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THE IMPACT OF RAISING THE SPEED LIMIT ON
FREEWAYS IN MICHIGAN

EXECUTIVE SUMMARY

BY

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AUGUST 2000



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INTRODUCTION

In 1995 the US Congress determined that it was no longer necessary for the federal government to be involved in setting speed limits on the nations roads and streets, including the Interstate Highway System. In response to this change in the national policy, the Michigan Legislature passed a bill directing the Michigan Department of Transportation (MDOT) and the Michigan State Police (MSP) to designate 500 miles of rural freeway where the speed limit would be increased from 65 MPH to 70 MPH. These departments were to study the impact of this change on vehicle speeds and traffic crashes over a six-month period and report back to the legislature.

Michigan State University conducted the required impact study and concluded that there was a small increase in speed (1-2 MPH) at some locations but less than 1 MPH at most reporting stations. There was insufficient data to determine the impact on traffic crashes given the lag time in obtaining and processing traffic crash reports. The legislature then authorized the MDOT to raise the speed limit on an additional 1000 miles of rural freeways on January 1, 1997. Truck speeds remained at 55 MPH throughout the study period.

The study of the impact of the change in the speed limit was expanded to include these additional freeway segments. The results of this study after one year were presented to MDOT and the MSP in the summer of 1998 and the results after two years were presented in an interim report dated December 1999. This final report covers the results

for the three years following the increase (January 1, 1997 through December 31, 1999), and it compares crashes for the three years before and three years after the change in the speed limit.

The 1500 miles of rural freeway included in this study is shown in Figure 1. The locations of the permanent count stations used to obtain speed and vehicle classification data are shown in Figure 2. Data from these counters are provided by the Transportation Planning division in a format designed for this study. Unfortunately, not all stations collect and transmit data every day. However, because of the very large data set, the missing data does not affect the results reported later in this report. For reference, Table 1 shows the data availability for each station by month.

Because this executive summary is intended for the general public as well as the sponsor, the results are presented in a question and answer format. We have tried to anticipate the questions of concern to the sponsors of the study and the general public.

Table1 - Data Available from the Permanent Count Stations

Station Number	Location	1997											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SPD-17	I-94	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	C	C
SPD-18	I-96	NR	NR	NR	NR	NR	NR	C	C	C	C	C	C
SPD-19	I-69	NR	NR	NR	NR	NR	NR	C	C	C	C	C	C
SPD-24	US-31	NR	NR	NR	NR	NR	NR	P	C	C	C	C	C
SPD-26	I-75	NR	NR	NR	NR	NR	NR	C	C	C	C	C	C
SPD-40	US-27	NR	NR	NR	NR	NR	NR	C	C	C	C	C	C
SPD-43	I-69	NR	NR	NR	NR	NR	NR	C	C	C	C	C	C
SPD-70	I-75	NR	NR	NR	NR	NR	NR	C	C	C	C	C	C
SPD-77	US-131	NR	NR	NR	NR	NR	NR	P	C	C	C	C	C
Station Number	Location	1998											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SPD-17	I-94	C	C	C	C	C	C	C	C	C	C	C	C
SPD-18	I-96	C	C	C	C	C	C	C	C	C	C	C	C
SPD-19	I-69	C	C	C	C	C	P	C	C	C	C	C	C
SPD-24	US-31	C	C	P	C	C	C	C	C	C	C	C	C
SPD-26	I-75	C	C	C	NR	C	C	C	C	C	C	C	C
SPD-40	US-27	C	C	C	C	C	P	NR	NR	NR	NR	NR	NR
SPD-43	I-69	C	NR	NR	P	C	C	C	C	C	C	C	C
SPD-70	I-75	C	C	C	C	C	C	C	C	C	C	C	C
SPD-77	US-131	C	C	C	C	C	C	C	C	C	C	C	C
Station Number	Location	1999											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SPD-17	I-94	C	C	C	C	C	C	P	C	C	C	C	C
SPD-18	I-96	C	C	C	C	C	C	C	C	C	C	C	C
SPD-19	I-69	C	NR	NR	NR	NR	NR	C	C	C	C	P	C
SPD-24	US-31	C	NR	NR	NR	NR	NR	P	C	C	C	C	C
SPD-26	I-75	C	NR	NR	NR	NR	NR	C	C	C	C	C	C
SPD-40	US-27	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	C	C
SPD-43	I-69	C	NR	NR	NR	NR	NR	C	C	C	C	C	C
SPD-70	I-75	C	NR	NR	NR	NR	NR	C	C	C	C	C	C
SPD-77	US-131	C	NR	NR	NR	NR	NR	C	C	C	C	C	P

