

Establishing Realistic Speed Limits and Installation of Speed Limit Signs

Alonso Uzcategui, PE
Traffic Signing Engineer



Toward Zero DeathsTM
National Strategy on Highway Safety



Basic Speed Law (257.627(1))

(1) A person operating a vehicle on a highway shall operate that vehicle at a careful and prudent speed not greater than nor less than is reasonable and proper, having due regard to the traffic, surface, and width of the highway and of any other condition existing at the time. A person shall not operate a vehicle upon a highway at a speed greater than that which will permit a stop within the assured, clear distance ahead.

Advisory Speed

- Speed recommended by roadway agency
- Below the posted legal speed limit
- Used at curves and special situations
- Used with warning signs
- Not enforceable except with basic speed law



Why do Speed Limits Change?

- Legislation
- Request from local government
- Change in traffic pattern or alignment

All proposed speed limit changes should have input from all affected local units of government.



Authority to Establish Speed Limits

- State Trunkline
 - MDOT
 - MSP
 - MVC 257.628 (3)
- County Roads
 - County Road Engineer/Manager
 - Township Supervisor
 - MSP
 - MVC 257.628 (1)





Michigan Vehicle Code, Section 257.628 (3)

(3) The state transportation department and the department of state police shall jointly determine any modified maximum or minimum speed limits on limited access freeways or trunk line highways consistent with the requirements of this section. A public record of a traffic control order establishing a modified speed limit authorized under this subsection shall be filed at the office of the county clerk of the county in which the limited access freeway or trunk line highway is located, and a certified copy of a traffic control order shall be evidence in every court of this state of the authority for the issuance of that traffic control order.



Michigan Vehicle Code, Section 257.628 (1)

(1) If the county road commission, the township board, and the department of state police unanimously determine upon the basis of an engineering and traffic investigation that the speed of vehicular traffic on a county highway is greater or less than is reasonable or safe under the conditions found to exist upon any part of the highway, then acting unanimously they may establish a reasonable and safe maximum or minimum speed limit on that county highway that is effective at the times determined when appropriate signs giving notice of the speed limit are erected on the highway.

A township board may petition the county road commission or the department of state police for a proposed change in the speed limit. A township board that does not wish to continue as part of the process provided by this subsection shall notify in writing the county road commission. A public record of a traffic control order establishing a modified speed limit authorized under this subsection shall be filed at the office of the county clerk of the county in which the limited access freeway or state trunk line highway is located, and a certified copy of a traffic control order shall be evidence in every court of this state of the authority for the issuance of that traffic control order. As used in this subsection, "county road commission" means the board of county road commissioners elected or appointed under section 6 of chapter IV of 1909 PA 283, MCL 224.6, or, in the case of a charter county with a population of 2,000,000 or more with an elected county executive that does not have a board of county road commissioners, the county executive.



General Speed Limits, Section 257.627

- “Limited Access Freeway General Speed Limit” (8)
 - 70 MPH, minimum 55 MPH
- “General Speed Limit” (9)
 - All non-freeway trunkline and county highways 55 MPH



General Speed Limits, Section 257.627

- Truck Speed (4)
 - School bus, semi tractor trailer (10,000 lb GVW)
 - Where the posted speed limit is greater than 65 MPH, these vehicles shall not exceed 65 MPH
- “General Gravel Road Speed Limit” (10)
 - 55 MPH
 - Municipality may request 45 MPH without a speed study

Legislative Speed Zones

Wait a minute!

- Public Act 445 of 2016 required prior to Jan 5, 2018
 - At least 600 miles of freeway raised to 75 mph
 - At least 900 miles of trunkline non-freeway raised to 65 mph
 - If supported by an engineering/safety study and 85th supporting under ideal conditions.



