

RECENT TRENDS IN TRAFFIC SPEEDS ON MAIN
RURAL HIGHWAYS¹

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SYNOPSIS

Since the President's request for a 40-mile per hour speed limit in March 1942, the Public Roads Administration has conducted studies at a number of locations to determine the effect on speed of both the 40-mile per hour limit and the 35-mile per hour limit that became effective on October 1. These studies have been supplemented by similar studies conducted by State highway departments. Speed data available November 1 at a total of 405 locations in 29 States have been analyzed and combined with data for 17 States obtained before the 40-mile per hour limit became effective.

In the States within the gasoline-rationed area, passenger car speeds on rural highways have decreased an average of 92 miles per hour and now average 36.6 miles per hour. There was an average decrease of 5.4 miles per hour during the 40-mile limit and there has been an additional decrease of 3.8 miles per hour since the 35-mile per hour limit became effective on October 1. Truck speeds have decreased a total of 4.0 miles per hour and now average 35.8 miles per hour.

In the nonrationed States, passenger car speeds decreased 6.1 miles per hour during the 40-mile limit and have decreased an additional 6.1 miles per hour since the 35-mile per hour limit became effective or a total decrease of 12.2 miles per hour. Truck speeds have decreased a total of 5.8 miles per hour, 2.6 miles per hour during the 40-mile limit and 3.2 miles per hour since October 1.

Although the decrease in speed has been less in the area where gasoline has been rationed than in the nonrationed area, average speeds are now about the same in both areas.

At the present time, about half of the drivers on rural highways exceed 35-miles per hour, one out of every five exceeds 40-miles per hour, few travel above 45-miles per hour, and speeds in excess of 50-miles per hour are rare. On an average, a lower percentage of the drivers now exceed 40-miles per hour than exceeded 50-miles per hour less than a year ago.

During normal conditions, both passenger cars and trucks travel slower in the gasoline-rationed area than in the nonrationed area. At the present time, a smaller percentage of the passenger cars and a larger percentage of the trucks are traveling at speeds in excess of 40-miles per hour in the rationed area than in the nonrationed area.

The 40-mile per hour limit resulted in an appreciable reduction in the percentage of passenger cars traveling in excess of 40-miles per hour and some reduction in the percentage traveling in excess of 35-miles per hour. This also is true for truck speeds in the nonrationed-gasoline area, but in the rationed area, the percentage of trucks traveling above 35-miles per hour did not change and there was only a slight decrease in the percentage traveling in excess of 40-miles per hour.

Since the studies during the 35-mile per hour limit were conducted within one month after the limit became effective, many of the States did not have adequate time to change their speed signs and the drivers did not have sufficient time to become accustomed to the 35-mile per hour limit. A further reduction in speed can, therefore, be expected.

The reduction in the wear due to lower speeds has increased tire mileage 33 per cent in the rationed area and 45 per cent in the nonrationed area. In both areas, 89 per cent of the tire mileage that would be possible if all drivers complied with the 35-mile limit is being obtained.

¹ Based on studies conducted by the Public Roads Administration and data submitted by State highway departments.

Since the President's request for a 40-mile per hour speed limit in March 1942, the Public Roads Administration has conducted speed studies each month on main rural highways in the vicinity of the District of Columbia where studies had been conducted prior to the present emergency Data obtained from similar studies conducted by a number of State highway departments, and submitted to the Public Roads Administration in some cases

States and 405 study locations are included. In some States, such as Iowa and Ohio, studies were made prior to and during the 40-mile per hour limit at the number of locations indicated, but studies have been completed at fewer locations since the 35-mile limit became effective. Data were obtained during only the 40-mile limit in 9 States, during only the 35-mile limit in 9 States, and during both the 40- and 35-mile limits in 11 States For 17

