

Abridgment

Preliminary Assessment of the Increased Speed Limit on Rural Interstate Highways in Illinois

CHARANJIT S. SIDHU

In May 1987, a 65-mph speed limit was posted on rural Interstate highways in Illinois. The effect of the change in vehicle speeds on the incidence of accidents is assessed for the first year. The method consisted of using 5 years of data collected before the new speed limit and subjecting these data to linear regression to project the number of accidents had there been no change in the posted speed limit. The projected number of accidents of each type was then compared with the reported numbers for the period of the assessment. Average speeds of passenger vehicles on the rural Interstates increased from 59.8 mph during the preceding year to 61.8 mph during the initial 12 months of the increased speed limit. The number of fatal accidents (expected versus reported) increased on each of the three different types of highways (15.2 percent on rural Interstates, 20.3 percent on urban Interstates, and 2.9 percent on the primary system of highways). Most of the increase in fatal accidents on the rural Interstates may be attributed to the increase in fatal pedestrian accidents and fatal accidents involving drinking and driving. Results indicate that the higher posted speed limit in Illinois did not have a clearly noticeable or an obviously adverse effect on fatal accidents during its first year.

For over 13 years (since March 1974), the maximum posted speed limit in all states, including Illinois, was 55 mph. This limit was enacted by Congress to conserve fuel in response to the oil embargo of 1973. As a result, traffic slowed on all major highways and the total amount of travel declined in 1976 for the first time since 1946. These changes in speed and travel were accompanied by a decreasing number of traffic fatalities. As the fuel shortage disappeared, safety became the dominant issue surrounding the 55-mph speed limit.

As compliance with this speed limit declined over the years and as fuel supplies became plentiful, the safety benefits of the speed limit also decreased. The early and middle 1980s were a period of intense debate, culminating with an assessment of the 55-mph speed limit by TRB (1) at the direction of Congress. The findings and recommendations of this study apparently opened the door for a higher speed limit on the nation's rural Interstate highways. Toward the end of the 55-mph limit (1985 through 1986), motorists' support for the 55-mph speed limit was exceeded only by their disregard for it on the road.

On April 2, 1987, Congress, with the passage of the Surface Transportation and Uniform Relocation Assistance Act

(STURAA), removed federal sanctions and permitted states to increase the posted speed limit to 65 mph on their rural Interstates. For all practical purposes, the 65-mph posted speed limit became effective on Illinois rural Interstates on May 1, 1987, and it applied to passenger vehicles, buses, motorcycles, and trucks under 4 tons. The speed limit on these highways for trucks over 4 tons, motor homes, campers, and trailers was maintained at 55 mph.

EVALUATION APPROACH

Since the second half of 1987, a number of reports assessing the effect of the 65-mph speed limit on accidents on rural Interstates have been released by various agencies. Most of these reports are based on before and after comparisons of accidents on the highways affected by the new speed limit. The corresponding periods for which accident data are compared are usually no longer than 1 year. This approach is unsatisfactory because this method ignores the trend of accidents on the highways in question over the previous several years, before the transition to the higher speed limit. Further, most of these studies are limited to analysis of fatal accidents and ignore the effect of the higher speed limit on injury and property damage accidents.

The evaluation approach applied is based on 5 years of accident data for approximately 1,200 mi of rural Interstates for the period when they were posted at 55 mph. With the application of regression analysis, the numbers of different types of accidents (fatal, personal injury, and property damage) are projected that are expected to occur for the period being assessed (May 1987 through April 1988) when the 65-mph speed limit applied. The difference in accidents between the projected numbers and the actual or reported number is attributable to the change in the posted speed limit of such highways. Accident data for other Interstates and other roads (non-Interstate) with the 55-mph posted speed limit have also been subjected to the same approach and analyzed. The source of these data is the computerized accident data files maintained by the Illinois Department of Transportation (IDOT), Division of Traffic Safety. Speed data for different highways were obtained from the IDOT Division of Highways, which operates automated speed-monitoring equipment on all types of roads throughout the state.

Illinois Department of Transportation, 2300 South Dirksen Parkway, Springfield, Ill. 62764.

CHANGE IN VEHICLE SPEEDS

Average speeds of passenger vehicles on rural Interstates varied from a low of 57.0 mph to a high of 60.7 mph (a range of 3.7 mph) during the 5-year period before the 65-mph speed limit was posted in May 1987. The average speed for the second quarter of 1987 was 59.7 mph. Since introduction of the higher speed limit, the average speeds increased during the third and fourth quarters of 1987 to 62.0 and 62.3 mph, respectively. During the first quarter of 1988, speeds reached 63.2 mph, declining in the second quarter to 62.1 mph.

