TRAFFIC SPEED STUDIES

PROGRESS REPORT NO. 72

JUNE, 1961

NO. 14

Joint
Highway
Research
Project

PURDUE UNIVERSITY
LAFAYETTE INDIANA

by

ED. MILLER

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Progress Report
TRAFFIC SPEED STUDIES
PROGRESS REPORT NO. 72

TO: E. B. Woods, Director
Joint Highway Research Project

FROM: H. L. Michael, Assistant Director
Joint Highway Research Project

June 21, 1961

File No: 8-3-3
Project No: C-36-100

The 72nd progress report on "Traffic Speed Studies" is attached. This report presents the results of the semi-annual speed study made at six locations on state highways in the vicinity of Lafayette, Indiana. The report has been prepared by Mr. Forrest D. Miller, Graduate Assistant on our staff, under the direction of Professor H. L. Michael.

This study is another in a series at these same locations which are made twice annually to determine the trend in average and 85th percentile speeds of passenger cars and trucks at locations where traffic is free-flowing. The results of this study are compared with results of previous studies and little change in average or 85th percentile speeds was noted.

The report is presented for the record. Copies will be sent, as usual for these studies, to the Bureau of Public Roads, the Indiana State Police, and the Office of Traffic Safety.

Respectfully submitted,

Harold L. Michael
Harold L. Michael
Secretary

HLM:jmc

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Progress Report

TRAFFIC SPEED STUDIES

Progress Report No. 72

by

**Forrest Miller
Graduate Assistant**

Joint Highway Research Project

File: 8-3-3

Project: C-36-100

**Purdue University
Lafayette, Indiana**

June 21, 1961

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TRAFFIC SPEED REPORT NO. 72

This report covers spot speed observations made during March and April 1961. All observations were made of free moving vehicles on level tangent sections of rural highways. The locations of the stations were the same as for previous studies and are as follows:

1. U.S. 52 - 1.0 mile south of south junction of S.R. 28
(4-lane highway)
2. U.S. 52 - 1.0 mile west of Klondike (4-lane highway)
3. U.S. 52 - 2.2 miles northwest of Templeton (2-lane highway)
4. U.S. 31 - 7.2 miles north of Perrysburg (2-lane highway)
5. S.R. 25 - 0.7 mile south of Americas (2-lane highway)
6. U.S. 41 - 1.0 mile north of Boswell (2-lane highway)

The data for this study were collected by using an Elektromatic Radar Speed Meter. The meter was concealed as much as possible and was placed near the edge of the pavement. It was directed along the highway at a small angle with respect to the direction of traffic so that it was not necessary to make angle corrections to the readings.

The radar equipment used will not operate properly if the voltage varies more than minus $1/2$ volt or plus 1 volt from the optimum twelve volts. The voltage was therefore checked periodically in the field and maintained within the desired range. Also, correct calibration was maintained by periodically checking it with a 60 mile per hour tuning fork.

The observers concealed themselves from traffic as much as local conditions permitted. It is thus believed that the speeds of the observed vehicles were not influenced by the observers or the equipment.

A summary of the results of this study, as well as of the last seven studies, is given in Table I. Indiana state law limits the speed of passenger cars and light trucks (those under 5,000 pounds GVW) to 65 miles per hour. The speed limit for trucks over 5,000 pounds GVW (heavy trucks) is 50 miles per hour on all highways except 4-lane highways which have a median strip of at least twenty feet in width where the speed limit is 55 miles per hour. This latter speed limit for trucks has been in effect since about May 1959. Most truck speed limit signs posted along state highways reflect this change and it is probable that most truck drivers are aware of this speed limit condition.

Truck speeds are shown in the tables for three groups: light trucks, heavy trucks, and all trucks. Speeds are also shown separately for 2-lane and 4-lane highways. All 4-lane observation stations were on highways with a median of greater than twenty feet. Since weights were not taken in this study, light trucks (less than 5,000 pounds) were considered to be only panel trucks and pick-up trucks. All other types of trucks were classified as heavy (over 5,000 pounds).

The passenger car data were also classified into three groups: Indiana, out-of-state, and all passenger cars. The classification was determined by observing the license plate on each passenger car passing the observation stations.

