

# Establishing Safe and Realistic Speed Limits

## Traffic Safety Issue



Spl/Sgt James Campbell

Michigan State Police

Training Division

[michigan.gov/msp-traffic](http://michigan.gov/msp-traffic)

# Our Goal is to Reduce the Number of Fatal and Serious Injury Crashes



# How are Speed Limits Established?

- \* A speed study is completed (*85<sup>th</sup> percentile speed determined*)
- \* Traffic crash data is analyzed (*number/rate and types of crashes*)
- \* Roadside environment is assessed (*residential, commercial, rural, etc.*)
- \* Roadway configuration is considered (*number of lanes, length of road, etc.*)
- \* All other factors that influence traffic and pedestrian movement are included in the **“Engineering and Traffic Investigation”**

# Education

- \* [Do You Know How They Set Speed Limits? - YouTube](#)

# How is a Speed Study Completed?

- \* 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 tube counters

# Why it needs to be done

- \* [Hamtramck does an about-face on speed trap after 7 Action News Investigation](#)

# What is “85th Percentile Speed”?

- \* The speed that 85 percent of the vehicles are traveling at or below
- \* Ideal speed to set as the maximum limit:
  - \* Provides the lowest speed variance between vehicles, and thus provides the lowest crash numbers
  - \* Provides optimum enforceability
- \* The **SAFEST** speed limit

# Safety vs. Revenue

- \* Metro Detroit is full of speed traps and a retired cop says he knows how to put the brakes on them



# Crash Involvement vs. Speed

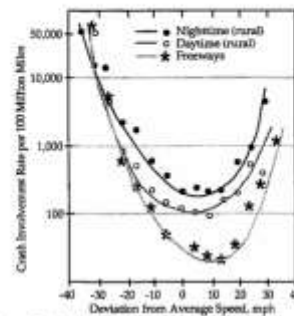


Figure B-2. Crash involvement rate by deviation from average traffic speed (Solomon 1964, Cirillo 1960 in Strayer and Collins 1997, 4). 1 mph = 1.609 km/h.

at the negative end of the speed axis, he further concluded that "low speed drivers are more likely to be involved in accidents than relatively high speed drivers" (p. 9). Solomon's findings from the predominantly rural highways of the late 1950s were generalized to interstate highway crashes by Cirillo (1960). His data were limited to daytime rear-end and angle collisions and same-direction side-swipe crashes, and they are plotted alongside those of Solomon in Figure B-2.

In a related analysis, Solomon studied crash involvement of pairs of passenger vehicles involved in rear-end collisions. He found that crash-involved pairs were much more likely to travel at larger speed

# Six Lane Urban Freeway



# SPEED STUDY, FREEWAY

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

**658 Vehicles, 17 minute study**

# SPEED STUDY, FREEWAY

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

**658 Vehicles, 17 minute study**

# 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 <sup>th</sup> Percentile
67		
68		
69		
70		
71		
72		
73		85 <sup>th</sup> Percentile
74		
75		
76		
77		
78		
79		
80		2.1% @ 80+ mph
81		
82		
83		
84 +		

**658 Vehicles, 17 minute study**

# SPEED STUDY, FREEWAY

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

**721 Vehicles, 18 minute study**

# SPEED STUDY, FREEWAY

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

**721 Vehicles, 18 minute study**

# SPEED STUDY, FREEWAY

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

**721 Vehicles, 18 minute study**



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

Average = 66.4mph Variance = 36.1

Average = 67.7mph Variance = 27.8 (-33%)

## 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 <sup>th</sup> Percentile
67		
68		
69		
70		
71		
72		
73		85 <sup>th</sup> Percentile
74		
75		
76		
77		
78		
79		
80		2.1% @ 80+ mph
81		
82		
83		
84 +		

658 Vehicles, 17 minute study

## SPEED STUDY, FREEWAY

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

721 Vehicles, 18 minute study

# Three Lane Residential Trunk Line



# SPEED STUDY

Speed	Number of Vehicles	Additional
<25		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		

**155 vehicles, 15 minute study**

## SPEED STUDY, POSTED 25MPH ROAD

Speed	Number of Vehicles	Additional
<25		
25		<b>Speed Limit</b>
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		

**155 vehicles, 15 minute study**

## SPEED STUDY, POSTED 25MPH ROAD

Speed	Number of Vehicles	Additional
<25		
25		<b>Speed Limit</b>
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		<b>+10mph</b>
36		<b>85<sup>th</sup> Percentile</b>
37		
38		
39		
40		<b>+15mph</b>
41		
42		<b>+17mph</b>
43		
44		
45		<b>+20mph</b>
46		
47		
48		
49		
50		

**155 vehicles, 15 minute study**

# SPEED STUDY

Speed	Number of Vehicles	Additional
<25		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		

**168 vehicles, 12 minute study**

## SPEED STUDY, POSTED 35MPH ROAD

Speed	Number of Vehicles	Additional
<25		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		<b>Speed Limit</b>
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		

**168 vehicles, 12 minute study**

## SPEED STUDY, POSTED 35MPH ROAD

Speed	Number of Vehicles	Additional
<25		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		<b>Speed Limit</b>
36		<b>85<sup>th</sup> Percentile</b>
37		
38		
39		
40		<b>+5mph</b>
41		
42		<b>+7mph</b>
43		
44		
45		<b>+10mph</b>
46		
47		
48		
49		
50		

**168 vehicles, 12 minute study**



# Speed Studies of Same Road with 25mph Speed Limit and 35mph Speed Limit

Average = 32.8mph Variance = 10.9

Average = 32.4mph Variance = 11.2

## SPEED STUDY, POSTED 25MPH ROAD

Speed	Number of Vehicles	Additional
<25		
25		Speed Limit
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		+10mph
36		85 <sup>th</sup> Percentile
37		
38		
39		
40		+15mph
41		
42		+17mph
43		
44		
45		+20mph
46		
47		
48		
49		
50		

155 vehicles, 15 minute study

## SPEED STUDY, POSTED 35MPH ROAD

Speed	Number of Vehicles	Additional
<25		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		Speed Limit
36		85 <sup>th</sup> Percentile
37		
38		
39		
40		+5mph
41		
42		+7mph
43		
44		
45		+10mph
46		
47		
48		
49		
50		

168 vehicles, 12 minute study

# Kalamazoo Speed Traps

- \* [Kalamazoo Michigan Speed Traps | The National Speed Trap Exchange](#)

# Case Study

9<sup>th</sup> Street – 35 mph

# Crash Data

\* [www.michigantrafficcrashfacts.org](http://www.michigantrafficcrashfacts.org)

Enforcement?

# Speed Study

85% in 1982 = 48 mph

85% in 2012 = 44 mph

# Construction Speed Limits

- \* [How fast can you go in a freeway work zone? - YouTube](#)





Thank You



[www.michigan.gov/msp-traffic](http://www.michigan.gov/msp-traffic)