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Statewide Transportation Analysis & Research

IMPACT OF

50, 55 or 60 M.P.H.

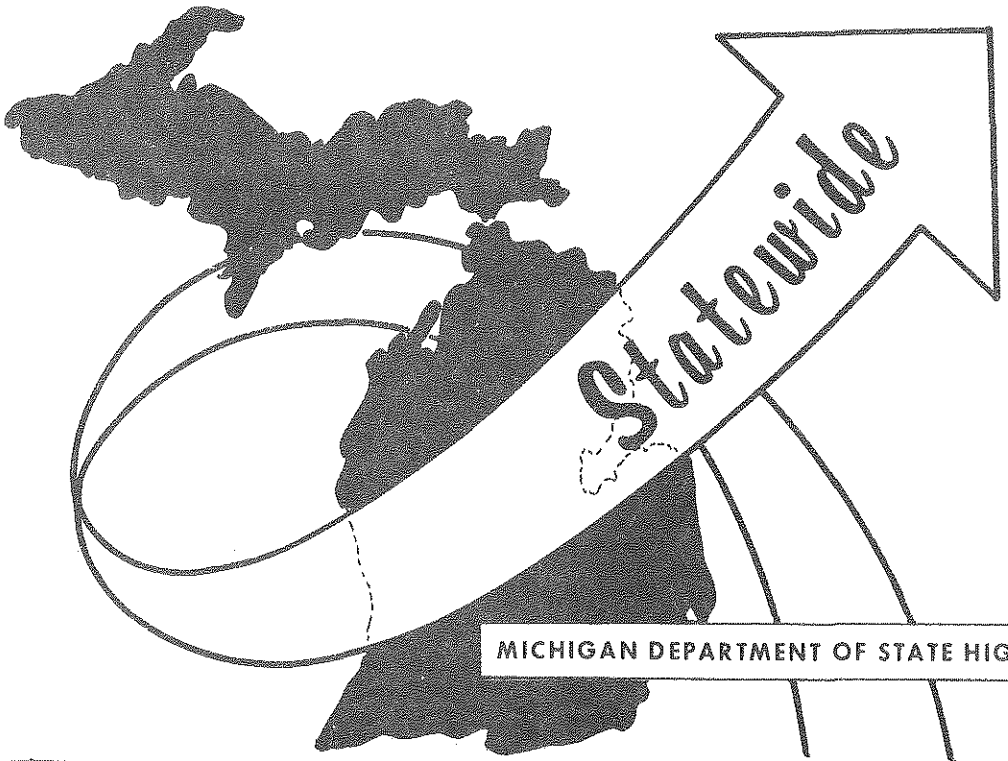
STATEWIDE SPEED

LIMIT

Report no. 12

January 9, 1974

Statewide Studies Unit



MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

MICHIGAN DEPARTMENT

OF

STATE HIGHWAYS AND TRANSPORTATION

IMPACT OF

50, 55 or 60 M.P.H.

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Report no. 12

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Statewide Studies Unit

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DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

STATE HIGHWAYS BUILDING – POST OFFICE DRAWER K – LANSING, MICHIGAN 48904

JOHN P. WOODFORD, DIRECTOR

January 9, 1974

Mr. Sam F. Cryderman
Deputy Director
Bureau of Transportation Planning

Dear Mr. Cryderman:

This report shows the probable savings in motor fuel that we believe could be realized if a 50 M.P.H. speed limit, a 55 M.P.H. speed limit, or a 60 M.P.H. speed limit were invoked and if reasonable compliance were achieved. The analysis was prepared by Mr. Richard E. Esch, Supervisor of the Statewide Studies Unit. Mr. Terry Gotts assisted in the final preparation.

Sincerely,

Keith E Bushnell

Keith E. Bushnell
Engineer of Transportation
Survey and Analysis Section

MICHIGAN
THE GREAT LAKE STATE

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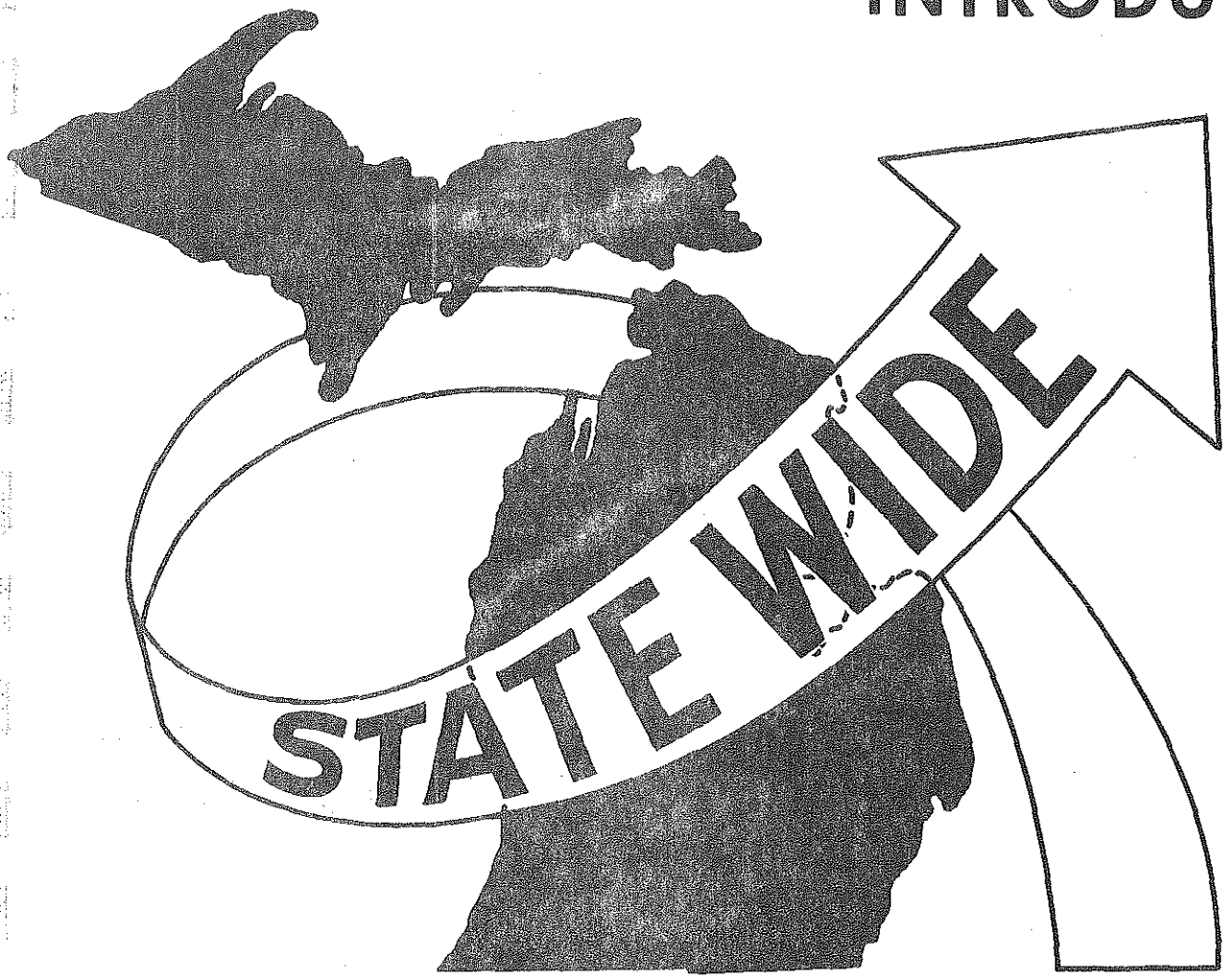
INTRODUCTION