Speed Limit Increases on Michigan Freeways and Non-freeways in 2017



School Speed Zones (257.627a)

- What is a school?
 - Student body must not be transported in a motor vehicle
 - Does not include in residence institutions
- Two type of school speed zones
 - Along school property
 - Students crossing a state trunkline or county roadway





School Speed Zones (257.627a)

- Along school property
 - Speed limit may be reduced up to 20 MPH but can not be less than 25 MPH
 - In effect not more than 30 minutes before and after regularly scheduled school session
 - Up to 1,000 ft from school property line
- Crossing a state trunkline or county roadway
 - If students cross a highway posted 35 MPH or more, superintendent may request a school speed zone
 - Superintendent must have completed a School Route Plan

Business District Speed Zones

- Falls under 257.627 (2)(b) and 257.5
 - 25 mph
- Minimum 600 feet in length with 50 percent or more of building frontage on both sides of road



Work Speed Zones

- Falls under 257.627 (6)
 - Zone must meet 257.79d(a)
 - Lane or part of the lane closed due to highway construction, maintenance, or surveying activities
 - 45 miles per hour unless a different speed limit is determined on accepted engineering practice





Hospital Speed Zones

- Falls under 257.627 (7)
 - Speed can be reduced by up to 10 mph from posted speed upon request from hospital
 - On state trunkline, posted must be at least 50 MPH and have 2 or fewer travel lanes in each direction
 - Zone can not extend more than 1,000 ft from hospital property along state trunkline in municipality

Other Speed Zones

- Vehicular Access Points (257.627 (2))
 - 25 – 45 mph
 - Depends on number of access points within $\frac{1}{2}$ mile
- Mobile Home Park (257.627 (2)(a))
 - 15 mph within boundaries



Other Speed Zones

- Public Parks (257.627 (2)(c))
 - State and County 25 mph, and Local 15 mph
 - Adjacent roads are 25 mph
- Residential Subdivision (257.627 (2)(d))
 - 25 mph within boundaries



Establishing a Modified Speed Limit

Speed Study (257.628)

(5) A speed limit established under this section shall be determined by an engineering and safety study and by the eighty-fifth percentile speed of free-flowing traffic under ideal conditions of a section of highway rounded to the nearest multiple of 5 miles per hour....



Speed Study (257.628)

(5)A speed limit established under this act shall not be posted at less than the fiftieth percentile speed of free-flowing traffic under optimal conditions on the fastest portion of the highway segment for which the speed limit is being posted.