A comparison between the results of the present study and those of the last previous study (August - September, 1960) is presented in Tables II through VII. Average and 85th percentile speeds were computed for each vehicle group from the sample of vehicles taken at each study site. All comparisons made are between the samples taken in this study and corresponding samples in August - September 1960.

The average speed for all passenger cars was 0.5 mile per hour faster than that obtained in the last study while average speeds for all trucks was 1.1 miles per hour lower than in August - September 1960. Indiana passenger cars had an average speed on 2-lane highways 1.0 mile per hour faster while their average on 4-lane highways decreased by 0.6 mile per hour. Out-of-state passenger cars increased their average speed on 2-lane highways as well as on 4-lane highways by 0.8 mile per hour.

The average speed for light trucks increased 0.7 mile per hour on 2-lane highways but decreased 0.8 mile per hour on 4-lane highways. For heavy trucks the average speed decreased by 0.6 mile per hour on 2-lane highways and 4.0 miles per hour on 4-lane highways.

The 85th percentile speed for all passenger cars increased 1.4 miles per hour.

Trend information on the average speeds of passenger cars and trucks and on the 85th percentile speed for passenger cars is shown in Table I and Figures 7 and 8. Table 1 is a summary of spot speed observations on Indiana highways for the last eight studies (since May 1957). This summary lists the observations for 2-lane highways, 4-lane highways, and all highways for both passenger cars and trucks.

Figure 7 is a graph showing rural speed trends from 1950-1961 for both passenger cars and trucks.

Figure 8 is a graph showing trends in percentile speeds and speed differential from 1955-1961 for both passenger cars and heavy trucks. The speed differential shown is the difference between the 85th percentile speed of passenger cars and the 15th percentile speed of heavy trucks.

TABLE I

SUMMARY OF SPOT SPEED OBSERVATION
ON INDIANA HIGHWAYS
(Free-Moving Vehicles on Level, Tangent Sections)

			Passenger Cars				Trucks		
			Ind Mean	Non-Ind Mean	All Mean	All 85 per	Light Mean	Heavy Mean	All Mean
Two-Lane Highways	May	'57	55.6	59.1	56.9	64.0	50.2	44.8	46.1
	Aug.	'57	55.5	56.7	55.9	62.1	51.7	45.8	47.3
	Aug.	'58	54.3	56.3	55.0	61.7	53.0	46.3	47.8
	Mar.	'59	55.5	57.7	56.1	61.9	50.4	45.4	46.3
	Aug.	'59	55.6	55.3	55.9	63.2	49.7	46.7	48.0
	Mar.	'60	53.3	54.8	53.7	61.2	48.5	45.9	46.6
	Sept.	'60	55.7	55.6	55.6	62.0	53.0	48.1	49.1
	Mar.	'61	56.7	56.4	56.6	63.9	53.7	47.5	49.3
Four-Lane Highways	May	'57	59.9	63.6	61.0	69.0	52.2	46.0	47.9
	Aug.	'57	57.5	59.9	58.5	64.8	52.0	46.6	47.6
	Aug.	'58	58.0	59.6	58.7	65.0	54.3	49.0	50.0
	Mar.	'59	58.2	61.7	59.0	64.9	53.6	47.0	48.4
	Aug.	'59	58.4	60.1	59.1	64.5	50.0	53.1	49.5
	Mar.	'60	58.1	59.2	58.4	65.0	52.4	47.3	48.4
	Sept.	'60	59.5	60.2	59.7	65.8	54.8	51.3	52.0
	Mar.	'61	58.9	61.0	59.6	66.7	54.0	47.3	48.9
All Highways	May	'57	57.2	60.3	58.3	66.0	50.9	45.2	46.6
	Aug.	'57	56.2	58.3	56.9	63.2	51.8	46.1	47.4
	Aug.	'58	55.7	57.9	56.5	63.1	53.4	47.5	48.7
	Mar.	'59	56.6	59.0	57.2	63.1	51.5	45.9	47.0
	Aug.	'59	56.5	58.4	57.4	63.5	50.6	47.8	48.6
	Mar.	'60	55.6	57.1	56.0	63.0	50.2	46.6	47.5
	Sept.	'60	57.3	57.6	57.4	63.7	53.7	49.4	50.2
	Mar.	'61	57.7	58.3	57.9	65.1	53.8	47.4	49.1