C (for complete, data is available for at least 20 days)

P (for partial, data is available for at least 5 days but less than 20 days)

NR (for not reporting, data is available for 4 days or less)

FIGURE 1: Freeways Included in the Study

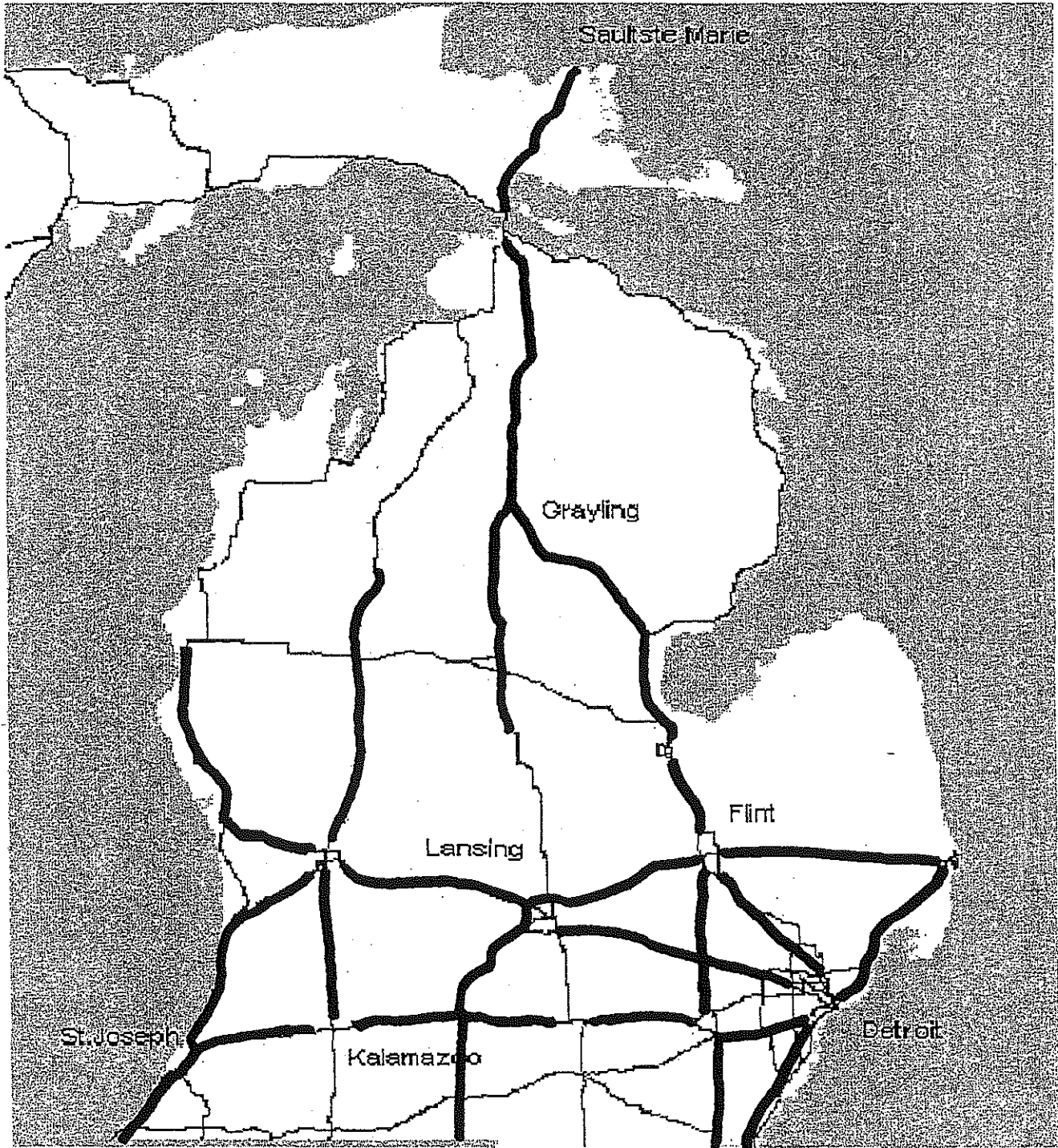