The average speed for passenger vehicles on the urban Interstates declined somewhat for the period of the assessment, from 57.1 mph (April through June 1987) to 55.7 mph (April through June 1988). The corresponding 85th-percentile speeds for these vehicles also declined from 65.4 to 64.3 mph. Similarly, the proportion of these vehicles exceeding 70 mph decreased from 4.0 to 3.0 percent.

Over a period of 5 years, from the second quarter of 1982 through the first quarter of 1987, the average speed of passenger vehicles on the two-lane primary system (state highways) was approximately 54 mph. During the first year of the increased speed limit on rural Interstates, average speeds on state highways ranged between 56.4 and 56.8 mph, an increase roughly close to that experienced on rural Interstates.

More specifically, before-after changes in average speeds of passenger vehicles on different highway systems are presented in Table 1, and speed data are graphically shown in Figures 1–3.

CHANGE IN ACCIDENTS

Generally speaking, accompanied by a 2- to 3-mph increase in average speeds of motor vehicles, accidents on the rural Interstates showed increases in each category. Similarly, fatal and personal injury accidents increased on urban Interstates; however, average speeds of vehicles on these highways had apparently declined by 1 to 2 mph. On the other hand, property damage accidents on urban segments declined, as expected, and the change was generally consistent with the change in average speeds. Except for fatal accidents on primary roadways, which increased slightly as expected, personal injury and property damage accidents apparently decreased by a slim margin, despite a small increase (1 to 2 mph) in the average speeds of vehicles. The changes in accidents are presented in Table 2.

INTERPRETATION OF RESULTS

A detailed examination of individual fatal accident reports from May 1987 through April 1988—for accidents on rural Interstate highways—reveals that the number of fatal pedestrian accidents and fatal accidents involving drinking and driving were 11 and 13, respectively. Individual fatal accident reports were also examined for the 24-month period (May 1985 through April 1987) before the increase in posted speed limit. The corresponding average frequencies of such accidents in this earlier period were 7 (pedestrian accidents) and 9 (accidents attributed to drinking and driving), respectively. From these data, hardly any reason exists to believe that a change in the speed limit, one way or another, caused any of these fatal accidents. In all likelihood, the apparent increase in such accidents had little to do with the speeds of vehicles traveling on rural Interstates. If a portion of the before-versus-after increases in these two types of fatal accidents (total of $4 + 4 = 8$ instances) was unconnected with the posted speed limit, the gap between expected and reported fatal accidents would only become smaller. Therefore, any increase in fatal accidents on rural Interstate highways caused by the increased speed limit must indeed be smaller than that shown in the results.

The data for the severity of accidents on rural Interstate highways are also worth examining. Personal injury rates (per 100 million vehicle miles of travel) for the periods of interest are presented in Table 3.

A glance at these data shows that the personal injury rate during May 1987 through April 1988 is quite consistent with such rates in the previous years. If anything, the rate for the period of assessment is somewhat lower than that of the preceding year (May 1986 through April 1987). In addition, when the proportions of the most severe injuries (Class A injuries) are examined, the earlier conclusion regarding the severity of accidents remains unchanged, as presented in Table 4.

Further, when fatal accidents and personal injury accidents as proportions of total accidents were tested for differences (Chi-squared test, 95 percent confidence) for the before (May 1982 through April 1987) and after periods (May 1987 through April 1988), no significant differences were found between such proportions. In short, the severity of accidents on rural Interstates almost certainly did not worsen and stayed within limits of random variation.

In summary, the analysis of all relevant data and the interpretation of results support the view that the 65-mph posted speed limit on rural Interstate highways in Illinois had appar-

TABLE 1 BEFORE-AFTER SPEED CHANGES FOR PASSENGER VEHICLES

Highway System	Average Speed (mph)		
	Before		After
	May 1982–April 1987	May 1986–April 1987	May 1987–April 1988
Rural Interstates	58.7	59.8	61.8
Urban Interstates	55.4	56.6	55.9
Primary system	54.0	55.1	56.1