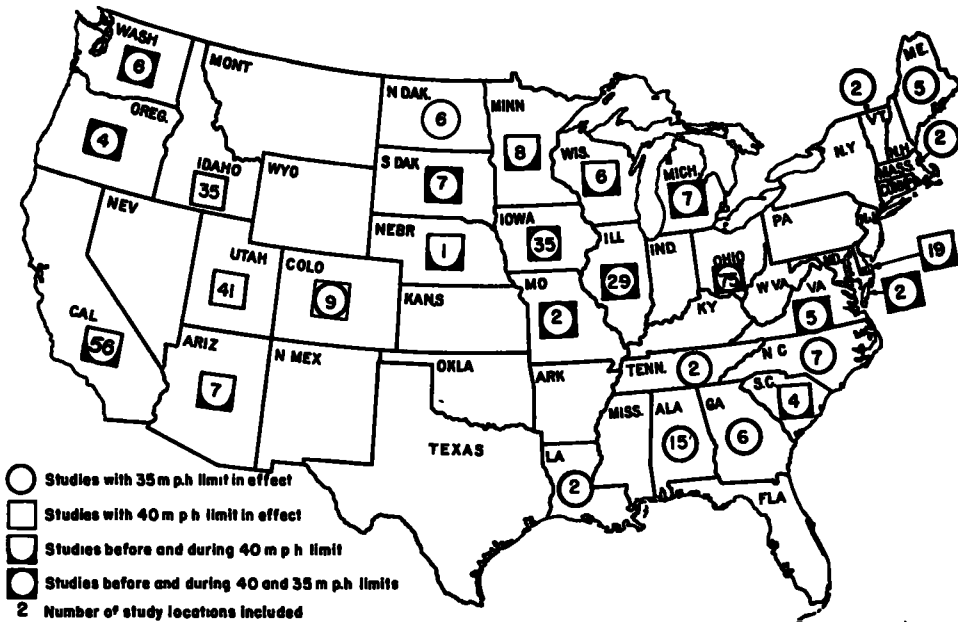


Figure 1. Locations of Recent Vehicle Speed Studies

through the National Highway Traffic Advisory Committee to the War Department, have been compiled and included in this paper to obtain an over-all picture for the United States of the effect on speeds of the 40-mile per hour limit and the 35-mile limit which was imposed by the Office of Defense Transportation October 1 for passenger cars and October 15 for commercial vehicles

Figure 1 shows the number of study locations in each State for which recent speed data are available A total of 29

of the 28 States where recent studies have been conducted, data regarding speeds prior to the time the 40-mile limit became effective have been included to determine changes in speed due to the 40- and 35-mile limits.

Table 1 shows the average speeds prior to and during the 40-mile limit and at the present time with the 35-mile limit in effect for passenger cars, trucks, and busses Values are shown both for the area where gasoline was rationed and the nonrationed area.

Speeds on main rural highways in the nonrationed area were appreciably higher than in the rationed area. However, there has been a larger decrease in speeds in the nonrationed area, so at the present time average speeds are only slightly higher in the nonrationed than in the rationed area. Passenger cars and trucks now travel at about the same speed in both areas, while busses travel faster than either trucks or passenger cars

The speed reductions in corresponding areas since October 1 when the 35-mile

and busses were affected. Many of the State highway departments had not changed their speed signs or started to enforce the reduced limit. A further decrease in average speeds can, therefore, be expected.

Considerable variation exists in the speed reductions obtained in the different States. Michigan, for example, has obtained a total reduction in passenger car speeds of 14.2 miles per hour, the largest reported, while in Maryland the total reduction has been only 6 miles per hour.

