are down sharply from previous counts. The average of the two daily volumes sampled in this study – 3,475 vehicles – is only 69% of the August 2003 volume shown in Figure 39 of the City's 2004 Master Plan.
- The average speed is 31.4 mph on the curve just north of Burroughs (location #1) and 32.0 mph on the tangent section between Burroughs and 12 Mile (location #2). Both locations now have a posted speed limit of 30 mph and are well away from the 25-mph speed zone near the school.
- The 85th-percentile speed is 35.5 mph at location #1 and 36.2 mph at location #2. Note that both speed statistics at location #1 are only 2% less than at location #2; this may reflect vehicles decelerating to or accelerating from Burroughs, rather than the presence of a curve, since that curve can be driven comfortably (per Table 1) at 40-42 mph.

Crash Experience – At our request, the Traffic Improvement Association searched its files for crashes occurring along Meadowbrook Road from 12-13 Mile Roads between 2005 and 2009, inclusive. Excluded were intersection crashes at the two "Mile" roads, since such crashes would likely be due primarily to factors other than the speed limit on Meadowbrook.

Detailed crash tabulations are appended to this report. Table 3 summarizes the seven crashes reported for the five-year period. Key findings are as follows:

- Three crashes involved (non-school) driveways, with one vehicle exiting and two waiting to enter.
- Three crashes involved rain/wet pavement or snow/snowy pavement.
- The seventh crash involved an animal collision after dark.

Conclusions and Recommendations

- An overall speed limit of 35 mph is supported by the observed 85th-percentile speeds, infrequent access points, inferred design speed of 40 mph, absence of overtly speed-related crashes, and comfortable curve speeds of 40-43 mph. No curve warning signs are warranted.
- Assuming that school superintendent wishes to see the 25-mph school speed zone preserved, (1) the hours of applicability must be added to the existing sign installations (e.g., Figure 7), and (2) the southbound installation should be relocated closer to 13 Mile Road.
- The School Crosswalk signs (Figure 8) should be relocated so as to be "as close as possible" to the crosswalk (per *MMUTCD* Section 7B.09).

Sincerely,
BIRCHLER ARROYO ASSOCIATES, INC.



Rodney L. Arroyo, AICP
Vice President



William A. Stimpson, P.E.
Director of Traffic Engineering

**Table 2. Summary of Speed Statistics for Meadowbrook Road, 12-13 Mile
for April 27-29, 2010**

Sampling Location	Dir.	Date	Sample Size	Speed (mph)			
				Average	85th %tile	10-mph Pace	% in Pace
1 (North)	NB	4-27-10 (>2 pm)	1070	32.3	36.5	25-35	75.8%
		4-28-10	1682	31.8	35.8	25-35	77.4%
		4-29-10 (<2 pm)	583	31.9	36.7	25-35	72.0%
		Average Day	1668	32.0	36.2	25-35	75.9%
	SB	4-27-10 (>2 pm)	713	31.1	35.1	25-35	77.6%
		4-28-10	1606	30.5	34.6	25-35	80.6%
		4-29-10 (<2 pm)	858	30.8	34.7	25-35	81.0%
		Average Day	1589	30.7	34.7	25-35	80.0%
Both	Average Day	3256	31.4	35.5	25-35	77.9%	
2 (South)	NB	4-27-10 (>2 pm)	1261	32.2	36.6	25-35	77.5%
		4-28-10	1943	31.8	35.8	25-35	80.4%
		4-29-10 (<2 pm)	641	32.1	36.9	25-35	76.9%
		Average Day	1923	32.0	36.2	25-35	70.9%
	SB	4-27-10 (>2 pm)	779	32.8	37.3	25-35	74.5%
		4-28-10	1774	31.9	36.0	25-35	79.3%
		4-29-10 (<2 pm)	988	31.5	35.3	25-35	82.0%
		Average Day	1771	32.0	36.1	25-35	79.0%
Both	Average Day	3693	32.0	36.2	25-35	74.8%	

Table 3. 2005-2009 Crash History for Meadowbrook Road between 12 Mile and 13 Mile