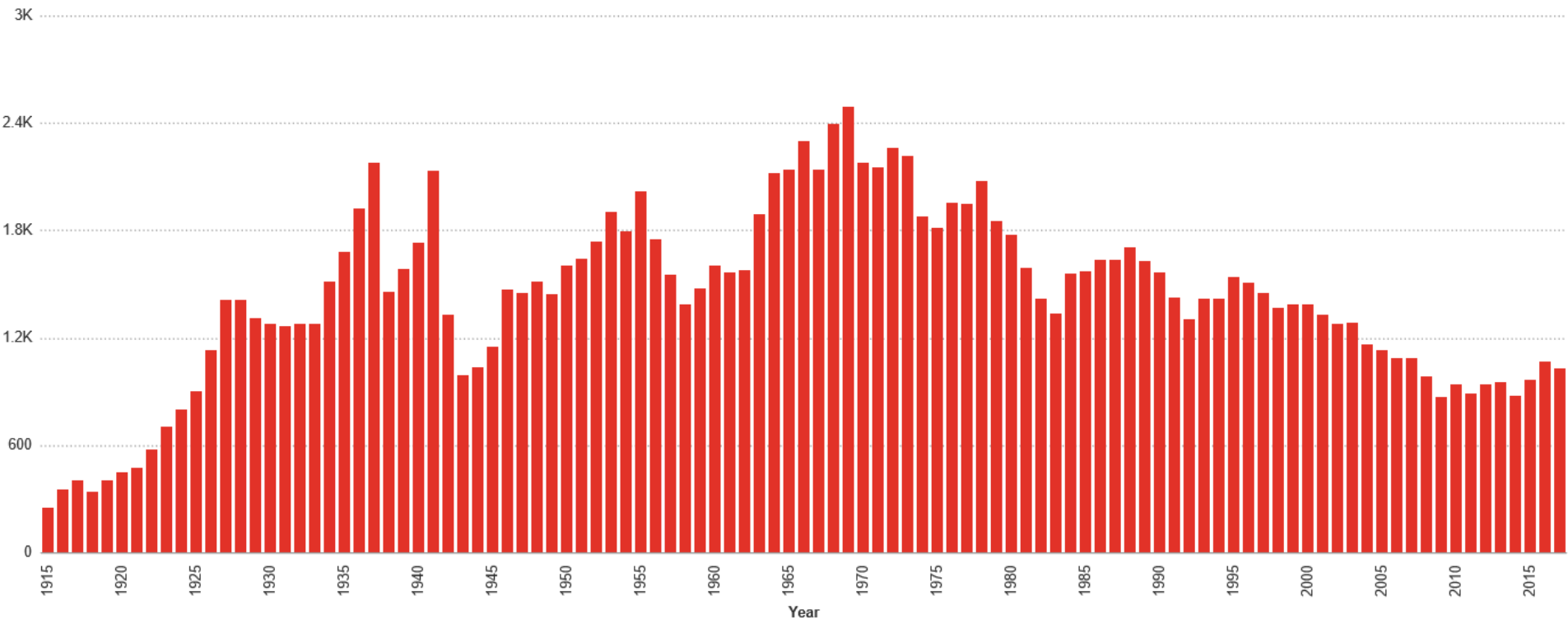


Factors to Consider in a Speed Study

- Traffic crash data
 - Number, rate and types of crashes
- Roadside environment
 - Residential, commercial, rural
- Roadway configuration
 - Alignment, number of lanes, length of road, number of signals, grade crossings, etc.
- Non-motorists such as pedestrians, bicyclists
- 85th percentile speed

Michigan's Fatalities and Fatality Rate

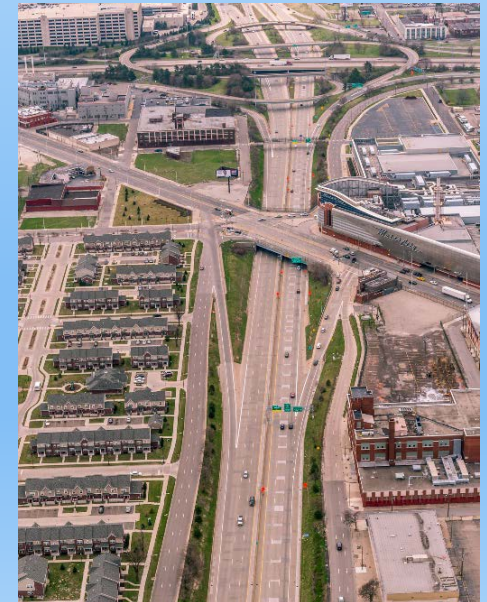
Michigan Motor Vehicle Fatalities (1915-2017)



Roadside Environment



Roadway Configuration



Speed Study

- Completed by MSP and roadway agency
- Conducted during ideal driving conditions
 - *Dry roads with free flow traffic*
- Vehicle speeds are recorded away from influencing factors
 - *Railroad crossings, signalized intersections, curves in the roadway, etc.*
- Completed using a LIDAR (laser) in an unmarked vehicle parked in an inconspicuous location, or with automated traffic counters
- Rule of thumb
 - *100 vehicles or 1 hour*

Speed Studies of Same Road with 55mph Speed Limit and 70mph Speed Limit

Average = 66.4mph Variance = 36.1
Speed Limit 55 mph

SPEED STUDY, FREEWAY

Speed	Number of Vehicles	Additional
55 <		Speed Limit (2.4%)
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		50 th Percentile
67		
68		
69		
70		
71		
72		
73		85 th Percentile
74		
75		
76		
77		
78		
79		
80		2.1% @ 80+ mph
81		
82		
83		
84 +		