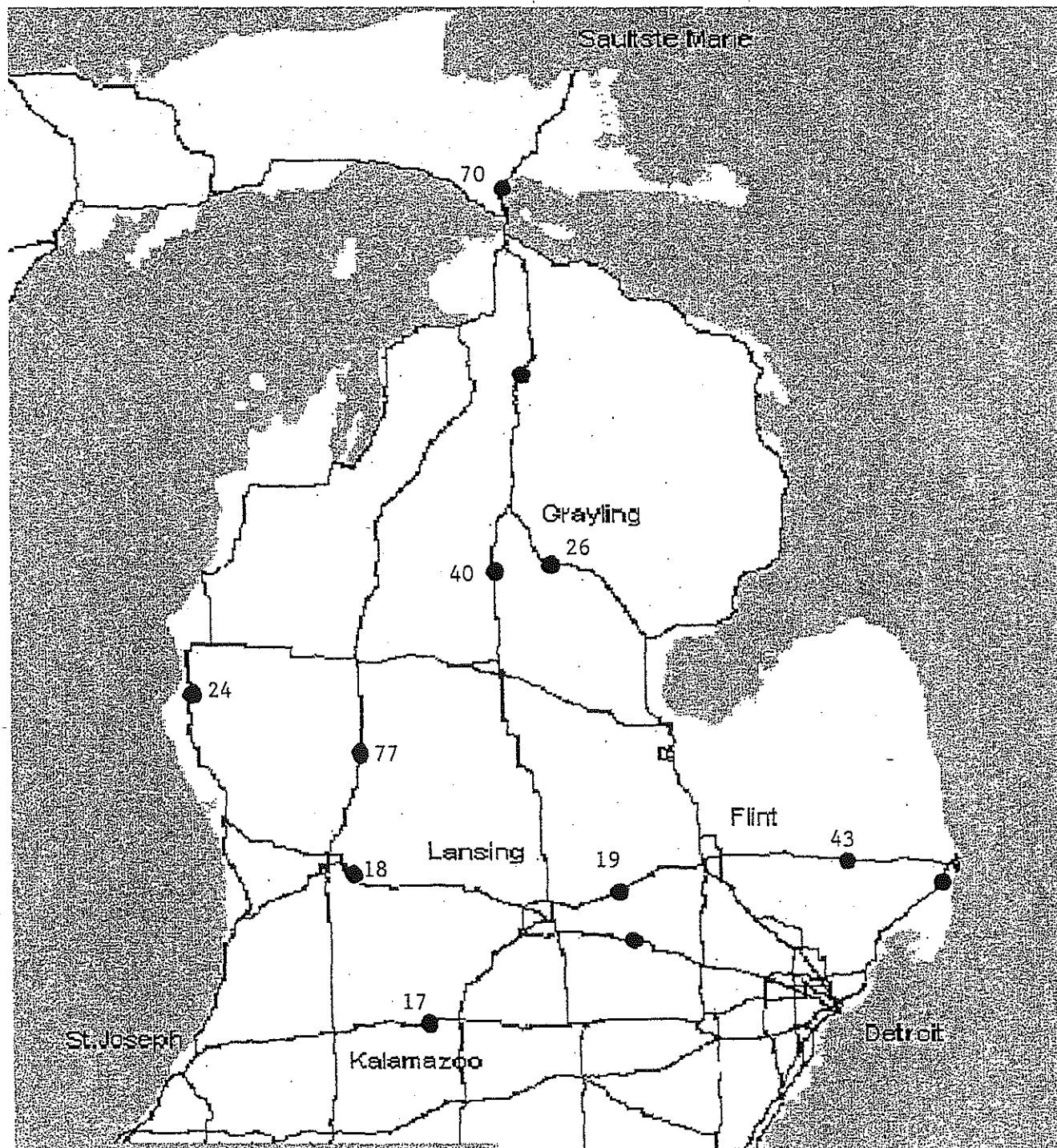


FIGURE 2: Location of Speed and Volume Detectors



QUESTION 1

DID TRAFFIC CRASHES INCREASE ON THE FREEWAYS WHERE THE SPEED LIMIT WAS INCREASED FROM 65 MPH TO 70 MPH IN JANUARY 1997.

1a) DID THE FREQUENCY OF SEVERE TRAFFIC CRASHES INCREASE WITH THE CHANGE IN THE SPEED LIMIT?