TABLE
SPEED DATA

III

Station 1.0 mile west of Mondike on U. S. 52

Surface: 4 lane divided - 24' Portland Cement Concrete

Weather Cool and Clear

This Observation

Last Previous Observation (Speed Report No. 71)

Date April 4, 1961

Date August 30; September 2, 1960

Time 8 - 10:20 AM; 1:30 - 2:20 PM; 5 - 5:40 PM

Time 2 - 2:20 PM; 1:50 - 4:10 PM

OBSERVATION	PASSENGER CARS						TRUCKS						BUSES				
	All			Indiana		Non-Indiana		All			Less than 5000 pounds		5000 pounds or more		All		
	Last	Present		Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present
No. of Vehicles Obs.	544	532		344	356	200	176	113	170	30	49	83	121				
Ave. Speed (m.p.h.)	59.1	58.9		58.6	58.2	60.0	60.2	52.4	49.4	53.4	51.9	51.9	48.4				
45 m.p.h.	—	—		—	—	—	—	81.4	74.1	80.0	73.5	81.9	74.4				
50 m.p.h.	94.7	91.2		93.3	88.2	97.0	97.2	69.0	52.4	73.3	55.0	67.5	51.2				
55 m.p.h.	76.1	75.6		75.3	71.9	77.5	82.5	36.3	22.4	43.3	34.7	33.8	17.4				
60 m.p.h.	50.0	50.2		47.4	48.0	54.5	54.5	16.8	6.5	33.3	18.4	10.9	1.7				
65 m.p.h.	20.9	19.4		18.0	18.3	25.5	21.6	1.8	0.0	6.7	0.0	0.0	0.0				
70 m.p.h.	6.2	6.6		4.9	5.9	8.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0				
75 m.p.h.	0.6	1.9		0.9	1.7	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0				
No. of Vehicles Obs.	302	257		191	184	111	73	68	104	14	24	54	80				
Ave. Speed (m.p.h.)	60.2	61.0		59.7	60.1	61.2	63.2	53.7	50.4	50.2	53.3	54.6	49.5				
Max. Speed (m.p.h.)	—	—		80	84	74	90	—	—	64	63	64	63				
State or Type	—	—		—	—	—	—	—	—	—	—	—	—				
Min. Speed (m.p.h.)	—	—		38	39	40	50	—	—	40	39	34	30				
State or Type	—	—		—	—	—	—	—	—	—	—	—	—				
No. of Vehicles Obs.	242	275		153	172	89	103	45	66	16	25	29	41				
Ave. Speed (m.p.h.)	57.7	57.0		57.2	56.3	58.4	58.1	50.2	47.9	56.3	50.6	46.9	46.2				
Max. Speed (m.p.h.)	—	—		74	71	72	74	—	—	63	64	56	56				
State or Type	—	—		—	—	—	—	—	—	—	—	—	—				
Min. Speed (m.p.h.)	—	—		40	38	42	43	—	—	32	40	26	26				
State or Type	—	—		—	—	—	—	—	—	—	—	—	—				

TABLE
SPEED DATA

Station 2.2 miles northwest of Templaton on U. S. 52

Surface 2 lane - 22' Bituminous Concrete

Weather Cool and cloudy
Last Previous Observation (Speed Report No. 71)

This Observation

Last Previous Observation (Speed Report No. 71)

Date March 31, 1961

Date September 1, 1960

Time 12:15 - 1:30 p.m.

Time 2 - 3:40 p.m.

