WYOMING LEGISLATIVE SERVICE OFFICE

Issue Brief

05 IB 002

Date: **January 11, 2005**

Author: **Nicole Novotny, Associate Research Analyst**

Re: **Impacts of Differential Speed Limits**

PURPOSE

Investigate the impacts of differential speed limits with states that have implemented such policies.

RESULTS IN BRIEF

Overall, research relating to the effectiveness of differential speed limits is currently not definitive. A lack of consistency among states in terms of policy rationale and evaluation makes it difficult to determine how and why speed differentiation affects the public. However, national studies and studies conducted in Virginia, Oregon, and Idaho provide insight into the potential outcomes experienced by states after implementing a differentiated speed limit.

BACKGROUND INFORMATION

In an effort to combat the national energy crisis in 1973, Congress passed the Emergency Highway Conservation Act limiting maximum speeds to 55 mph on interstate highways. The Surface Transportation and Uniform Relocation Assistance Act of 1987 allowed states to raise interstate speeds to 65 mph in rural sections. In 1995, the adoption of the National Highway System Designation Act returned speed limit authority to the states. Currently, all states have a maximum speed limit that is between 65 mph and 75 mph.

According to data provided by the National Conference of State Legislatures, there are eleven states that currently have differentiated speed policies for rural interstate highways: Arkansas, California, Idaho, Illinois, Indiana, Michigan, Montana, Ohio, Oregon, Texas, and Washington. (See Attachment A) The State of Texas has also implemented differentiated speed limits for urban interstate highways and other limited access roads. Furthermore, the State of Virginia once adopted a differentiated speed limit policy, but has since repealed the differentiated limit.

The most common measure of vehicle speed is referred to as the "85th percentile speed." This is the speed at which 85 percent of the free-flowing vehicles are traveling. This standard measure is utilized by federal and state government as a reference point for determining appropriate speed limits. Generally, the 85th percentile encourages individuals to comply with speed limit laws simply because it appeals to 85 percent of the population within a calculated speed distribution chart.

NATIONAL STUDIES

In 1994, the United States Department of Transportation Federal Highway Administration wrote a technical summary entitled, "Safety Impacts of Different Speed Limits for Cars and Trucks, Final Report." This report concluded that the mean speed of cars traveling on interstate highway systems was not affected by different speed limits. However, research conducted by the Federal Highway Administration did find that states with differentiated speed limits experienced an 26 percent increase in car-into-truck rear-end accidents compared to states with uniform speed limits. Conversely, states with uniform speed limits demonstrated higher levels of truck-into-car rear-end accidents (57 percent), sideswipe accidents (41 percent), and other vehicle collisions (103) percent by comparison.

Overall, the technical analysis of the Federal Highway Administration's summary showed that there was very little difference in accidents or accident severity between states with differentiated speed limits and states with uniform speed limits for interstate highway systems.

In September 2004, the Federal Highway Administration conducted another, more comprehensive, study of differential speed limits and safety on rural interstate highways. Once again, the results of this study did not quantify the effects of speed limit changes among the states considered. Similar to the Portland State Study, to be discussed later, this analysis also determined that mean speed and crash rates increased from 1991 to 2001 but changes in speed limit regulation did not necessarily impact safety and speed characteristics. (See Attachment B)

STATE STUDIES

Virginia -- In 2002, the University of Virginia Department Center for Transportation Studies conducted a study entitled "The Safety Impacts of Differential Speed Limits on Rural Interstate Highways." This study compared safety effects between states with uniform speed limits and differentiated speed limits from 1991 to 2000. This study demonstrated that overall mean speed, 85th percentile speed, median speed, and crash rates among the ten states studied tended to increase over the ten year period regardless of speed limit differentiation or uniformity. The study further suggests that the relationship between crashes and traffic volume cannot be generalized, but instead, must be studied by site or state. (See Attachment C)

Oregon -- In August of 2004, the Center for Transportation Studies at Portland State University conducted a study to understand issues related to potential speed limit changes in the State of Oregon. One area of the study focused on a potential change in the Oregon speed limit from 65 mph to 70 mph for cars and 55 mph to 65 mph for trucks. The results of this portion of the study suggest that:

- Higher truck speeds and mass of trucks combine to produce more severe collisions;
- The change to a 70 mph passenger car limit and 65 mph truck limit will likely result in less speed dispersion between cars and trucks;
- Reducing speed dispersion for a more uniform traffic stream will have a positive effect on safety; and
- The link between differential speed limits and safety is not well established—research on the subject has not demonstrated any definitive evidence that supports the safety case for or against differential truck speeds.

