

ARIZONA DEPARTMENT OF TRANSPORTATION

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# **SAFETY AND OPERATIONAL IMPACTS OF RAISING THE SPEED LIMIT TO 65 MPH**

**Final Report**

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## SI (METRIC) UNIT CONVERSION FACTORS

The material contained in this report is presented in terms of English units. The following factors may be used to convert the measures used in this report to the International System of Units (SI):

1 mile per hour (mph) = 1.6093 kilometer per hour (km/h)

1 km/h = 0.6214 mph

1 mile = 1.6093 kilometer

1 kilometer = 0.6214 mile

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## INTRODUCTION

Speed limits on rural highways has been a topic of intense interest to both the general public and the traffic engineering and enforcement communities during the past 15 years. The national maximum speed limit of 55 miles per hour was enacted in 1974 and remains in effect on most of the nation's rural highway mileage. In April, 1987 the United States Congress passed legislation allowing individual states to increase the speed limit on the rural Interstate system to 65 miles per hour. To date, about 40 states have chosen to increase the speed limit on the rural Interstate.

Increasing the speed limit to 65 miles per hour has led to an intensified debate about the safety impacts of the higher speed limit. Proponents and opponents have engaged in spirited discussion. Quantitative data have been assembled and presented to show changes in the number of accidents but, thus far, the information has been based on relatively short time periods. Information on changes in driver behavior (actual speeds driven) has received very little attention. A statistically sound evaluation and appraisal of the accident impacts of increasing the speed limit will require nationwide data from both the states where the speed limit has been raised and the states where it has not been raised. It will also require at least twelve months of "after" data from each of the states where the speed limit has been raised. Because some states raised their speed limits as late as the fall of 1987, the type of rigorous evaluation described above is unlikely to be completed before the end of 1988. The Arizona Department of Transportation was interested in determining the impacts of raising the speed limit in Arizona. It, therefore, requested that research be undertaken to evaluate the impacts. The problem statement and the research objectives for that research effort are given in Table 1.

This report presents the results of that research effort. It presents the experience of a single state - Arizona - with the 65 mile per hour speed limit. This single state experience is not intended to be representative of experience in other states. Information is presented on both driver behavior (a before and after comparison of the speeds that motorists are actually driving) and accident

experience (a before and after comparison). The "before" period in Arizona ends on April 15, 1987, the date that the speed limit was raised. The after period begins on April 16, 1987 and ran through April 15, 1988.

Throughout this report the term "rural Interstate" is used to denote those portions of the Arizona Interstate system that now have a 65 mile per hour speed limit. "Urban Interstate" is used to denote those portions that still have a 55 mile per hour speed limit. Table 2 lists those portions of the Arizona Interstate that are "rural" and "urban."

This report is intended to simply present the facts on changes in driver behavior and actual numbers of accidents. It is not intended to interpret, demonstrate or imply any cause and effect relationship between changes in the speed limit and accident experience. This report is not intended to advocate support or non-support for the 65 mile per hour speed limit on rural Interstate highways. The decision to implement or rescind the 65 mile per hour speed limit is a policy decision and should be made by policy making bodies.

## **DRIVER BEHAVIOR**

The Arizona Department of Transportation has about 76 speed compliance monitoring locations on its highway system. Thirty-five are located on the rural Interstate, 12 are located on the urban Interstate and 29 are located on the rural primary system. Although federal law no longer requires speed monitoring data to be collected on the 65 mile per hour Interstate, Arizona has continued to do so. Speed data from the speed monitoring compliance locations was used in this study to evaluate driver behavior.

Fourteen calendar quarters of "before" speed data and four quarters of "after" speed data were available and were analyzed. The results are presented in the following paragraphs. It is emphasized that this study used raw speed data collected at speed monitoring sites and that the data have not been adjusted in the ways that are used for the 55 mile per hour compliance purposes. For example, the speeds have not been adjusted for speedometer error. In addition, the speeds reported here for the urban Interstate are only for those times of day when free flow occurred; speeds during congested periods are not included. As a result, the speeds reported herein are different from, and higher than, those reported by Arizona for speed limit compliance purposes. Overall, it appears that Arizona motorists are complying with the 55 mile per hour speed limit.

### **RURAL INTERSTATE**

Figure 1 presents data on the 50th percentile speed and the 85th percentile speed for a composite of 26 locations on the rural Interstate. In Arizona, speed is not measured at every speed monitoring station in every calendar quarter. Thus, Figure 1 presents data from sites which varied, to some extent, from quarter to quarter. The percentile speed in a given quarter was computed as the weighted average of the percentile speed at each of the locations (weighted in proportion to the traffic volume at each location). The 50th percentile speed stayed almost constant, at about 59 - 60 miles per hour, in the years 1984 through 1986. The 85th percentile speed also stayed fairly constant - at about 65 miles per hour. An observable, though small, increase in speeds occurred in

the after period. Fiftieth percentile speeds increased to about 62 to 64 miles per hour and eighty-fifth percentile speeds to about 68 to 69 miles per hour.

Figure 2 presents 50th and 85th percentile speed data for nine rural Interstate locations where data were collected at all nine sites in the Fall of 1986 and again in the Fall of 1987. Fiftieth percentile speeds increased from 60.5 to 63.4 miles per hour and 85th percentile speeds increased from 66.3 to 69.0 miles per hour. Both cases represent an increase of less than 3.0 miles per hour.

Figure 3 presents, for the composite of 26 rural Interstate locations, the percentile of vehicles in the traffic stream which were exceeding 55 mph, 60 mph and 65 mph. Once again, there appears to be no trend in speeds during the before period. The percent of vehicles exceeding 55 miles per hour increased from about 80 percent in the before period to about 88 to 91 percent in the after period. The percent of vehicles exceeding 60 miles per hour increased from about 50 percent in the before period to about 70 to 76 percent in the after period. The percent of vehicles exceeding 65 miles per hour increased from about 20 percent in the before period to about 37 to 47 percent in the after period.

Figure 4 presents the same type of information for the nine rural Interstate locations. The percentages are summarized below:

	Fall 1986	Fall 1987
Percent of vehicles exceeding 55 mph	82	89
Percent of vehicles exceeding 60 mph	52	71
Percent of vehicles exceeding 65 mph	19	38

The data indicate that there is slightly more dispersion of vehicle speeds. In the Fall of 1986, 63 percent of the vehicles were traveling between 55 and 65 mph. In the Fall of 1987, 51 percent of the vehicles were traveling between 55 and 65 mph.

## **URBAN INTERSTATE**

Driver behavior on the Arizona urban Interstate was also evaluated using data from the 12 speed monitoring compliance locations on the urban Interstate. This evaluation was done to determine if there was any change in driver behavior in urban areas following the change in the rural Interstate speed limit. Since the objective was to measure driver behavior during free-flow, unconstrained conditions, speed data for those hours in which high traffic volumes caused speeds to be reduced were not included in the evaluation. The evaluation showed that urban Interstate speeds remained the same or exhibited a slight decrease after the rural Interstate Speed limit was increased. The two following paragraphs and Figures 5 and 6 describe this in more detail.

Figure 5 presents data on the 50th percentile speed and the 85th percentile speed for a composite of 10 locations on the urban Interstate. As was the case with rural locations, speed was not measured at every urban speed monitoring station in every calendar quarter. Thus, Figure 5 (and also Figure 6) present data from sites which varied, to some extent, from quarter to quarter. The 50th percentile speed stayed almost constant, at about 57 to 58 miles per hour, in the two quarters prior to and the two quarters following the increase in the rural Interstate speed limit. The 85th percentile speed also stayed fairly constant - at about 62 to 63 miles per hour.

Figure 6 presents, for the composite of the 10 urban Interstate locations, the percent of vehicles in the traffic stream which were exceeding 55 mph, 60 mph and 65 mph. Again, the percent of vehicles in each of these categories remained almost constant in the time periods just before and just after the speed limit increase on the rural Interstate.

## **RURAL PRIMARY HIGHWAYS**

The preceding data suggests that the increase in the rural Interstate speed limit had no impact on the speeds traveled on the urban Interstate. Did the increase in the rural Interstate speed limit have an impact on the speeds traveled on rural primary highways? The following paragraphs and Figures 7 through 12 address the question of whether there were "spillover" effects to the rural primary highways.

To portray the changes in vehicle speeds on rural primary highways, speed monitoring sites were selected in three different ways. The first selection of sites represents a composite of 21 speed monitoring locations, all of which had speed data collected at least once after the increase in the speed limit. As noted previously, speed is not measured at every speed monitoring station in every calendar quarter. Thus, the data presented in Figures 7 and 8 is from sites which varied, to some extent, from quarter to quarter. The disadvantage of this set of sites is that variations in speed from quarter to quarter will be influenced by the locations which happen to be selected in a calendar quarter. The advantages are that it represents a relatively large number of sites and it has geographic diversity.

As shown in Figure 7, 50th percentile speeds exhibited some variation in the years 1984 through 1986. During the five calendar quarters immediately before the rural Interstate speed limit increase, speeds remained very consistent at about 57-1/2 miles per hour. Following April 15, 1987 speeds increased slightly, to about 58-1/2 miles per hour. Eighty-fifth percentile speeds closely paralleled the 50th percentile speeds. They also increased slightly.

The second selection of sites picked six locations that were data "rich" in that every site had data for almost every calendar quarter during the four and one half year period. The advantage of this set of sites is that the locations are almost perfectly consistent from quarter to quarter and, hence, there is very little bias due to location selection. The disadvantages are that it represents a relatively small number of sites and geographic diversity.

Figure 8 shows that this set of six locations exhibited some variation during the "before" period. Speeds increased by a very small amount immediately following the increase in the rural Interstate speed limit. They then continued to increase during the remainder of the one year "after" period. By the first quarter of 1988 the 50th percentile speed was about 2-1/2 miles per hour higher than it was in the first quarter of 1987. Eighty-fifth percentile speeds were also about 2-1/2 miles per hour faster.

The third selection of sites represents groups where the locations were exactly the same in the before period and the after period. In addition, the speed measurements in the "after" period

were made four calendar quarters following the speed measurements in the "before" period. There were four groups created in this manner and they are described as follows:

<b>GROUP</b>	<b>NUMBER OF SITES</b>	<b>"BEFORE" DATA</b>	<b>"AFTER" DATA</b>
A	6	April,May,June 1986	Apr 15 - June 30, 1987
B	5	July,Aug,Sept. 1986	July,Aug,Sept. 1987
C	9	Oct,Nov,Dec. 1986	Oct,Nov,Dec. 1987
D	5	Jan,Feb,Mar. 1987	Jan,Feb,Mar. 1988

Figure 9 shows that 50th percentile speeds and 85th percentile speeds increased at each group of sites over the one year period between the "before" data and the "after" data. These changes are relatively small, however, ranging from almost no increase to an increase of about 1-1/2 miles per hour.

Figures 7, 8 and 9 indicate that 50th and 85th percentile speeds on rural primary highways increased between one and two and one-half miles per hour within one year after the increase in the rural Interstate speed limit. This compares to an increase in speeds of about three miles per hour on the rural Interstate.

Figures 10, 11 and 12 present data on the percent of vehicles in the traffic stream which were exceeding 55 mph, 60 mph, and 65 mph. These figures represent, respectively, the same selection of sites as are represented by Figures 7, 8 and 9. Figures 10 and 12 show very minor changes in the percent of vehicles exceeding given speeds between the "before" and "after" periods. Figure 11 shows that at the six rural primary locations there was an upturn in the percentage of vehicles exceeding a given speed, particularly in the fourth quarter following the increase in the rural Interstate speed limit. The percent of vehicles exceeding 55 miles per hour increased from about 62 percent in the "before" period to about 78 percent one year after the increase. The percent of vehicles exceeding 60 miles per hour increased from about 33 percent to about 48 percent in the same period. The percent of vehicles exceeding 65 miles per hour increased from about 10 percent to 17 percent. These findings parallel the increases found at the nine rural Interstate locations but in this case the increases were not as great.

The data from the six rural primary locations suggests a drop in speed dispersion. In the "before" period about 52 percent of the vehicles were traveling between 55 and 65 miles per hour. In the "after" period about 61 percent of the vehicles were traveling in this speed range.



## ACCIDENT EXPERIENCE

This section of the report presents information on accident experience before and after the increase in the rural Interstate speed limit. Accident data is presented for both rural Interstate and urban Interstate but not for other classes of roadway such as rural primary routes.