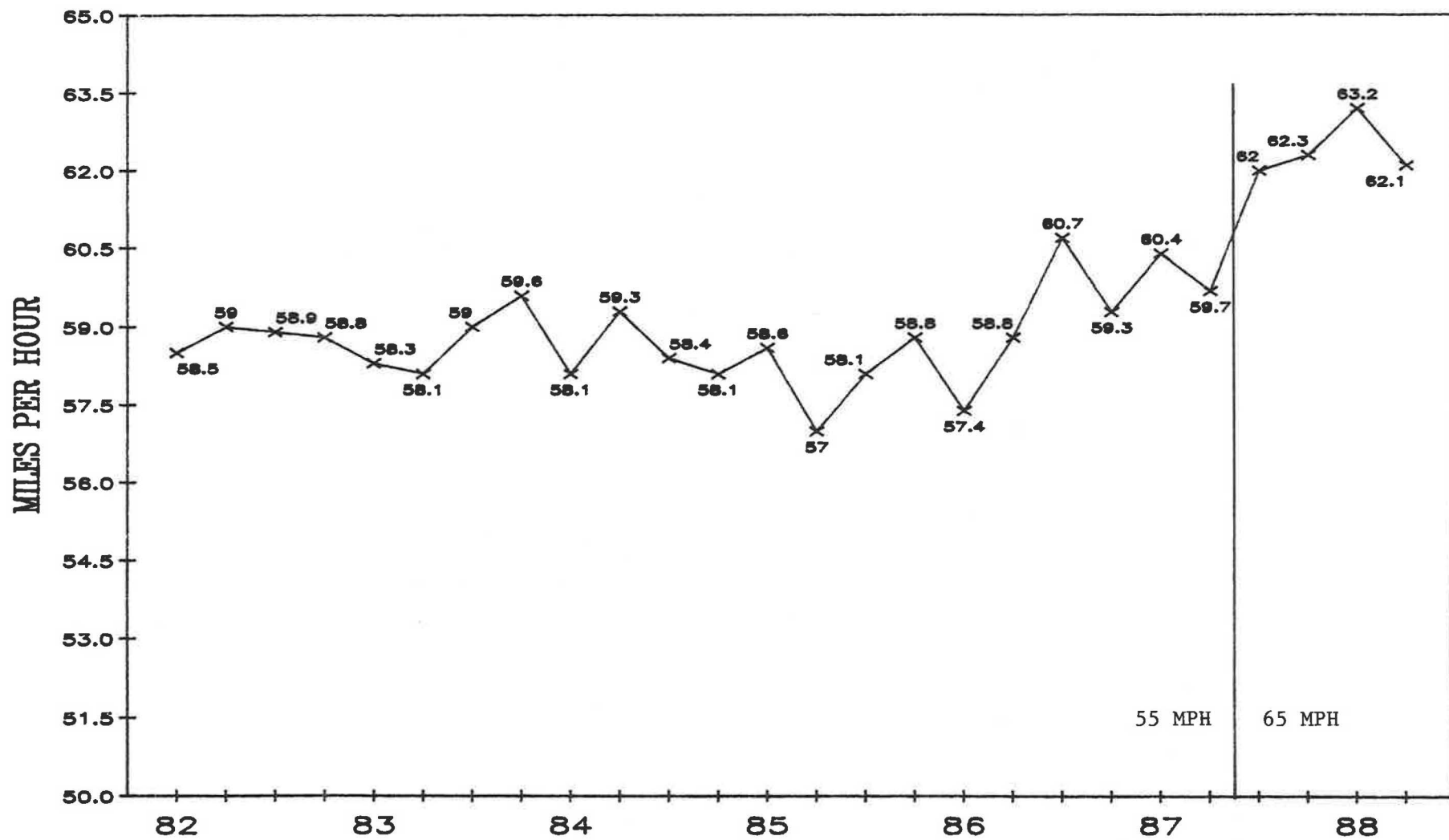


FIGURE 1 Average speeds of passenger vehicles on rural Interstate routes by quarter.