OBSERVATION	PASSENGER CARS						TRUCKS						BUSES				
	All			Indiana		Non-Indiana		All			Less than 5000 pounds		5000 pounds or more		All		
	Last	Present		Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present
No. of Vehicles Obs.	345	355		149	140	196	215	78	46		5	10	73	36			
Ave. Speed (m.p.h.)	56.8	56.5		56.7	56.3	56.8	56.6	49.5	48.7		50.9	51.3	49.3	48.0			
45 m.p.h.	—	—		—	—	—	—	79.5	69.6		80.0	80.0	79.4	66.7			
50 m.p.h.	91.9	89.9		89.3	87.9	93.9	91.2	62.8	56.5		60.0	60.0	63.0	55.6			
55 m.p.h.	66.6	63.1		63.1	65.0	69.4	61.9	20.5	19.6		40.0	40.0	19.2	13.9			
60 m.p.h.	33.8	37.7		34.3	37.1	33.7	38.1	3.8	2.2		20.0	10.0	2.7	0.0			
65 m.p.h.	9.0	7.1		12.2	7.1	6.7	7.0	0.0	0.0		0.0	0.0	0.0	0.0			
70 m.p.h.	3.5	0.8		6.2	0.7	1.5	0.9	0.0	0.0		0.0	0.0	0.0	0.0			
75 m.p.h.	0.3	0.3		0.7	0.7	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0			
No. of Vehicles Obs.	194	174		76	83	118	91	38	16		1	3	37	13			
Ave. Speed (m.p.h.)	56.7	57.4		56.8	57.2	56.6	57.6	48.6	46.3		54.0	49.3	48.4	45.5			
Max. Speed (m.p.h.)	—	—		76	76	70	70	—	—		54	54	56	56			
State or Type	—	—		—	—	—	—	—	—		—	—	—	—			
Min. Speed (m.p.h.)	—	—		36	42	30	46	—	—		54	42	30	40			
State or Type	—	—		—	—	—	—	—	—		—	—	—	—			
No. of Vehicles Obs.	151	181		73	57	78	124	40	30		4	7	36	23			
Ave. Speed (m.p.h.)	56.9	55.5		56.6	54.9	57.7	55.8	50.3	50.1		50.0	52.1	50.3	49.4			
Max. Speed (m.p.h.)	—	—		72	68	74	70	—	—		62	60	60	59			
State or Type	—	—		—	—	—	—	—	—		—	—	—	—			
Min. Speed (m.p.h.)	—	—		44	42	42	42	—	—		32	43	34	40			
State or Type	—	—		—	—	—	—	—	—		—	—	—	—			

TABLE V SPEED DATA

Station 7.2 miles north of Parrysburg on U. S. 31

Surface 2 lane - 22' Bituminous Concrete

Weather Cool, clear and windy

This Observation

Last Previous Observation (Speed Report No. 71)

Date April 3, 1961

Date September 6, 1960

Time 3:15 - 5:35 p.m.

Time 11:20 a.m. - 12:30 p.m.; 1:15 - 2:40 p.m.

OBSERVATION	PASSENGER CARS						TRUCKS						BUSES								
	All			Indiana			Non-Indiana			All			Less than 5000 pounds			5000 pounds or more			All		
	Last	Present		Last	Present		Last	Present		Last	Present		Last	Present		Last	Present		Last	Present	
No. of Vehicles Obs.	344	339		270	271		74	68		86	82	25	25	61	57						
Ave. Speed (m.p.h.)	56.0	57.1		55.4	57.1		58.2	57.4		49.9	49.9	53.1	54.6	48.6	47.8						
45 m.p.h.	—	—		—	—		—	—		79.1	76.9	80.0	96.0	78.7	68.5						
50 m.p.h.	82.3	88.8		79.3	87.8		93.3	92.6		58.2	54.9	68.0	72.0	54.1	47.4						
55 m.p.h.	57.9	64.9		55.9	62.4		64.9	75.0		19.8	23.2	36.0	48.0	13.2	12.3						
60 m.p.h.	30.5	38.9		31.5	38.0		27.1	42.6		7.1	15.9	20.0	40.0	1.6	5.3						
65 m.p.h.	9.4	11.2		9.3	12.2		9.5	7.4		2.4	2.5	8.0	8.0	0.0	0.0						
70 m.p.h.	2.0	5.6		2.2	5.9		1.4	4.4		1.2	0.0	4.0	0.0	0.0	0.0						
75 m.p.h.	1.2	2.1		1.1	2.2		1.4	1.5		1.2	0.0	4.0	0.0	0.0	0.0						
No. of Vehicles Obs.	145	180		119	140		26	40		38	30	10	13	28	17						
Ave. Speed (m.p.h.)	55.5	57.5		54.6	57.3		59.9	58.2		49.3	49.8	49.3	53.8	49.3	46.8						
Max. Speed (m.p.h.)	—	—		78	98		64	71		—	—	58	66	56	61						
State or Type	—	—		—	—		—	—		—	—	—	—	—	—						
Min. Speed (m.p.h.)	—	—		32	35		46	43		—	—	38	40	30	34						
State or Type	—	—		—	—		—	—		—	—	—	—	—	—						
No. of Vehicles Obs.	199	159		151	131		48	28		48	52	15	12	33	40						
Ave. Speed (m.p.h.)	56.3	56.7		56.0	56.8		57.3	55.3		50.4	49.9	55.7	55.6	48	48.2						
Max. Speed (m.p.h.)	—	—		80	84		78	76		—	—	80	67	60	61						
State or Type	—	—		—	—		—	—		—	—	—	—	—	—						
Min. Speed (m.p.h.)	—	—		40	38		40	40		—	—	42	46	34	32						
State or Type	—	—		—	—		—	—		—	—	—	—	—	—						

