USE OF STUDDED TIRES IN THE UNITED STATES

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About 30,000 studded tires were sold in the United States in the winter of 1963-64. Sales are expected to reach about 6,000,000 during the 1972-73 winter months. Estimates from 30 states indicate that 6 to 61 percent of passenger cars in those states are equipped with studded tires. The weighted average for these same states is 20 percent.

STUDDED tires were little more than a novelty in the United States 10 years ago. Today, they are standard wintertime equipment on millions of highway vehicles in this country. Many highway administrators and engineers have questions about the safety of studded tires under some operating conditions, and most of them recognize that studded tires are either an actual or a potential cause of serious pavement damage. For these reasons, professionals in the highway field should know where, and to what extent, studded tires are being used.

STUDDED-TIRE SALES

Sales figures show the tremendous increase in the use of studded tires that has occurred in the United States during the past 10 years. Estimated sales for the 3 years beginning with the 1963-64 winter are as follows (1): 1963-64, 30,000; 1964-65, 250,000; and 1965-66, 2,500,000. It is not surprising that, by the spring of 1966, tire dealers and stud manufacturers were forecasting continued sales increases and a generally bright future for studded tires in the United States.

Sales of snow and mud tires increased more than 30 percent during the period of 1965 to 1969. At least part of this increase must be attributed to public acceptance of studded tires. Shipments of snow and mud tires in 1969 totaled approximately 18,800,000.

During the same period, that is from 1965 to 1969, the annual sales of tire studs increased threefold. Total sales in 1969 were estimated to be 830,000,000 (2). Assuming an average of 100 studs per tire, it would have been possible to produce 8,300,000 studded tires, which is 44 percent of all of the snow and mud tires shipped in 1969. Admittedly, this is only a rough estimate of the availability of studded tires in that year. Actual sales of studded tires in the winter of 1969-70 may have been anywhere from 25 to 50 percent of total snow-tire shipments.

The annual shipments of snow and mud tires have continued to increase. One reason for this increase is greater public interest in all types of winter traction aids prompted by the introduction of studded tires. Shipments of snow and mud tires in 1971 were 19,067,000. Even though overall industry figures are not available, it appears reasonable to expect that one-third of these were equipped with studs when sold by dealers.

OBSERVED USE OF STUDDED TIRES

Although annual sales estimates demonstrate the continuing popularity of studded tires, it is the total number of vehicles with studded tires that is of most concern to highway engineers and administrators. In November 1972, a questionnaire concerning studded-tire use was sent to the highway departments in 45 states.

The response to the questionnaire was excellent. Answers were received from 44 of the states (Table 1). It was not sent to Minnesota, Utah, Mississippi, Louisiana, or Hawaii because the use of studded tires is not legal in those states.

Table 1. Estimated studded-tire use.

State	Use (percent)[a]		Estimate Based on Survey	Interest in	
	1972-73	1976-77		Ban	Tax
Alabama	1	1			
Alaska	61	61	X		
Arizona	1	1			
Arkansas	1	1		X	
California	NA[b]	NA		X	
Colorado	30	40	X	X	X
Connecticut	25	25	X	X	
Delaware	18	18	X		
Florida	NA	NA			
Georgia	NA	NA			
Hawaii	NL[c]	NL			
Idaho	27	5		X	X
Illinois	12	22	X		
Indiana	10	12	X	X	
Iowa	25	40	X	X	
Kansas	7	5			
Kentucky	12	19		X	
Louisiana	NL	NL			
Maine	NA	NA			
Maryland	NA	NA		X	
Massachusetts	32	45	X		
Michigan	12	26	X	X	
Minnesota	NL	NL			
Mississippi	NL	NL			
Missouri	14	14	X		
Montana	60	77	X		
Nebraska	38	38		X	
Nevada	6	6		X	
New Hampshire	30	50			
New Jersey	20	32	X		
New Mexico	NA	NA			
New York	30	35	X		
North Carolina	2	2			
North Dakota	32	32			
Ohio	20	30	X	X	
Oklahoma	1	2			
Oregon	10	11	X		
Pennsylvania	28	37	X	X	X
Rhode Island	NA	NA			
South Carolina	3	3			
South Dakota	40	40	X		
Tennessee	NA	NA			
Texas	0	0			
Utah	NL	NL			
Vermont	60	55			
Virginia	10	30	X	X	
Washington	35	45	X	X	
West Virginia	10	10		X	
Wisconsin	20	32	X	X	X
Wyoming	35	40			