TABLE 1
AVERAGE SPEEDS ON MAIN RURAL HIGHWAYS,^a

	Rationed area			Nonrationed area		
	Passenger cars, m p h	Trucks, m p h	Busses, m p h	Passenger cars, m p h	Trucks, m p h	Busses, m p h
Prior to 40 m p h limit	45.8	39.8	41.8	49.2	41.9	53.0
During 40 m p h limit	40.4	37.8	41.5	43.1	39.3	45.7
Present speeds	36.6	35.8	39.8	37.0	36.1	41.9
Effect of 40 m p h limit	-5.4	-2.0	-0.3	-6.1	-2.6	-7.3
Effect of 35 m p h limit	-3.8	-2.0	-1.7	-6.1	-3.2	-3.8
Total effect	-9.2	-4.0	-2.0	-12.2	-5.8	-11.1

^a Actual speeds during the period when the largest amount of data were available (present time in rationed area and during 40-mile limit in nonrationed area) have been used and the average speeds for the other periods have been determined from the actual speed changes in States where comparable information is available (See Tables 3 through 5)

limit became effective have been about the same as the speed reductions during the period that the 40-mile limit was in effect, with the exception of the reduction in bus speeds. In the rationed area, bus speeds have changed very little, a total reduction of 2 miles per hour, while in the nonrationed area, there was a reduction of 7.3 miles per hour while the limit was 40-miles per hour and there has been an additional reduction of 3.8 miles per hour since the 35-mile limit became effective.

Most of the studies to obtain the effect of the 35-mile limit were conducted in the latter part of October, or within a month after the limit became effective for passenger cars and a few days after trucks

However, speeds on main rural highways in Michigan are still higher than in Maryland. The trend in all States is toward an appreciable reduction in speed.

Figure 2 shows the percentages of passenger cars that exceeded various speeds on main rural highways prior to the 40-mile limit as crosshatched bars and the percentages that now exceed various speeds as solid bars. At the present time in the rationed area (the chart to the left) over half the drivers travel at speeds exceeding 35 miles per hour, nearly one out of every four exceeds 40 miles per hour, few travel above 45 miles per hour, and speeds in excess of 50 miles per hour are rare.

The values shown for the nonrationed area on the chart to the right are all higher than corresponding values for the rationed area. However, the change, or difference between the crosshatched and solid bars in each case is greater for the nonrationed than rationed area. In both areas as low a percentage of passenger car drivers now exceed 40 miles per hour as exceeded 50 less than a year ago.

in zones where there is a 35-mile limit. It must also be remembered that on most main highways the opportunity to travel safely at high speeds has increased due to the decrease in traffic density

At a few of the study locations, speeds of out-of-State and local vehicles were compared. In each case the average speed for out-of-State vehicles was somewhat higher than for local vehicles