Idaho -- In 1998, Idaho implemented a differentiated speed limit that required a lower speed limit for certain classes of trucks operating on interstate highways. Trucks with five or more axels and/or a weight of more than 26,000 pounds were required to travel at a speed 10 miles per hour less than that of other vehicles.

A study conducted by the National Institute for Advanced Transportation Technology from 1997 to 2000 assessed the impacts that the differential speed limit had upon overall highway safety in the State of Idaho. The study determined that the speed limit change caused the following to occur:

- Passenger car speeds increased by 0.85 mph and 85th percentile speeds increased by 0.8 mph;
- Truck speeds declined by 1.0 mph and 85th percentile speeds declined by 2.5 mph;
- Speed differentials between trucks and passenger cars increased from 5.5 mph to 7.4 mph; and
- The standard deviation of vehicle speeds—including all vehicles—did not increase.
- Crash data did not increase as a result of the speed limit change

Ultimately, the study determined that "while the potential for a decrease in safety exists because of the speed limit differential, data collected show that a significant change in the safety level has not occurred…while the crash data is limited, there is no evidence of an increase in crashes involving trucks."

ADDITIONAL INFORMATION

In 1988, the University of Virginia conducted a study for the AAA Foundation for Traffic Safety entitled "Speed Variance and its Influence on Accidents." Though the study did not evaluate the effectiveness of differentiated speed limits, it did analyze the relationship between vehicular speed and the geometric characteristics of highways in traffic streams. The study concluded that the design of the highway played a significant role in whether or not individuals obeyed the posted speed limit. Furthermore, the study concluded that accident rates do not necessarily increase as average speed increases; rather, accident rates increase with increased speed variance.

Another study published in 1988, "Commercial Motor Vehicle Speed Control Devices" sheds light on the issue of speed limits. This study, conducted by the U.S. Department of Transportation National Highway Traffic Safety Administration notes the fact that "…Most heavy truck crashes do not occur on roadways where very high travel speeds (greater than 70 mph) are prevalent. More than 90 percent of combination-unit truck crashes and 95 percent of single-unit truck crashes occur on roadways where the speed limit is less than 65 mph."

An analysis brief published by the United States Department of Transportation Office of Motor Carrier Safety in 1999 focuses specifically on fatal accidents involving large trucks traveling at high speeds. Though this study did not consider the uniform and differentiated speed limits, the study did determine that fatal crashes involving large trucks occurred most frequently on rural highways, not interstates. According to the summary, 48 percent of the fatal crashes that occurred in the State of Wyoming from 1992 to 1997 were speed related.

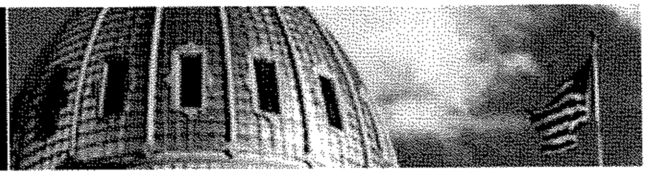
CONCLUSION

Since 1991, the speeds at which vehicles on interstates and highways travels have increased. Several states have implemented differentiated speed limit policies to enhance traffic safety, but the benefits and costs of such policies cannot be definitively determined. Several factors, besides speed, influence interstate and highway safety overall. Because of these varying factors, much of the research considered in this memo concludes that more research must be done on the subject of speed differentiation in order to determine just how, when, and why such policies may be beneficial for the overall safety of the general public.

Copies of the research products considered for the purpose of this memorandum are available through the LSO General Research Division.