Accident data were acquired for 1983 through April 15, 1988 from the state's accident records system (Accident Location Identification and Surveillance System). Selected accident data were acquired from the records system through printed reports. Accident data was acquired in a form such that the rural Interstate mileage and the urban Interstate mileage were split into separate groups. Only accidents on the Interstate mainline roadway were considered. Accidents on ramps and on frontage roads were not included because they would not be affected by the higher speed limit.

Vehicle-miles of travel on the rural Interstate and on the urban Interstate were calculated for calendar years 1983 through 1987. This information was used to calculate accident rates. Each year, the Transportation Planning Division of ADOT conducts traffic counts on the state highway network. It also estimates ADT for locations where counts are not made. Traffic volume information for all roadway segments is then annually published in "Traffic on the Arizona Highway System-(Year)." This served as the source of information for ADT and segment length for all Interstate mileage. Vehicle-miles of travel was calculated for each Interstate segment and tallied as either rural Interstate or urban Interstate vehicle-miles of travel. Table 3 presents vehicle-miles of travel, for each calendar year, for both the rural and urban Interstate. This section of the report also combines the data on numbers of accidents and vehicle-miles of travel to present information on accident rates.

In this section of the report the "one year after period" refers to the twelve months from April 16, 1987 to April 15, 1988.

## ACCIDENTS AND ACCIDENT RATE

Historical accident data, beginning in 1983 and extending through April 15, 1988, are presented in Table 4. A similar tabulation of accident rate is presented in Table 5. Accident rate takes into account the growth in vehicle-miles of travel from year to year. It thus takes into account one of the other variables that changes over a period of time.

For comparison purposes, Figure 13 presents a five-year record of accidents on the urban Interstate. As shown, there was only a very slight growth in the total number of accidents from 1984 through April 15, 1988. During this time period vehicle miles of travel on the urban Interstate increased from 1.360 billion in 1983 to 1.907 billion in the one year after period. As shown in Figure 14, there was a downward trend in accident rate from 1984 through April, 1988.

Figure 15 shows that accidents on the rural Interstate stayed fairly constant from 1984 through 1986. A very observable increase occurred for the one year after period. Vehicle miles of travel on the rural Interstate increased from 3.745 billion in 1983 to 4.966 billion in the one year after period.

When accident rates are plotted (Figure 16), the very observable increase in accidents in the one year after period is not so apparent. Although the accident rate in the one year after period is higher than in 1986, it is virtually the same as the 1983-85 average. Figure 17 presents a bar chart for fatal accidents on the rural Interstate. The figure shows an increase in the number of fatal accidents from 1983 to 1986. An additional increase is found in the number of fatal accidents for the one year after period. When adjusted for vehicle-miles of travel there is still an upward trend. Figure 18 shows that fatal accident rate generally increased from 1983 through April, 1988.

Injury accidents (Figure 19) show little change from year to year in 1984 through 1986. An increase is found for the one year after period. Figure 20 presents injury accident rate. When presented in this form, the increase in accidents in the one year after period is not so apparent. The accident rate in the one year after period is more than in 1986 and 1985 but it is about the same as in 1984 and 1983.

Figures 21 and 22 present comparisons of changes in the number of accidents on the rural Interstate versus the urban Interstate. As shown in Figure 21, fatal accidents remained fairly constant on the urban Interstate. During the same time periods, rural fatal accidents increased during the before years and increased after the speed limit was raised. Although urban injury accidents exhibited a slight decline following the increase in the speed limit, rural injury accidents increased.

### **FATALITIES, INJURIES AND RATES**

The discussion of accident experience to this point has focused on number of accidents. Data have been presented on total number of accidents, number of fatal accidents and number of injury accidents. It is also of interest to look at how many persons were killed and how many persons were injured. Table 6 presents this information.

Over a five year period the number of persons killed on the urban Interstate varied from 10 to 19 each year. The number killed in the one year after period was 15 - in the middle of the range. Similarly, the number of persons injured in the one year after period - 1119 - was slightly less than the average for the years 1983 through 1986.

On the rural Interstate the number of persons killed has grown continuously over the five year period. The number of persons injured averaged 1837 per year from 1983 through 1986 and was 2504 persons injured in the one year after period.

Number of persons killed and number of persons injured can also be adjusted for vehicle miles of travel to produce fatality rate and injury rate. This information is presented in Table 7.

On the urban Interstate the number of injuries per 100 million vehicle-miles traveled was less in the one year after period than in any of the previous years. In addition, the rate was substantially below the 1986 rate. The fatality rate varied considerably from year to year. In the one year after period it was near the low end of the range for the before years.

Rural Interstate injury accident rate exhibited a continuous decline from 1983 through 1986. The injury accident rate in the one year after period was higher than in any of the before

years. Rural Interstate fatality rate varied from year to year. It was also higher in the one year after period than in any of the before years.

### **ACCIDENT SEVERITY**

One hypothesis is that higher speeds will result in more accidents. The preceding portions of this section present information which shows whether or not there were more accidents in the one year after period. There was a very observable increase in total accidents on the rural Interstate in the one year after period. However, the total accident rate in the one year after period was the same as in 1984 and 1985. A second hypothesis is that higher speeds will result in accidents that are more severe. Table 8 presents a distribution of accidents by severity. The percentage of all accidents which were property damage only, injury, or fatal are given for each year.

On the urban Interstate there was an overall tendency for accidents to be slightly less severe in the one year after period. Compared to the prior years the percentage of property damage only accidents increased, the percentage of injury accidents went down, and the percentage of fatal accidents increased very slightly.

The overall tendency on the rural Interstate was for accidents to be slightly more severe. The percentage of property damage only accidents declined while the percentages of injury accidents and fatal accidents both increased.

### **PROBLEM LOCATIONS**

One of the objectives of this research project was to identify any roadway segments having unusually large increases in accident rate (25 percent or more) during the one year after period. All mileage on the rural Interstate was reviewed for this purpose. No roadway segments were found to have unusually large increases in accident rate.

### **SUBSTITUTION EFFECT**

A very observable increase in total accidents on the rural Interstate was observed in the one year after period. It could be hypothesized that, due to higher speeds, some traffic may have

diverted from rural primary routes (higher accident rate) to rural Interstate routes (lower accident rate). The increase in volume on the rural Interstate may have resulted in increased accidents there while the decrease in volume on the rural primary routes may have resulted in decreased accidents on those facilities. There may have been an *overall* decrease in accidents as a result of this effect. It was not possible to test this hypothesis in this study. Considering the network of rural primary routes and the readily available accident and vehicle-miles of travel data, there was no way to consistently measure this effect.

## CONCLUSIONS

1. Actual speeds driven by motorists on Arizona's rural Interstate stayed almost constant during the three years before the speed limit was increased.
2. Actual speeds driven on the rural Interstate increased by only about three miles per hour or less during the four quarters following the increase in the rural Interstate speed limit.
3. There is slightly more dispersion in vehicle speeds on the rural Interstate now than there was before the speed limit was increased.
4. Speeds on the urban Interstate did not change appreciably following the increase in the speed limit on the rural Interstate.
5. Speeds on rural primary highways increased between one and two and one-half miles per hour from the "before" period to the "after" period.
6. There is less dispersion in vehicle speeds on the rural primary highways now than there was before the speed limit was increased on the rural Interstate.
7. Number of accidents on the *urban* Interstate changed very little during the three years before and the one year after the speed limit was increased on the *rural* Interstate.
8. Accident rate on the *urban* Interstate was on the decline beginning in 1984 and continuing through the one year after period.
9. Number of accidents on the *rural* Interstate increased after the speed limit was increased.
10. Accident rate on the *rural* Interstate did increase for total accidents and for injury accidents when the one year after period is compared with 1986. However, the accident rate is approximately the same as in 1984.
11. The fatal accident rate on the *rural* Interstate was higher in the one year after period than in any of the years 1983 through 1986.
12. The information presented in this paper does not prove or disprove a cause and effect relationship between actual speeds driven and accident experience. Many other factors -- factors

not addressed in this paper -- have an influence on accident experience. They include: vehicle-miles traveled; seat belt usage; alcohol involvement; and weather conditions.

## **LIST OF REFERENCES**

"Traffic on the Arizona State Highway System - 1984. "Arizona Highway System Report #3230-85-2. Travel and Facilities Branch, Transportation Planning Division, Arizona Department of Transportation. Phoenix, Arizona. July 1, 1985.



**TABLE 1**  
**PROBLEM STATEMENT AND RESEARCH OBJECTIVES**

**PROBLEM STATEMENT:**

The Federal law has recently been changed to allow individual states to raise the speed limit to 65 mph on rural interstate highways. This increase in the speed limit may result in increased accident rates in terms of total accidents, injury accidents and fatal accidents. The magnitude of this increase, if any, will be of great interest to traffic engineering and law enforcement agencies, highway safety groups and the general public.

The magnitude of the accident rate increase on those interstate segments where the speed limit is raised is unpredictable, in addition, there may be spillover effects on other roadways. Average speeds and accident rate may increase on urban interstate highways where the speed limit is not raised. The same effect may occur on two lane rural highways, particularly in the vicinity of interstate routes. Due to geographic, geometric design, traffic characteristics, or other factors, the increase in accident rate may be much greater on certain segments of roadway.

**RESEARCH OBJECTIVES**

The objective of this study is to determine the effect of increasing the speed limit to 65 mph on rural interstate highways on accident rates.

Using a before and after study approach, the following tasks will be performed:

- 1) Determine the effect of the increase in the speed limit on rural interstate highways on driver behavior. Mean speed, 85th percentile speed, and measures of speed dispersion would be used to detect changes in driver behavior. Data from rural interstate, urban interstate, and rural primary routes would be analyzed to determine the effects on each of these types of roadway. Existing speed monitoring stations will serve as data collection points.
- 2) Determine the effect of the increase in the speed limit on rural interstate highways on accident rates. Total accident rate, injury accident rate, and fatal accident rate for pre- and post-65 mph speed limit will be determined. Data from rural interstate, urban interstate, and rural primary routes will be determined. Data for the pre-65 mph era will be collected for a five year period.
- 3) Using one year of post-65 mph speed limit accident data, identify any roadway segments having unusually large increases in accident rate.
- 4) Prepare a final report documenting the research efforts and discussing the recommendations and conclusions.

**TABLE 2**  
**INTERSTATE MILEAGE BY SPEED LIMIT**

Interstate Mileage with 65 mph Speed Limit After April 15, 1987  
(Referred to as "Rural" Interstate in report).

<i>ROUTE NUMBER</i>	<i>BEGINNING MILEPOST</i>	<i>ENDING MILEPOST</i>	<i>LOCATION</i>
I-8	2.92	178.33	Yuma to I-10
I-10	0.00	133.68	California border to Phoenix
I-10	161.68	250.35	Phoenix to Tucson
I-10	268.08	391.23	Tucson to New Mexico border
I-15	0.00	29.40	Nevada border to Utah border
I-17	217.11	340.02	Phoenix to I-40
I-19	0.00	57.80	Mexican border to Tucson
I-40	0.00	359.63	California border to New Mexico border
Total rural mileage = 1090.65 miles			

Interstate Mileage with 55 mph Speed Limit After April 15, 1987  
(Referred to as "Urban" Interstate in report).