The main purpose of the 35-mile limit is to increase tire mileage. Based on the

Figure 3 shows the same information for trucks. Trucks in the nonrationed

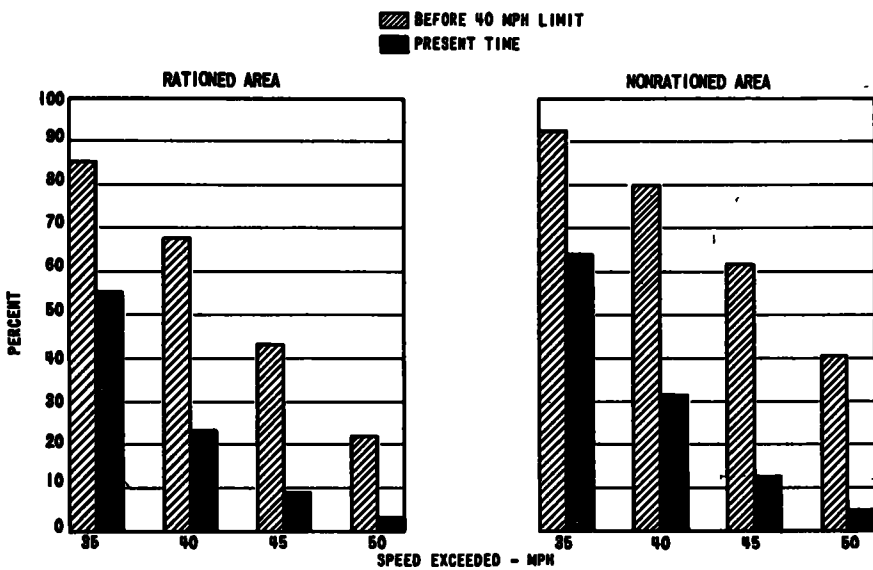


Figure 2. Percentage of Passenger Cars Exceeding Various Speeds

area have not only reduced their speeds more than trucks in the rationed area but the percentages traveling in excess of 35, 40 and 45 miles per hour are lower than for the rationed area. When we consider that in several States there is little or no enforcement of the 35-mile limit and compliance is entirely voluntary, it is encouraging to find that so few drivers travel at speeds more than 5 miles per hour in excess of the limit. Even with rigid enforcement during normal conditions, it is difficult to prevent a large percentage of drivers from traveling between 35 and 40

results of these speed studies and tire wear at various speeds as reported by Professor R. A. Moyer,² passenger car tire wear on main rural highways is 25 per cent less per vehicle-mile in the rationed area and 31 per cent less in the nonrationed area than the wear per mile prior to the present emergency. These reductions in tire wear due to lower speeds have increased tire

² R. A. Moyer, "Motor Vehicle Operating Costs and Related Characteristics on Untreated Gravel and Portland Cement Concrete Road Surfaces," *Proceedings, Highway Research Board*, Vol 19, p 68 (1939)

mileage 33 per cent in the rationed area and 45 per cent in the nonrationed area (Fig 4).

An additional increase of 16 per cent in

car tire mileage, the 35-mile per hour limit is, therefore, about 67 per cent effective in the rationed area and 71 per cent effective in the nonrationed area. In both areas,