ATTACHMENT A

NATIONAL CONFERENCE of STATE LEGISLATURES



nvironment, Energy and Transportation Program

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State Maximum Posted Speed Limit Laws

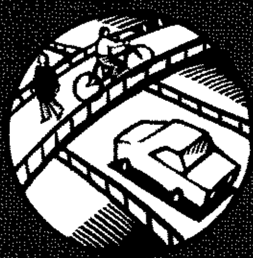
State/Jurisdiction	Rural Interstates	Urban Interstates	Other Limited Access Roads	Other Roads
Alabama	70	65	65	65
Alaska	65	55	65	55
Arizona	75	55	55	55
Arkansas	70; trucks: 65	55	60	55
California	70; trucks: 55	65	70	65
Colorado	75	65	65	65
Connecticut	65	55	65	55
Delaware	65	55	65	55
Florida	70	65	70	65
Georgia	70	65	65	65
Hawaii	60	50	45	45
Idaho	75; trucks: 65	75	65	65
Illinois	65; trucks: 55	55	65	55
Indiana	65; trucks: 60	55	55	55
Iowa	65	55	65	55
Kansas	70	70	70	65
Kentucky	65	65	65	55
Louisiana	70	70	70	65
Maine	65	65	65	60
Maryland	65	65	65	55
Massachusetts	65	65	65	55
Michigan	70; trucks: 55	65	70	55
Minnesota	70	65	65	55
Mississippi	70	70	70	65
Missouri	70	60	70	65

lontana	75; trucks: 65	65	day: 70; night: 65	day: 70; night: 65
lebraska	75	65	65	60
levada	75	65	70	70
lew Hampshire	65	65	55	55
lew Jersey	65	55	65	55
lew Mexico	75	75	65	55
lew York	65	65	65	55
lorth Carolina	70	70	70	55
lorth Dakota	75	75	70	65
)hio	65; trucks: 55	65	55	55
)klahoma	75	70	70	70
)regon	65; trucks: 55	55	55	55
ennsylvania	65	55	65	55
Rhode Island	65	55	55	55
South Carolina	70	70	60	55
South Dakota	75	75	65	65
Tennessee	70	70	70	65
Texas	day: 75; night: 65; trucks: 65	day: 70; night: 65	day: 75; night: 65; trucks: 65	day: 60; night: 55
Utah	75	65	75	65
Vermont	65	55	50	50
Virginia	65	65	65	55
Washington	70; trucks: 60	60	60	60
West Virginia	70	55	65	55
Wisconsin	65	65	65	55
Wyoming	75	60	65	65
District of Columbia	N/A	55	N/A	25
Source: Insurance Institute for Highway Safety, AAA, and NCSL, 2003.				

Back to State Law Charts

ATTACHMENT B

TECHBRIEF



The Safety Impacts of Differential Speed Limits on Rural Interstate Highways

BACKGROUND

The Surface Transportation and Uniform Relocation Assistance Act (STURAA), enacted on April 2, 1987, permitted individual States to raise speed limits from the previously mandated national speed limit of 88 kilometers per hour (km/h) to 105 km/h (55 miles per hour (mi/h) to 65 mi/h) on rural interstate highways. After this date, some States uniformly raised their speed limits for passenger cars and trucks. Other States raised the speed limit for passenger cars only while leaving the truck limit at 88 km/h (55 mi/h), creating a Differential Speed Limit (DSL)—different speed limits for cars and heavy trucks traveling on the same roadway. Speed limits that are the same for both passenger cars and trucks are known as Uniform Speed Limits (USL). On November 28, 1995, the national maximum speed limit was repealed, giving States further flexibility in setting their limits. By 2002 several States had experimented with both DSLs and USLs.

OBJECTIVE

Previous studies conducted during the early 1990s that compared USLs and DSLs were constrained because of the limited data available. Over the past decade several States have either eliminated or implemented a lower limit for trucks providing the opportunity for a before and after study that might provide more reliable results. In 1994, Virginia switched from a differential speed limit of 105 km/h (65 mi/h) for cars and 88 km/h (55 mi/h) for trucks to a uniform speed limit of 105 km/h (65 mi/h) for all vehicles. In 1996, Arkansas adopted a differential speed limit by raising the speed limit for cars to 113 km/h (70 mi/h) but maintaining 105 km/h (65 mi/h) for trucks. In 1998, Idaho changed from a uniform speed limit of 121 km/h (75 mi/h) for all vehicles to a 105 km/h (65 mi/h) limit for trucks. With more than a decade having elapsed since the passage of the STURAA, the Federal Highway Administration (FHWA) sponsored a long-term study to investigate the effect of USLs and DSLs on vehicle speeds and crashes on rural interstates nationwide.