INTRODUCTION

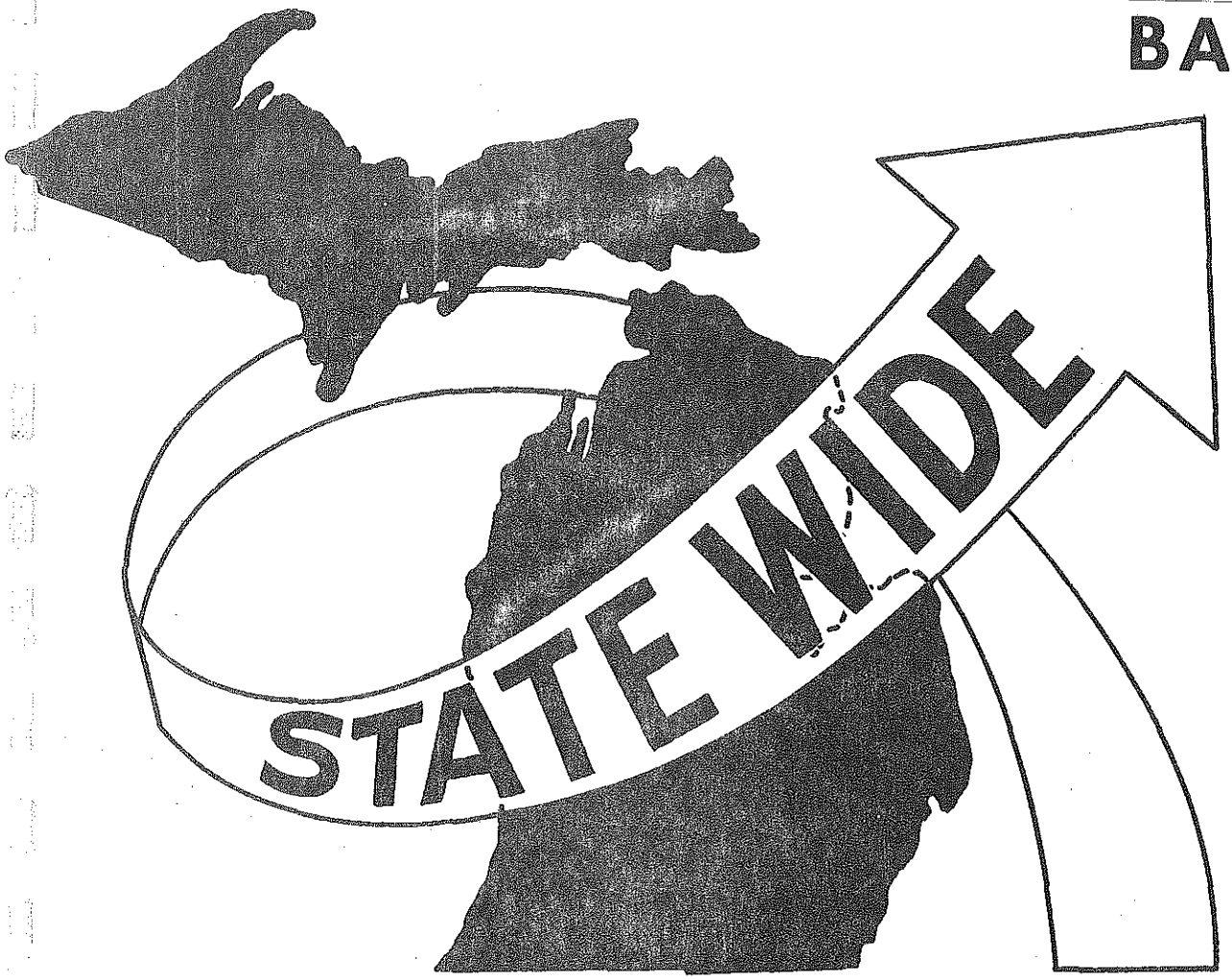
This analysis was completed in order to determine the probable impact that a statewide speed limit might have on a motor fuel consumption in the State of Michigan. For the purposes of this study it was assumed that the most likely speed limit would be 50 M.P.H. Additional analyses were also completed for both a 55 M.P.H. speed limit and also a 60 M.P.H. speed limit.

Three basic data sources were used to complete this analysis. They were:

1. 1972 U.S. Department of Transportation, Table T.A. 1 for Michigan.
2. Text book by Robley Winfrey entitled Economic Analysis for Highways.
3. Michigan Department of State Highways and Transportation Report #66 entitled Speed Report, April 1972.

Analysis completed in this document is intended solely as an initial inquiry. The results obtained are based upon several judgemental assumptions and use of this information must be based upon full knowledge of these assumptions.

DATA BASE



DATA BASE

For this study the annual vehicle miles by each of these highway types was obtained from Table TA-1 (special report submitted annually to the Federal Highway Administration) for Michigan. The annual vehicle miles (millions) for 1972 by type appear in the final column in Figure 1.

HIGHWAY SYSTEM ANNUAL VEHICLE MILES

Class Number	Highway Type	1972 Annual Vehicle Miles (Millions)
01	Interstate Rural	3706
02	Interstate Urban	5094
03	Federal Aid Primary Rural	7607
04	Federal Aid Primary Urban	7771
05	Federal Aid Secondary State Rural	1642
06	Federal Aid Secondary State Urban	665
07	Federal Aid Secondary Local Rural	7412
08	Federal Aid Secondary Local Urban	2607
09	Other State Rural	35
10	Other State Urban	81
11	Local Rural	3157
12	Local Urban	7662
—	All Others	10378
	TOTAL	57817

FIGURE 1

The data used to complete the final analysis was based on a division of the highway system in Michigan into 13 categories. The first column in Figure 1 is the numeric code assigned each of the 12 classes of highways. A description of each highway type appears in the second column.