658 Vehicles, 17 minute study

Average = 67.7mph Variance = 27.8 (-33%)
Speed Limit 70 mph

SPEED STUDY, FREEWAY

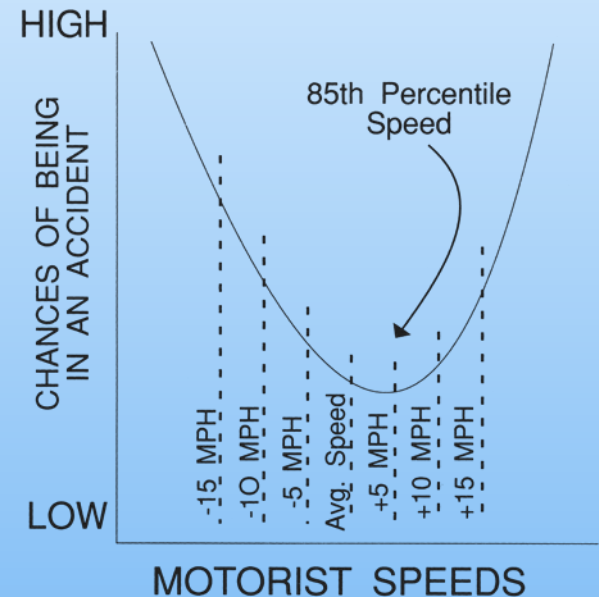
Speed	Number of Vehicles	Additional
55 <		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		50 th Percentile
69		
70		Speed Limit
71		
72		85 th Percentile
73		
74		
75		
76		
77		
78		
79		
80		1.1% @ 80+ mph
81		
82		
83		
84 +		

721 Vehicles, 18 minute study

85th Percentile Speed

- Uniformity increases safety and reduces the risks of crashes.
- Deviation from a standard speed increases potential for crashes.
 - Slow car in a rear end collision
 - Fast car completing lane changes through slower traffic.
- Setting the speed limit as close to the 85th percentile speed achieves uniformity and increases safety.

Accident Involvement vs. Motorist Speeds




Source: "Speed Zoning on Texas Highways" State Department of Highways and Public Transportation, Austin, Texas, October 1990
Figure 2

Installation of Speed Zone

- Traffic Control Order (TCO) prepared, signed, and sent to county clerk.
- Signs installed reflecting the speed change.



STATE OF MICHIGAN
File: 43012, 83011, 83012


TRAFFIC CONTROL ORDER



Order No. SP 83-022-17 Effective August 8, 2017 and when official traffic control signs conforming to the mandate of this order shall have been created.

In accordance with Act 300 of 1949, as amended, we have jointly ordered a traffic engineering investigation of traffic conditions on state trunk line highway M-37 in the Counties of Lake and Wexford, and as a result of said investigation do hereby direct the maximum speed limit on state trunk line highway M-37 shall be as follows:

A speed limit of sixty-five (65) miles per hour from north junction of US-10 in Lake County to one half (0.5) mile south of Carnahan Drive and;
Sixty (60) miles per hour from one half (0.5) mile south of Carnahan Drive to Carnahan Drive in Lake County and;
Sixty-five (65) miles per hour from Carnahan Drive to M-115 in Wexford County.

This traffic control order shall be filed in the offices of the Lake and Wexford County Clerks.