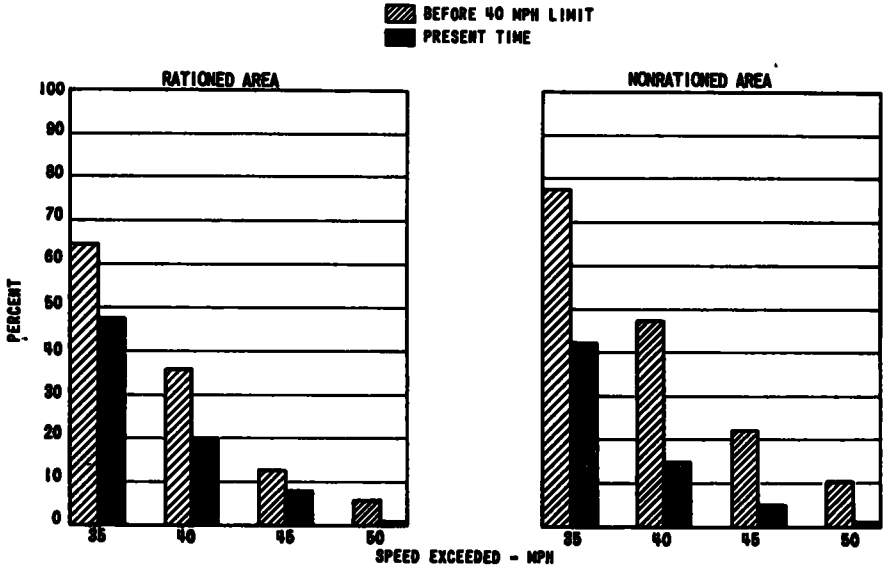


Figure 3. Percentage of Trucks Exceeding Various Speeds

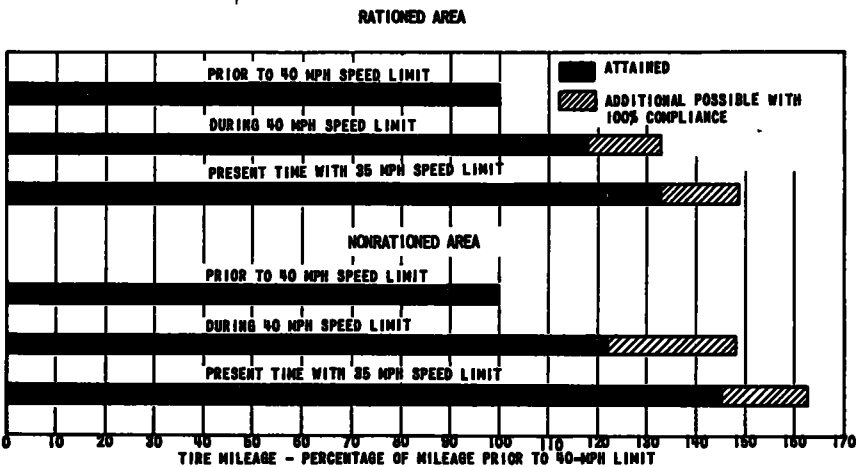


Figure 4. Average Increase in Passenger Car Tire Mileage

tire mileage is possible in the rationed area and an additional 18 per cent is possible in the nonrationed area if all drivers now traveling over 35 miles per hour would reduce to that speed. Based on passenger

89 per cent of the tire mileage is being obtained of the total that would be possible if all drivers complied with the 35-mile limit.

While the 40-mile limit was in effect,

passenger car tire mileage was increased 18 per cent in the rationed area and 22 per cent in the nonrationed area. The 35-mile per hour limit is, therefore, about twice as effective as the 40-mile limit in conserving passenger car tires. However, if all drivers had complied with the 40-mile limit, tire mileage would have been the same as at present, since about half of the drivers are now exceeding the 35-mile limit.

These increases in tire mileage by decreased wear prolong tire life and are in addition to the increase in tire life brought about by a reduction in the number of vehicle miles traveled. Based on traffic counts made during October, travel on main rural highways is about 40 per cent lower in the gasoline-rationed area and 24 per cent lower in the nonrationed area than a year ago. The total passenger car tire wear on main rural highways is therefore less than half as great at the present time as it was a year ago.

TABLE 2
PERCENTAGE OF VEHICLES EXCEEDING VARIOUS SPEEDS ON MAIN RURAL HIGHWAYS

Period	Rationed area		Non-rationed area	
	Passenger cars, per cent	Trucks, per cent	Passenger cars, per cent	Trucks, per cent
PERCENTAGE OF VEHICLES TRAVELING OVER 35 MILES PER HOUR				
Prior to 40 m p h limit	85	65	92	78
During 40 m p h limit	71	65	84	68
Since 35 m p h limit	55	48	64	43
PERCENTAGE OF VEHICLES TRAVELING OVER 40 MILES PER HOUR				
Prior to 40 m p h limit	68	36	80	48
During 40 m p h limit	43	32	59	37
Since 35 m p h. limit	23	20	32	15
PERCENTAGE OF VEHICLES TRAVELING OVER 45 MILES PER HOUR				
Prior to 40 m p h limit	43	13	62	23
During 40 m p h limit	21	10	35	16
Since 35 m p h limit	9	8	13	5
PERCENTAGE OF VEHICLES TRAVELING OVER 50 MILES PER HOUR				
Prior to 40 m p h limit	22	6	41	11
During 40 m p h limit	8	3	18	6
Since 35 m p h limit	3	1	5	1