<i>ROUTE NUMBER</i>	<i>BEGINNING MILEPOST</i>	<i>ENDING MILEPOST</i>	<i>LOCATION</i>
I-8	0.00	2.92	Yuma urban area
I-10	133.68	142.65	Phoenix urban area
I-10	148.56	161.68	Phoenix urban area
I-10	250.35	268.08	Tucson urban area
I-17	194.02	217.11	Phoenix urban area
I-19	57.80	63.09	Tucson urban area
Total urban mileage = 71.11 miles			

**TABLE 3**  
**VEHICLE-MILES OF TRAVEL ON INTERSTATE SYSTEM**

ANNUAL VEHICLE-MILES OF TRAVEL ( $\times 10^6$ )						
	1983	1984	1985	1986	1987	4/16/87 to 4/15/88*
Urban Interstate	1,360.0	1,469.7	1,577.0	1,791.4	1,862.1	1,906.6
Rural Interstate	3,745.0	3,991.7	4,128.7	4,619.9	4,869.5	4,966.1

\*Estimated based upon 4 year growth trend in VMT

**TABLE 4**  
**NUMBER OF ACCIDENTS ON THE INTERSTATE SYSTEM**

<i>NUMBER OF ACCIDENTS</i>						
	<b>1983</b>	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1/1/87- 4/15/87</b>	<b>4/16/87- 4/15/88</b>
<b>Urban Interstate</b>						
Property Damage only	1717	2092	2124	2105	681	2217
Injury	609	750	815	803	215	737
Fatal	10	16	13	13	7	15
<b>Total</b>	<b>2336</b>	<b>2858</b>	<b>2952</b>	<b>2921</b>	<b>903</b>	<b>2969</b>
<b>Rural Interstate</b>						
Property Damage only	1428	1654	1757	1669	718	1969
Injury	978	1052	1015	1047	326	1322
Fatal	71	82	92	97	20	117
<b>Total</b>	<b>2477</b>	<b>2788</b>	<b>2864</b>	<b>2813</b>	<b>1064</b>	<b>3408</b>

**TABLE 5**  
**ACCIDENT RATE ON THE INTERSTATE SYSTEM**

<i>ACCIDENT RATE</i> <i>(ACCIDENTS/100 MILLION VEHICLE MILES OF TRAVEL)</i>					
	1983	1984	1985	1986	4/16/87- 4/15/88
<b>Urban Interstate</b>					
Property Damage only	126.3	142.3	134.7	117.5	116.3
Injury	44.78	51.0	51.68	44.83	38.66
Fatal	0.7353	1.089	0.824	0.7257	0.9336
Total	171.8	194.5	187.2	163.1	155.7
<b>Rural Interstate</b>					
Property Damage only	38.13	41.44	42.56	36.13	39.65
Injury	26.11	26.35	24.58	22.66	26.62
Fatal	1.896	2.054	2.228	2.099	2.356
Total	66.14	69.84	69.37	60.89	68.63

**TABLE 6**  
**NUMBER OF PERSONS KILLED OR INJURED**  
**ON THE INTERSTATE SYSTEM**

	1983	1984	1985	1986	4/16/87- 4/15/88
<b>Urban Interstate</b>					
Number of Persons Injured	895	1144	1272	1230	1119
Number of Persons Killed	10	19	14	16	15
<b>Rural Interstate</b>					
Number of Persons Injured	1803	1903	1771	1871	2504
Number of Persons Killed	75	98	112	107	140

**TABLE 7**  
**INJURY RATE AND FATALITY RATE ON THE INTERSTATE SYSTEM**

	1983	1984	1985	1986	4/16/87- 4/15/88
<b>Urban Interstate</b>					
Number of Injuries per 100 MVMT*	65.81	77.84	80.66	68.66	58.69
Number of Fatalities per 100 MVMT*	0.7353	1.293	0.8877	0.8931	0.7867
<b>Rural Interstate</b>					
Number of Injuries per 100 MVMT*	48.14	47.67	42.89	40.50	50.42
Number of Fatalities per 100 MVMT*	2.002	2.455	2.713	2.316	2.819

\*100 MVMT = 100 million vehicle-miles traveled

**TABLE 8**  
**DISTRIBUTION OF ACCIDENTS BY SEVERITY**

<i>PERCENTAGE OF TOTAL ACCIDENTS IN EACH SEVERITY CLASS</i>					
	<i>1983</i>	<i>1984</i>	<i>1985</i>	<i>1986</i>	<i>4/16/87- 4/15/88</i>
<b>Urban Interstate</b>					
Property Damage Only	73.50	73.20	71.95	72.06	74.67
Injury	26.07	26.24	27.61	27.49	24.82
Fatal	0.43	0.56	0.44	0.45	00.51
Total	100.	100.	100.	100.	100.
<b>Rural Interstate</b>					
Property Damage Only	57.65	59.33	61.35	59.33	57.78
Injury	39.48	37.73	35.44	37.22	38.79
Fatal	2.87	2.94	3.21	3.45	3.43
Total	100.	100.	100.	100.	100.



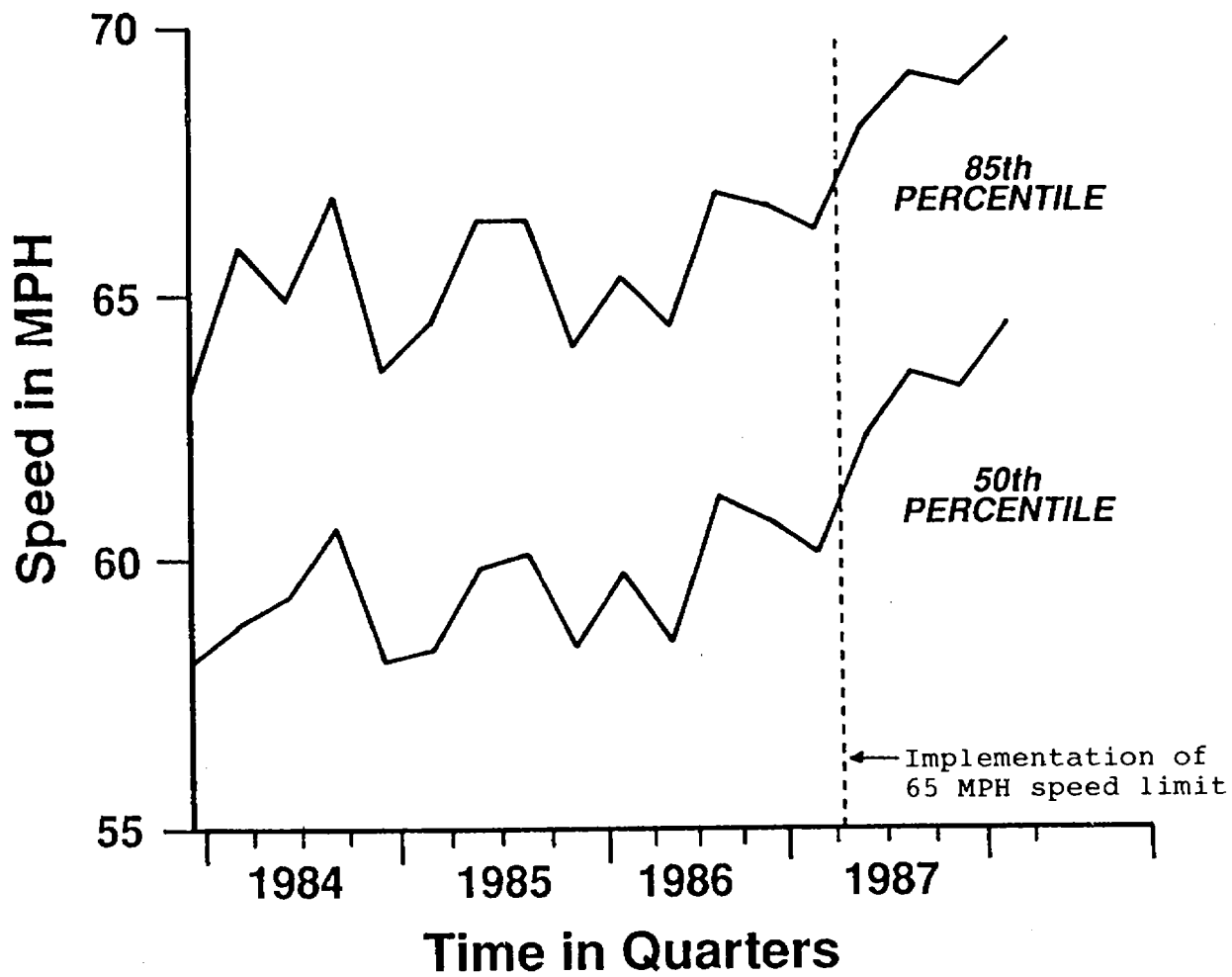


FIGURE 1. PERCENTILE SPEEDS ON THE RURAL INTERSTATE (26 LOCATIONS)

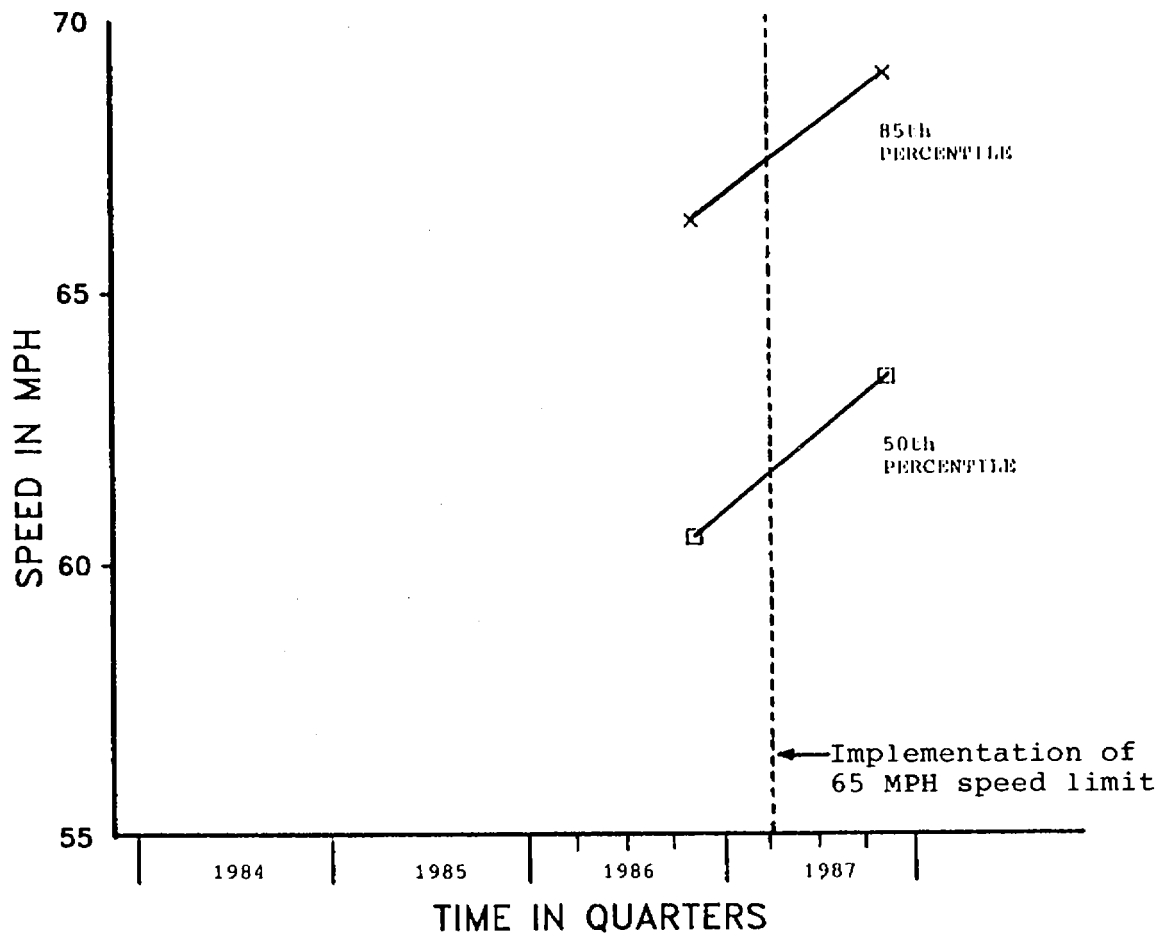


FIGURE 2. PERCENTILE SPEEDS ON THE RURAL INTERSTATE (9 LOCATIONS)