MICHIGAN DEPARTMENT OF STATE POLICE MICHIGAN DEPARTMENT OF TRANSPORTATION

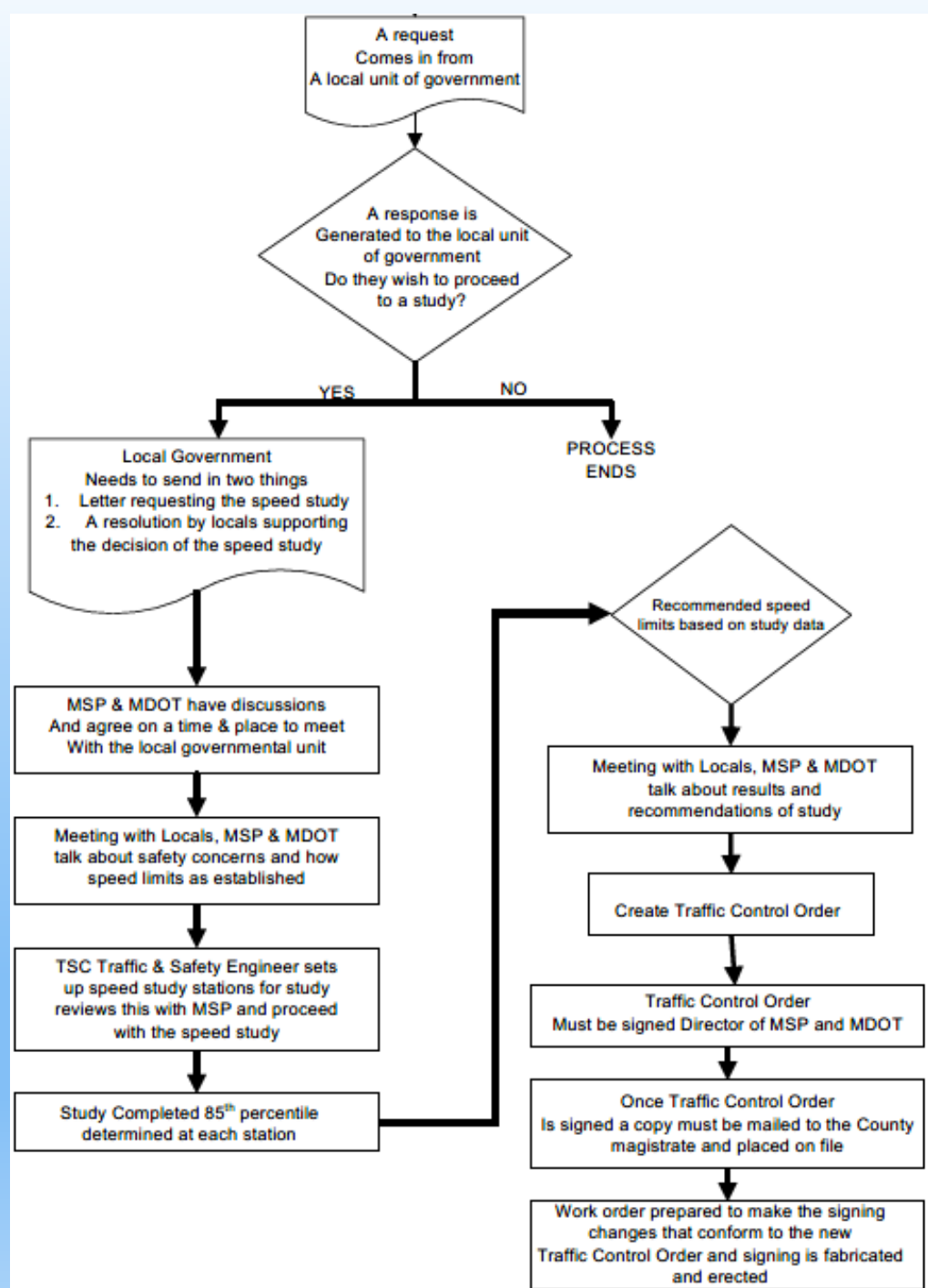
 Designee  Director

Date: August 8, 2017 Date: Aug 7 2017

The MDOT Process



The MDOT Process



Request from Local Agency

Upon Request MDOT:
Acknowledge receipt with
memo
Requests formal resolution



April 16, 2007

Judy A. Guenther, City Clerk
City of Perry
203 W. Polly Street
Perry, MI 48872-9503

Dear Ms. Guenther,

The Michigan Department of Transportation (MDOT) has received your request to initiate a speed study on M-52 and Lansing Road within the City of Perry in Shiawassee County.

MDOT works closely with the Michigan Department of State Police (MSP) to set speed limits on trunkline highways. Speed limits are established based on nationally accepted standards using a variety of engineering and traffic data. This data includes the geometric configuration of the roadway, 85th percentile average speeds, roadside features, parking allowances, pedestrian activities, and the reported crash experience for a 12-month period. Engineering and traffic data collected will be used to determine the speed limit on M-52. This data could show the current speed limit needs to be raised, stay the same, or be lowered.