Yes for fatal crashes, but only slightly, as shown in Table 2. There were 311 fatal crashes on these freeway sections in the three years before the change and 325 fatal crashes in the three years after the change in the speed limit. This is a 4.5 percent increase.

The reverse was true for crashes resulting in an incapacitating injury, but no fatality. There were 2389 incapacitating injury crashes in the three years before the change and 2165 crashes in the three years after the change in the speed limit. This is a 9.3% decrease.

Table 2: 70 MPH Freeway Severe Crashes

YEAR	1994	1995	1996	1997	1998	1999	Difference
FATAL	98	100	113	110	101	114	14
A INJURY	750	775	864	737	668	760	-224

1b) DID THE FREQUENCY OF ALL CRASHES INCREASE WITH THE INCREASE IN THE SPEED LIMIT?

Yes, as shown in Table 3, there were 66,523 total crashes in the three years before the change and 73,492 total crashes after the change. This is a 10.5% increase in crashes.

Since we do not have volume counts for each segment of the freeway system, we do not know if the crash rate increased after the change in the speed limit. The Transportation Planning Bureau of MDOT estimates that the vehicle miles of travel (VMT) on rural freeways increased by an average of 3.95% per year over this period. Thus, the average VMT in the after period (1997-99) is approximately 11.9% higher than the average in the before period (1994-96). This means that the total number of crashes increased slower than the growth in vehicle miles of travel on these freeway segments.

Table 3: 70 MPH Freeway Total Crashes

1994	1995	1996	1997	1998	1999	Difference
20,167	22,310	24,046	24,691	22,461	26,340	6.969

1c) WAS THE CHANGE IN SEVERE CRASHES AND/OR TOTAL CRASHES DIFFERENT THAN THE CHANGE EXPERIENCED ON THE OTHER ROADS IN MICHIGAN?

Yes, as shown in Table 4, the decrease in fatal, A injury and total crashes were greater on the rest of the road system than it was on the freeway segments. This results in the percentage of statewide crashes occurring on the freeways being higher in the three years after the speed limit was changed than it was in the three years before the change. Since we do not know the change in VMT for the entire road system, it is not possible to determine what percent of this increase would be due to a different rate of growth in traffic volume between the two categories.

Table 4: Percent Of Crashes Occurring On 70 MPH Freeways

	Statewide		70 MPH Freeways		Percentage	
	1994-1996	1997-1999	1994-1996	1997-1999	1994-1996	1997-1999
FATAL CRASHES	4,087	3,849	311	325	7.6	8.4
A INJURY CRASHES	41,668	34,762	2,389	2,165	5.7	6.2
TOTAL CRASHES	1,257,765	1,249,696	66,523	73,492	5.3	5.9

QUESTION 2

DID TRAFFIC CRASHES INVOLVING HEAVY TRUCKS INCREASE WHEN THE SPEED LIMIT FOR AUTOMOBILES WAS INCREASED FROM 65 MPH TO 70 MPH AND THE SPEED LIMIT FOR TRUCKS REMAINED AT 55 MPH?

2a) DID THE FREQUENCY OF TRUCK INVOLVED SEVERE CRASHES INCREASE WITH THE CHANGE IN THE AUTOMOBILE SPEED LIMIT?

No, as shown in Table 5, there were 69 fatal crashes in the three years before the change and 59 fatal crashes in the three years after the change in the speed limit. This is a reduction of 14.5% in fatal crashes.

For incapacitating injury crashes, there was a decrease from 326 in the three years before the change in the speed limit to 247 in the three years after the change in the speed limit. For incapacitating injury crashes, the reduction was 24.2%.

Table 5: 70 MPH Freeway Truck Involved Severe Crashes

YEAR	1994	1995	1996	1997	1998	1999	Difference
FATAL	25	22	22	20	22	17	-10
A INJURY	100	93	133	76	86	85	-79

2b.) DID THE FREQUENCY OF ALL TRUCK INVOLVED CRASHES INCREASE WITH THE CHANGE IN THE AUTOMOBILE SPEED LIMIT?

Yes, as shown in Table 6, there were 6896 crashes involving heavy trucks in the three years before the change and 7327 in the three years after the change. This is a 7.0 percent increase in the number of crashes.

Since we do not have volume counts for each segment of the freeway system, we do not know if the crash rate increased after the change in the speed limit.