Year	Date	Hour Starting	Location	Crash Type						Crash Severity (# Persons)					Contributing Factors
				Angle	Head-On	Sideswipe		Rear-End	Single-Vehicle	Fatal	Personal Injury			Property Damage Only	
						Opposite Direction	Same Direction				A	B	C		
2009	5-21	5 pm	300 ft north of 12 Mile					SB						2	Lead vehicle probably waiting to turn left into driveway.
2008	12-23	3 pm	At Burroughs		X								1	1	SB vehicle crossed centerline on snow-covered pavement.
	11-30	2 pm	¼ mile north of 12 Mile	WB-NB										2	Vehicle pulled out of driveway on east side of snowy road.
	6-13	6 pm	At Burroughs	EB-SB										3	EB vehicle failed to yield, in rain.
	4-14	10 am	600 ft north of 12 Mile					NB						3	Lead vehicle probably waiting to turn left into driveway.
2007	No reported crashes.														
2006	1-08	7 pm	500 ft north of 12 Mile						SB						Hit animal after dark.
2005	12-15	4 pm	At Burroughs	EB-SB										2	SB "speeding" vehicle lost control on snow and hit EB stopped vehicle.
Total				3	1	0	0	2	1	0	0	0	1	13	



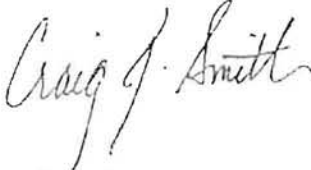
Figure 7. School Speed Limit with No Time Periods Specified



Figure 8. Southbound School Crosswalk Warning Sign Past Crosswalk

1998 TRAFFIC CONTROL ORDERS FOR
NORTHERN HALF OF SUBJECT ROAD SECTION

BUSINESS OF THE NOVI CITY COUNCIL
NOVI, MICHIGAN

SUBJECT	Traffic Control Orders 98-11 and 98-12		
DATE SUBMITTED	March 5, 1998	FOR AGENDA	March 16, 1998
DEPT APPROVAL	 Craig J. Smith DPW Superintendent	LEGAL APPROVAL IF REQUIRED	

EXPENDITURE REQUIRED	
AMOUNT BUDGETED	
APPROPRIATION REQUIRED	
LINE ITEM NUMBER	

BRIEF HISTORY

Dr. Geisler, Walled Lake Schools Superintendent, has requested a lower speed limit by the new Meadowbrook Elementary School on Meadowbrook Road.

RECOMMENDED ACTION

Our Traffic Engineer has recommended a 25 MPH speed limit in the school area. To accomplish the new speed limit, the original 30 MPH speed limit needs to be revoked, the original Traffic Control Order pre-dates our records

	1	2	Y	N
MAYOR McLALLEN				
MAYOR PROTEM CRAWFORD				
COUNCILMAN DEROCHE				
COUNCILMAN KRAMER				

	1	2	Y	N
COUNCILWOMAN LORENZO				
COUNCILWOMAN MUTCH				
COUNCILMAN SCHMID				

Approved each count
Agenda @ 3/14/98 mtg.
Councilman
3/14/98

CITY OF NOVI
TRAFFIC CONTROL ORDER

SPEED
 PARKING
 OTHER

DATE OF ORDER: March 4, 1998

CONTROL NUMBER 98-12

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 CRAIG J. SMITH, D.P.W. SUPERINTENDENT, DULY AUTHORIZED AS TRAFFIC ENGINEER, BY SEC. 33.141 OF THE AFORESAID CHAPTER.

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

Meadowbrook Road - Thirteen Mile and to a point one-half mile south of the Elementary School.

AND AFTER SAID INVESTIGATION, IT IS HEREBY ORDERED AND DIRECTED THAT THE DEPARTMENT OF PUBLIC WORKS ERECT AND MAINTAIN THE 25 MPH SIGNS IN ACCORDANCE WITH THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AS REQUIRED BY SEC. 33.217 OF THE AFORESAID CHAPTER, SAID SIGNS TO GIVE NOTICE OF THE FOLLOWING DETERMINATION:

A 25 MPH Speed Limit signs on Meadowbrook Road - Between Thirteen Mile and a point one-half a mile south of the Elementary School.