MDOT conducts speed studies at the request of local government agencies. Please have the Perry City Council send a formal resolution from the council requesting a speed study be performed on M-52 in the City of Perry in Shiawassee County.

A template resolution which can be used by your village is included on page 2 of this letter. The last paragraph of this template resolution beginning, "Now Therefore be it Resolved. . ." must be included before MDOT will implement a speed study on the requested route.

If you have any questions, please contact me at 517-324-2263.

Sincerely,

Steve Shaughnessy, Traffic and Safety Engineer
Lansing Transportation Service Center

CC: L. Doyle

C.S. 76011

Resolution #12-12-25

A resolution of the City of Bronson requesting a speed study for a portion of US 12

WHEREAS, traffic on US 12 from Wayne Street to Parham Road has steadily increased over the past several years due to the development and growth of City of Bronson, and

WHEREAS, this development has increased the number of access points to the state trunkline resulting in an increase in traffic congestion and the volume of turning traffic along the corridor, and

WHEREAS, it has become increasingly difficult for residents to negotiate left-hand turns, or move into and out of the flow of traffic safely due to the increased volume of traffic,

NOW, THEREFORE BE IT RESOLVED, the City Council is formally requesting the Michigan Department of Transportation (MDOT) conduct a speed study on US 12 from Wayne Street to Parham Road. It is understood MDOT in cooperation with the Michigan State Police (MSP) will use engineering data gathered in the speed study to make a decision which could raise, lower, or maintain the current speed limit. It is further understood City of Bronson will abide by the decision made by MDOT and MSP as a result of this speed study.

Approved this 10th day of December, 2012.


