TRAFFIC SPEED REPORT NO. 82
TRUCK WEIGHT-SPEED STUDY

DECEMBER 1965
NO. 31

Joint
Highway
Research
Project

PURDUE UNIVERSITY
LAFAYETTE INDIANA

by
D. A. WRIGHT

Progress Report

Traffic Speed Report No. 82

December 9, 1965

File: 8-3-4

Project: C-36-10D

TO: G. A. Leonards, Director
Joint Highway Research Project

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

Attached is a Progress Report entitled "Traffic Speed Report No. 82", conducted in August and September of 1965. The report was prepared by Mr. Darrell A. Wright, Graduate Assistant on our staff, under the direction of Professor H. L. Michael.

This report contains the results of the 1965 study of the relationship between truck weights and truck speeds. The report was prepared from data obtained during the annual truck weight study performed by the Highway Planning Survey Section of the Indiana State Highway Commission. The Joint Highway Research Project has cooperated in this study in a similar manner for many years.

The report is presented to the Board for information and the record. It is requested that approval be granted to distribute copies of the report to the Indiana State Highway Commission, the Bureau of Public Roads, the State Police, the Office of Traffic Safety, and the Traffic Safety Foundation.

Respectfully submitted,

Harold L. Michael *HLM*
Harold L. Michael, Secretary

HLM:sat

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Progress Report

TRAFFIC SPEED REPORT NO. 82

TRUCK WEIGHT - SPEED STUDY

by

**Darrell A. Wright
Graduate Assistant**

Joint Highway Research Project

File No: 8-3-4

Project No: C-36-10D

**Purdue University
Lafayette, Indiana**

December 9, 1965

Progress Report

TRAFFIC SPEED REPORT NO. 82

INDIAN DEPARTMENT OF TRANSPORTATION

James A. Wright
Indiana Department of Transportation

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ABSTRACT

This report is the annual, continuing study of the relationship between truck weight and truck speed. The weight and speed of trucks on two-lane and four-lane highways in Indiana were taken during August and September, 1965.

Analysis of the data indicated that as truck weight increased, truck speed decreased slightly. However, it was found that the weight of the truck only accounted for a small portion of the variability in truck speeds.

The average speeds for trucks were lower than the values for the previous study. However, the trend in average speed still seems to be increasing with the trend for heavier trucks on four-lane highways tending to level near the speed limit.

TRAFFIC SPEED REPORT NO. 82

During the months of August and September the Highway Planning Survey Section of the Indiana State Highway Commission conducted the annual study of truck weights on Indiana highways. The type of truck, weight, size, and material hauled were recorded at twenty-three stations throughout the state.

This report is an analysis of the 1965 truck weight-speed data collected by personnel of the Joint Highway Research Project in cooperation with personnel of the Indiana State Highway Commission. The truck weight-speed study compares the weight of a truck, obtained by the Planning Survey Section through the use of loadometer and pit scales, and the speed of the same truck, obtained by the personnel of the Joint Highway Research Project, using a radar meter. The radar unit was located approximately two miles from the weighing site. A positive identification method was used to match the truck weight with its associated speed.

Although the Highway Planning Survey Section made observations at twenty-three locations throughout the state, only ten stations were used for the collection of truck weight-speed data. The ten stations are shown on Figure 1 and described as follows:

<u>Station</u>	<u>Highway</u>	<u>Location</u>	<u>Date of Observation</u>	<u>No. of Lanes</u>
58B	U.S. 31	2000' S. of Southport Road	Aug. 24	4
75	U.S. 41	0.25 Mi. S. of U.S. 41 Business	Aug. 25	4
83	U.S. 41	0.5 Mi. N. of S.R. 37	Aug. 26	4
81	U.S. 150	0.3 Mi. S.E. of S.R. 57	Aug. 27	2