CRAIG J. SMITH
TRAFFIC ENGINEER

DATED: March 4, 1998

APPROVED BY CITY COUNCIL

TRAFFIC CONTROL ORDER NUMBER 98-12 HAVING BEEN PRESENTED TO THE COUNCIL OF THE CITY OF NOVI, MICHIGAN FOR STUDY AND APPROVAL, IS HEREBY APPROVED AND IT IS HEREBY ORDERED AND DIRECTED THAT THIS ORDER BE FILED IN THE OFFICE OF THE CITY CLERK AND A COPY THEREOF IN THE OFFICE OF THE CHIEF OF POLICE OF SAID CITY.

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

A 25 MPH Speed Limit signs on Meadowbrook Road - Between Thirteen Mile and a point one-half a mile south of the Elementary School.

ADOPTED AT THE REGULAR MEETING
OF COUNCIL ON _____

BY: _____
MAYOR - Kathleen McLallen

CITY CLERK - Tonni Bartholomew

2005-2009 CRASH DATA



Traffic Improvement Association

Crash Report Meadowbrook Rd 12 Mile to 13 Mile

Request #: 0003643

Printed By: Dominique Matich

Printed On: 3/29/2010

FROM_DATE:	1/1/2005
TO_DATE:	12/31/2009

PR/MP	PR 656706 FROM MP 4.005 TO MP 5.001 [Meadowbrook Rd & W 12 Mile Rd to Meadowbrook Rd & W 13 Mile Rd]
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#1 Location: MEADOWBROOK RD (4.53) 2494 feet S of W 13 MILE RD Crash ID: 6231045
 Crash Date: 12/15/2005 Day: Thu Hour: 4pm Weather: snow Roadway: snowy Light: day
 Injuries K: 0 Inj A: 0 Inj B: 0 Inj C: 0 Inj 0: 2 How: angle
 CVT: Novi Area: curved HBD: N Drugs: N Complaint No: 0568725

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	S	go straight	loss of control	veh in transpt	none	none	speeding	car	ctrfront
2	E	stop on road	veh in transpt	none	none	none	none	pickup	lftfront

UD-10: 055762380

#2 Location: MEADOWBROOK RD (4.08) 500 feet N of 12 MILE RD Crash ID: 6238313
 Crash Date: 01/08/2006 Day: Sun Hour: 7pm Weather: cloudy Roadway: dry Light: dark/unltd
 Injuries K: 0 Inj A: 0 Inj B: 0 Inj C: 0 Inj 0: 1 How: single
 CVT: Novi Area: straight HBD: N Drugs: N Complaint No: 061975

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	S	go straight	animal	none	none	none	none	car	rtfront

UD-10: 061004145

#3 Location: MEADOWBROK (4.12) 600 feet N of 12 MILE Crash ID: 6984694
 Crash Date: 04/14/2008 Day: Mon Hour: 10am Weather: clear Roadway: dry Light: day
 Injuries K: 0 Inj A: 0 Inj B: 0 Inj C: 0 Inj 0: 3 How: rr-end
 CVT: Novi Area: straight HBD: N Drugs: N Complaint No: 80017412

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	N	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	N	slow/stop on rd	veh in transpt	none	none	none	unknown	pickup	clrear

UD-10: 080205270

#4 Location: MEADOWBROOK RD (4.54) 1 feet S of BURROUGHS AVE Crash ID: 7029320
 Crash Date: 06/13/2008 Day: Fri Hour: 6pm Weather: rain Roadway: wet Light: day
 Injuries K: 0 Inj A: 0 Inj B: 0 Inj C: 0 Inj 0: 3 How: angle
 CVT: Novi Area: curved HBD: N Drugs: N Complaint No: 80028674

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	left turn	veh in transpt	none	none	none	failed to yeild	car	lftfront
2	S	go straight	veh in transpt	none	none	none	none	car	rtfront