Motion by Council Member: *Cole*

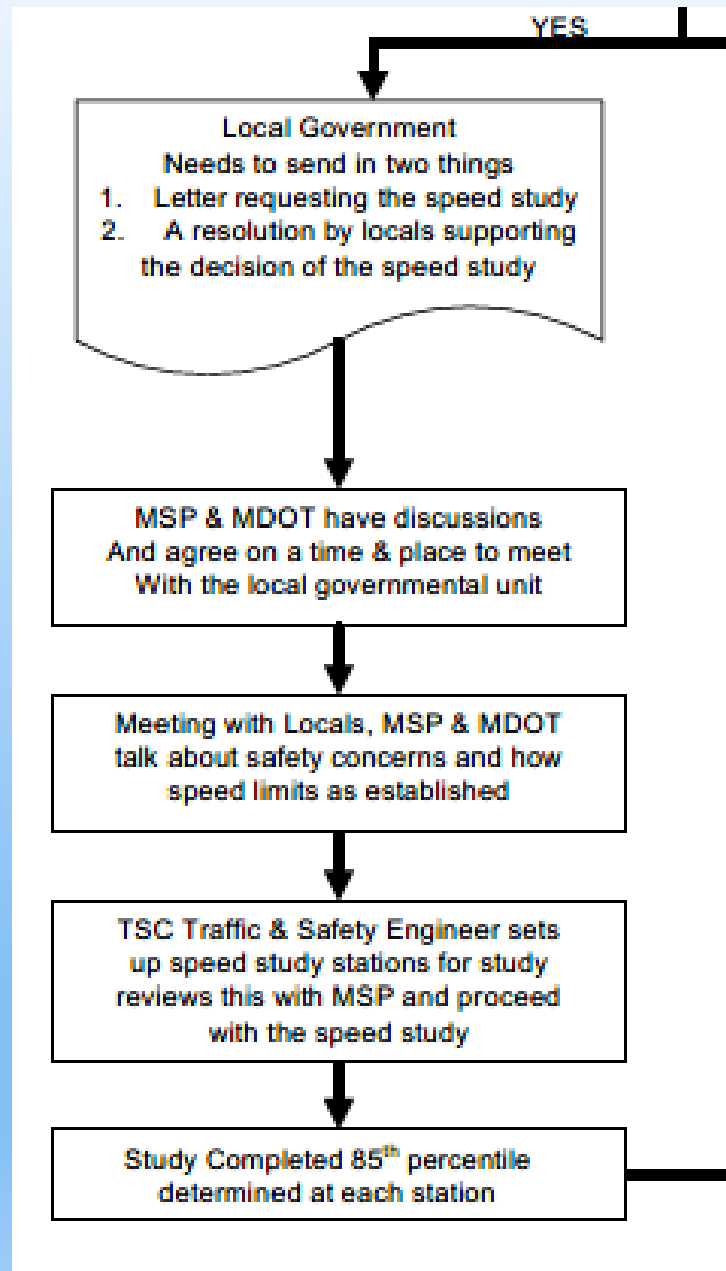
Second by Council Member: *McConn*

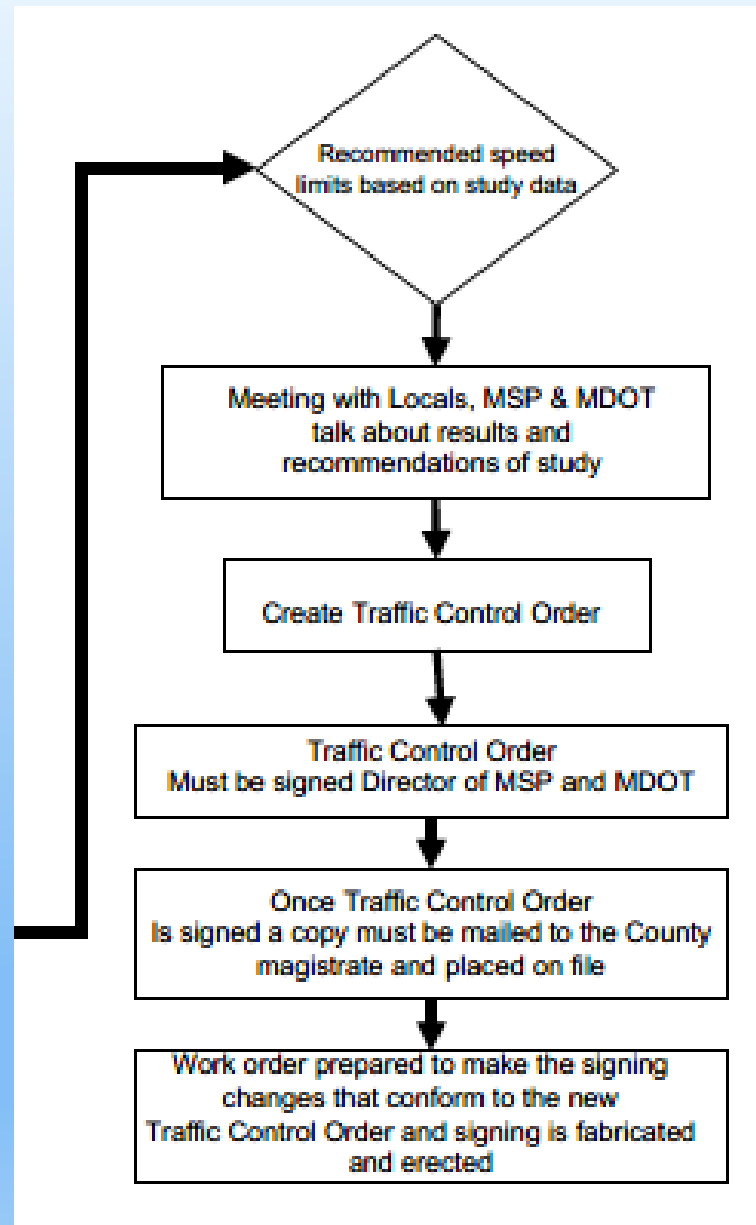
AYES: *All*

NAYS: *None*


Thomas J. Rissman
Mayor


Karen A. Smith
Clerk





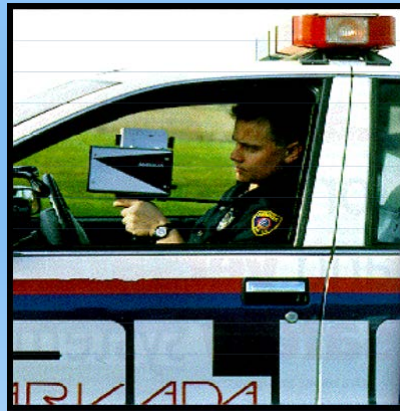
Post Study Meeting with Local Agency

- Inform Locals of speed study results
- Get Local Concurrence
- Vetted through Region Engineer