FIG. 1 LOCATIONS OF TRUCK WEIGHT-SPEED STATIONS

45B	S.R. 67	1.0 Mi. S.W. of Muncie	Sept. 2	2
16	U.S. 6	3.0 Mi. W. of S.R. 49	Sept. 13	2
15	U.S. 30	Between S. R. 55 and S.R. 53	Sept. 14	4
14	U.S. 41	0.5 Mi. S. of N. Jct. of S.R. 2	Sept. 15	4
12	U.S. 52	2.25 Mi. W. of U.S. 41	Sept. 16	2
42	U.S. 52	600' S.E. of N. Jct. of S.R. 28	Sept. 20	4

Equipment and Field Procedure

The speed observations were made on level tangent sections of the highways approximately two miles from the weight stations. In all cases sufficient distance was allowed for the trucks to regain normal cruising speeds. Care was also taken not to choose a location where the trucks might be influenced by an intersection or a railroad crossing.

The speeds of the trucks were obtained by the use of an "Electro-Matic" Radar Speed Meter, built by Automatic Signal Division, Eastman Industries, Inc., East Norwalk, Conn. The meter was placed approximately four feet from the edge of the pavement at an angle of less than 10 degrees with the highway centerline. For angles less than 10 degrees, the error in reading the vehicle speed is negligible.

Prior to beginning the study, a test using a "fifth wheel" was performed to determine the accuracy of the radar meter. The fifth wheel was checked for accuracy at a five-mile odometer check section and no significant errors were found in the instrument. The radar unit was found to have an error of less than 1/2 mile per hour; consequently, the

use of a calibration curve was deemed unnecessary. During the observations at a station, the radar meter was checked periodically with the 60 mile per hour tuning fork to assure the accuracy of the readings.

Each truck for which a speed was recorded was free flowing (the speed of the truck should not have been affected by other vehicles traveling in the same direction).

To avoid influencing the vehicles on the facility, the vehicle which was used in the study was not parked on the roadside at the observation station. The vehicle was parked on a side road in the vicinity of each station with an attempt to conceal it from the view of the passing vehicles.

The radar unit was placed on a platform in a green cardboard barrel, similar in size and color to the metal barrels used by the Indiana State Highway Department for roadside trash collection. The cable to the speed recording meter was stretched toward the roadside fence. In this manner, the personnel in the study were approximately 25 feet from the roadside and created a minimum influence on the passing trucks.

The truck weight-speed data were collected from 8 A.M. to 4 P.M. During the four A.M. hours the weights and speeds were recorded for trucks traveling in one direction, and during the four P.M. hours the information was recorded for trucks traveling in the opposite direction.

A positive method of identification was used to match the truck weights recorded with the truck speeds. At the weight stations, in addition to the weight of each truck, the name, the number of axles, the color of the cab and trailer, the time that the truck left the weight

station, and any other identifying features were recorded. The same information was recorded for each truck that passed the radar unit. By estimating the time required to travel from the weight station to the radar unit and using the other identifying features, the truck weights were matched to the appropriate truck speed. If there was any doubt in the matching, the particular weight and speed were not used in the analysis.

Analysis

For the purpose of analysis the trucks were classified as single unit or multi-unit for each station. An analysis was made for each type of roadway, two-lane and four-lane. The single unit trucks were divided into those less than 5000 pounds and those 5000 pounds or greater. The weight classification corresponds to the Indiana speed limits:

- 65 MPH for light trucks (less than 5000 pounds)
- 55 MPH for heavy trucks (5000 pounds or more) on 4-lane
 highways with a median of 20 feet or more
- 50 MPH for heavy trucks on other roadways

To determine the relationship between truck weight and truck speed for each classification of truck on each type of roadway, a linear equation was fitted to the data using regression techniques. A weighted regression analysis program (WRAP) was used for the regression analysis. The computations were performed using the 7094 computer at Purdue University.