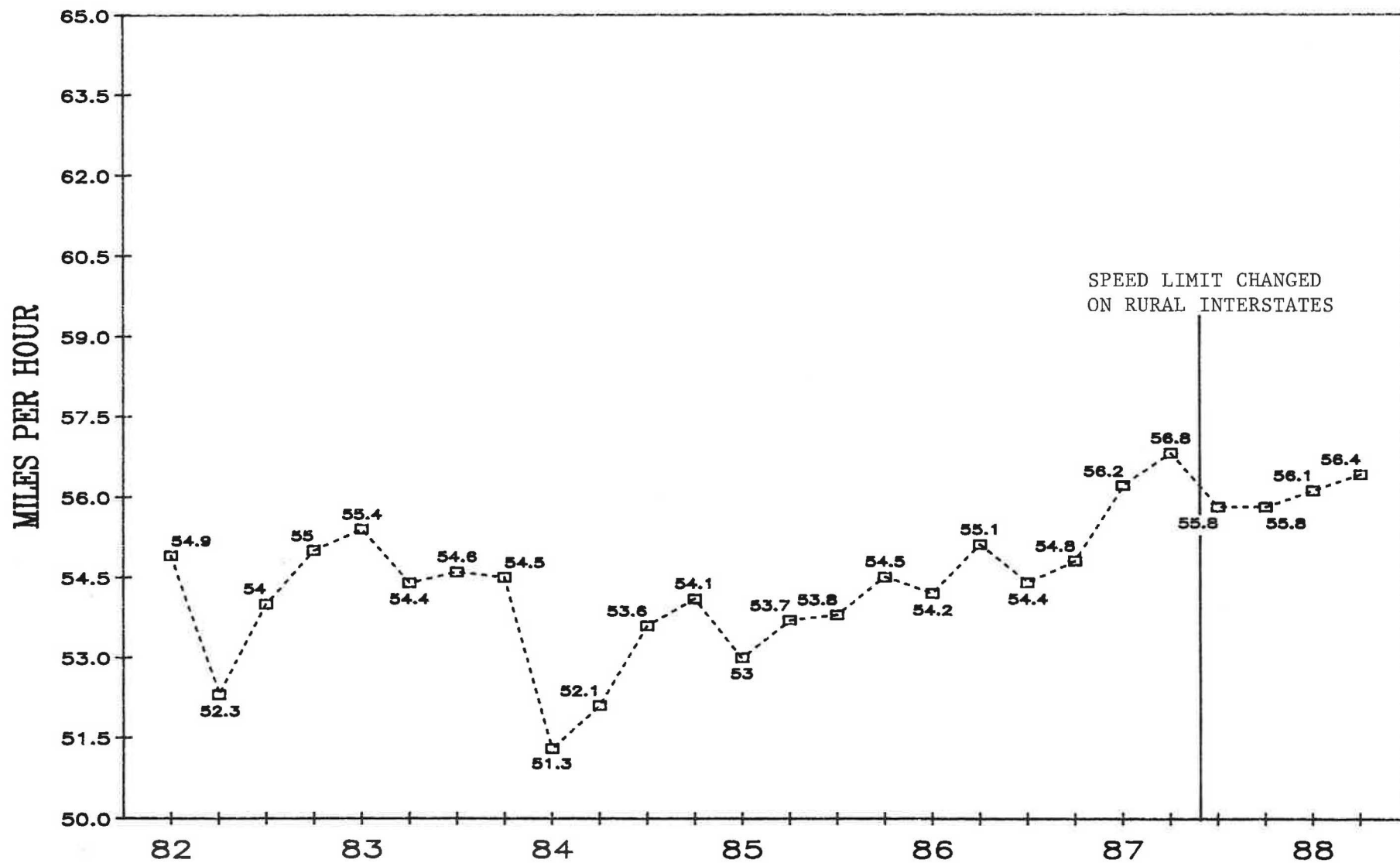


FIGURE 3 Average speeds of passenger vehicles on primary routes by quarter.