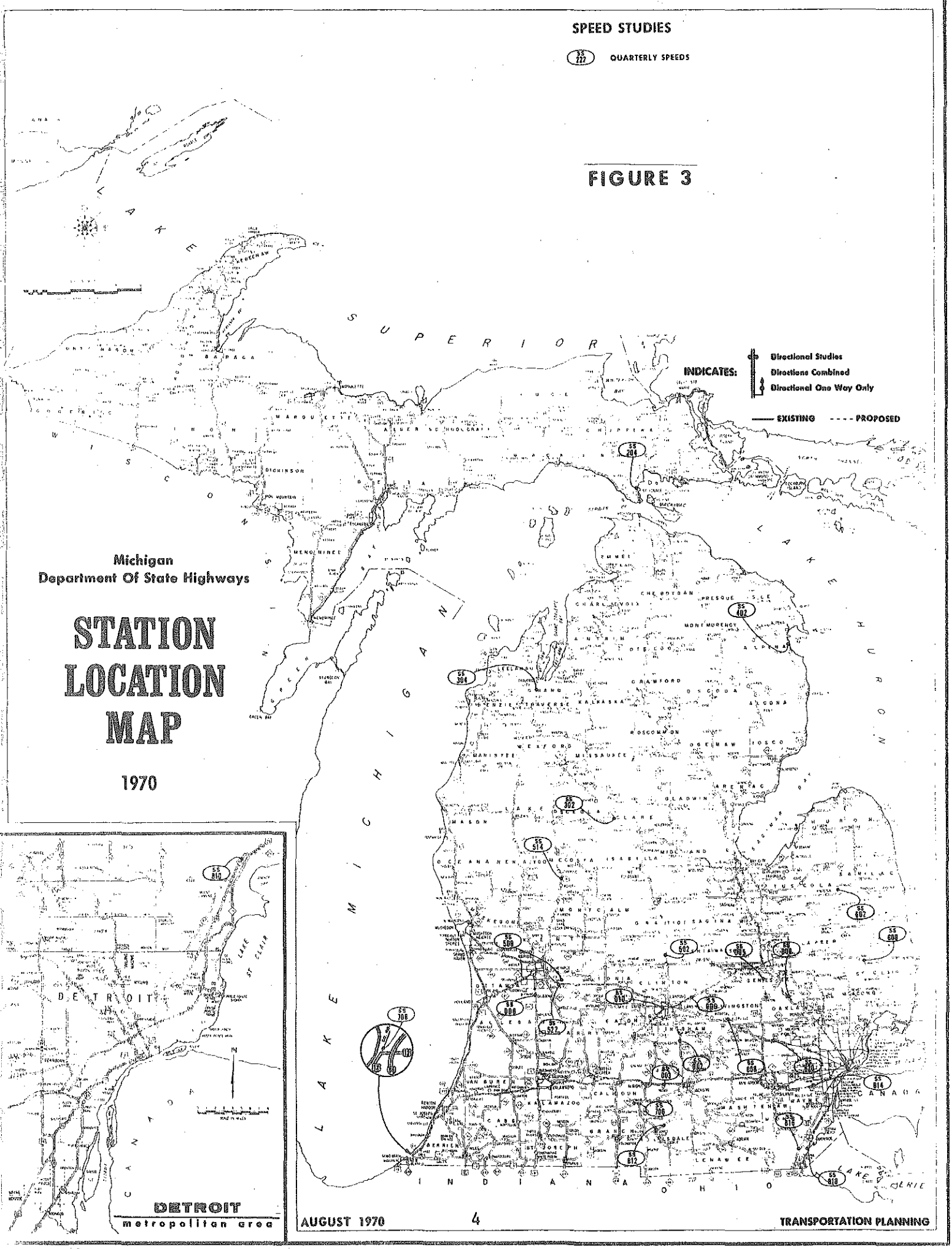
The data used to estimate gasoline consumption was obtained from Appendix A of a text book by Robley Winfrey entitled Economic Analysis for Highways (1969). The gasoline consumption rates used are for an average 4,000 lb. passenger car and are shown in Figure 2. It has been assumed for this study that all grades are level as no information was available on grades by highway type. No differentiation was made for car and trucks.

GASOLINE CONSUMPTION AT UNIFORM SPEED ON THE LEVEL

(Gallons per 1000 Vehicle Miles)

Gals./1000 Veh. Miles	Miles Per Gallon	Speed MPH
102.4	9.8	5
76.1	13.1	7 1/2
63.3	15.8	10
55.8	17.9	12 1/2
51.1	19.6	15
48.0	21.0	17 1/2
45.9	21.8	20
44.4	22.5	22 1/2
43.5	23.0	25
43.0	23.3	27 1/2
42.8	23.4	30
43.0	23.3	32 1/2
43.3	23.1	35
43.9	22.8	37 1/2
44.7	22.4	40
45.6	21.9	42 1/2
46.8	21.4	45
48.1	20.8	47 1/2
49.6	20.2	50
51.3	19.5	52 1/2
53.2	18.8	55
55.3	18.2	57 1/2
57.6	17.4	60
60.2	16.6	62 1/2
63.1	15.9	65
66.3	15.1	67 1/2
70.0	14.3	70
74.1	13.5	72 1/2
78.7	12.7	75
84.1	11.9	77 1/2
90.4	11.1	80

FIGURE 2


SPEED STUDIES
SS 222 QUARTERLY SPEEDS
FIGURE 3
INDICATES:
Directional Studies
Directions Combined
Directional One Way Only
EXISTING
PROPOSED
Michigan
Department Of State Highways
STATION LOCATION MAP
1970
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
LAKE ERIE
LAKE ST CLAIR
DETROIT
metropolitan area
CANADA
INDIANA
OHIO
SS 204
SS 402
SS 304
SS 302
SS 514
SS 602
SS 608
SS 502
SS 508
SS 510
SS 522
SS 708
SS 814
SS 818
SS 812
SS 706
SS 810

Motor fuel consumption is directly related to the speed that each vehicle is traveling so the third source of travel data required to complete a realistic evaluation of the impact speed limit changes might have is speed data. The Michigan Department of State Highways and Transportation collects speed data four times a year. The data is typically collected during the months of January, April, July and October at the stations appearing in Figure 3. The speed study inventory for April 1972 was selected for this analysis as this data most represents an average day. Any other month or year could be substituted if desired. Figure 4-7 are summary tables of the April 1972 speed study results.

These three data sources complete the data base used in the following analysis. Any individual having more refined information can quickly take the initial annual vehicle miles information and complete additional analyses if desired.

Daytime Speeds - Rural
6 Locations
01/IR Interstate Rural Final Locations
Stations: 003, 204, 522, 814, 818, 820.

SPEED	ALL VEHICLES		PASSENGER CARS		COMMERCIAL		BUSSES	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
25 AND UNDER								
OVER 25 THRU 30								
OVER 30 THRU 35	1	0.1	1	0.1				
OVER 35 THRU 40	2	0.2	2	0.2			N	
OVER 40 THRU 45	3	0.3			3	1.3	O	
OVER 45 THRU 50	13	1.1	4	0.4	9	3.9		
OVER 50 THRU 55	48	4.1	18	1.9	30	12.9	B	
OVER 55 THRU 60	130	11.2	46	5.0	84	36.2	U	
OVER 60 THRU 65	245	21.1	165	17.7	80	34.5	S	
OVER 65 THRU 70	312	26.8	288	31.0	24	10.3	S	
OVER 70 THRU 75	284	24.4	282	30.3	2	0.9	E	
OVER 75 THRU 80	104	8.9	104	11.2			S	
OVER 80 THRU 85	18	1.5	18	1.9				
OVER 85 THRU 90	3	0.3	3	0.3				
OVER 90								
TOTAL	1163	100.0	931	100.0	232	100.0		
AVERAGE SPEED	67.3		69.2		59.6			
85TH PERCENTILE		74.1		74.7		64.4		
PACE	63-73		63-73		55-65			

FIGURE 4

Daytime Speeds - Rural
15 Locations
03/0FR Other F. A. Primary Rural
Stations: 005, 006, 302, 304, 402, 502, 514, 602, 606, 608, 706, 802, 810, 812, 816.