Results of Analysis

The observed values for truck weights at each station were separated into 4,000 pound weight classes. Tables 1 and 2 show the number of trucks

TABLE 1 - HIGHWAY TRAFFIC VOLUMES (TRV)

Station	Two-lane Highways						Four-lane Highways								Total 4-lane and 6-lane					
	17	18	45B	81	Total 2-lane		11	15	42	58B	71	83	Total 4-lane							
Weight (lbs)	Ave. No. of Speed Trucks	Ave. No. of Speed Trucks	Ave. No. of Speed Trucks	Ave. No. of Speed Trucks	Ave. No. of Speed Trucks		Ave. No. of Speed Trucks	Ave. No. of Speed Trucks	Ave. No. of Speed Trucks	Ave. No. of Speed Trucks	Ave. No. of Speed Trucks	Ave. No. of Speed Trucks	Ave. No. of Speed Trucks	Ave. No. of Speed Trucks						
0-4	47.0	4	45.2	1	27.7	44.2	4	47.4	17	40.0	1	38.3	2	31.0	1	30.6	7	40.8	8	
4-5	42.0	3	55.5	2	50.3	7	50.9	11	31.4	28	48.1	3	34.7	10	52.0	4	51.8	4	40.7	10
Light Trucks	8	5	17	15	42	2	2	0	3	5	12	11	47	28						
Ave. Wt. (lbs)	2,900	2,920	4,080	4,000	4,050	4,100	4,100	4,130	4,140	4,460	4,460	4,220	4,470	4,160						
Ave. Speed	30.1	40.6	30.6	49.4	47.8	47.3	47.3	47.2	33.2	37.9	36.3	30.6	37.6	37.6						
Conf. Level	95	95	95	95	95	95	95	95	95	95	95	95	95	95						
Conf. Hyper	37.1	40.6	55.0	33.0	33.0	---	---	30.5	33.5	60.0	35.2	37.7	36.6	37.6						
Conf. Lower	43.1	33.6	57.0	35.0	41.1	---	---	30.5	40.5	44.0	44.0	41.5	47.4	47.6						
5-11	50.1	4	40.7	2	42.2	10	43.4	12	40.4	20	38.2	7	38.6	10	47.2	12	40.2	8	47.8	27
11-14	47.4	3	40.3	4	44.4	10	45.0	18	44.1	40	37.4	8	37.7	16	43.3	17	40.3	19	40.3	35
14-16	40.3	2	45.8	5	24.3	10	44.0	0	47.4	27	40.4	13	34.6	7	37.8	13	30.3	12	40.8	33
16-20	40.5	2	31.0	2	30.3	3	41.0	7	47.6	16	40.4	9	34.1	3	41.6	7	40.8	3	36.0	3
20-25	30.0	1	---	---	---	---	43.5	4	48.4	5	47.7	16	37.1	3	37.2	3	41.0	3	37.5	2
25-30	---	---	41.0	1	---	---	---	---	37.0	1	38.7	11	---	---	30.0	2	37.6	1	41.5	2
30-32	45.0	1	40.0	1	36.0	1	43.0	2	47.4	6	37.7	4	---	---	37.0	1	43.0	2	43.0	4
32-36	---	---	---	---	---	---	---	---	37.0	1	43.0	2	43.0	4	31.0	4	47.9	9	47.9	10
36-40	---	---	---	---	---	---	---	---	37.0	2	47.0	2	47.0	2	41.0	2	40.5	4	---	---
40-44	---	---	40.3	2	37.0	3	41.0	3	40.4	8	40.7	3	---	---	37.0	1	37.0	2	40.3	3
44-48	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
48-52	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
52-56	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
56-60	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
60-64	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
64-68	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
68-72	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
72-76	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Heavy Trucks	17	10	41	56	138	12	23	23	37	97	39	36	326	168						
Ave. Wt. (lbs)	11,990	16,590	11,580	14,910	13,720	14,980	14,980	13,430	14,120	17,200	13,660	14,300	14,420	14,980						
Ave. Speed	40.7	40.3	40.2	44.9	42.8	42.8	42.2	42.6	32.8	40.2	40.1	40.2	40.4	40.9						
Conf. Level	95	95	95	95	95	95	95	95	95	95	95	95	95	95						
Conf. Hyper	37.0	37.1	31.7	43.7	43.0	36.4	35.9	33.8	37.7	47.0	41.4	39.6	39.1	37.3						
Conf. Lower	43.0	42.5	35.9	44.1	44.1	47.4	49.1	49.7	46.2	55.2	47.0	47.6	47.6	47.3						