U.S. Department of Transportation
Federal Highway Administration

Research, Development, and Technology
Turner-Fairbank Highway Research Center
6300 Georgetown Pike
McLean, VA 22101-2296

www.tfhrc.gov

TABLE 1. *Accident Proportions by Speed Limit, Collision Type, and Vehicle Involvement.*
(Adapted from table 32, reference 1)

Speed Limit	Rear End		Sideswipe		Other	
	Car-Into-Truck	Truck-Into-Car	Car-Into-Truck	Truck-Into-Car	Car-Into-Truck	Truck-Into-Car
USL: 105 km/h and 88 km/h (65 mi/h and 55 mi/h)	10.91	10.78	22.12	21.07	2.57	2.01
DSL: 105/88 km/h and 105/97 km/h (65/55 mi/h and 65/60 mi/h)	13.70	6.86	21.52	14.96	2.07	0.99

LITERATURE REVIEW

The safety effects of differential speed limits for cars and trucks have been inconclusive in previous studies. Some studies found no difference between USL and DSL (references 1, 2, 3, and 4). Other studies found one or the other to be a better policy choice.[5,6] The studies were mainly cross-sectional comparisons of speed or crashes in States with different speed limits for cars and trucks to those in nearby States with uniform speed limits. The differences (or lack thereof) observed between States could be due to variations in traffic density, weather, and many other factors.

Impact of DSL on Mean Speed

In 1990, Freedman and Williams analyzed speed data collected at 54 sites in 11 Northeastern States to determine the effect of DSL on mean and 85th percentile speeds.[5] Six States had retained a USL of 88 km/h (55 mi/h), three had raised USLs to 105 km/h (65 mi/h), and two States employed a DSL of 105 km/h (65 mi/h) for cars and 88 km/h (55 mi/h) for trucks. For *passenger cars* in the DSL States, the mean speed and 85th percentile speeds were not significantly different from the 105 km/h (65 mi/h) USL States. For *trucks* in the DSL States, the mean and 85th percentile speeds were not significantly different from those of the 105 km/h (65 mi/h) USL States. Similar results were obtained when comparing the percentage of vehicles complying with the speed limit.

In 1994 Harkey and Mera found no significant difference between passenger car and truck mean speeds when comparing USLs and DSLs.[1]

Impact of DSL on Speed Variance

The implication of increased speed variance is an increase in interactions between vehicles, leading to a potential increase in crashes. Council et al. in 1998 found that for rear-end collisions between cars and trucks, a high-speed differential increases the severity of the crash.[6] However, Harkey and Mera found no significant differences between car speed variances at the USL and DSL sites.[1] Furthermore, they found no difference between the speed distributions for both cars and trucks for the 105/97 km/h (65/60 mi/h) and 105/105 km/h (65/65 mi/h) speed limits.

A 1974 study by Hall and Dickinson showed that speed differences contributed to crashes, primarily rear end and lane change collisions.[2]

Impact of DSL on Crashes

Harkey and Mera investigated crash results from 26 sites in 11 States.[1] The study investigated the percentage of three different crash types (rear-end, sideswipe, and all other) for USLs and DSLs. Table 1 shows that a higher proportion of car-into-truck and truck-into-car crashes occurred in USL States, except for rear end crashes where more car-into-truck collisions happened in the DSL group.

A study by Garber and Gadiraju conducted in 1991 compared

TABLE 2. *Types of Speed Limits Throughout the 1990s on Rural Interstate Highways.*

Maintained USL	Maintained DSL	Changed from USL to DSL	Changed from DSL to USL
Arizona Iowa North Carolina	Illinois Indiana Washington	Arkansas Idaho	Virginia

crash rates in the adjacent States of Virginia (DSL) and West Virginia (USL).[3] The increase in the posted speed limit for trucks to 105 km/h (65 mi/h) did not result in a significant increase in fatal, injury, and overall accident rates. There was, however, some evidence that the DSL may increase some types of crash rates while reducing others.

