

STUDED TIRE SURVEY, WINTER 1970



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MICHIGAN DEPARTMENT OF STATE HIGHWAYS

STUDED TIRE SURVEY, WINTER 1970

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Testing and Research Division
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Department of State Highways
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STUDED TIRE SURVEY, WINTER 1970

During the period January 13 to February 28 the Research Laboratory conducted a statewide survey of non-commercial vehicles in order to determine the proportion using studded tires.

The basic sample size was 100 vehicles, the basic sample area was the county, and sampling intensity was a function of county vehicle registration quantities. A statistical sampling plan, based on the preceding criteria, was used during the survey. Field survey work was carried out by Research Laboratory staff and by personnel temporarily assigned to the Laboratory from the Field Testing Section.

Only vehicles with Michigan license plates were counted; State owned vehicles and trucks other than pickups were not counted. After selecting a site, the first 100 vehicles were surveyed in order of their physical location. Sites were primarily parking lots but, in smaller towns, vehicles parked on streets were counted. Notation was made regarding which axle of a vehicle had studded tires.

Surveying was begun on January 13 and completed on February 28 with a total of 49,700 vehicles surveyed.

Table 1 is an alphabetical listing of counties showing the number of vehicles surveyed in each county, the proportion of vehicles with studded tires, and the axle location of the studded tires. Table 2 contains the same information but is separated by District. Table 3 separates studded tire use by type of vehicle and Table 4 lists counties by decreasing order of studded tire intensity.

Figure 1 is a map of the State showing the intensity of studded tire use for each county and Figure 2 shows the significant correlation between studded tire usage and average annual snowfall in a county. The dispersion of points on the graph could likely be reduced by considering economic and geographic features of the counties.

The statewide mean average value of non-commercial vehicles using tire studs was 12 to 13 percent and intensity ranged from a low of 5 percent in Lenawee County to a high of 42 percent in Houghton County.

The survey was conducted efficiently and with no major problems. Survey results in conjunction with average daily traffic values should provide an excellent tool for evaluating pavement damage caused by tire studs. Since tire stud damage to pavements is becoming internationally recognized as a problem, it is recommended that these surveys be conducted annually.

TABLE 1
WINTER, 1970 STUDED TIRE SURVEY BY COUNTIES

County	No. of Vehicles	Percent of Vehicles			
		Without Studs	With Studs on Front Only	With Studs on Rear Only	With Studs on Front and Rear
Alcona	100	89.00	0.00	11.00	0.00
Alger	100	70.00	1.00	28.00	1.00
Allegan	400	82.75	0.00	17.25	0.00
Alpena	200	92.50	0.00	7.50	0.00
Antrim	100	75.00	0.00	25.00	0.00
Arenac	100	86.00	0.00	13.00	1.00
Baraga	100	70.00	0.00	29.00	1.00
Barry	200	77.00	0.00	23.00	0.00
Bay	700	91.86	0.00	8.14	0.00
Benzie	100	77.00	0.00	23.00	0.00
Berrien	1000	87.50	0.00	12.40	0.10
Branch	200	91.50	0.00	8.50	0.00
Calhoun	800	89.75	0.00	10.25	0.00
Cass	100	87.00	0.00	13.00	0.00
Charlevoix	100	82.00	0.00	18.00	0.00
Cheboygan	100	77.00	0.00	23.00	0.00
Chippewa	200	84.00	0.50	15.50	0.00
Clare	100	80.00	0.00	20.00	0.00
Clinton	200	90.50	0.00	9.50	0.00
Crawford	100	75.00	0.00	24.00	1.00
Delta	200	79.50	0.00	20.50	0.00
Dickinson	100	76.00	0.00	23.00	1.00
Eaton	300	92.00	0.00	8.00	0.00
Emmett	100	67.00	0.00	33.00	0.00
Genesee	2600	91.19	0.00	8.81	0.00
Gladwin	100	89.00	0.00	11.00	0.00
Gogebic	100	83.00	0.00	17.00	0.00
Grand Traverse	200	78.00	0.00	22.00	0.00
Gratiot	200	84.50	0.00	15.50	0.00
Hillsdale	200	91.00	0.00	8.50	0.50
Houghton	200	58.00	0.00	40.50	1.50
Huron	200	81.50	0.00	18.50	0.00
Ingham	1500	87.20	0.00	12.80	0.00
Ionia	200	82.00	0.00	18.00	0.00
Iosco	100	93.00	0.00	7.00	0.00
Iron	100	88.00	0.00	12.00	0.00
Isabella	200	84.50	0.00	15.50	0.00
Jackson	800	93.50	0.00	6.50	0.00
Kalamazoo	1100	81.91	0.09	17.91	0.09
Kalkaska	100	78.00	0.00	22.00	0.00
Kent	2400	82.13	0.00	17.87	0.00
Keweenaw	100	65.00	0.00	35.00	0.00
Lake	100	90.00	1.00	9.00	0.00
Lapeer	200	93.50	0.00	6.50	0.00
Leelanau	100	83.00	0.00	17.00	0.00