TABLE 2 - TRUCK-ONLY DATA SUMMARY (199)

Station	Two-lane Highways						Four-lane Highways												Total	
	L2	+ 16	42H	62	Total		L2	16	L2	50H	75	83	Total						Two-lane and	Four-lane
Weight (lbs)	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks		Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks	Ave. No. of Trucks
0-12	65.0	1	---	---	---	---	65.0	1	---	---	---	---	---	---	---	---	---	---	65.0	1
12-16	67.0	1	51.0	2	---	---	67.0	2	40.0	3	---	---	---	---	---	---	---	---	67.0	2
16-20	68.0	2	42.0	4	27.0	1	68.0	2	42.0	2	31.0	3	30.0	1	30.0	2	30.0	24	42.0	27
20-24	69.0	4	30.0	6	44.0	2	69.0	19	30.0	15	51.0	18	50.0	10	44.0	11	40.0	12	30.0	75
24-28	64.0	2	52.0	13	34.0	8	60.0	3	31.0	33	31.0	23	30.0	17	32.0	23	32.0	18	31.0	131
28-32	64.0	4	50.0	5	51.0	6	67.0	3	40.0	19	31.0	20	30.0	13	30.0	15	30.0	5	32.0	109
32-36	65.0	7	47.0	3	47.0	2	67.0	1	40.0	23	31.0	15	30.0	12	30.0	10	30.0	4	30.0	69
36-40	64.0	1	47.0	9	47.0	1	67.0	19	30.0	18	30.0	5	30.0	10	40.0	9	40.0	3	31.0	17
40-44	---	---	30.0	10	30.0	2	66.0	1	31.0	13	30.0	10	30.0	8	40.0	2	40.0	6	31.0	42
44-48	---	---	31.0	5	31.0	2	---	---	31.0	10	30.0	10	40.0	6	31.0	2	30.0	2	30.0	37
48-52	---	---	31.0	9	30.0	2	60.0	3	30.0	14	40.0	6	40.0	7	40.0	5	30.0	21	40.0	19
52-56	67.0	2	32.0	7	40.0	2	40.0	2	30.0	12	30.0	8	30.0	9	40.0	6	40.0	5	31.0	41
56-60	---	---	30.0	10	30.0	2	31.0	1	30.0	12	30.0	7	30.0	12	30.0	6	30.0	6	31.0	33
60-64	67.0	1	31.0	13	---	---	67.0	4	30.0	10	30.0	5	30.0	7	40.0	3	30.0	3	30.0	34
64-68	---	---	30.0	20	41.0	2	40.0	1	40.0	13	30.0	15	30.0	8	40.0	10	30.0	5	31.0	2
68-72	---	---	30.0	3	31.0	2	30.0	1	30.0	13	30.0	15	30.0	17	40.0	3	30.0	17	40.0	39
72-76	61.0	1	31.0	2	40.0	2	40.0	3	40.0	21	30.0	10	40.0	7	40.0	15	30.0	3	30.0	49
76-80	---	---	---	3	40.0	2	40.0	3	40.0	11	30.0	1	40.0	12	40.0	8	40.0	11	---	---
80-84	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
84-88	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
88-92	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
92-96	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
96-100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
100-104	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total Trucks	41	110	49	36	222		41	171	163	139	105	95	943						1145	
Ave Wt. (lbs)	33,140	47,150	47,140	44,620	44,230		47,150	47,150	47,150	47,150	47,150	47,150	47,150						47,150	
Ave Speed	47.9	54.0	47.6	47.9	47.9		51.1	51.3	51.3	48.0	49.2	51.3	50.9						50.9	
Conf. level	95	95	95	95	95		95	95	95	95	95	95	95						95	
Conf. Upper	50.0	51.0	50.3	51.3	51.2		51.0	54.3	50.9	48.0	51.4	51.6	51.6						51.6	
Conf. Lower	45.8	49.0	46.9	44.3	46.5		50.4	50.3	50.3	47.6	47.0	49.8	50.2						50.2	

and the average speed for each weight class. The tables also show the average speed for each classification of trucks at each station and summaries of the same values for each roadway type. The results for each truck classification and roadway type are as follows:

Single Unit (less than 5000 pounds)

	2-lane	4-lane	all
No. of vehicles	42	43	85
Average Speed - MPH	49.8	51.4	50.6
Average Weight - lbs	4,050	4,270	4,160

Single Unit (5000 lbs or more)

	2-lane	4-lane	all
Number of trucks	132	326	458
Average Speed - MPH	47.8	49.4	49.0
Average Weight - lbs	13,730	14,810	14,500

Multi-Unit

	2-lane	4-lane	all
Number of trucks	222	943	1165
Average Speed - MPH	49.9	50.9	50.7
Average Weight - lbs	44,330	46,480	46,070

The values in Table 3 are the percent of trucks exceeding the speed limit and the percent exceeding 5 miles above the speed limit for each station. The following chart summarizes the results in Table 3.

Single Unit

	light	heavy	Multi-Unit
2-lane			
Speed Limit	2.4	31.1	48.6
5 MPH above limit	0.0	6.1	9.0
4-lane			
Speed limit	4.6	18.4	17.8
5 MPH above limit	0.0	5.2	1.9

Sta.	SINGLE UNIT TRUCKS						MULTIPLE UNIT TRUCKS			
	Trucks Weighing Under 5000 lbs			Trucks Weighing over 5000 lbs			All Weights			
	No Trucks observed	% exceeding 65 MPH	% exceeding 70 MPH	No Trucks observed	% exceeding 50 MPH	% exceeding 55 MPH	No Trucks observed	% exceeding 50 MPH	% exceeding 55 MPH	% exceeding 60 MPH
12	9	11.1	0.0	17	35.3	0.0	21	23.8	0.0	
16	5	0.0	0.0	18	16.7	0.0	118	58.5	11.9	
45B	13	0.0	0.0	41	46.3	12.2	49	51.0	8.2	
61	15	0.0	0.0	56	23.3	5.4	34	26.5	5.9	
All 2 lane	42	2.4	0.0	132	31.1	6.1	222	48.6	9.0	
					% exceeding 55 MPH	% exceeding 60 MPH		% exceeding 55 MPH	% exceeding 60 MPH	
14	2	50.0	0.0	42	26.2	7.1	232	14.2	1.7	
15	8	12.5	0.0	35	25.7	2.9	171	32.2	2.3	
42	5	0.0	0.0	57	36.8	12.3	183	18.0	1.6	
58B	5	0.0	0.0	57	5.3	1.7	156	7.0	1.3	
75	12	0.0	0.0	79	12.7	3.8	105	18.1	4.8	
83	11	0.0	0.0	56	10.3	3.6	96	17.7	0.0	
All 4 lane	43	4.6	0.0	326	18.4	5.2	943	17.8	1.9	
Summary	85	3.5	0.0	458	—	—	1165	—	—	—

TABLE 3

PERCENTAGE OF TRUCKS VIOLATING SPEED LIMITS

Table 4 lists the number of observations, average speed, and average weight for each truck classification for the past seventeen years.

Figures 2, 3 and 4 show graphically the accumulative speed distribution for each classification of truck on two-lane, four-lane, and the combination of both roadway types. Figures 5 and 6 show the trends in the 85th percentile truck speed for two-lane and four-lane roadways for the past twelve years.

Figures 7 and 8 show the relationship between truck weight and speed for single unit and multi-unit trucks on each type of roadway. The weight-speed relationships for all single unit and multi-unit trucks observed are shown in Figure 9.

Summary and Conclusions

The linear equations derived for the relationship between truck weight and truck speed, Figures 7, 8 and 9, indicate that as truck weight increases, truck speed decreases. However, the coefficients of linear association, " r ", were small, indicating that the data have a small relation to a linear equation or that there is a great deal of scatter in the data. The coefficients of determination, " r^2 ", were also small. This coefficient expresses the percent of the variability in the data which the equation explains.