According to Hall and Dickinson, the existence of a posted DSL, however, was not related to the occurrence of truck crashes.[2] Finally, an evaluation conducted by the Idaho Department of Transportation found that a change from USL to DSL did not increase crashes.[4]

Caveats to the Following Study

There are six limitations that may apply to the speed and crash rates results of this study:

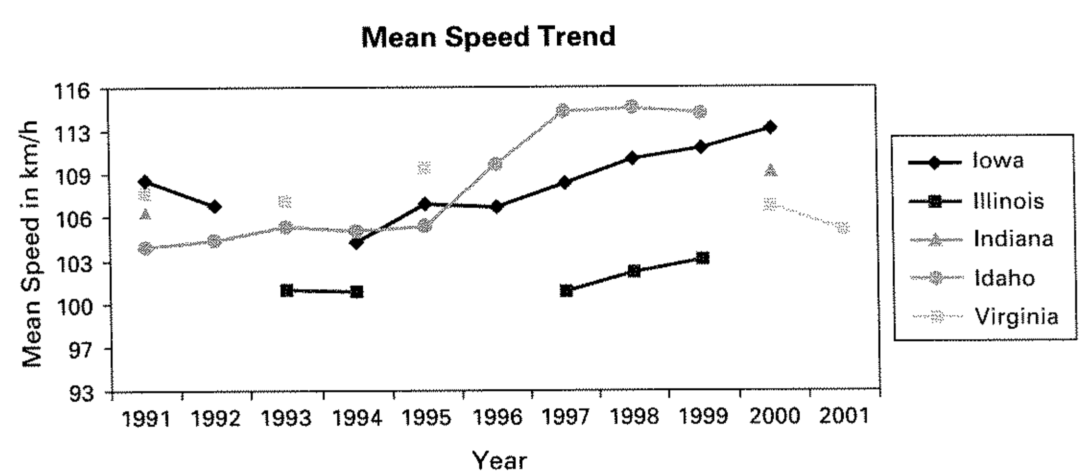
- Selected sites may be a biased sample.
- It was not possible to obtain speeds by vehicle type (passenger cars and truck).
- Durations used in this study are relatively short.
- Rural interstates were analyzed at an annual level of detail.
- Sample size used in the statistical tests associated with the speed analysis was defined as the number of speed monitoring sites and varied by state.
- Law enforcement patterns during these time periods are unknown.

METHODOLOGY

Three general steps comprised the methodology used in this research:

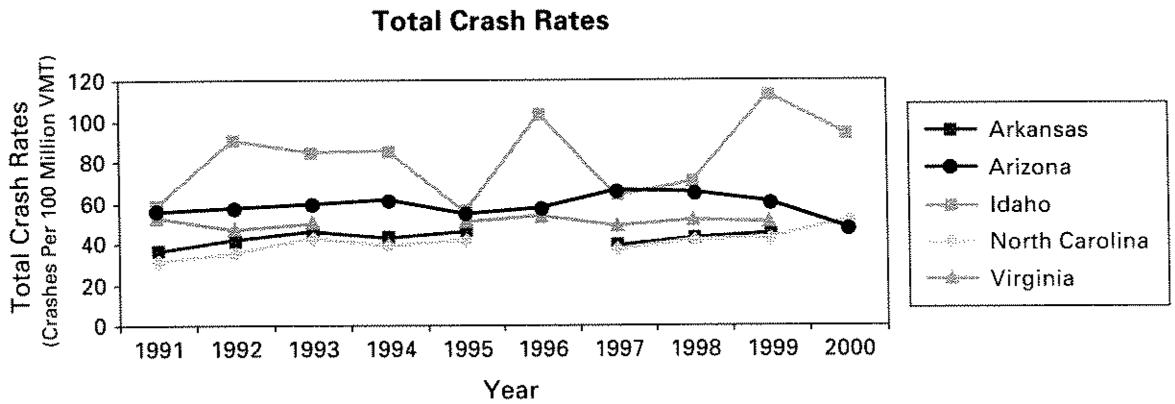
- Speed and crash data were collected from States that had been identified as having changed their speed limits at least once during the 1990s from USL to DSL or vice versa.