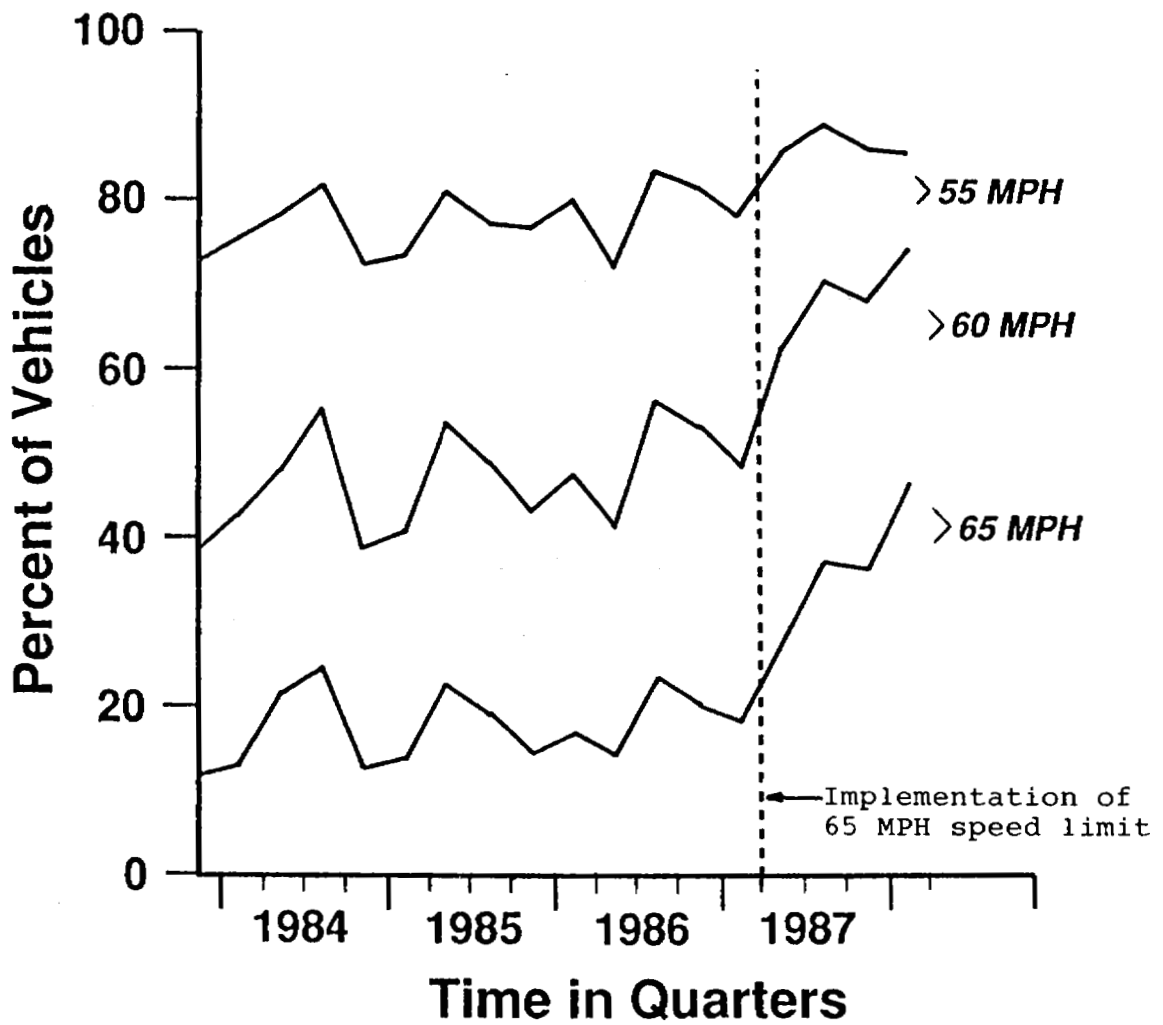


FIGURE 3. PERCENT OF VEHICLES EXCEEDING GIVEN SPEED ON THE RURAL INTERSTATE (26 LOCATIONS)

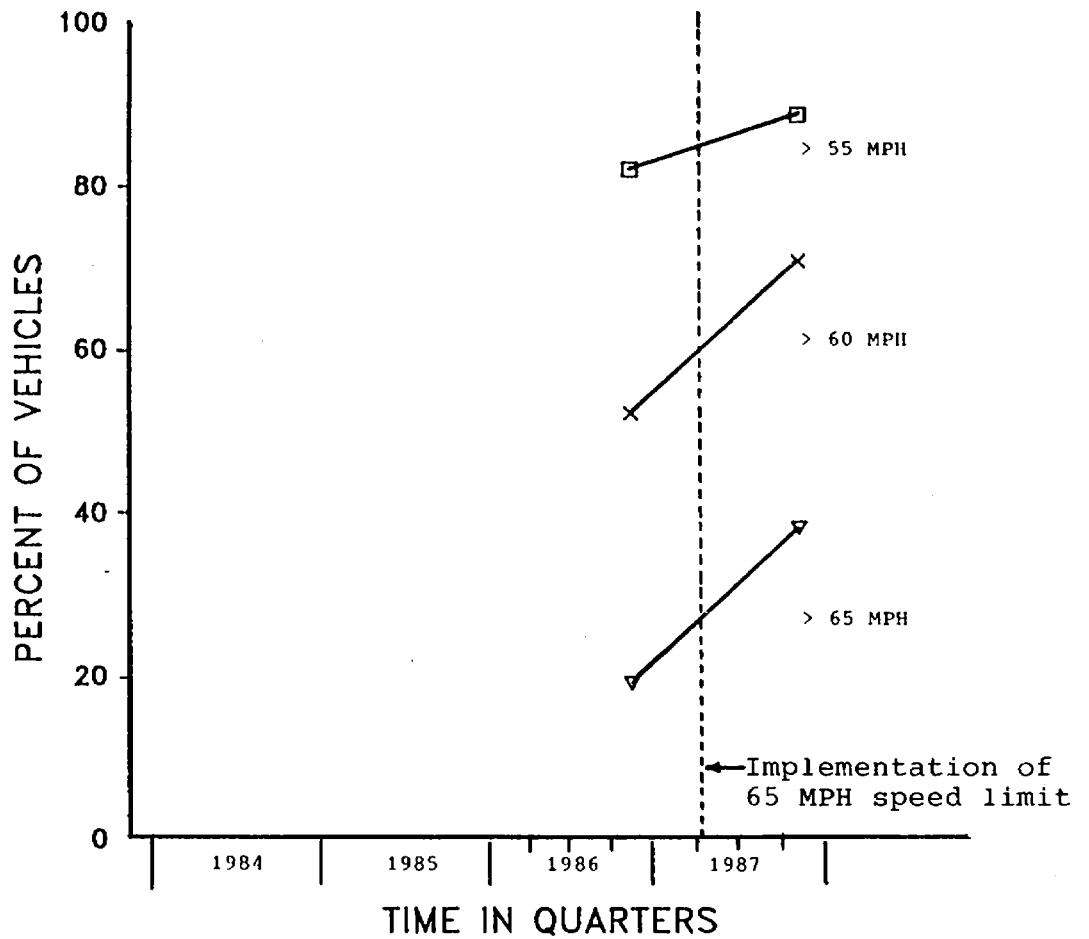


FIGURE 4. PERCENT OF VEHICLES EXCEEDING GIVEN SPEED ON THE RURAL INTERSTATE (9 LOCATIONS)

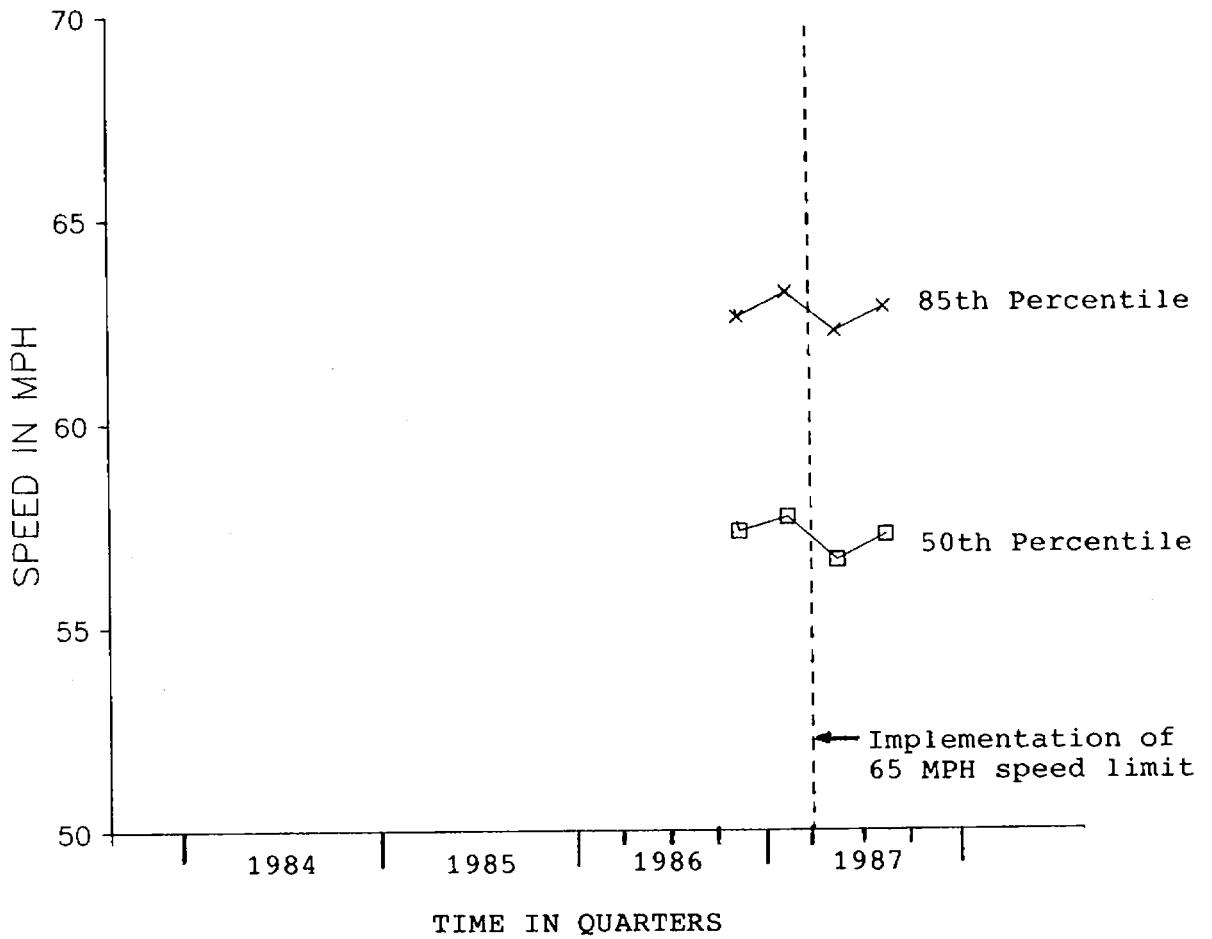


FIGURE 5. PERCENTILE SPEEDS ON THE URBAN INTERSTATE (10 LOCATIONS)

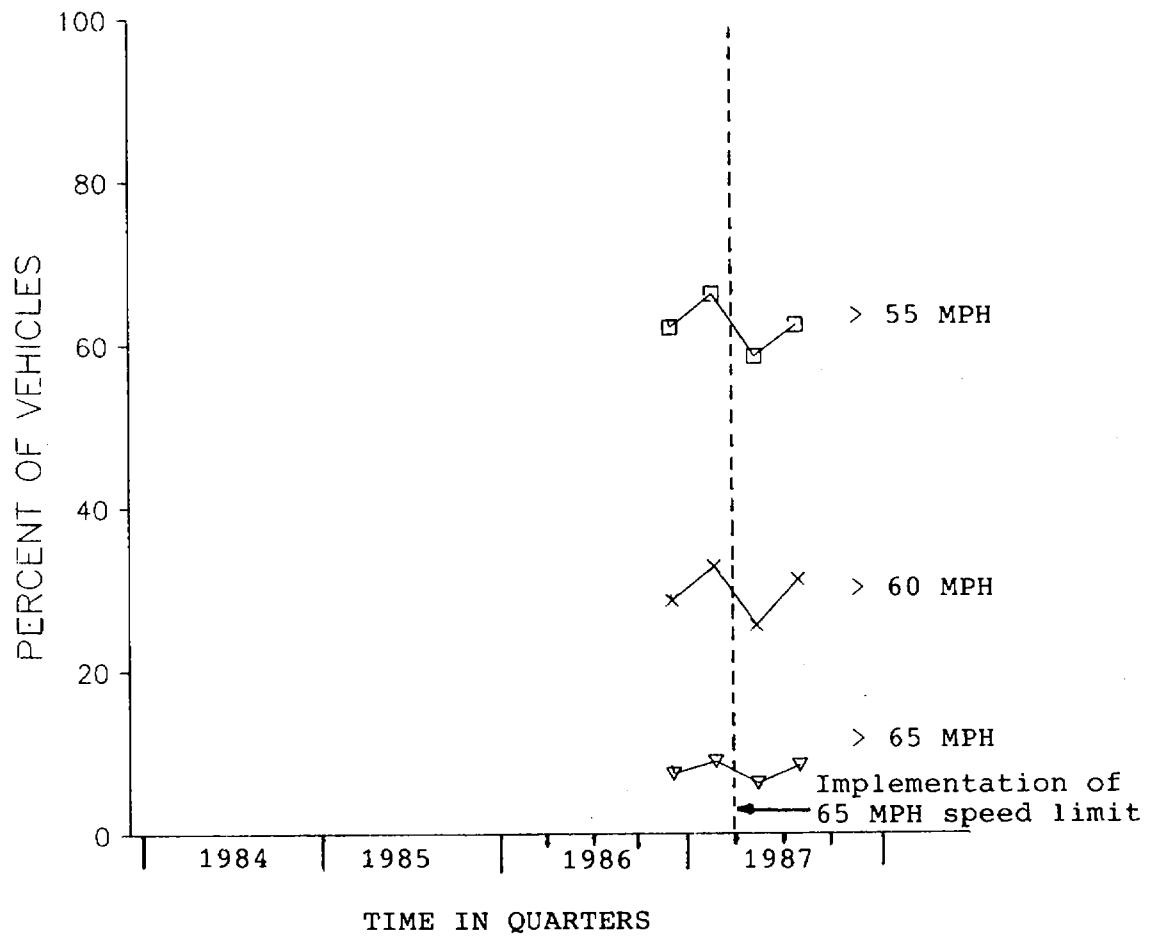


FIGURE 6. PERCENT OF VEHICLES EXCEEDING GIVEN SPEED ON THE URBAN INTERSTATE ( 10 LOCATIONS)