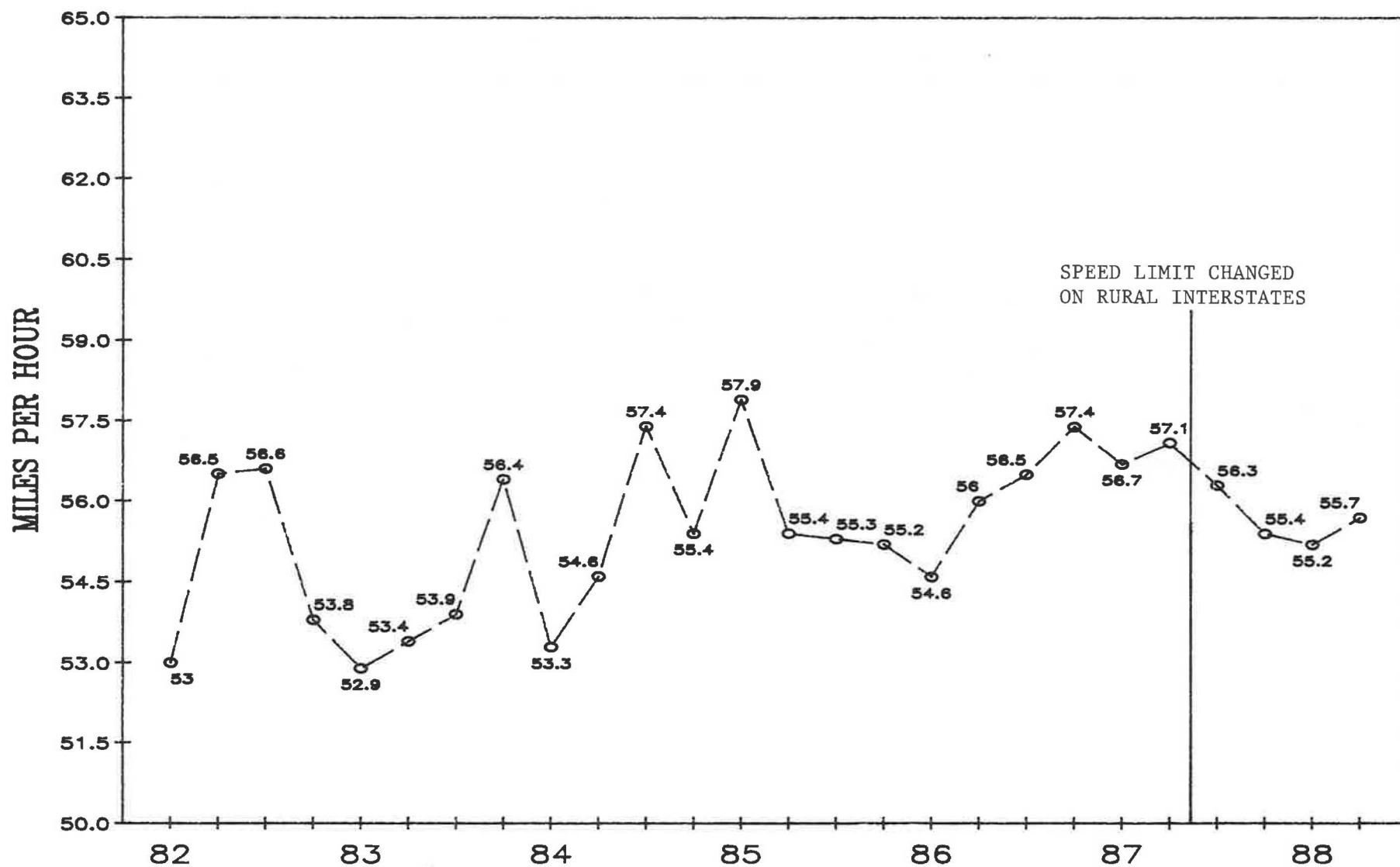


FIGURE 2 Average speeds of passenger vehicles on urban Interstate routes by quarter.

TABLE 2 EXPECTED VERSUS REPORTED ACCIDENTS

Accident Type	No. Expected	No. Reported	% Change	Statistically Significant
(Rural Interstate Highways)				
F.A.	46	53	+15.2	No
P.I.	1,120	1,181	+5.4	No
P.D.	2,483	2,647	+6.6	Yes
(Urban Interstate Highways)				
F.A.	64	77	+20.3	No
P.I.	6,146	6,231	+1.3	No
P.D.	15,239	14,105	-7.4	Yes
(Primary or State Roadways)				
F.A.	669	689	+2.9	No
P.I.	50,626	49,945	-1.3	No
P.D.	122,325	121,379	-0.7	Yes

TABLE 3 PERSONAL INJURY RATES

Time Periods	Personal Injury Rates
May 1982 - April 1983	29.0
May 1983 - April 1984	43.0
May 1984 - April 1985	32.0
May 1985 - April 1986	32.3
May 1986 - April 1987	34.1
May 1987 - April 1988	33.8

TABLE 4 PROPORTION OF SERIOUS INJURIES

Time Periods	No. of "A" Injuries	No. of Total Injuries	% of Total
May 1982 - April 1983	510	1313	38.8
May 1983 - April 1984	745	1973	37.7
May 1984 - April 1985	608	1543	39.4
May 1985 - April 1986	600	1636	36.6
May 1986 - April 1987	530	1816	29.1
May 1987 - April 1988	572	1901	30.0

ently a small effect on fatal accidents during the first year. Similarly, even though personal injury accidents on these highways apparently increased, the observed change is within the limits of random fluctuation. On the other hand, property damage accidents on these highways increased beyond their expected level and the increase in such accidents is statistically significant.

The first year of the increased speed limit in Illinois does not appear to have had a clearly noticeable or an obviously adverse effect on the safety of rural Interstate motorists.

REFERENCE

1. *Special Report 204: 55: A Decade of Experience*. TRB, National Research Council, Washington, D.C., 1984.

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