[a]Figures shown are approximately middle values for those states that provided estimated ranges; for example, 20 to 30 percent is listed as 25 percent. Estimated studded-tire use is expressed as the percentage of registered passenger cars equipped with studded tires.
[b]NA = estimate not available.
[c]NL = not legal.

Estimates of the number of vehicles equipped with studded tires (studded-tire use) were reported as a percentage of registered passenger cars by each of 37 states. Estimates were unavailable from 8 states, but it may be assumed that studded-tire use in 4 of these states is less than 1 percent.

Of the 37 states that did provide estimates, 7 reported a studded-tire use of not more than 5 percent. The remaining 30 states reported estimates ranging from 6 to 61 percent. The data from these 30 states may be viewed as indicative of the present status of studded-tire use in the United States north of the 37th parallel—Minnesota and Utah excepted.

An average studded-tire use of 20 percent was obtained by weighting the estimates from each of the 30 states by the estimated number of passenger cars registered in each

of the states in 1972. This same figure, 20 percent, was coincidently reported by 3 of the 30 states. Estimates above the average were reported by 16 states and estimates below the average by 11 states. The total passenger car registrations for the 30 states were 57,751,000, and the total number of cars equipped with studded tires was computed to be 11,673,000.

In 20 of the 30 states that reported more than 5 percent studded-tire use, the estimates were based on surveys made during the past 3 years (Table 1). In some instances, the use of studded tires may vary widely within individual states. Such variation is not unexpected in states where winter weather causes driving problems only in the mountainous areas, although considerable variation has been noted even in Iowa where there are no mountains and terrain is not an important factor in winter driving.

FUTURE USE OF STUDDED TIRES

The future for studded tires in the United States will be influenced by many factors, some of which may not even be apparent at this time. Certainly, so long as American motorists continue to want studded tires, there will be a studded-tire industry to satisfy that want. It is possible that new developments in design and manufacture may result in studs that will cause significantly less pavement wear. Likewise, development of other traction aids or changes in tire design could lessen motorists' interest in studded tires.

Perhaps the bare pavement policy, including the frequent use of salt, will have to be modified in response to environmental considerations. This would undoubtedly accelerate the demand for all types of traction aids.

Legislation to ban, tax, or otherwise control the use of studded tires is a possibility in some states. Interest in a ban or tax has been noted in 18 states (Table 1).

The 30 states, each of which estimated studded-tire use in 1972-73 to be more than 5 percent, also provided estimates of studded-tire use in 1976-77. The weighted average of these estimates is 26 percent—an increase of 6 percent over 1972-73.

CONCLUDING REMARKS

Highway administrators and engineers, particularly those living in the northern part of the United States, may feel that average estimates of 20 percent for 1972-73 and 26 percent for 1976-77 are too low. In this regard, two statements made previously merit repetition: First, these are weighted averages; second, the individual state estimates for 1972-73 ranged from 6 to 61 percent.

These averages, just like most average statistics, cannot always be used to properly describe local conditions. In the final analysis, it is the local, or perhaps statewide, estimate of studded-tire use that is most meaningful to the people directly responsible for safe, economical highway facilities.

REFERENCES

1. Miller, W. P., II. The Winter Tire Stud. Highway Research Record 136, 1966, pp. 1-6.
2. Life or Death for Studded Tires. Modern Tire Dealer, December 1970.