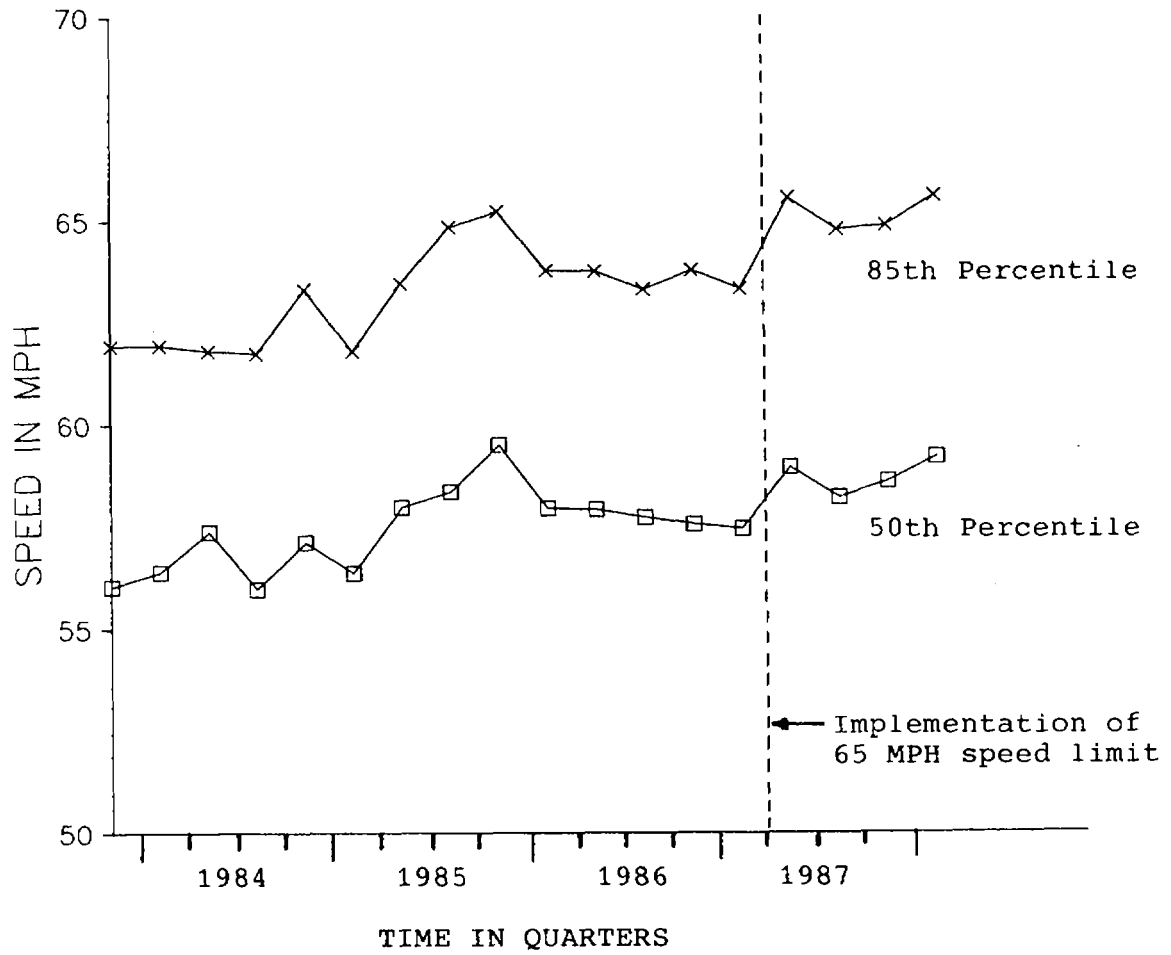


FIGURE 7. PERCENTILE SPEEDS ON RURAL PRIMARY HIGHWAYS (21 LOCATIONS)

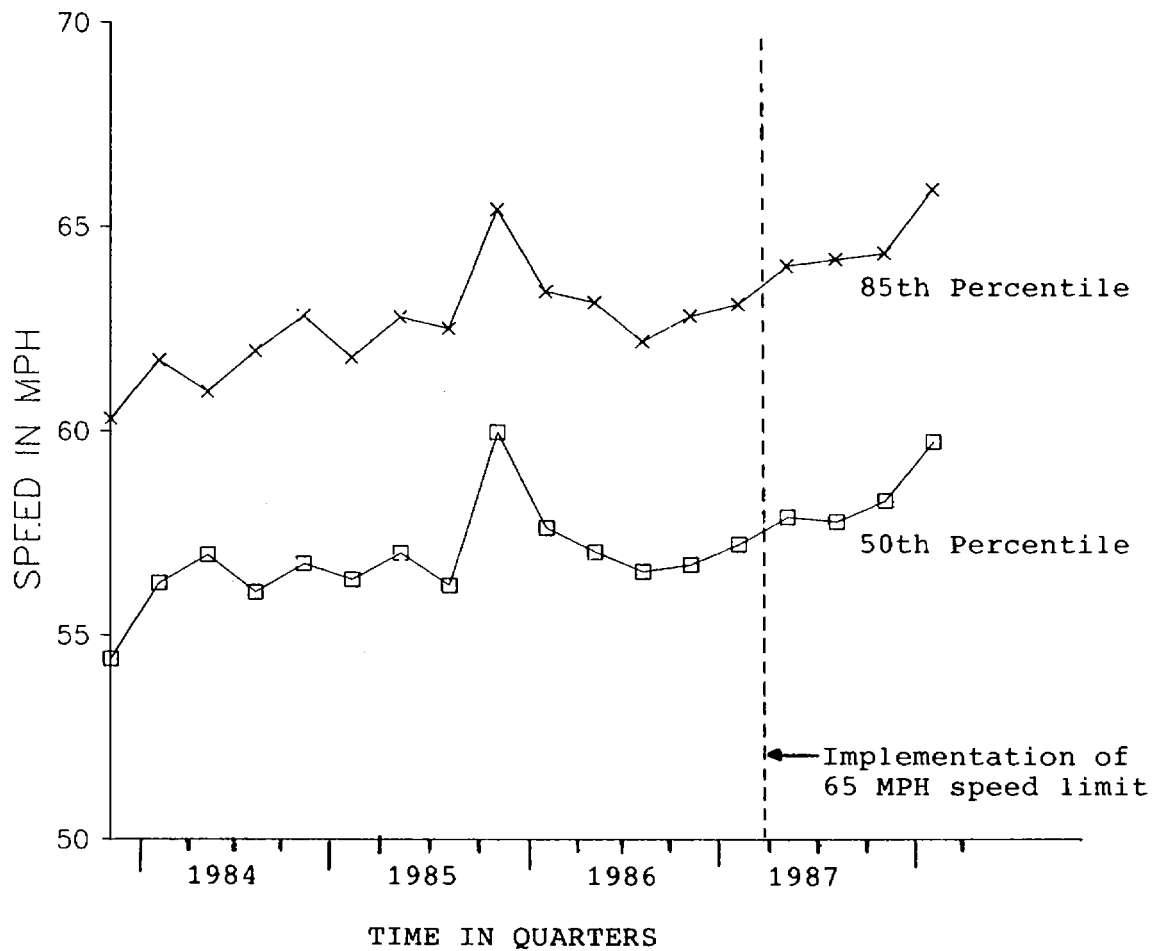


FIGURE 8. PERCENTILE SPEEDS ON RURAL PRIMARY HIGHWAYS (6 LOCATIONS)