Myths about Speed Limits

- Lowering Speed Limit slows traffic and is safer
- Enforcement will help lower the speed limit
- Why not install stop signs, traffic signals or speed bumps to lower speeds?



Fabrication and Installation of Speed Limit Signs

Sign Overlay





SPEED

LIMIT

75

TRUCKS

65

S

L

7

TR

6



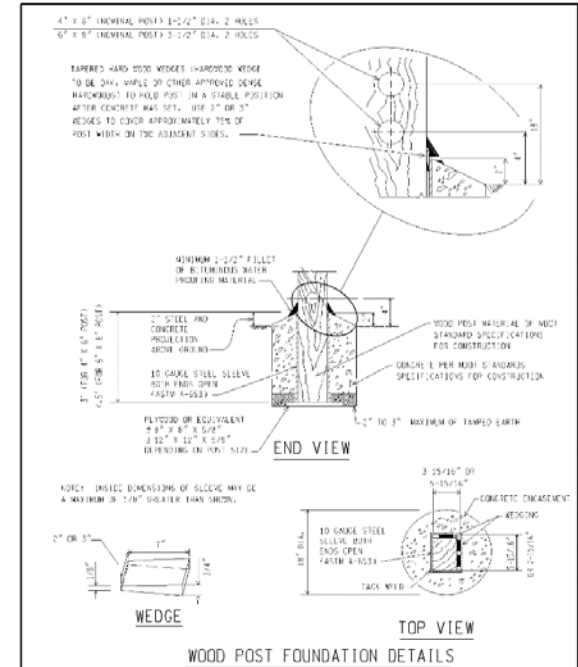






Sign Installation

Installation



	PREPARED BY <i>Randy R. Ruff</i> DESIGN DIVISION DRAWN BY: <i>GRD</i> CHECKED BY: <i>ALL</i>	APPROVED BY <i>Michael J. Ruff</i> DIRECTOR, MICHIGAN DEPARTMENT OF TRANSPORTATION	MICHIGAN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAY DEVELOPMENT & MAINTENANCE PLANS UNIT WOOD POSTS
	ORDERED BY: <i>ALL</i>	DATE: 05/01/15 T.O. NO. 30000A	DATE: 08/13/14 PLAN NO.

Installation



- A wooden “cookie” is placed in the bottom of the hole
- The sleeves are set in and plumbed

Installation



- Sleeves are aligned and held in place with an angle and locking pliers
- Spacing is determined by the size of the sign
- $\frac{1}{6}$ from each end leaving $\frac{2}{3}$ in the middle
- An easier way is to take the length of the sign in feet and multiply by 8 inches

installation



- Wedges installed – wedges should cover approximately 75% of the post on 2 adjacent sides.
- Tar should be applied to adhere to the post and the sleeve. Ensure the tar encapsulates the wedges.
- Sign 210 states in the Notes that the foundations should set 24 hours before the signs are installed.

installation



- Level tops of the posts.
- Drill mounting hole approximately 1" down from top of post, use level to mark and drill the second hole.

installation



- Hang sign then drill bottom holes.
- Use stainless steel bolts, nuts and washers.
- Use a nylon washer against the face of the sign.

Installation



- Place $\frac{1}{4}$ " saw cut approximately 6" below bottom of sign on traffic approach side.
- 1" deep for 4"x6" post
- 1 $\frac{1}{2}$ " deep for 6"x8" post

installation



- Install date tags.
- On two panel signs, make sure there is a date tag on both panels.

Questions