To estimate the change in VMT for trucks, the percentage of trucks in the traffic stream at seven permanent count stations in 1996 and 1998 were obtained. The average annual growth rate for all vehicles was 4.06 percent (which compares closely with the MDOT estimates of 3.95 percent from the Department of Transportation), while the annual growth rate for Truck VMT was 6.4 percent. Thus, it appears that the truck involved crash rate remained nearly constant on these road segments where the speed limit differential was increased from 10 MPH to 15 MPH.

Table 6: 70 MPH Freeway Total Truck Involved Crashes

1994	1995	1996	1997	1998	1999	Difference
2,206	2,252	2,438	2,416	2,235	2,726	481

2c) WAS THE CHANGE IN TRUCK INVOLVED SEVERE CRASHES AND/OR TOTAL CRASHES DIFFERENT THAN THE CHANGE EXPERIENCED ON OTHER ROADS IN MICHIGAN?

No, as shown in Table 7, the percentage of all truck involved crashes on the freeway segments where the automobile speed limit was increased remained nearly constant (15.6 to 15.7 percent). During the same time period, the percentage of severe crashes (fatal and incapacitating injury combined) involving trucks decreased from 18.2 to 16.3. Since we do not know the changes in VMT for the entire road system, it is not possible to determine what percentage of this decrease would be due to a different rate of growth in traffic volume between these two road categories.

Table 7: Percent Of Truck Involved Crashes Occurring On 70 MPH Freeways

	Statewide		70 MPH Freeways		Percentage	
	1994-1996	1997-1999	1994-1996	1997-1999	1994-1996	1997-1999
FATAL CRASHES	384	365	69	59	18.0	16.2
A INJURY CRASHES	1,781	1,506	326	247	18.3	16.4
TOTAL CRASHES	44,257	46,909	6,896	7,377	15.6	15.7

QUESTION 3

DID THE SPEED AT WHICH VEHICLES TRAVEL INCREASE ON THE FREEWAYS WHERE THE SPEED LIMIT WAS INCREASED FROM 65 MPH TO 70 MPH IN JANUARY 1997?

3a) Was there an increase in the speed when considering all vehicles?

Overall, there was a small increase in the speed of traffic when the speed limit was changed. However, this increase was not experienced at all monitoring locations, and was not greater than 2 mph at any location.

Table 8 summarizes the difference in speed between July 1996 (six months before the change) and July 1997 (six months after the change).

Table 8 – The Difference in Speed – 50th and 85th Percentile Speeds (MPH)

Station	Location	July 1996		July 1997		Difference	
		50 th	85 th	50 th	85 th	50 th	85 th
18 SPD	I-96	70.0	75.0	70.1	75.1	+0.1	+0.1
19 SPD	I-69	71.2	76.9	71.9	77.5	+0.7	+0.6
24 SPD	US-31	68.7	73.8	69.6	75.1	+0.9	+1.3
26 SPD	I-75	70.7	76.1	71.5	76.5	+0.8	+0.4
40 SPD	US-27	69.0	73.9	69.3	74.7	+0.3	+0.8
43 SPD	I-69	68.5	74.4	68.7	75.0	+0.2	+0.6
70 SPD	I-75	70.1	76.5	70.3	76.5	+0.2	0

Table 9 shows similar data for July 1997 and July 1999.

3b) HAVE DRIVERS INCREASED THEIR SPEED OVER TIME AS THEY BECOME MORE ACCUSTOMED TO THE 70-MPH SPEED LIMIT?

There is no evidence of the phenomenon (often referred to as speed creep), for the time period of January 1997 through December 1999. Figures 3 through 6 show the 50th percentile and the 85th percentile speed at two locations.

Table 9 shows this increase or decrease in speed between July 1997 and July 1999 for the six permanent count stations for which data are available. In only one location was the increase in speed greater than 2 mph on this two-year period. The average increase was 0.8 MPH for the 50th percentile speed and 0.9 MPH for the 85th percentile speed.