TABLE 1
SPEED DATA

Station 0.7 mile south of Americus on SR 25

Surface 2 lane - 22' Bituminous Concrete

Weather Cool and Clear

This Observation

Last Previous Observation (Speed Report No. 71)

Date March 16, 1961

Date September 2, 1960

Time 10 AM - 12:45 PM

9 - 11:30 AM

[illegible]

TABLE VII SPEED DATA

Station 1.0 mile north of Boswell on US 41

Surface 2 lane - 22' Portland Cement Concrete

Weather Cool and Cloudy

Last Previous Observation (Speed Report No. 71)

This Observation

Date March 31, 1961

Date September 1, 1960

Time 9:30 - 11:10 AM

Time 10:20 AM - 1:05 PM

OBSERVATION	PASSENGER CARS								TRUCKS								BUSES	
	All				Indiana		Non-Indiana		All				Less than 5000 pounds		5000 pounds or more		All	
	Last Present	Last	Present		Last Present	Last	Present	Last Present	Last	Present	Last Present	Last	Present	Last Present	Last	Present	Last Present	
No. of Vehicles Obs.	282	343			116	143		166	200	109	52	17	16	92	36			
Ave. Speed (m.p.h.)	51.7	55.7			51.6	55.6		51.8	55.8	45.9	46.7	47.6	50.7	45.6	44.9			
45 m.p.h.	—	—			—	—		—	—	60.6	57.7	58.8	81.2	60.9	47.2			
50 m.p.h.	64.2	88.0			65.6	83.2		63.3	91.5	33.0	36.5	41.2	68.7	31.5	22.2			
55 m.p.h.	33.0	61.2			31.9	60.1		33.8	62.0	8.2	15.4	23.6	25.0	5.5	11.1			
60 m.p.h.	11.6	27.4			10.5	27.3		10.9	27.5	0.9	1.9	0.0	6.2	1.1	0.0			
65 m.p.h.	2.5	5.5			1.7	6.3		3.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0			
70 m.p.h.	0.0	1.5			0.0	2.8		0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0			
75 m.p.h.	0.0	0.6			0.0	1.4		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
No. of Vehicles Obs.	123	93			49	43		74	50	53	26	6	6	47	20			
Ave. Speed (m.p.h.)	53.7	56.7			53.5	57.4		53.8	56.1	44.9	46.3	44.8	50.7	44.9	45.1			
Max. Speed (m.p.h.)	—	—			68	81		66	72	—	—	52	54	60	57			
State or Type	—	—			—	—		—	—	—	—	—	—	—	—			
Min. Speed (m.p.h.)	—	—			32	40		40	41	—	—	36	46	32	36			
State or Type	—	—			—	—		—	—	—	—	—	—	—	—			
No. of Vehicles Obs.	159	250			67	100		92	150	56	26	11	10	45	16			
Ave. Speed (m.p.h.)	50.2	55.4			50.2	54.8		50.3	55.7	46.9	47.0	49.0	50.7	46.4	44.7			
Max. Speed (m.p.h.)	—	—			60	72		66	63	—	—	53	60	56	56			
State or Type	—	—			—	—		—	—	—	—	—	—	—	—			
Min. Speed (m.p.h.)	—	—			40	40		36	40	—	—	33	38	30	34			
State or Type	—	—			—	—		—	—	—	—	—	—	—	—

FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

FIGURE 5

FIGURE 6

INDIANA RURAL SPEED TRENDS 1950-1961

TRENDS IN PERCENTILE SPEED & SPEED DIFFERENTIAL 1955-1961