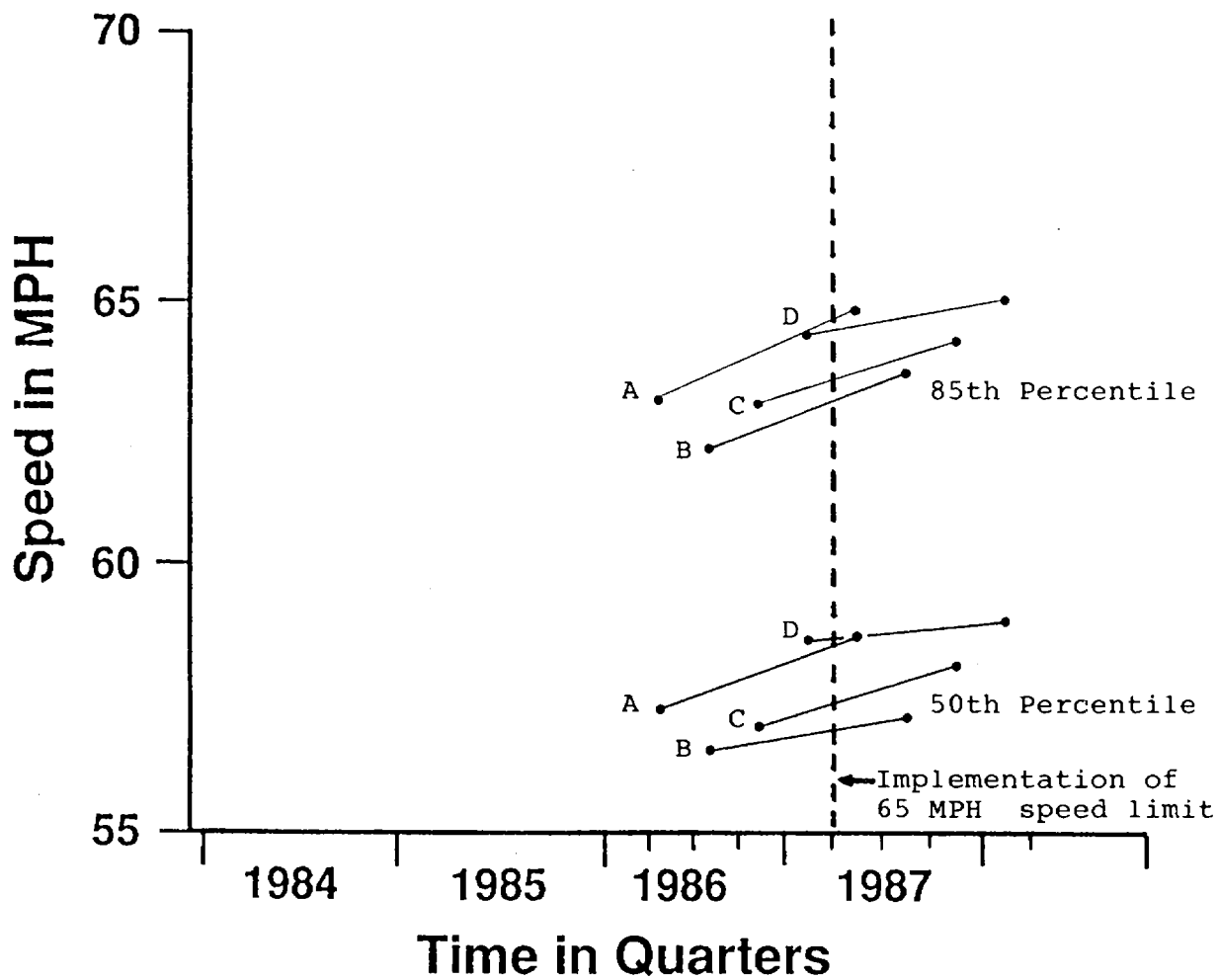


FIGURE 9. PERCENTILE SPEEDS ON RURAL PRIMARY HIGHWAYS - ONE YEAR CHANGES

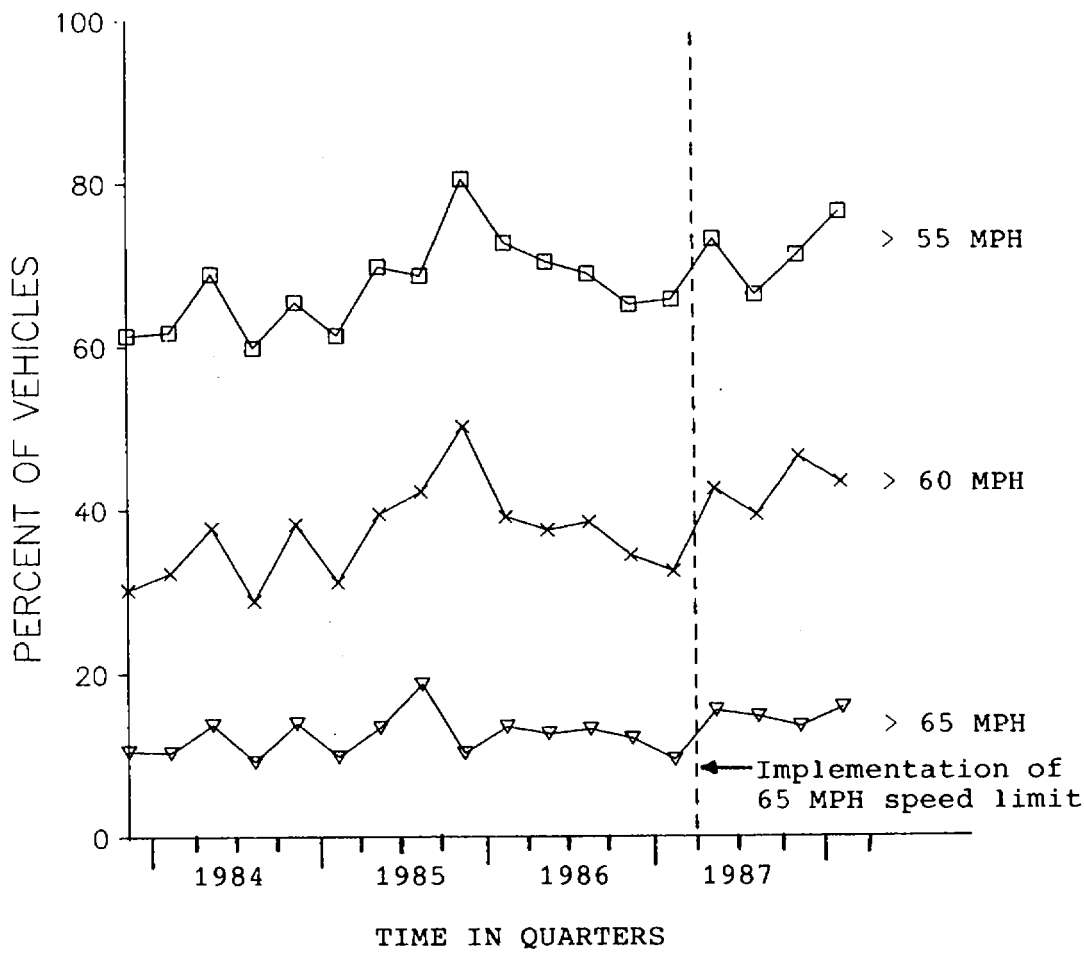


FIGURE 10. PERCENT OF VEHICLES EXCEEDING GIVEN SPEED ON RURAL PRIMARY HIGHWAYS (21 LOCATIONS)

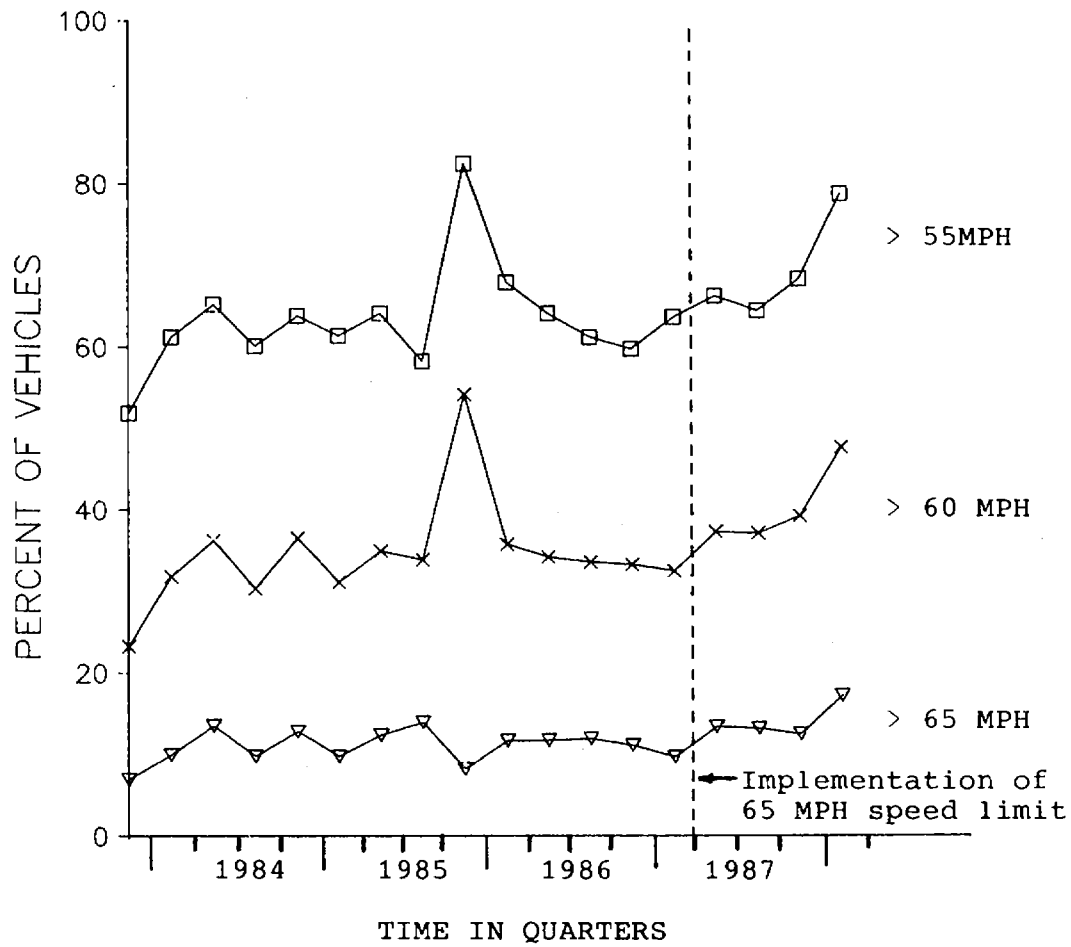


FIGURE 11. PERCENT OF VEHICLES EXCEEDING GIVEN SPEED ON RURAL PRIMARY HIGHWAYS (6 LOCATIONS)