Table 9 – The Difference in Speed – 50th and 85th Percentile Speeds (MPH)

Station	Location	July 1997		July 1999		Difference	
		50 th	85 th	50 th	85 th	50 th	85 th
18SPD	I-96	70.1	75.1	71.1	76.3	+1.0	+1.2
19SPD	I-69	71.9	77.5	74.5	79.7	+2.6	+2.2
24SPD	US-31	69.6	75.1	70.3	75.1	+0.7	+0.0
26SPD	I-75	71.5	76.5	71.9	77.1	+0.4	+0.6
43SPD	I-69	68.7	75.0	67.6	75.2	-1.1	+0.2
70SPD	I-75	70.3	76.5	71.3	77.9	+1.0	+1.4

Summary

Raising the speed limit from 65 mph to 70 mph appears to have had little effect on either the speed of traffic or traffic crashes. The average increase in the 50th percentile speed between July 1996 (the last month before the speed limit was increased) and July 1999 was 1.3-mph. The increase averaged 0.5 mph in the first year, and 0.8-mph over the next two years.

There was an increase in traffic crashes in the three years following the change in the speed limit, but this increase was less than the increase in traffic volume in the same time period. The number of crashes resulting in a fatality or an incapacitating injury decreased over the three-year period, presumably due to increased seat belt use and air bags. Crashes involving heavy trucks showed the same pattern, with an increase in total crashes and a decrease in severe crashes over this three-year period.