TABLE 3
AVERAGE VEHICLE SPEEDS ON RURAL HIGHWAYS IN STATES WITHIN THE GASOLINE-RATIONED AREA

State	Passenger cars						Trucks					
	Average speed			Change in speed			Average speed			Change in speed		
	Prior to 40 m p h limit, m p h	During 40 m p h limit, m p h	During 35 m p h limit, m p h	During 40 m p h limit, m p h	During 35 m p h limit, m p h	During 40 m p h limit, m p h	Prior to 40 m p h limit, m p h	During 40 m p h limit, m p h	During 35 m p h limit, m p h	During 40 m p h limit, m p h	During 35 m p h limit, m p h	
Delaware	45 6	37 0		-8 6			41 5	34 9		-6 6		
Georgia		36 6						34 2				
Maine	41 0	37 6	37 0	-3 4	-2 6		34 8	36 7	34 4	+1 9	-2 3	
Maryland			35 0									
Massachusetts			36 2									
North Carolina			38 4	-3 0				38 0	37 6			
South Carolina	44 0	41 0										
Vermont			37 0									
Virginia (near D. C.)	44 7	38 0	35 7	-6 7	-2 3		39 0	37 6	35 7	-1 4	-1 9	
Virginia (other)		43 9	37 3		-6 6			39 0	37 1		-1 9	
Average	43 8	39 5	36 6				38 4	37 2	35 8			
EFFECT OF 40 M P H SPEED LIMIT (P C—4 STATES, TRUCKS—3 STATES)												
	43 8	38 4		-5 4			38 4	36 4		-2 0		
EFFECT IN GOING FROM 40 TO 35 M P H SPEED LIMIT (3 STATES)												
	39 8	36 0		-3 8			37 7	35 7		-2 0		

TABLE 4
AVERAGE VEHICLE SPEEDS ON RURAL HIGHWAYS IN STATES OUTSIDE THE GASOLINE-RATIONED AREA

State	Passenger cars						Trucks					
	Average speed			Change in speed			Average speed			Change in speed		
	Prior to 40 m p h limit, m p h	During 40 m p h limit, m p h	During 35 m p h limit, m p h	During 40 m p h limit, m p h	During 35 m p h limit, m p h	During 40 m p h limit, m p h	Prior to 40 m p h limit, m p h	During 40 m p h limit, m p h	During 35 m p h limit, m p h	During 40 m p h limit, m p h	During 35 m p h limit, m p h	
Alabama	50 4	44 8	37 3	-5 6			39 4	36 2				
Arizona	47 1	40 7		-6 4	-9 7			36 8			-4 8	
California		47 0	37 3					37 7				
Colorado		46 7		-2 6	-6 0			33 1			-0 5	
Idaho	44 2	41 6	35 6									
Illinois				-4 9	-7 6							
Iowa	48 2	43 3	35 7					34 7			-5 1	
Louisiana			34 0	-6 8	-7 4			31 0			+0 4	
Michigan	49 7	42 9	35 5					33 9			-1 7	
Minnesota	49 0	43 5		-5 5	-3 3			41 8			-1 4	
Missouri	53 6	46 0	42 7	-7 6				42 5			-2 9	
Nebraska	51 4	44 2		-7 2				37 5			-6 2	
North Dakota			30 4									
Ohio	48 0	42 7	36 3	-5 3	-6 4							
Oregon	48 8	43 0	38 0	-5 8	-5 0							
South Dakota	48 4	40 9		-7 5				39 2			-1 4	
Utah		39 0										
Washington	46 5	43 0	39 6	-3 5	-3 4			37 3			-3 9	
Wisconsin	51 3	40 8		-10 5				41 4				
Average	49 0	43 1	36 6				41 8	39 3				

EFFECT OF 40 M P H SPEED LIMIT (P C—13 STATES, TRUCKS—6 STATES)

49 0	42 9		-6 1	41 8	39 2	-2 6
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EFFECT IN GOING TO 35 M P H LIMIT (P. C.—7 STATES, TRUCKS—6 STATES)

	43 7	37 6	-6 1		39 2	36 0	-3 2
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TABLE 5
 AVERAGE BUS SPEEDS ON MAIN RURAL HIGHWAYS
 WITHIN GASOLINE-RATIONED AREA