The coefficients computed for each classification of truck on each type of roadway were as follows:

<u>Equation</u>	r	r^2
2-lane single unit	0.3030	0.0918
4-lane single unit	0.1320	0.0174
2-lane multi-unit	0.0084	0.0001
4-lane multi-unit	0.2516	0.0633

Year	Single-Unit			Multi-Unit		
	Number	Average Speed	Average Weight	Number	Average Speed	Average Weight
1949	578	42.2	9,400	581	43.2	32,500
1950	791	42.4	8,700	879	42.7	36,700
1951	1,242	43.0	8,600	1,402	43.5	36,700
1952	1,482	43.4	8,700	1,354	44.1	35,900
1953	1,239	43.9	8,400	1,507	43.1	35,800
1954	905	45.8	8,000	1,064	43.6	37,400
1955	762	45.9	8,900	1,120	43.5	38,400
1956	952	47.0	8,300	1,033	44.4	37,900
1957	1,028	46.3	9,400	1,161	42.5	37,100
1958	837	46.5	9,900	1,130	46.1	39,500
1959	481	45.5	9,200	604	48.6	40,300
1960	424	49.1	12,000	644	50.3	39,300
1961	938	48.0	10,600	1,149	48.6	42,600
1962	610	48.7	11,800	1,079	49.2	42,700
1963	488	44.9	11,500	736	45.9	43,600
1964	677	50.6	11,200	1,176	51.1	44,100
1965	543	49.2	12,900	1,165	50.7	46,100

TABLE 4

TRUCK-WEIGHT SPEED DATA
COMPARISON OF DATA FROM STUDIES IN VARIOUS YEARS

FIGURE 2. ACCUMULATIVE SPEED CURVES

FIGURE 3. ACCUMULATIVE SPEED CURVES

PERCENTILE

FIGURE 4. ACCUMULATIVE SPEED CURVES

FIG. 5 - TRENDS IN THE 85TH PERCENTILE TRUCK SPEED ON TWO-LANE HIGHWAYS (1954-1965)

FIG. 6 - TRENDS IN THE 85TH PERCENTILE TRUCK SPEED ON FOUR-LANE HIGHWAYS (1954-1965)

FIG. 7 - REGRESSION ANALYSIS: SINGLE UNIT TRUCKS BY ROADWAY TYPE

FIG.8 - REGRESSION ANALYSIS: MULTI-UNIT TRUCKS BY ROADWAY TYPE

FIG. 9 - REGRESSION ANALYSIS: ALL TRUCKS BY TRUCK TYPE

single unit (total)	0.1618	0.0271
Multi-unit (total)	0.2027	0.0411

A positive 1.00 for "r" would indicate that there was a positive linear association in the samples. A value of 1.00 for " r^2 " would indicate that all of the variability in a truck's speed could be explained by the truck's weight.

The trends in the 85th percentile truck speeds on two-lane highways, Figure 5, still seem to be increasing. Whereas, the trends on four-lane highways, Figure 6, seem to be leveling just above the speed-limit. The results in Table 3 indicate that a large number, 31.1% of the heavy single unit trucks and 48.6% of the multi-unit trucks, were exceeding the 50 mile per hour speed limit on the two lane facilities. But only 6.1% and 9.0% of the trucks exceeded 55 miles per hour. This indicates a tendency for many trucks to travel at the same speed on both types of facilities despite the differences in speed limits.

The overall average speed (Table 4) for single unit and multi-unit trucks decreased approximately one mile per hour from last year. The values for last year increased approximately five miles per hour from the proceeding year. When results of the previous seventeen years are considered, it is doubtful that a downward trend in truck speeds is beginning. Further study will be required to determine a change in the past upward trend in average truck speeds.

Recommendations for Future Studies

1. Weight Station 81 at West Baden should be replaced by another two-lane station for the weight-speed study. The topography in the area makes it very difficult to find a satisfactory level, tangent section

to record the truck speeds.

2. A 50 foot extension cord should be purchased for the radar meter.

This would facilitate concealing the personnel recording the speeds of the passing trucks. Truck drivers seem very proficient at detecting unusual activities, such as, a radar unit.