SPEED	ALL VEHICLES		PASSENGER CARS		COMMERCIAL		BUSSES	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
25 AND UNDER								
OVER 25 THRU 30								
OVER 30 THRU 35	5	0.2	2	0.1	3	0.8		
OVER 35 THRU 40	21	0.7	9	0.3	12	3.0		
OVER 40 THRU 45	79	2.6	56	2.2	23	5.8		
OVER 45 THRU 50	210	7.0	162	6.2	48	12.1		
OVER 50 THRU 55	433	14.4	327	12.6	105	26.5	1	50.0
OVER 55 THRU 60	638	21.3	505	19.4	133	33.6		
OVER 60 THRU 65	660	22.0	609	23.4	51	12.9		
OVER 65 THRU 70	547	18.2	527	20.3	19	4.8	1	50.0
OVER 70 THRU 75	305	10.2	303	11.6	2	0.5		
OVER 75 THRU 80	73	2.4	73	2.8				
OVER 80 THRU 85	24	0.8	24	0.9				
OVER 85 THRU 90	5	0.2	5	0.2				
OVER 90								
TOTAL	3000	100.0	2602	100.0	396	100.0	2	100.0
AVERAGE SPEED	61.2		62.2		55.1		61.5	
85TH PERCENTILE	69.6		70.2		61.2			
PACE	56-66		57-67		50-60			

FIGURE 5

Daytime Speeds - Urban
1 Location
04/0FU Other F. A. Primary Urban
Station: 10

SPEED	ALL VEHICLES		PASSENGER CARS		COMMERCIAL		BUSSES	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
25 AND UNDER								
OVER 25 THRU 30	1	0.5	1	0.5				
OVER 30 THRU 35	10	5.0	9	4.6	1	20.0		
OVER 35 THRU 40	50	25.0	47	24.1	3	60.0	N	
OVER 40 THRU 45	73	36.5	73	37.4			O	
OVER 45 THRU 50	44	22.0	43	22.1	1	20.0		
OVER 50 THRU 55	20	10.0	20	10.3			B	
OVER 55 THRU 60	2	1.0	2	1.0			U	
OVER 60 THRU 65							S	
OVER 65 THRU 70							S	
OVER 70 THRU 75							E	
OVER 75 THRU 80							S	
OVER 80 THRU 85								
OVER 85 THRU 90								
OVER 90								
TOTAL	200	100.0	195	100.0	5	100.0		
AVERAGE SPEED	43.7		43.8		39.6			
85TH PERCENTILE		49.1		49.2				
PACE	35-45		35-45					

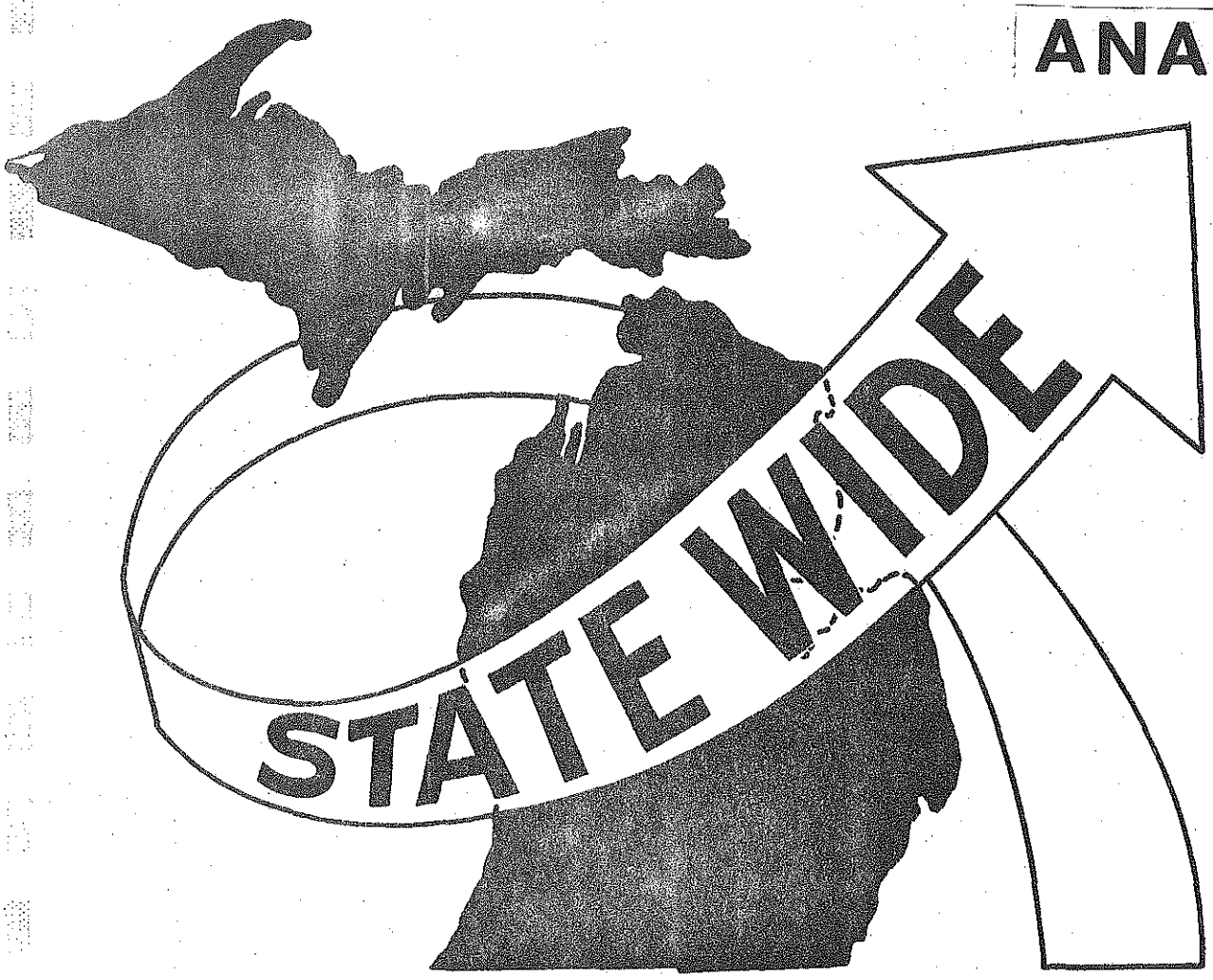
FIGURE 6

Daytime Speeds - Rural
4 Locations
07/FLR F. A. Secondary Rural Local Jurisdiction
Stations: 508, 708, 806, 808.

SPEED	ALL VEHICLES		PASSENGER CARS		COMMERCIAL		BUSSES	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
25 AND UNDER								
OVER 25 THRU 30								
OVER 30 THRU 35	6	0.9	4	0.6	2	2.8		
OVER 35 THRU 40	22	3.2	11	1.8	11	15.3	N	
OVER 40 THRU 45	47	6.8	37	6.0	10	13.9	O	
OVER 45 THRU 50	69	10.0	55	8.9	14	19.4		
OVER 50 THRU 55	137	19.8	115	18.6	22	30.5	B	
OVER 55 THRU 60	188	27.2	176	28.4	12	16.7	U	
OVER 60 THRU 65	127	18.4	126	20.3	1	1.4	S	
OVER 65 THRU 70	68	9.8	68	11.0			S	
OVER 70 THRU 75	24	3.5	24	3.9			E	
OVER 75 THRU 80	2	0.3	2	0.3			S	
OVER 80 THRU 85	1	0.1	1	0.2				
OVER 85 THRU 90								
OVER 90								
TOTAL	691	100.0	619	100.0	72	100.0		
AVERAGE SPEED	56.7		57.6		48.9			
85TH PERCENTILE	64.6		65.2		55.9			
PACE	53-63		53-63		48-58			

FIGURE 7

SPEED LIMIT IMPACT ANALYSIS



SPEED LIMIT IMPACT ANALYSIS

The annual vehicle miles by highway type and the speed data for April 1972 were combined into the chart shown in Figure 8. The information in this chart was used as a base for all study analysis. This chart indicates what percent of the travel occurs in each speed group for each highway class except "all others" as most of this travel is under 50 M.P.H.