State	Average speed			Change in speed	
	Prior to 40 m p h limit, m p h	During 40 m p h limit, m p h	During 35 m p h limit, m p h	During 40 m p h limit, m p h	During 35 m p h limit, m p h
Georgia			40 8		
Maryland	40 2	39 9	34 4	-0 3	-5 5
North Carolina			37 8		
Virginia (near D C)		41 3	42 8		+1 5
Virginia (other)		44 0	43 0		-1 0
Average	40 2	41 7	39 8		

Effect of 40 M P H Speed Limit (1 State)

40 2	39 9		-0 3	
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Effect in Going from 40 to 35 M P H Speed Limit (3 States)

	41 7	40 0		-1 7
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OUTSIDE GASOLINE-RATIONED AREA

California		42 5			
Missouri	55 3	48 0	44 2	-7 3	-3 8
Washington		46 5	42 6		-3 9
Average	55 3	45 7	43 4		

Effect of 40 M P H Speed Limit (1 State)

55 3	48 0		-7 3	
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Effect of Going from 40 to 35 M P H Speed Limit (2 States)

	47 2	43 4		-3 8
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TABLE 6
 PERCENTAGE OF VEHICLES TRAVELING OVER 35 MILES PER HOUR
 WITHIN GASOLINE-RATIONED AREA

State	Pas-senger cars			Trucks		
	Prior to 40 m p h limit, per cent	During 40 m p h limit, per cent	During 35 m p h limit, per cent	Prior to 40 m p h limit, per cent	During 40 m p h limit per cent	During 35 m p h limit, per cent
Delaware	93	59		80	47	
Georgia			44			35
Maine			44			
Maryland	76	64	46	54	60	31
Massachusetts			69			
North Carolina			66			58
South Carolina	83	75			70	
Virginia (near D C)	89	67	53	62	71	52
Virginia (other)		92	64		79	62
Average	85	71	55	65	65	48

Comparable percentage in same States	4 States			3 States		
	85	66		65	59	
	3 States			3 States		
		74	54		70	48

OUTSIDE GASOLINE-RATIONED AREA

Alabama			72			60
Arizona	94	88				
California	87	72			58	
Colorado		90	56		72	45
Idaho		88			73	
Illinois	85	58	49		37	29
Iowa	92	89	55	80	84	48
Louisiana			58			29
Michigan	93	81	53	72	51	37
Minnesota	91	87		71	81	
Missouri	98	93	87			
Nebraska	92	79		90	60	
Ohio	91	88	69			
Oregon	94	88	63			
South Dakota	93	82	63	78	74	29
Utah		85			78	
Washington	92	90	78		82	64
Wisconsin	91	91				
Average	92	84	64	78	68	43

Comparable percentage in same States	13 States			5 States		
	92	84		78	70	
	9 States			6 States		
		84	64		67	42

TABLE 7
 PERCENTAGE OF VEHICLES TRAVELING OVER 40 MILES PER HOUR
 WITHIN GASOLINE-RATIONED AREA

State	Passenger cars			Trucks		
	Prior to 40 m p h limit, per cent	During 40 m p h limit, per cent	During 35 m p h limit, per cent	Prior to 40 m p h limit, per cent	During 40 m p h limit, per cent	During 35 m p h limit, per cent
Delaware	79	19		53	25	
Georgia			34			27
Maine			17			
Maryland	53	36	17	15	27	6
Massachusetts			16			
North Carolina			34			32
South Carolina	68	45			38	
Virginia (near D C)	72	36	20	41	35	16
Virginia (other)		77	24		37	21
Average	68	43	23	36	32	20
Comparable percentage in same States	4 States			3 States		
	68	34		36	29	
	3 States			3 States		
		50	20		33	14
OUTSIDE GASOLINE-RATIONED AREA						
Alabama			38			23
Arizona	86	71				
California	72	44			28	
Colorado		76	24		56	22
Idaho		64			41	
Illinois	72	33	21		16	6
Iowa	77	65	22	48	50	8
Louisiana		26				7
Michigan	84	59	18	42	22	9
Minnesota	78	67		49	60	
Missouri	93	79	60			
Nebraska	81	60		65	15	
Ohio	77	67	37			
Oregon	80	65	24			
South Dakota	78	52	34	36	35	14
Utah		30			25	
Washington	78	73	45		59	33
Wisconsin	82	44				
Average	80	59	32	48	37	15
Comparable percentage in same States	13 States			5 States		
	80	60		48	36	
	9 States			6 States		
		68	32		40	15