Figure 1. *Mean Speed for All Vehicles.*



1 mi/h = 1.6 km/h

Figure 2. *Total Crash Rates per million vehicle-miles traveled (VMT).*
Note that speed limits changed in Idaho (1996, 1998), Arkansas (1996), and Virginia (1994)



- Conventional statistical approaches (analysis of variance – Tukey's and Dunnett's tests) were used to analyze speed and crash data from these States.

- Empirical Bayes procedure was applied to these crash data.

Nine States were selected so they could be divided into four policy groups based on the type of speed limit employed during the period, as shown in table 2.

RESULTS

Vehicle Speeds

Five speed measures (mean speeds, speed variance, 85th percentile speeds, median speeds, and noncompliance rates) were analyzed for the five States where such speed monitoring data were readily available. Speed data were generated from speed monitoring stations throughout the States; individual speeds on specific interstates were not always available. It was not possible to obtain speeds by vehicle type (passenger cars and trucks).

Figure 1 illustrates the trends in mean speeds, for all vehicle types, among the five States with speed data. Data could not be obtained for all years during the time periods. Except for Virginia, the main observation is that all speeds appear to be increasing over time, regardless of speed limit type.

Crashes

Figure 2 presents an overall representation of crash data from the various States. While the data in figure 2 are based on crash rates and validates the results generated by the Empirical Bayes method, it should be noted that the Empirical Bayes method did not use crash rate in the modeling process but included annual average daily traffic (AADT) and section length as independent variables. Only North Carolina showed a significant increase in the total crash rate; the other States showed no significant change in the total crash rate.

Caveats to the Use of Empirical Bayes Method

Several data limitations might have influenced the results of the Empirical Bayes analysis.

- Comparison groups were imperfect. Ideally, the comparison group would have been selected from the same State at the same time as the studied group.

- Although speed monitoring data were available to understand statewide speed trends, specific speeds for every interstate section used in the crash analysis were not available.

- The crash estimation model used only two variables—AADT and section length. There may have been other relevant variables that were not included in the model.

TABLE 3. *Impact of Speed Limit Changes, Confidence Intervals and Crash Increases According to the Empirical Bayes formulation.*

Crash Type	Ratio θ	Confidence Interval Lower Bound Increase	Confidence Interval Upper Bound Increase	Crash Effect
Maintained a uniform limit (Arizona)				
Total crashes	1.26	24.2%	28.6%	Increase
Total crashes with truck involved	1.16	12.1%	20.7%	Increase
Maintained a uniform limit (North Carolina)*				
Total crashes	1.26	19.9%	31.9%	Increase
Total crashes with truck involved	0.91	-19.7%	1.5%	No change
Maintained a differential limit (Washington)				
Total crashes	0.99	-6.6%	5.0%	No change
Changed from uniform to differential (Arkansas)				
Total crashes	1.07	0.4%	13.4%	Increase
Total crashes with truck involved	1.31	18.9%	42.8%	Increase
Changed from uniform to differential (Idaho)				
Total crashes	1.29	13.2%	46.7%	Increase
Total crashes with truck involved	2.46	68.6%	224.9%	Increase
Changed from differential to uniform (Virginia)				
Total crashes	1.15	12.9%	17.2%	Increase
Total crashes with truck involved	1.25	20.0%	29.8%	Increase

*North Carolina maintained their uniform limit but also raised this limit for both passenger car and trucks

FINDINGS

To evaluate how a treatment affects safety, the Empirical Bayes method predicts what the expected crash frequency *would have been* during the after period had there been no such treatment and then compares it to the actual number of crashes that occurred during the after period. Using the Empirical Bayes technique, the ratio θ of the "actual" after crashes to the "would have been" after crashes is calculated. If the ratio θ is greater than 1.0, then the treatment (e.g., a change from one type of speed limit to another) resulted in an increase in the number of crashes.

In most cases, θ was greater than 1.0, as shown in table 3, indicating an increase in crashes. However, the data in table 3 are not consistent. The ratio θ for total crashes in Virginia, which changed from DSL to USL, is higher than one of the States that changed from USL to DSL (Arkansas) but lower than the other state that changed from USL to DSL (Idaho). The table also shows that for total crashes, θ was approximately 1.0 for the State that maintained DSL (Washington) while it was greater than 1.0 for States that maintained USL (Arizona and North Carolina).

Additional crash types, such as rear-end type crashes, are discussed in the final report.