SPEED DISTRIBUTION OVER 50 M. P. H.
PERCENT

Highway Classes	Annual Vehicle Miles	Speed Groups					
		50-55	55-60	60-65	65-70	70-75	75-80
01*	3706	4.1	11.2	21.1	26.8	24.4	10.7
02	5094	21.1	26.8	24.4	8.9	1.5	0.3
03*	7607	14.4	21.3	22.0	18.2	10.2	2.4
04*	7771	10.0	1.0	----	----	----	----
05	1642	14.4	21.3	22.0	18.2	10.2	2.4
06	665	10.0	1.0	----	----	----	----
07*	7412	19.8	27.2	18.4	9.8	3.5	0.3
08	2607	10.0	1.0	----	----	----	----
09	35	19.8	27.2	18.4	9.8	3.5	0.3
10	81	10.0	1.0	----	----	----	----
11	3157	9.8	3.5	0.3	----	----	----
12	7662	----	----	----	----	----	----

*ACTUAL SPEED DATA

FIGURE 8

Actual speed data (Figure 4-7) is available for only four classes as indicated by the asterisk in Figure 8. These classes were 01, 03, 04 and 07. Speed data percentages for 02 which is interstate urban freeway were assumed to have a distribution similar to the 01 class which is interstate rural. All percentages were skewed to the left two columns (10 M.P.H.) because the present speed limit is 70 M.P.H. for rural interstate and 60 M.P.H. on most urban interstate routes. Class 05 was assumed to be similar to the 03 class as their basic design is similar -- only the Federal aid designation is different. The actual 04 classification speed distribution was assumed to apply to 06, 08 and also 10 for the reason that design standards within urban areas for these classes does not appear to vary enough to effect speed distribution changes.

The 11 classification is very similar to the 07 classification except that it may include "gravel type" highways and typically the speed limits tend to be around 50 M.P.H. rather than the 65 M.P.H. of the 07 classification;therefore the 11 class speed distribution is the 07 distribution skewed to the left three columns to represent the 15 M.P.H. class differential.

Class 12 was assumed to have an average speed of 25 M.P.H. for this study as no information is presently available which might be applicable. Additional speeds in this class most probably fall below the 50 M.P.H. speed limit and will not affect the results of this study.

Travel above 80 M.P.H. was included in the 75-80 M.P.H. group, as Winfrey's gasoline consumption tables do not go beyond 80 M.P.H. This affects only the 01 classification and includes only 1.8 percent of the vehicles in this class.

Figure 9 is a summarization of the annual vehicle miles in millions that presently occur in each speed group by highway class. These data may be used for analysis involving all three speed limits. The entire table is used in the 50 M.P.H. analysis; all but the left-most ("50-55") column is used in the 55 M.P.H. analysis; and all but the left-most two columns are used for the 60 M.P.H. calculations.

VEHICLE MILES DISTRIBUTION BY SPEED GROUP

Highway Classes	Annual Vehicle Miles (Millions)	Used in 50 MPH Analysis						Present Typical Speed
			Used in 55 MPH Analysis					
				Used in 60 MPH Analysis				
		50-55	55-60	60-65	65-70	70-75	75-80	
01	3706	152	415	782	993	904	397	70 *
02	5094	1075	1365	1243	454	76	15	60 +
03	7607	1095	1620	1674	1384	776	183	65 *
04	7771	777	78	0	0	0	0	-50
05	1642	236	350	361	299	167	39	65 *
06	665	67	7	0	0	0	0	-50
07	7412	1468	2016	1364	726	259	22	65 *
08	2607	261	26	0	0	0	0	-50
09	35	7	10	6	3	1	0	-50
10	81	8	1	0	0	0	0	-50
11	3157	309	110	9	0	0	0	-50
12	7662	0	0	0	0	0	0	-50

FIGURE 9

*Final Analysis: 50,55,60
+Final Analysis: 50,55 only

These are the annual vehicle miles by each category that will be used to calculate probable motor fuel consumption reductions. Highways where the present speed limit is 50 M.P.H. or less have been eliminated from the analysis as speed limit changes in these areas generally will be inconsequential. In the 50 and 55 M.P.H. speed limit analysis classes 01, 02, 03, 05 and 07 were used. For the 60 M.P.H. analysis only four classes (01 03 05 and 07) were included.

It has also been assumed that speed percentage distributions for these five classes will remain the same except for a skewing to the left because of lower speed limits. The skewing was accomplished by comparing the present speed limit with each proposed speed limit. For example, in the 50 M.P.H. case, class 01 has a present speed limit of 70; therefore it was assumed those presently driving 55 M.P.H. would drive 50 M.P.H., those driving 60 M.P.H. would drive 50 M.P.H., those driving 65 would drive 50 M.P.H. and those driving 70 would drive 50 M.P.H.. These four groups were individuals who followed the speed limits in the past and for this study it is assumed they will continue. Finally it is assumed that those who exceed the speed limit continue to do so and the 75 M.P.H. group was adjusted to 55 M.P.H. and the 80 M.P.H. group was adjusted to 60 M.P.H. This same process was applied to the other four highway classes. Finally the above procedure was also used for the 55 and 60 M.P.H. cases.

Figure 10 shows the probable results of the speed limit changes and a redistribution of vehicle miles in millions by speed change grouping. Figure 10-A identifies 13 speed change groups for which motor fuel reduction analysis was calculated for the 50 M.P.H. speed limit.

VEHICLE MILES IN MILLIONS BY SPEED CHANGE GROUP ASSUMING 50 M. P. H. SPEED LIMIT

SPEED CHANGE CATEGORIES		HIGHWAY CLASSIFICATION					VM TOTAL (MILLIONS)
		01	02	03	05	07	
55	50	152	1075	1095	236	1468	4026
60	50	415	1365	1620	350	2016	5766
65	50	782		1674	361	1364	4181
70	50	993					993
75	55	904					904
80	60	397					397
65	55		1243				1243
70	60		454				454
75	65		76				76
80	70		15				15
70	55			1384	299	726	2409
75	60			776	167	259	1202
80	65			183	39	22	244

FIGURE 10A

The same reduction analysis was also completed assuming a 55 or 60 M.P.H. speed limit. Those speed change groups and the vehicle miles data appear in Figures 10-B and 10-C.