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TABLE 1 (Cont.)
WINTER, 1970 STUDDED TIRE SURVEY BY COUNTIES

County	No. of Vehicles	Percent of Vehicles			
		Without Studs	With Studs on Front Only	With Studs on Rear Only	With Studs on Front and Rear
Lenawee	500	95.00	0.00	5.00	0.00
Livingston	300	85.33	0.00	14.67	0.00
Luce	100	71.00	2.00	27.00	0.00
Mackinac	100	82.00	0.00	18.00	0.00
Macomb	2200	91.00	0.05	8.95	0.00
Manistee	100	76.00	0.00	24.00	0.00
Marquette	300	59.67	0.00	40.33	0.00
Mason	100	81.00	0.00	19.00	0.00
Mecosta	100	84.00	0.00	16.00	0.00
Menominee	100	91.00	0.00	9.00	0.00
Midland	400	85.00	0.00	15.00	0.00
Missaukee	100	75.00	0.00	25.00	0.00
Monroe	600	93.83	0.00	6.17	0.00
Montcalm	200	88.00	0.00	12.00	0.00
Montmorency	100	90.00	0.00	10.00	0.00
Muskegon	900	81.67	0.00	18.22	0.11
Newaygo	200	74.50	0.00	25.00	0.50
Oakland	5400	88.91	0.00	11.02	0.07
Oceana	100	75.00	0.00	25.00	0.00
Ogemaw	100	83.00	0.00	17.00	0.00
Ontonagon	100	88.00	0.00	12.00	0.00
Osceola	100	80.00	1.00	19.00	0.00
Oscoda	100	87.00	0.00	13.00	0.00
Otsego	100	82.00	0.00	18.00	0.00
Ottawa	700	80.86	0.00	19.14	0.00
Presque Isle	100	91.00	0.00	9.00	0.00
Roscommon	100	81.00	0.00	19.00	0.00
Saginaw	1200	91.33	0.00	8.67	0.00
Sanilac	200	86.00	0.00	14.00	0.00
Schoolcraft	100	70.00	0.00	30.00	0.00
Shiawassee	300	86.67	0.00	13.33	0.00
St. Clair	700	92.00	0.00	8.00	0.00
St. Joseph	300	90.00	0.00	10.00	0.00
Tuscola	200	78.50	0.00	21.50	0.00
Van Buren	300	84.00	0.00	15.67	0.33
Washtenaw	1200	89.58	0.00	10.42	0.00
Wayne	15300	90.31	0.03	9.64	0.02
Wexford	100	76.00	0.00	24.00	0.00
	49700	87.73	0.03	12.19	0.04

TABLE 2
WINTER, 1970 STUDED TIRE SURVEY BY DISTRICTS

District	No. of Vehicles	Percent of Vehicles			
		Without Studs	With Studs on Front Only	With Studs on Rear Only	With Studs on Front and Rear
1	1200	71.33	0.00	28.25	0.42
2	800	77.50	0.50	21.87	0.13
3	1400	79.21	0.14	20.64	0.00
4	1300	84.62	0.00	15.31	0.09
5	5400	82.20	0.00	17.76	0.04
6	6200	89.74	0.00	10.26	0.02
7	4400	85.70	0.02	14.20	0.07
8	4800	90.00	0.00	9.98	0.02
9	8300	89.72	0.02	10.22	0.05
10	<u>15900</u>	<u>90.44</u>	<u>0.03</u>	<u>9.51</u>	<u>0.02</u>
	49700	87.73	0.03	12.19	0.04

TABLE 3
WINTER, 1970 STUDED TIRE SURVEY
BY VEHICLE TYPES

Vehicle		Percent of Vehicles			
Type	No.	None	Front	Rear	Front and Rear
Standard Passenger Car	46486	87.7	0.0	12.3	0.0
Pickup	2454	88.8	0.0	11.1	0.1
Panel	456	88.2	0.2	11.4	0.2
4-Wheel Drive	275	92.7	0.7	3.6	2.9
Front Wheel Drive	29	79.3	17.2	0.0	0.3