UD-10: 080300496

#5 Location: MEADOWBROOK RD (4.26) 1320 feet N of 12 MILE RD Crash ID: 7170113
 Crash Date: 11/30/2008 Day: Sun Hour: 2pm Weather: snow Roadway: snowy Light: day
 Injuries K: 0 Inj A: 0 Inj B: 0 Inj C: 0 Inj 0: 2 How: angle
 CVT: Novi Area: driveway HBD: N Drugs: N Complaint No: 800065661

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	enter rdwy	veh in transpt	none	none	none	other	car	ctrfront
2	N	go straight	veh in transpt	none	none	none	none	car	rtside

UD-10: 080606266

#6 Location: MEADOWBROOK RD (4.53) 10 feet S of BURROUGHS AVE Crash ID: 7202917
 Crash Date: 12/23/2008 Day: Tue Hour: 3pm Weather: snow Roadway: snowy Light: day
 Injuries K: 0 Inj A: 0 Inj B: 0 Inj C: 1 Inj O: 1 How: head-on
 CVT: Novi Area: curved HBD: N Drugs: N Complaint No: 80070245

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	S	go straight	loss of control	cross ctrline/med	veh in transpt	none	speeding	pickup	ctrfront
2	N	slow/stop on rd	veh in transpt	none	none	none	none	car	lftfront

UD-10: 080674093

#7 Location: MEADOWBROOK (4.06) 300 feet N of 12 MILE Crash ID: 7323204
 Crash Date: 05/21/2009 Day: Thu Hour: 5pm Weather: clear Roadway: dry Light: day
 Injuries K: 0 Inj A: 0 Inj B: 0 Inj C: 0 Inj O: 2 How: rr-end
 CVT: Novi Area: straight HBD: N Drugs: N Complaint No: 90032419

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	S	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	S	stop on road	veh in transpt	none	none	none	none	car	clrear

UD-10: 090247207

Crash Type

Count	Type
0	uncoded
1	single
1	head-on
0	head-on/lt
3	angle
2	rr-end
0	rr-end/lt
0	rr-end/rt
0	ss-same
0	ss-opp
0	unknown
Totals: 7	

Light Conditions

Count	Type
0	uncoded
6	day
0	dawn
0	dusk
0	dark/lt
1	dark/unltd
0	unknown
Totals: 7	

Weather

Count	Type
0	uncoded
2	clear
1	cloudy
0	fog/smoke
1	rain
3	snow
0	wind
0	sleet/hail
0	unknown
Totals: 7	

Road Condition

Count	Type
0	uncoded
3	dry
1	wet
0	icy
3	snowy
0	muddy
0	slushy
0	debris
0	unknown
Totals: 7	

Vehicle Type

Count	Type
0	uncoded
10	car
0	other
0	truck/bus
0	van
3	pickup
0	sm truck
0	motorcycle
0	moped
0	go-cart
0	snowmobile
0	off-rd veh
Totals: 13	

Crashes By Month

Count	Type
1	January
0	February
0	March
1	April
1	May
1	June
0	July
0	August
0	September
0	October
1	November
2	December
Totals: 7	

Hazardous Action

Count	Type
6	none
2	speeding
0	imprp/no signal
0	imprp backing
2	unable to stop
1	other
1	unknown
0	reckls driving
0	negl driving
0	spd too slow
1	failed to yeild
0	disrgd traffic cntrl
0	wrong way
0	left of center
0	imprp passing
0	imprp lane use
0	imprp turn
Totals: 13	

Unit Type

Count	Type
0	uncoded
13	vehicle
0	pedestrian
0	bicyclist
0	engineer
Totals: 13	

Crash Severity

	FATAL	A	B	C	No Inj	Total
Persons	0	0	0	1	14	15
Crashes	0	0	0	1	6	7

Alcohol in Crashes

	FATAL	PI	PD	Total
Drinking	0	0	0	0
Not Drinking	0	1	6	7
Total	0	1	6	7

Crashes per Hour by Day

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