CONCLUSIONS

The results presented in table 3 are on a State-by-State basis. Overall, the study was not able to isolate or measure the effect of USL/DSL changes. The effect of the DSL, if any, is not enough to be detected in the aggregate speed data that were analyzed.

Speed characteristics were generally unaffected by a USL or DSL policy. Except for Virginia, mean speeds tended to increase over the 1990s regardless of whether the State maintained a USL, maintained a DSL, or changed from one to the other. In some cases the increase in speed was significant, in other cases it was not.

No consistent safety effects of DSL as opposed to USL were observed within the scope of the study. The mean speed and crash rates tended to increase over the 10-year period, regardless of whether a USL or DSL limit was employed. The Empirical Bayes methodology suggested that crash risk during the study period increased for all four policy groups.

REFERENCES

1. Harkey, D. L. and Ruben Mera: *Safety Impacts of Different Speed Limits on Cars and Trucks*, U.S. Department of Transportation, Federal Highway Administration, Publication No. FHWA-RD-93-161, Washington, D.C., May 1994.

2. Hall, J. W. and L. V. Dickinson. *An Operational Evaluation of Truck Speeds on Interstate Highways*, Department of Civil Engineering, University of Maryland, February, 1974.

3. Garber, N. J. and R. Gadiraju., *Impact of Differential Speed Limits on Highway Speeds and Accidents*, Department of Civil Engineering, University of Virginia, Charlottesville, VA, 1991, pp13.

4. Idaho Transportation Department Planning Division, *Evaluation of the Impacts of Reducing Truck Speeds on Interstate Highways in Idaho, -Phase III, Final Report*, December, 2000, National Institute for Advanced Transportation Technology, University of Idaho.

5. Freedman, M. and A. F. Williams. "Speeds Associated with 55 mi/h and 65 mi/h Speed Limits in Northeastern States," *ITE Journal*, pp. 17-21, Vol. 2, No. 2, 1992, Institute of Transportation Engineers, Washington, D.C.

6. Council, F. M. et al. "Applying the Ordered Probit Model to Injury Severity in Truck-Passenger Car Rear-End Collisions," *Transportation Research Record 1635*, Transportation Research Board, National Research Council, Washington, D.C., 1998.

Researcher—This study was performed by the Virginia Transportation Research Council.

Distribution—This TechBrief is being distributed according to a standard distribution. Direct distribution is being made to the Divisions and Resource Centers.

Availability—The report will be available in Fall 2004 and may be obtained from the FHWA Report Center by e-mail to report.center@fhwa.dot.gov, by fax to 301–577–1421, by phone to 301–577–0818, or online at www.tfhrc.gov/safety/intersect.htm.

Key Words—Differential speed limit, universal speed limit, truck speed limit, speed limit

ATTACHMENT C

"The Safety Impacts of Differential Speed Limits on Rural Interstate Highways"
Center for Tranportation Studies, University of Virginia
May 2002