VEHICLE MILES IN MILLIONS BY SPEED CHANGE GROUP ASSUMING 55 M. P. H. SPEED LIMIT

SPEED CHANGE CATEGORIES		HIGHWAY CLASSIFICATION					VM TOTAL
		01	02	03	05	07	
60	55	415	1365	1620	350	2016	5766
65	55	782		1674	361	1364	4181
70	55	993					993
75	60	904					904
80	65	397					397
65	60		1243				1243
70	65		454				454
75	70		76				76
80	75		15				15
70	60			1384	299	726	2409
75	65			776	167	259	1202
80	70			183	39	22	244

FIGURE 10B

VEHICLE MILES IN MILLIONS BY SPEED CHANGE GROUP ASSUMING 60 M. P. H. SPEED LIMIT

SPEED CHANGE CATEGORIES		HIGHWAY CLASSIFICATION				VM TOTAL
		01	03	05	07	
65	60	782	1674	361	1364	4181
70	60	993				993
75	65	904				904
80	70	397				397
70	65		1384	299	726	2409
75	70		776	167	259	1202
80	75		183	39	22	244

FIGURE 10C

The motor fuel reduction calculation for each of these groups appears in Figures 11 A-B-C. These calculations are based on Winfrey's data in Figure 7.

MOTOR FUEL REDUCTION PER 1000 VEHICLE MILES BY SPEED CHANGE GROUP ASSUMING 50 M. P. H. SPEED LIMIT

SPEED CHANGE GROUPS	CONSUMPTION RATES	GALLONS SAVED PER 1000 V.M.
55 MPH to 50 MPH	53.2 gal. -49.6 gal.	3.6 gal. savings
60 MPH to 50 MPH	57.6 gal. -49.6 gal.	8.0 gal. savings
65 MPH to 50 MPH	63.1 gal. -49.6 gal.	13.5 gal. savings
70 MPH to 50 MPH	70.0 gal. -49.6 gal.	20.4 gal. savings
75 MPH to 55 MPH	78.7 gal. -53.2 gal.	25.5 gal. savings
80 MPH to 60 MPH	90.4 gal. -57.6 gal.	32.8 gal. savings
65 MPH to 55 MPH	63.1 gal. -53.2 gal.	9.9 gal. savings
70 MPH to 60 MPH	70.0 gal. -57.6 gal.	12.4 gal. savings
75 MPH to 65 MPH	78.7 gal. -63.1 gal.	15.6 gal. savings
80 MPH to 70 MPH	90.4 gal. -70.0 gal.	20.4 gal. savings
70 MPH to 55 MPH	70.0 gal. -53.2 gal.	16.8 gal. savings
75 MPH to 60 MPH	78.7 gal. -57.6 gal.	21.1 gal. savings
80 MPH to 65 MPH	90.4 gal. -63.1 gal.	27.3 gal. savings

FIGURE 11A

FIGURE 11B

MOTOR FUEL REDUCTION PER 1000 VEHICLE MILES

BY SPEED CHANGE GROUP

ASSUMING 55 M. P. H. SPEED LIMIT

SPEED CHANGE GROUPS	CONSUMPTION RATES	GALLONS SAVED PER 1000 V.M.
60 MPH to 55 MPH	57.6 gal. -53.2 gal.	4.4 gal. savings
65 MPH to 55 MPH	63.1 gal. -53.2 gal.	9.9 gal. savings
70 MPH to 55 MPH	70.0 gal. -53.2 gal.	16.8 gal. savings
75 MPH to 60 MPH	78.7 gal. -57.6 gal.	21.1 gal. savings
80 MPH to 65 MPH	90.4 gal. -63.1 gal.	27.3 gal. savings
65 MPH to 60 MPH	63.1 gal. -57.6 gal.	5.5 gal. savings
70 MPH to 65 MPH	70.0 gal. -63.1 gal.	6.9 gal. savings
75 MPH to 70 MPH	78.7 gal. -70.0 gal.	8.7 gal. savings
80 MPH to 75 MPH	90.4 gal. -78.7 gal.	11.7 gal. savings
70 MPH to 60 MPH	70.0 gal. -57.6 gal.	12.4 gal. savings
75 MPH to 65 MPH	78.7 gal. -63.1 gal.	15.6 gal. savings
80 MPH to 70 MPH	90.4 gal. -70.0 gal.	20.4 gal. savings

FIGURE 11C

MOTOR FUEL REDUCTION PER 1000 VEHICLE MILES

BY SPEED CHANGE GROUP

ASSUMING 60 M. P. H. SPEED LIMIT

SPEED CHANGE GROUPS	CONSUMPTION RATES	GALLONS SAVED PER 1000 V.M.
65 MPH to 60 MPH	63.1 gal. -57.6 gal.	5.5 gal. savings
70 MPH to 60 MPH	70.0 gal. -57.6 gal.	12.4 gal. savings
75 MPH to 65 MPH	78.7 gal. -63.1 gal.	15.6 gal. savings
80 MPH to 70 MPH	90.4 gal. -70.0 gal.	20.4 gal. savings
70 MPH to 65 MPH	70.0 gal. -63.1 gal.	6.9 gal. savings
75 MPH to 70 MPH	78.7 gal. -70.0 gal.	8.7 gal. savings
80 MPH to 75 MPH	90.4 gal. -78.7 gal.	11.7 gal. savings

The total gallons saved by each speed change group appears in Figure 12 A-B-C along with the probable total annual gallons saved in Michigan as the result of three possible speed limit changes.

TOTAL MOTOR FUEL SAVINGS BY SPEED CHANGE GROUP ASSUMING 50 M. P. H. SPEED LIMIT

Speed Change Groups	Vehicle Miles (Figure 10)		Gallons Saved (Figure 11)		Annual Gallons Saved
55 50	4026000000VM	x	3.6 gal/1000VM	=	14,493,600 gal.
60 50	5766000000VM	x	8.0 gal/1000VM	=	46,128,000 gal.
65 50	4181000000VM	x	13.5 gal/1000VM	=	56,443,500 gal.
70 50	993000000VM	x	20.4 gal/1000VM	=	20,257,200 gal.
75 55	904000000VM	x	25.5 gal/1000VM	=	23,052,000 gal.
80 60	397000000VM	x	32.8 gal/1000VM	=	13,021,600 gal.
65 55	1243000000VM	x	9.9 gal/1000VM	=	12,305,700 gal.
70 60	454000000VM	x	12.4 gal/1000VM	-	5,629,600 gal.
75 65	76000000VM	x	15.6 gal/1000VM	=	1,185,600 gal.
80 70	15000000VM	x	20.4 gal/1000VM	=	306,000 gal.
70 55	2409000000VM	x	16.8 gal/1000VM	=	40,471,200 gal.
75 60	1202000000VM	x	21.1 gal/1000VM	=	25,362,200 gal.
80 65	244000000VM	x	27.3 gal/1000VM	=	6,661,200 gal.
	TOTAL ANNUAL GALLONS SAVED			=	265,317,400 gal.