TABLE 4
PERCENT OF VEHICLES USING STUDED TIRES BY COUNTIES

County	Percent	County	Percent	County	Percent
Houghton	42.00	Huron	18.50	Ontonagon	12.00
Marquette	40.33	Muskegon	18.33	Oakland	11.09
Keweenaw	35.00	Kalamazoo	18.09	Alcona	11.00
Emmet	33.00	Charlevoix	18.00	Gladwin	11.00
Alger	30.00	Ionia	18.00	Washtenaw	10.42
Baraga	30.00	Mackinac	18.00	Calhoun	10.25
Schoolcraft	30.00	Otsego	18.00	Lake	10.00
Luce	29.00	Kent	17.87	Montmorency	10.00
Newaygo	25.50	Allegan	17.25	St. Joseph	10.00
Antrim	25.00	Gogebic	17.00	Wayne	9.69
Crawford	25.00	Leelanau	17.00	Clinton	9.50
Missaukee	25.00	Ogemaw	17.00	Hillsdale	9.00
Oceana	25.00	Chippewa	16.00	Macomb	9.00
Dickinson	24.00	Mecosta	16.00	Menominee	9.00
Manistee	24.00	Van Buren	16.00	Presque Isle	9.00
Wexford	24.00	Gratiot	15.50	Genesee	8.81
Barry	23.00	Isabella	15.50	Saginaw	8.67
Benzie	23.00	Midland	15.00	Branch	8.50
Cheboygan	23.00	Livingston	14.67	Bay	8.14
Grand Traverse	22.00	Arenac	14.00	Eaton	8.00
Kalkaska	22.00	Sanilac	14.00	St. Clair	8.00
Tuscola	21.50	Shiawassee	13.33	Alpena	7.50
Delta	20.50	Cass	13.00	Iosco	7.00
Clare	20.00	Oscoda	13.00	Jackson	6.50
Osceola	20.00	Berrien	12.50	Lapeer	6.50
Ottawa	19.14	Ingham	12.50	Monroe	6.17
Mason	19.00	Iron	12.00	Lenawee	5.00
Roscommon	19.00	Montcalm	12.00		

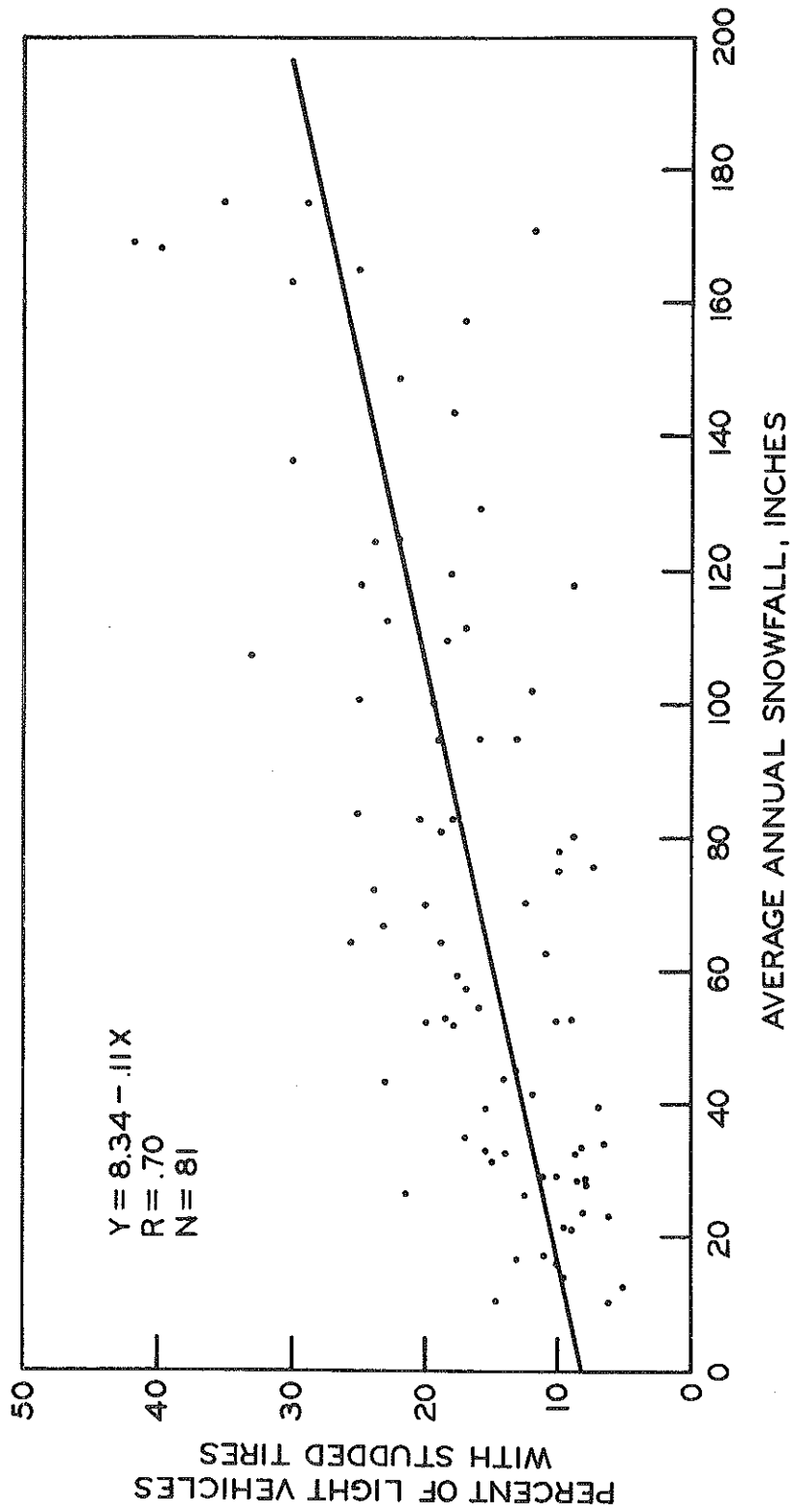


Figure 2. Relationship between snowfall and studded tire usage.