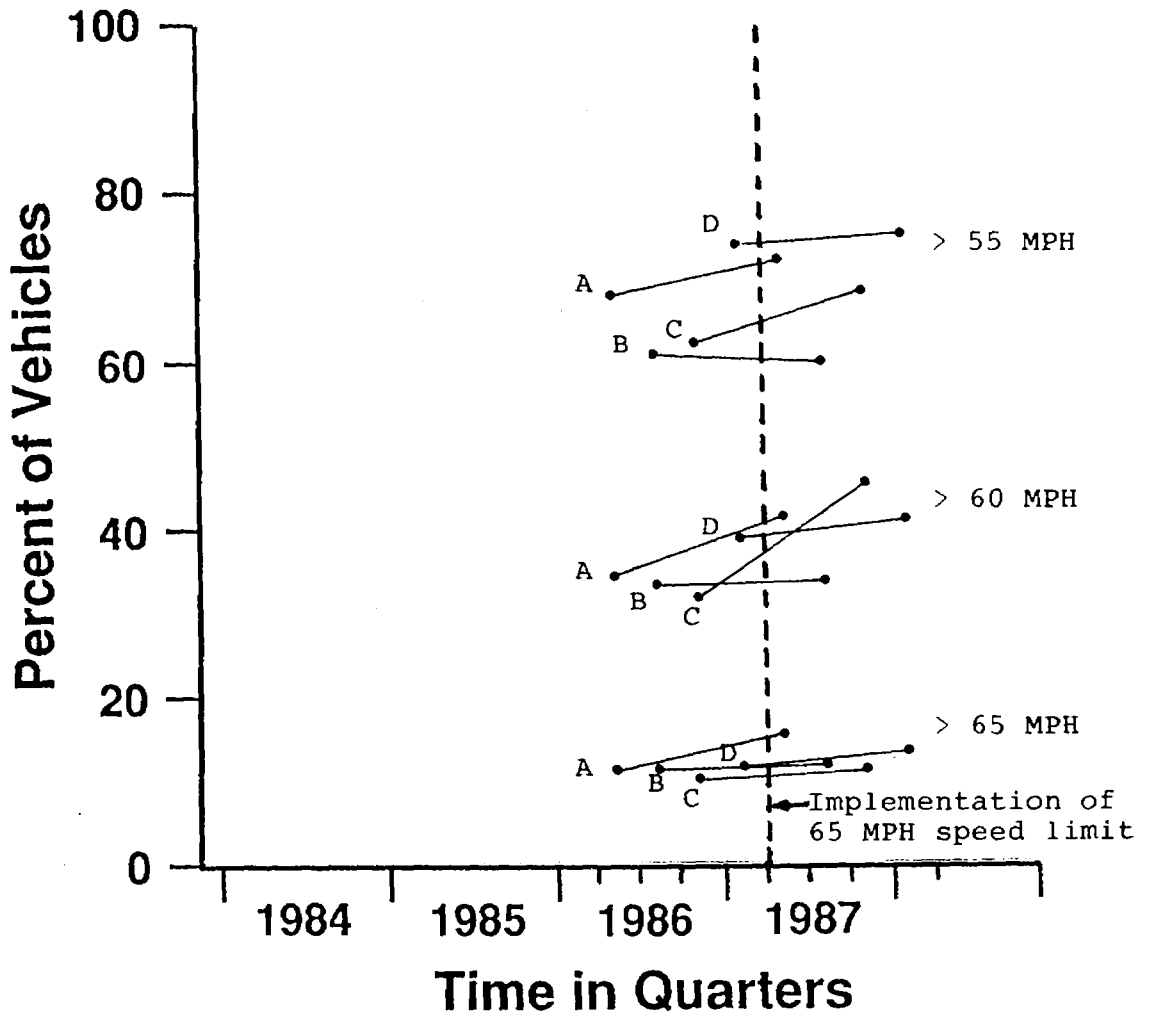


FIGURE 12. PERCENT OF VEHICLES EXCEEDING GIVEN SPEED ON RURAL PRIMARY HIGHWAYS - ONE YEAR CHANGES

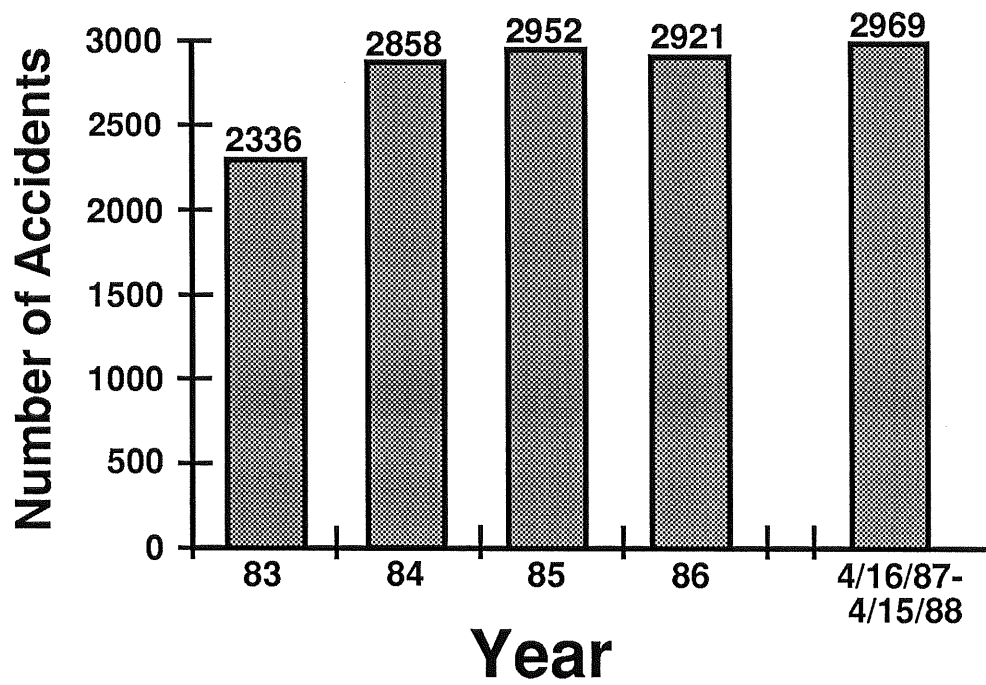


FIGURE 13. TOTAL ACCIDENTS ON URBAN INTERSTATE

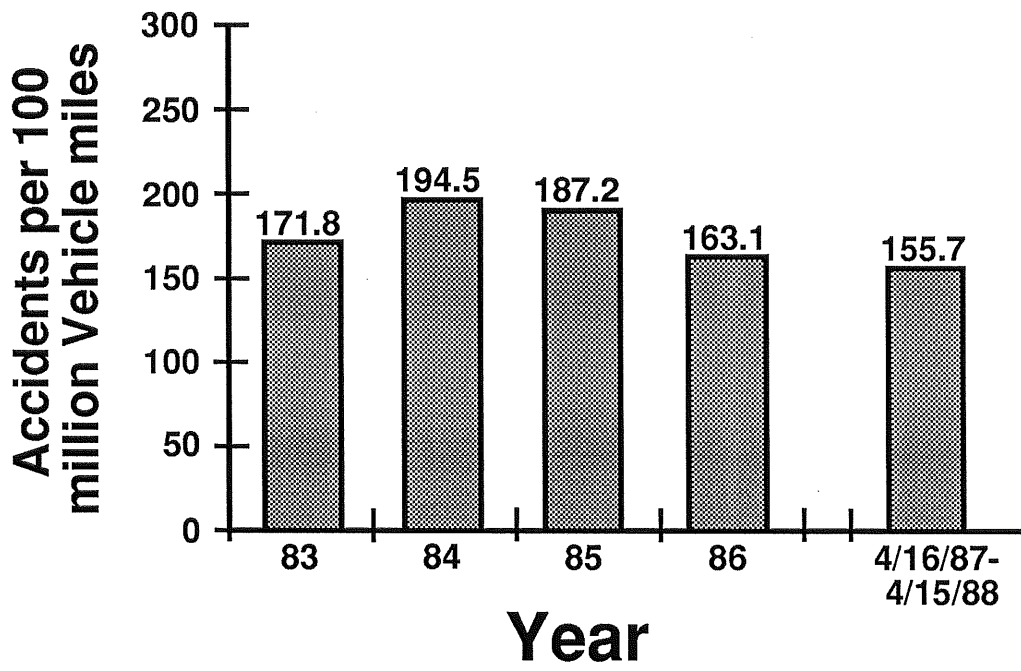


FIGURE 14. ACCIDENT RATE FOR TOTAL ACCIDENTS ON URBAN INTERSTATE

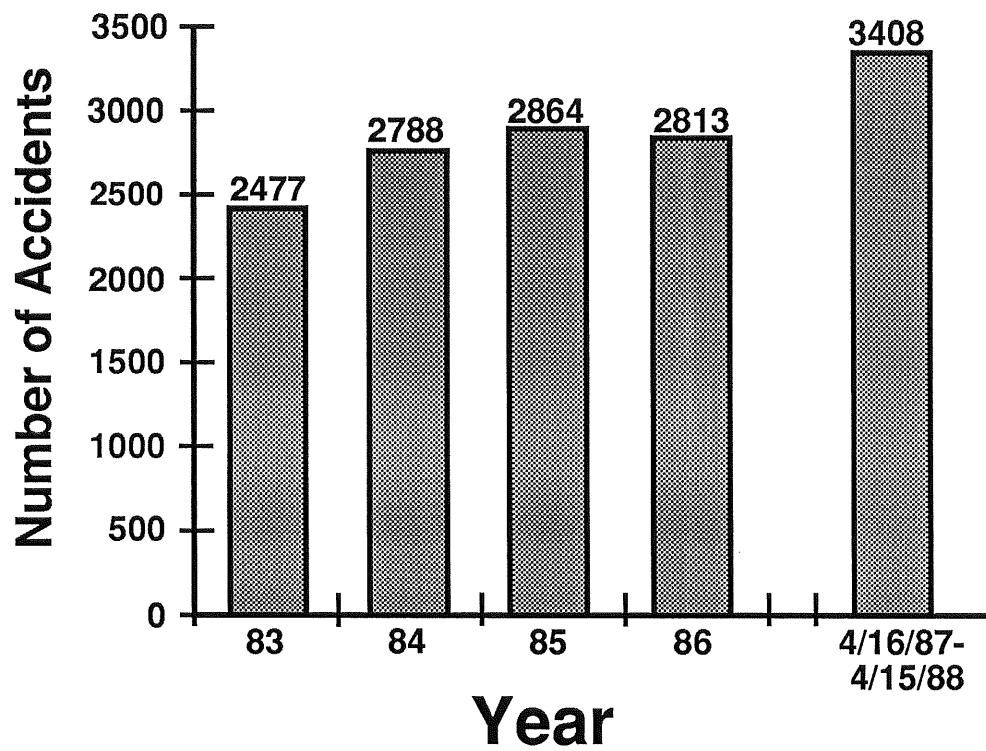


FIGURE 15. TOTAL ACCIDENTS ON RURAL INTERSTATE

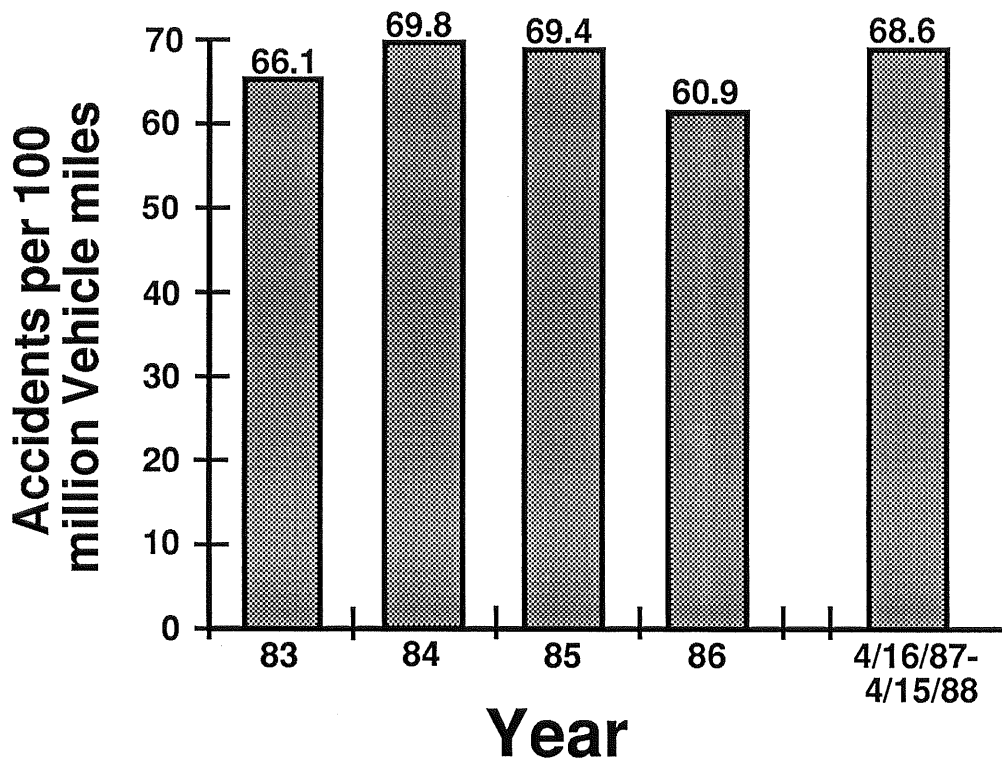


FIGURE 16. ACCIDENT RATE FOR TOTAL ACCIDENTS ON RURAL INTERSTATE



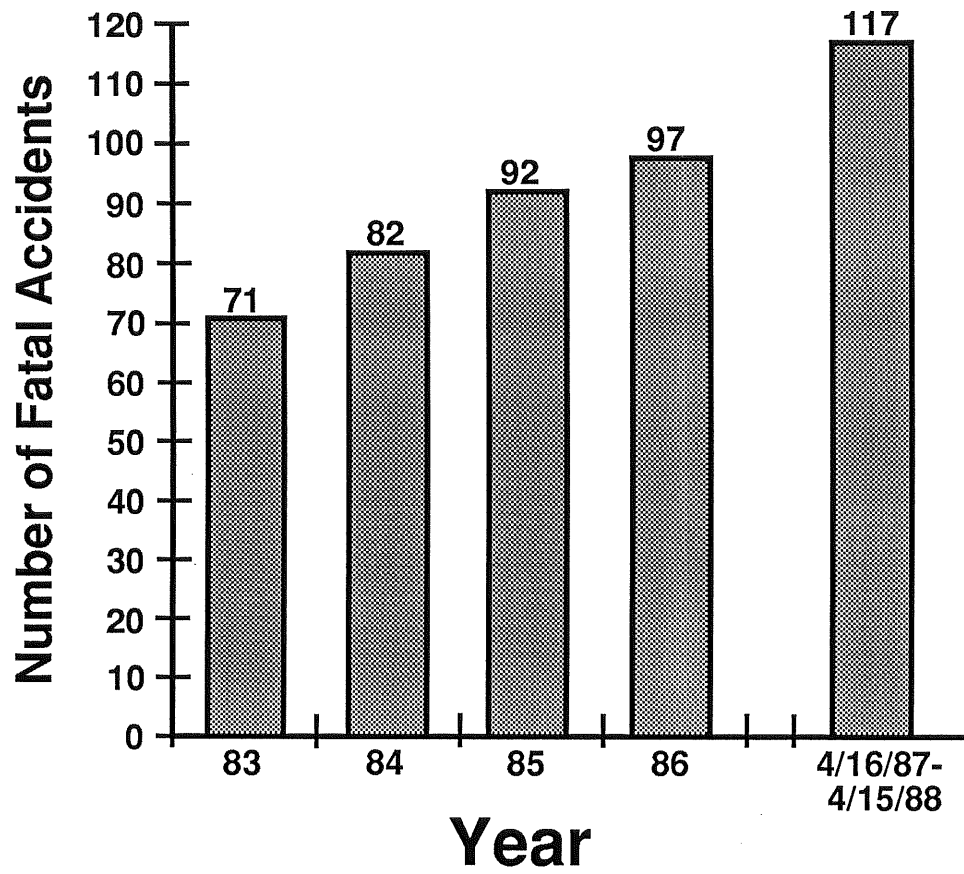