FIGURE 12A

TOTAL MOTOR FUEL SAVINGS BY SPEED CHANGE GROUP
ASSUMING 55 M. P. H. SPEED LIMIT

FIGURE 12B

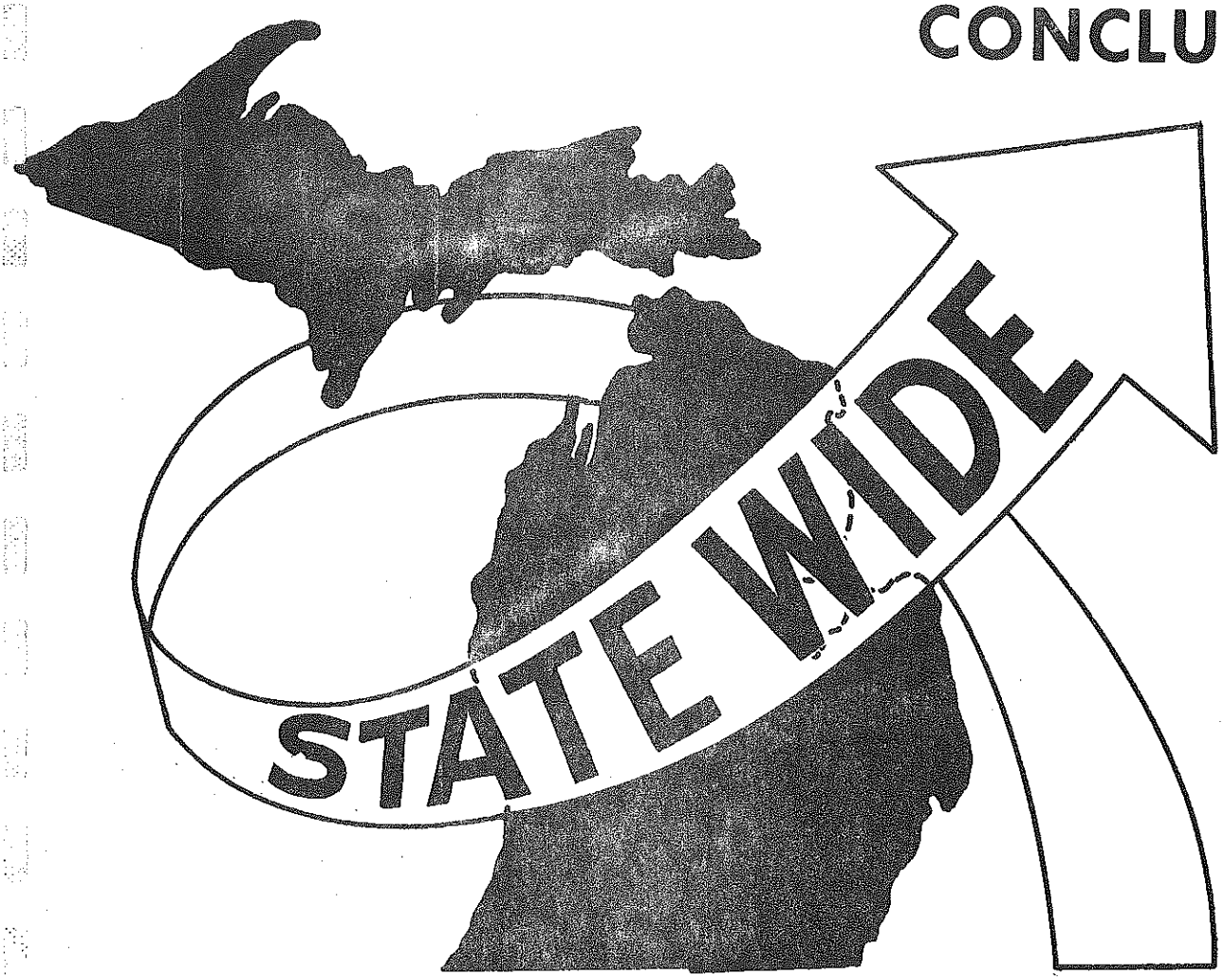
Speed Change Groups	Vehicle Miles (Figure 10)		Gallons Saved (Figure 11)		Annual Gallons Saved
60 55	5766000000VM	x	4.4 gal./1000VM	=	25,370,400 gal.
65 55	4181000000VM	x	9.9 gal./1000VM	=	41,391,900 gal.
70 55	993000000VM	x	16.8 gal./1000VM	=	16,682,400 gal.
75 60	904000000VM	x	21.1 gal./1000VM	=	19,074,400 gal.
80 65	397000000VM	x	27.3 gal./1000VM	=	10,838,100 gal.
65 60	1243000000VM	x	5.5 gal./1000VM	=	6,836,500 gal.
70 65	454000000VM	x	6.9 gal./1000VM	=	3,132,600 gal.
75 70	76000000VM	x	8.7 gal./1000VM	=	661,200 gal.
80 75	15000000VM	x	11.7 gal./1000VM	=	175,500 gal.
70 60	2409000000VM	x	12.4 gal./1000VM	=	29,871,600 gal.
75 65	1202000000VM	x	15.6 gal./1000VM	=	18,751,200 gal.
80 70	244000000VM	x	20.4 gal./1000VM	=	4,977,600 gal.
	TOTAL ANNUAL GALLONS SAVED			=	177,763,400 gal.

TOTAL MOTOR FUEL SAVINGS BY SPEED CHANGE GROUP
ASSUMING 60 M. P. H. SPEED LIMIT

FIGURE 12C

Speed Change Groups	Vehicle Miles (Figure 10)		Gallons Saved (Figure 11)		Annual Gallons Saved
65 60	4181000000VM	x	5.5 gal./1000VM	=	22,995,500 gal.
70 60	993000000VM	x	12.4 gal./1000VM	=	12,313,200 gal.
75 65	904000000VM	x	15.6 gal./1000VM	=	14,102,400 gal.
80 70	397000000VM	x	20.4 gal./1000VM	=	8,098,800 gal.
70 55	2409000000VM	x	6.9 gal./1000VM	=	16,622,100 gal.
75 60	1202000000VM	x	8.7 gal./1000VM	=	10,457,400 gal.
80 65	244000000VM	x	11.7 gal./1000VM	=	2,854,800 gal.
	TOTAL ANNUAL GALLONS SAVED			=	87,444,200 gal.