Figure 3: 50th Percentile Speed on US-31 in Oceana County

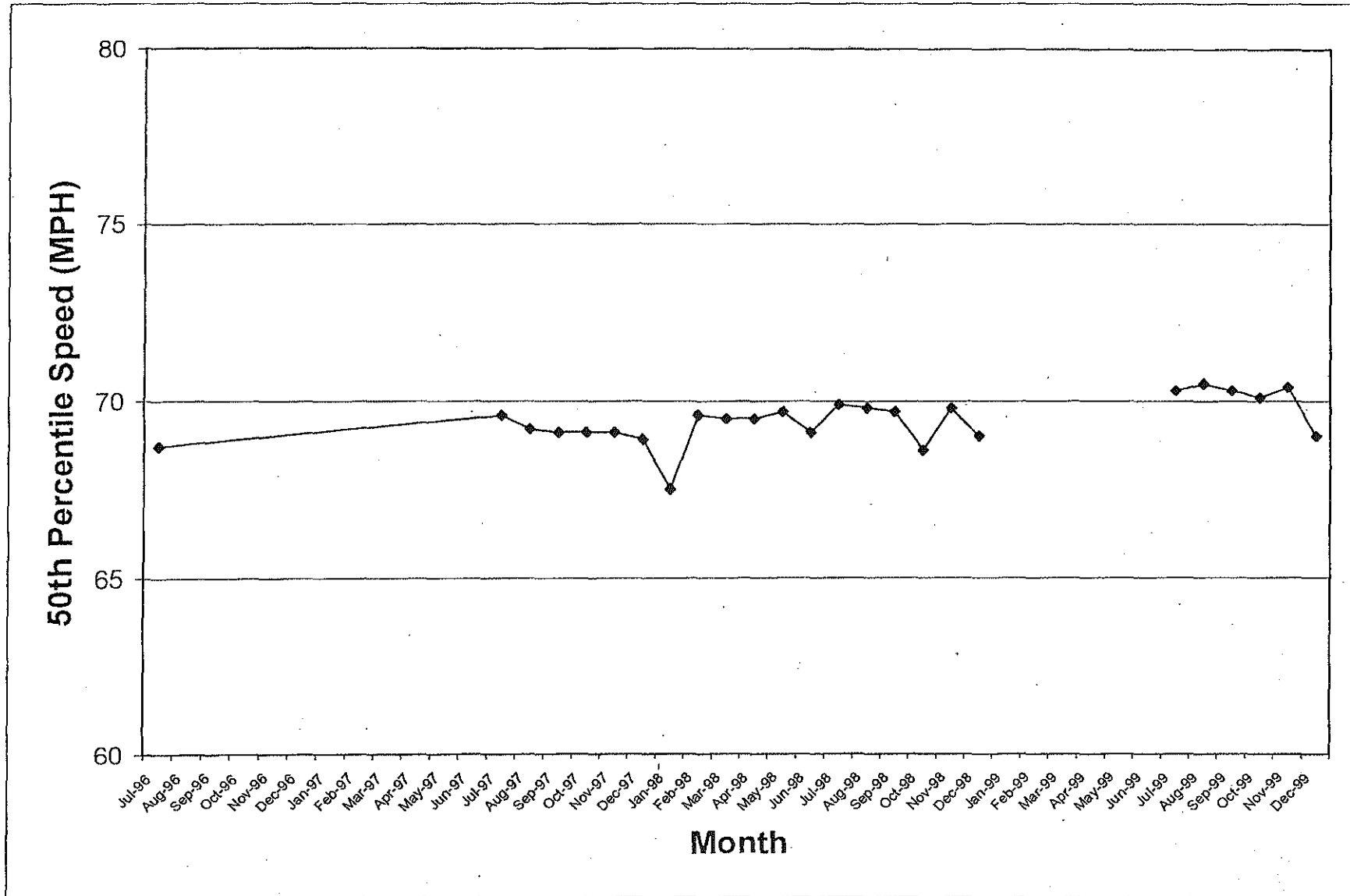


Figure 4: 85th Percentile Speed on US-31 in Oceana County

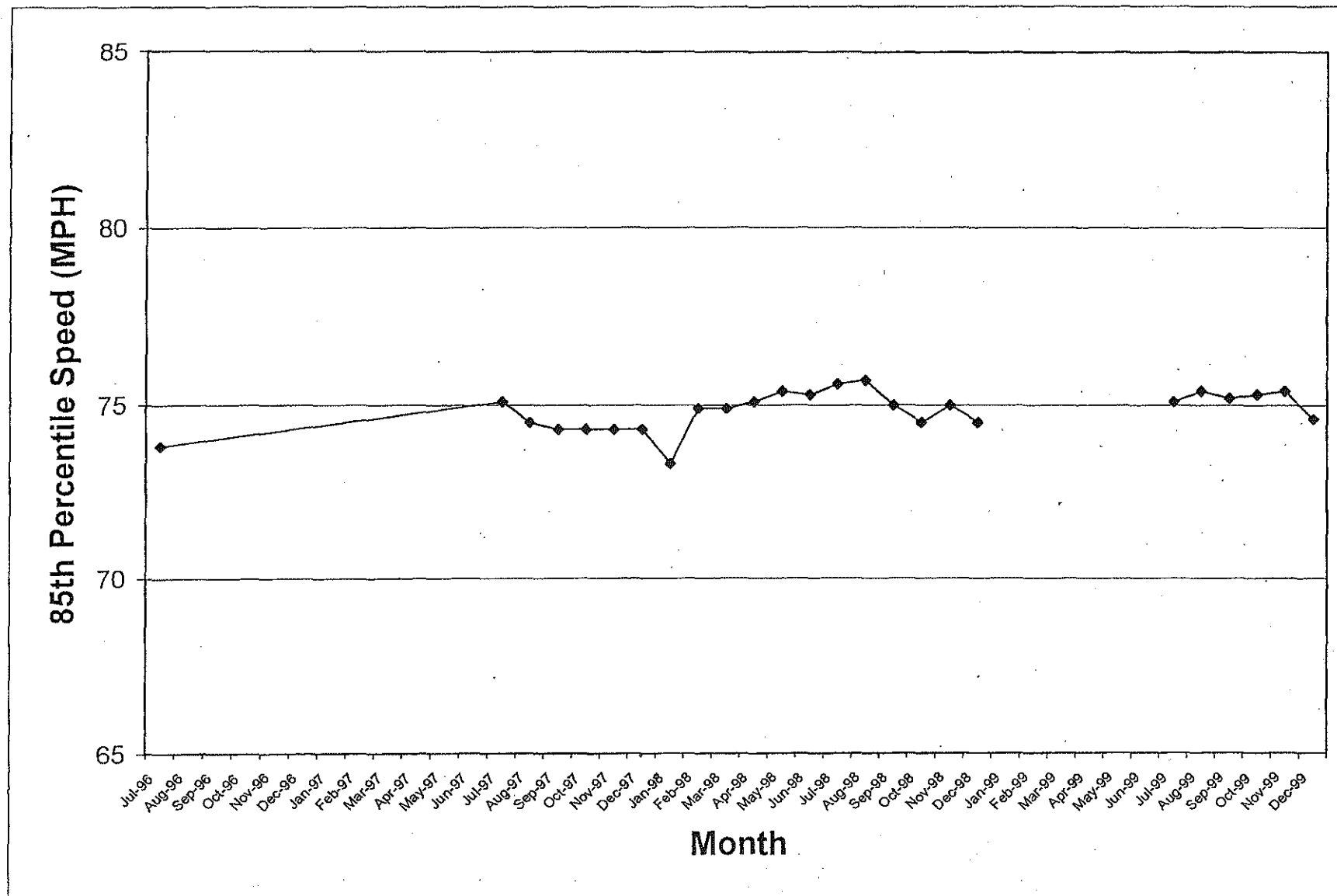