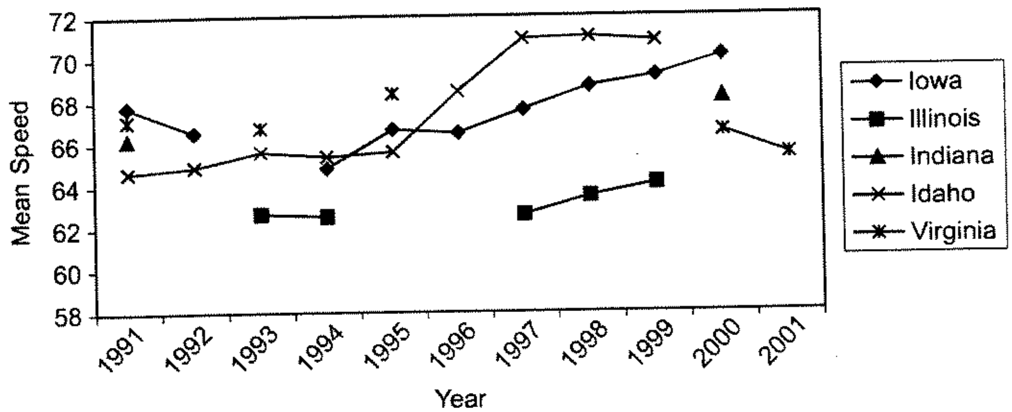


Figure 1. Mean Speed for All Vehicles

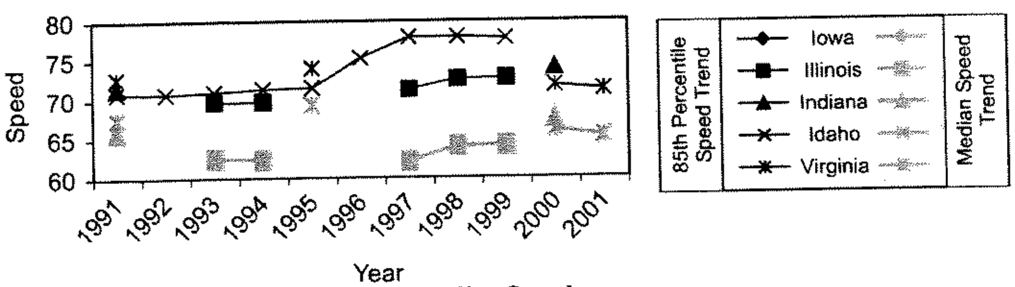


Figure 2. 85th Percentile Speeds and Median Speeds
Note that speed limits changed in Idaho (1996, 1998), Arkansas (1996), and Virginia (1994)

Table 5. Statistical Tests for the Significance in Crash Rates

Policy Group	State	Type of Crash Rate	Before-After Analysis Result			
			All Sites		ADT Filtered Sites	
			Difference	Significance (p)	Difference	Significance (p)
Group 1: maintained a uniform limit	Arizona	Total	+	N (0.583)	+	Y (0.000)
		Fatal	+	N (0.140)	+	N (0.075)
		Rear end	+	N (0.052)	+	Y (0.000)
		Total truck involved	+	N (0.949)	+	Y (0.016)
		Truck-involved fatal	+	N (0.134)	+	Y (0.044)
		Truck-involved rear end	+	N (0.406)	+	N (0.085
	Missouri	Total	+	N (0.218)		
		Fatal	-	N (0.286)		
		Rear end	+	N (0.256)		
		Total truck involved	+	Y (0.001)		
		Truck-involved fatal				
		Truck-involved rear end				
	North Carolina	Total	+	Y (0.007)	+	Y (0.001)
		Fatal	+	N (0.100)	-	N (0.999)
		Rear end	+	Y (0.035)	+	Y (0.040)
		Total truck involved	+	N (0.504)	+	N (0.395)
		Truck-involved fatal	-	N (0.525)	-	N (0.447)
		Truck-involved rear end	+	N (0.366)	+	N (0.202)
Group 3: Changed from Uniform to Differential Limit	Arkansas	Total	-	N (0.935)	+	N (0.325)
		Fatal	+	N (0.495)	+	N (0.718)
		Rear end	+	N (0.258)	+	N (0.066)
		Total truck involved	+	N (0.250)	+	Y (0.015)
		Truck-involved fatal				
		Truck-involved rear end				
	Idaho	Total	-, +	N, N (0.539,0.153)	+, +	N, N (0.474, 0.851)
		Fatal	-, +	N, N (0.336,0.192)	-, +	N, N (0.581, 0.223)
		Rear end	-, +	N, N (0.539, 0.327)	-, +	N, N (0.281,0.622)
		Total truck involved	-, +	N, N (0.473,0.139)	-, +	N, N (0.605,0.294)
		Truck-involved fatal	-, 0	N, N (0.656,1.000)	-, 0	N, N (0.658,1.000)
		Truck-involved rear end	-, +	N, N (0.820,0.370)	-, +	N, N (0.994, 0.477)
Group 4: Changed from Differential to Uniform	Virginia	Total	+	N (0.425)	+	N (0.287)
		Fatal	-	N (0.270)	-	N (0.704)
		Rear end	+	N (0.119)	+	Y (0.026)
		Total truck involved	+	Y (0.000)	+	Y (0.002)
		Truck-involved fatal	+	N (0.665)	+	N (0.894)
		Truck-involved rear end				

Note that the number of truck involved fatal crashes was zero in Idaho which is why "1.000" is shown in that cell.