FIGURE 17. FATAL ACCIDENTS ON RURAL INTERSTATE

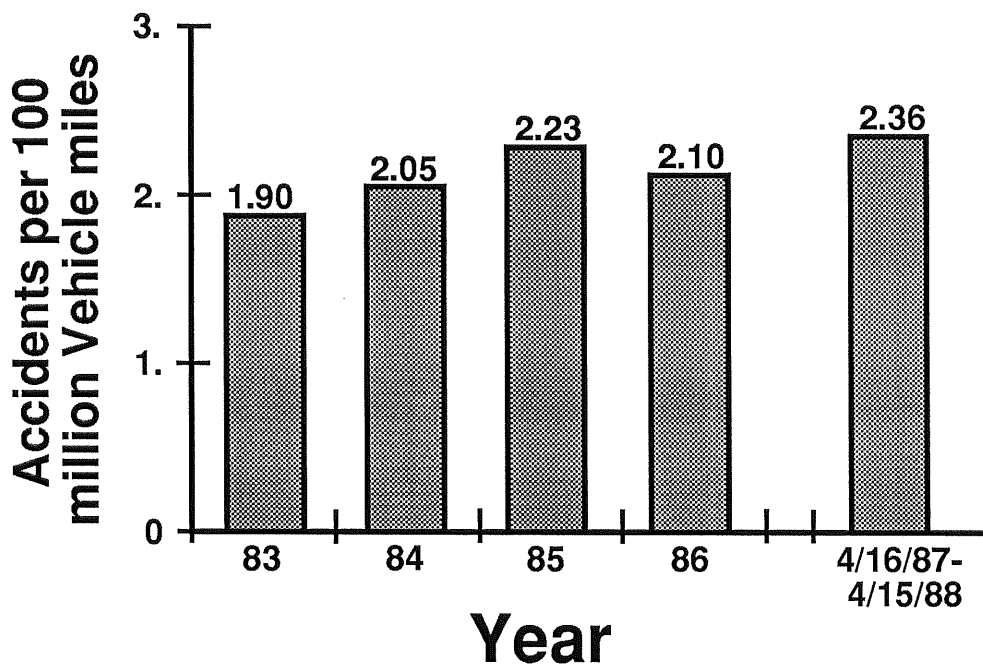


FIGURE 18. ACCIDENT RATE FOR FATAL ACCIDENTS ON RURAL INTERSTATE

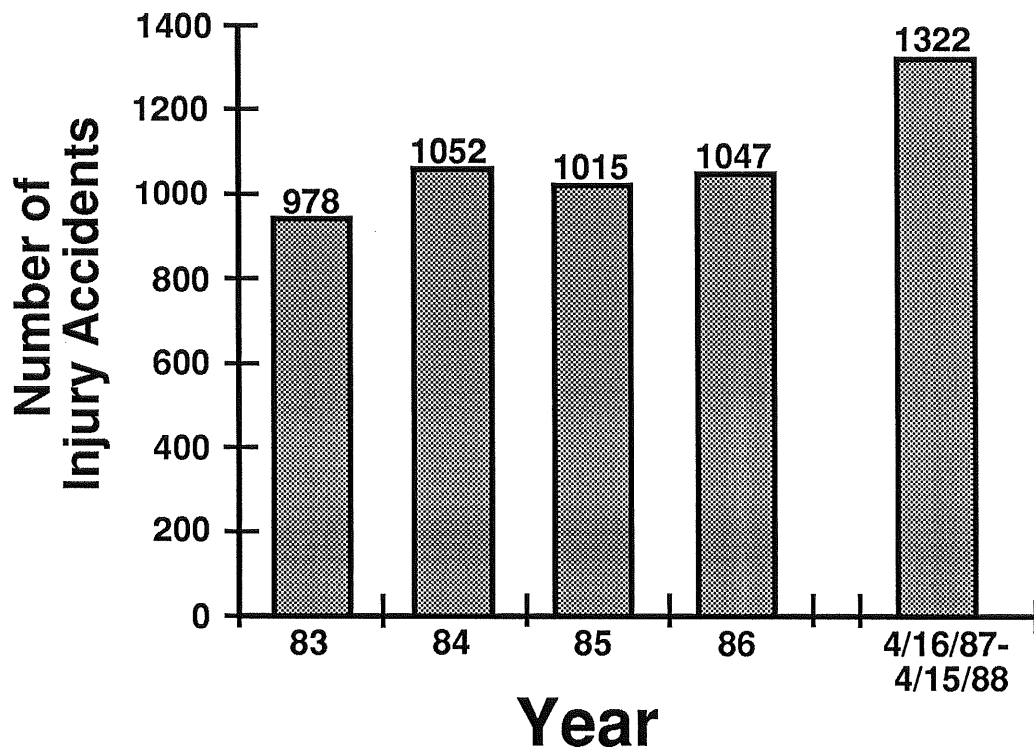


FIGURE 19. INJURY ACCIDENTS ON RURAL INTERSTATE

10A

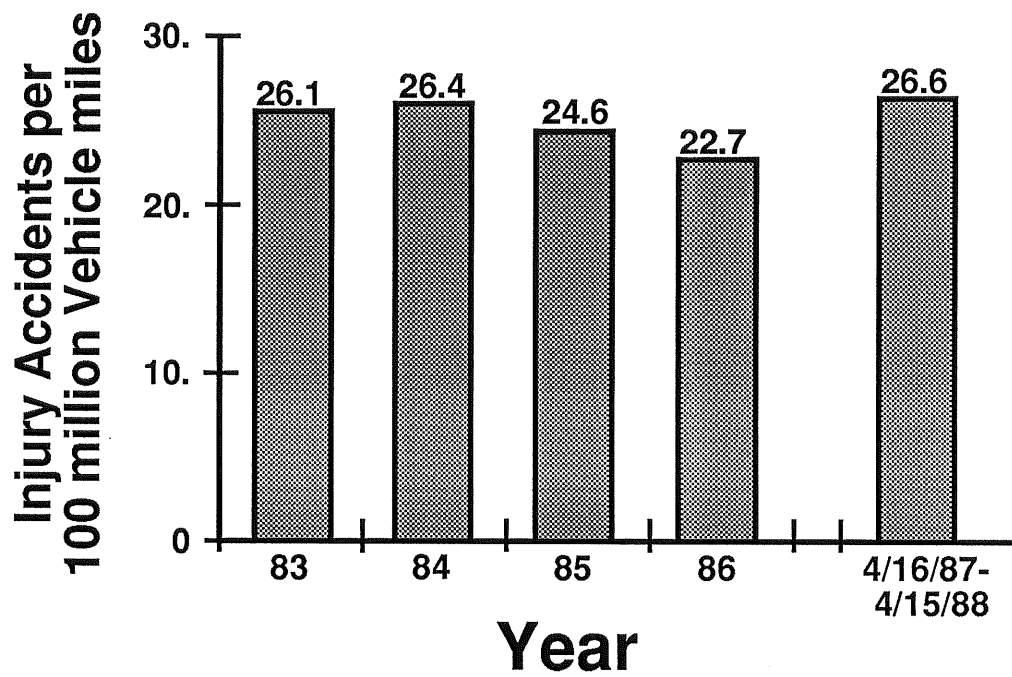


FIGURE 20. ACCIDENT RATE FOR INJURY ACCIDENTS ON RURAL INTERSTATE

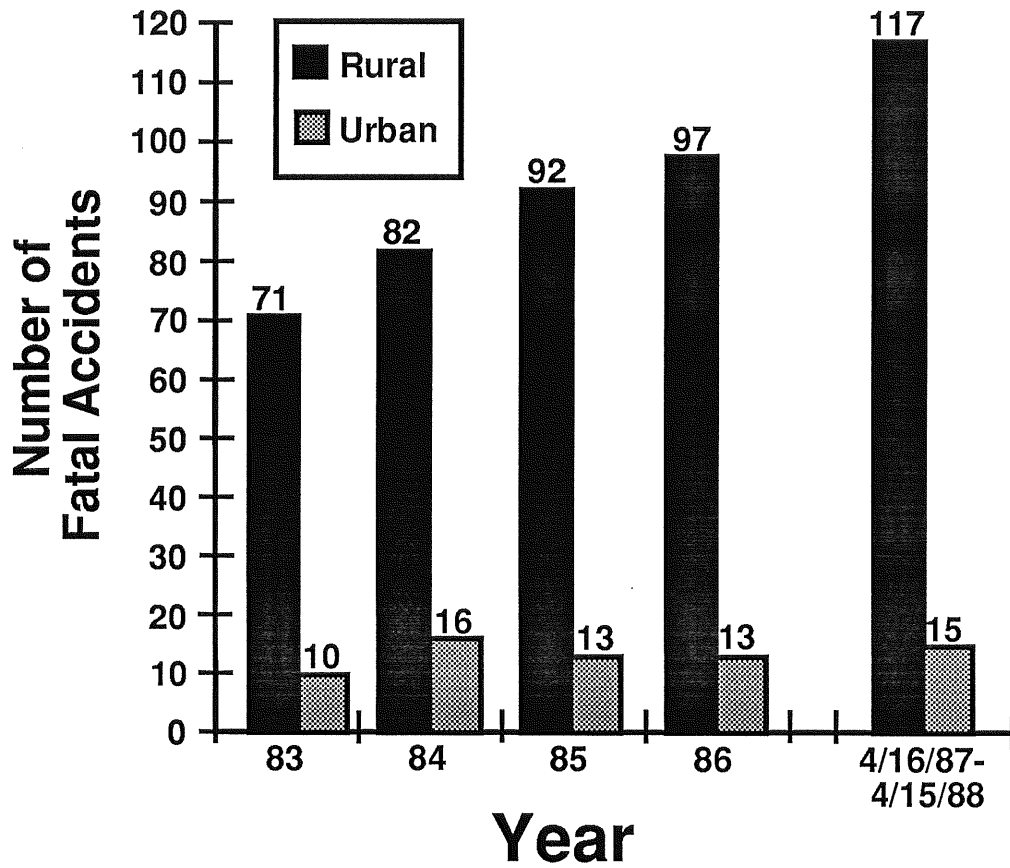


FIGURE 21. INTERSTATE FATAL ACCIDENTS, URBAN VS. RURAL

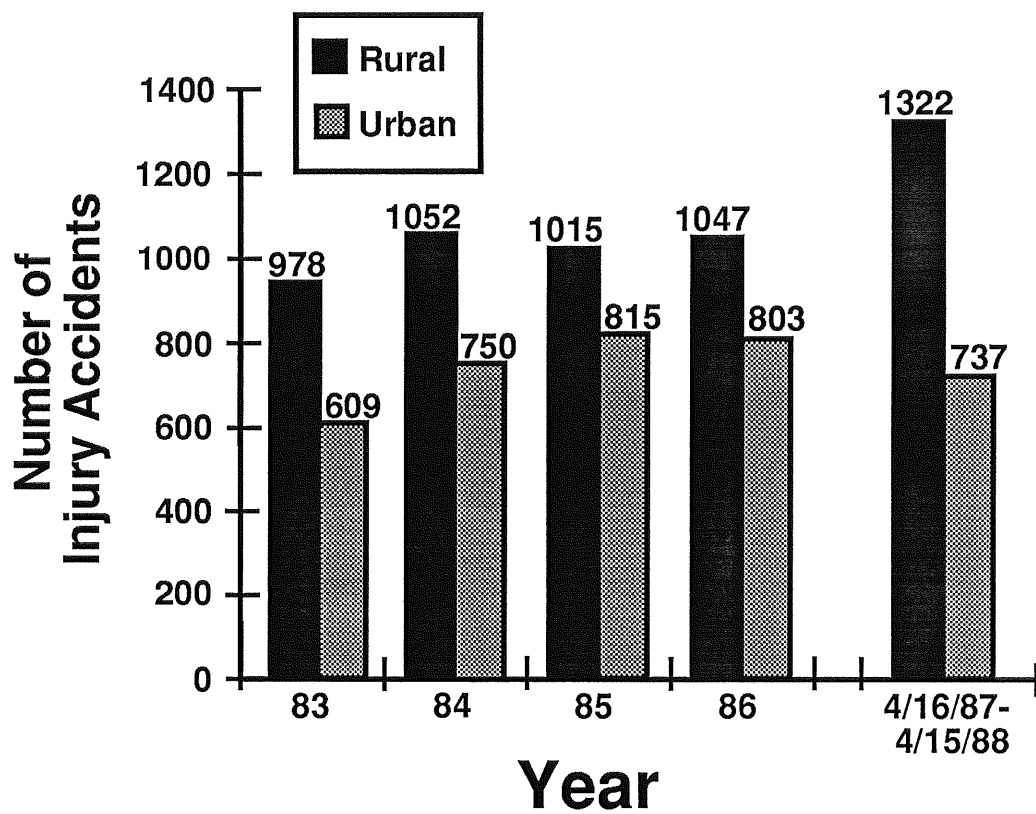


FIGURE 22. INTERSTATE INJURY ACCIDENTS, URBAN VS. RURAL