Figure 5: 50th Percentile Speed on I-75 in Roscommon County

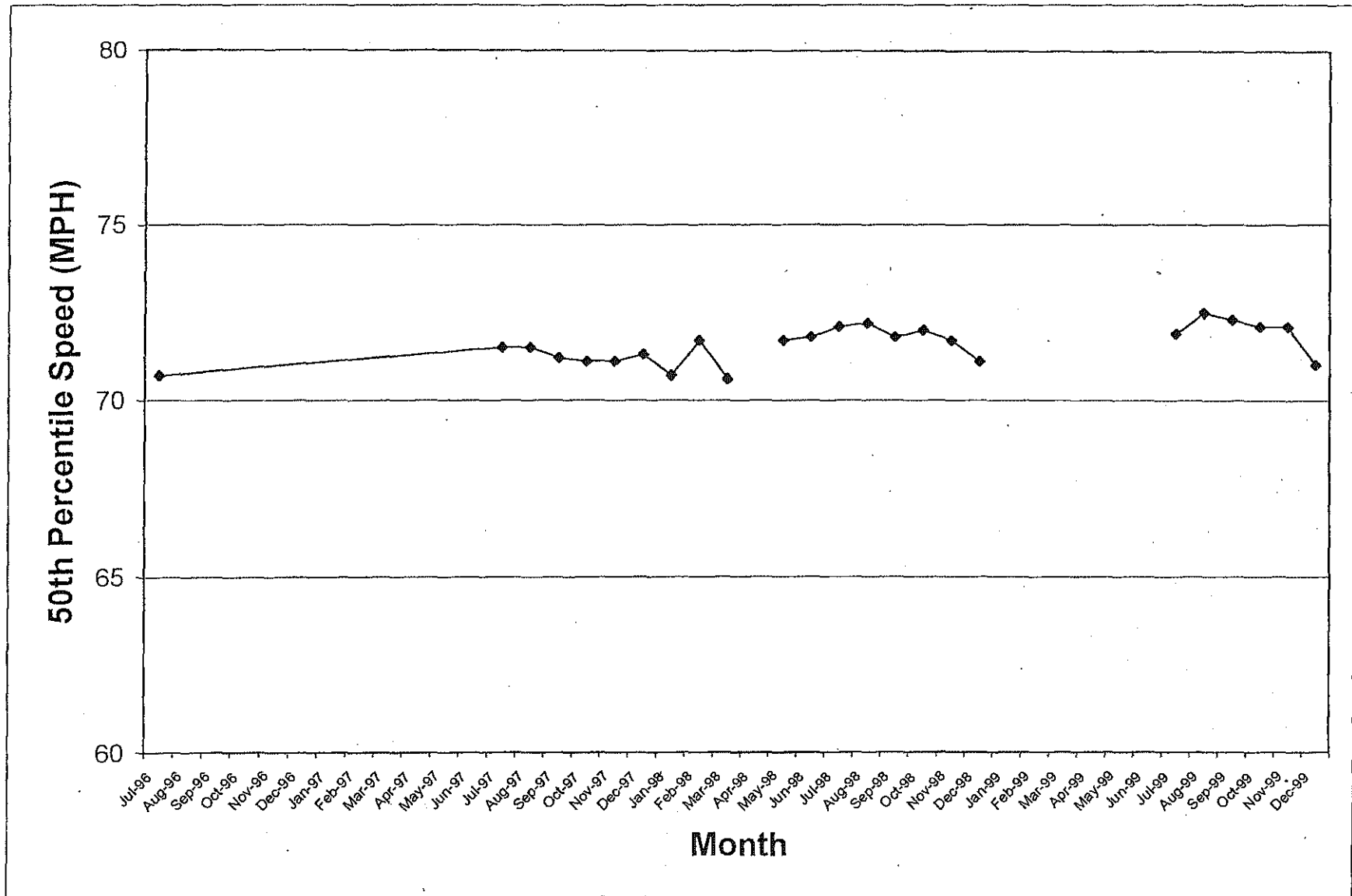


Figure 6: 85th Percentile Speed on I-75 in Roscommon County