TABLE 8
 PERCENTAGE OF VEHICLES TRAVELING OVER 45 MILES PER HOUR
 WITHIN GASOLINE-RATIONED AREA

State	Passenger cars			Trucks		
	Prior to 40 m p h limit, per cent	During 40 m p h limit, per cent	During 35 m p h limit, per cent	Prior to 40 m p h limit, per cent	During 40 m p h limit, per cent	During 35 m p h limit, per cent
Delaware	54	9		21	2	
Georgia			19			12
Maine			4			
Maryland	28	12	7	0	8	2
Massachusetts			6			
North Carolina			13			13
South Carolina	45	25			17	
Virginia (near D C)	46	14	7	18	9	5
Virginia (other)		43	8		17	6
Average	43	21	9	13	10	8
Comparable percentage in same States	4 States			3 States		
	43	15		13	6	
	3 States			3 States		
		23	7		11	4
OUTSIDE GASOLINE-RATIONED AREA						
Alabama			17			7
Arizona	72	45				
California	51	19			9	
Colorado		54	12		26	11
Idaho		52				
Illinois	42	16	8		4	2
Iowa	63	41	5	25	16	2
Louisiana			10			0
Michigan	68	36	4	24	8	2
Minnesota	62	38		29	30	
Missouri	84	55	36			
Nebraska	63	35		22	0	
Ohio	56	35	14			
Oregon	60	35	7			
South Dakota	65	29	13	17	11	7
Utah		12			12	
Washington	51	32	15		30	6
Wisconsin	68	26				
Average	62	35	13	23	16	5
Comparable percentage in same States	13 States			5 States		
	62	34		23	13	
	9 States			6 States		
		37	13		16	5

TABLE 9
 PERCENTAGE OF VEHICLES TRAVELING OVER 50 MILES PER HOUR
 WITHIN GASOLINE-RATIONED AREA

State	Passenger cars			Trucks		
	Prior to 40 m p h limit, per cent	During 40 m p h limit, per cent	During 35 m p h limit, per cent	Prior to 40 m p h limit, per cent	During 40 m p h limit, per cent	During 35 m p h limit, per cent
Delaware	30	2		4	0	
Georgia			5			2
Maine			1			
Maryland	9	4	3	0	2	0
Massachusetts			0			
North Carolina			5			0
South Carolina	25	12			5	
Virginia (near D C)	22	4	2	15	3	1
Virginia (other)		17	2		5	2
Average	22	8	3	6	3	1

Comparable percentage in same States	4 States			3 States		
	22	5		6	2	
	3 States			3 States		
		8	2		3	1

OUTSIDE GASOLINE-RATIONED AREA

Alabama			8			2
Arizona	49	23				
California	30	7			3	
Colorado		35	4		18	3
Idaho			33		13	
Illinois	29	6	3		1	0
Iowa	43	22	1	11	6	0
Louisiana			3			0
Michigan	49	16	1	9	0	0
Minnesota	41	19		27	13	
Missouri	68	31	16			
Nebraska	42	15		3	0	
Ohio	37	18	6			
Oregon	39	10	2			
South Dakota	38	11	0	3	2	0
Utah		5			5	
Washington	26	14	6		10	2
Wisconsin	40	16				
Average	41	18	5	11	6	1

Comparable percentage in same States	13 States			5 States		
	41	16		11	4	
	9 States			6 States		
		18	4		6	1