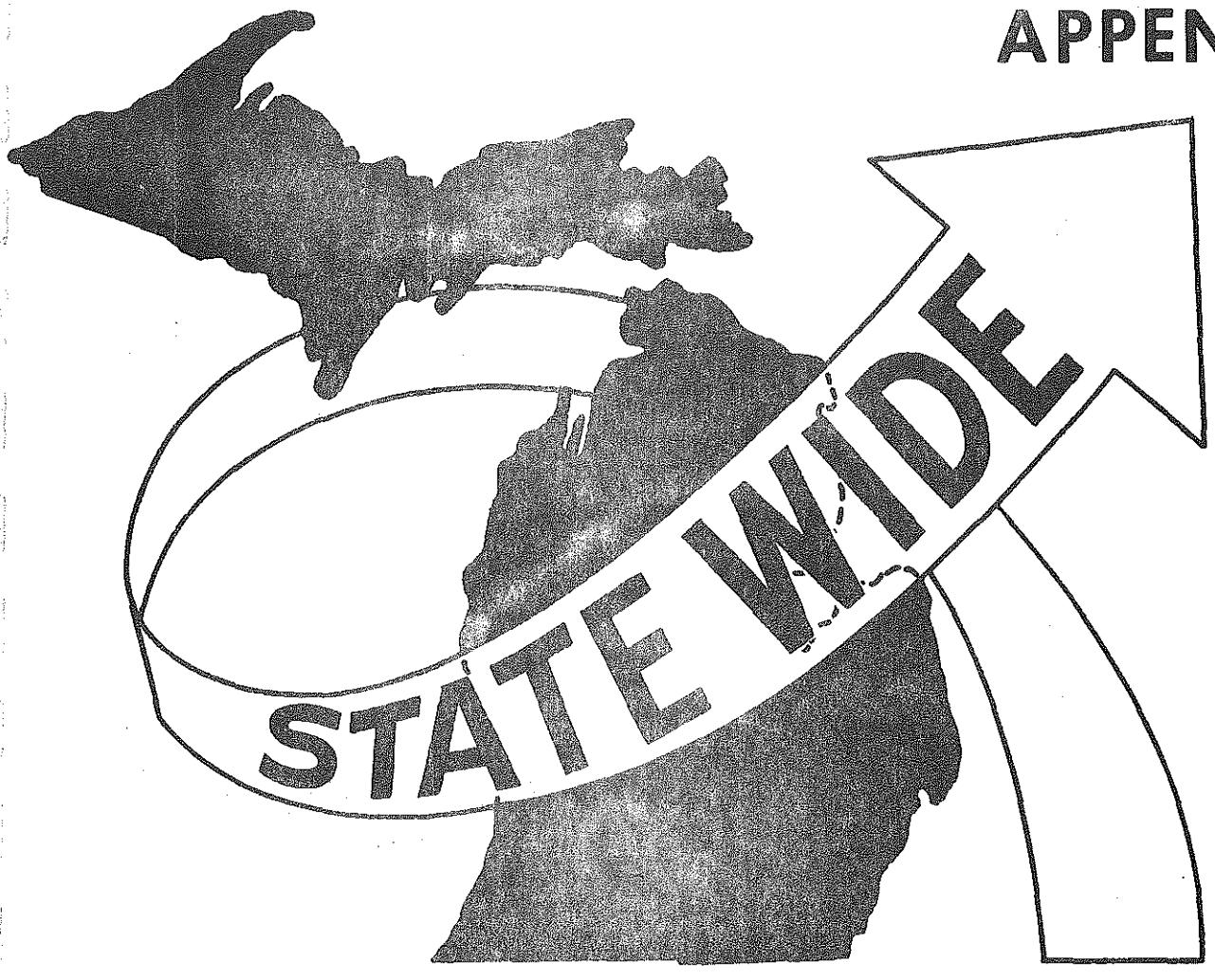
CONCLUSION



CONCLUSION

As indicated in the 1972 Table TA-1, approximately 4,363,000,000 gallons of motor fuel were consumed in Michigan in 1972. A 50 M.P.H. speed limit would appear to save about 265 million gallons--approximately 6 percent of the total--annually. If a 55 M.P.H. speed limit were initiated, the annual gasoline savings would be about 178 million gallons, or 4 percent of the 1972 total. Finally, a 60 M.P.H. speed limit would probably result in a 2 percent decrease in gasoline consumption, approximately 87.5 million gallons per year.

APPENDIX



APPENDIX

The analysis in this report is based upon the assumption that there will be reasonable compliance with whichever new speed limit is implemented. Figures 13 A-B-C show a graph of speeds measured during the World War II speed limit of 35 M.P.H. This graph shows only average speeds; no information is available which shows the speed distribution or violations. As can be seen, the speed limit was very effective for a short time.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

Bureau of Transportation Planning

Transportation Survey and Analysis Section

VEHICULAR SPEED TRENDS BY TYPES

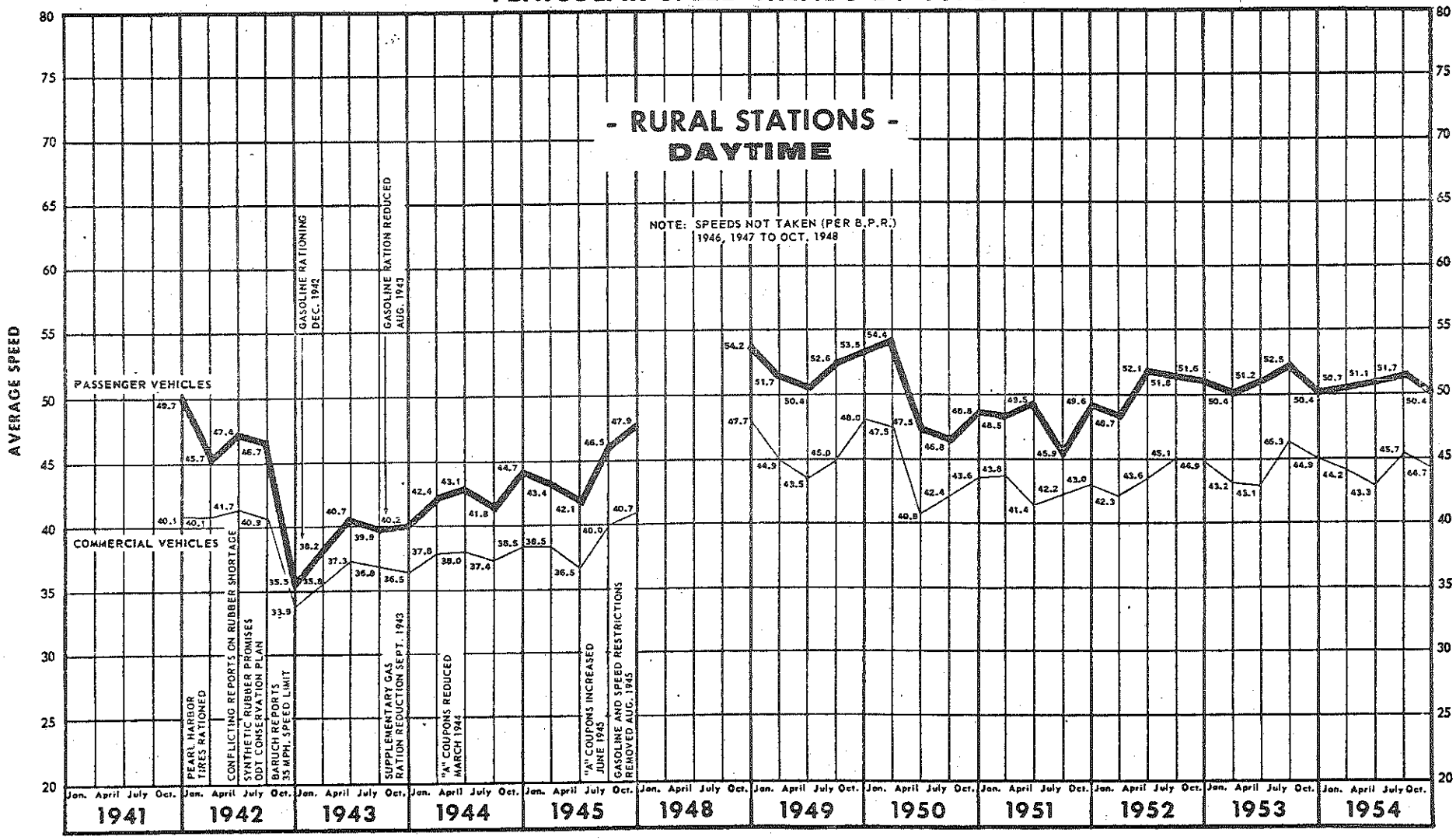


FIGURE 13A

MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

Bureau of Transportation Planning

Transportation Survey and Analysis Section

VEHICULAR SPEED TRENDS BY TYPES

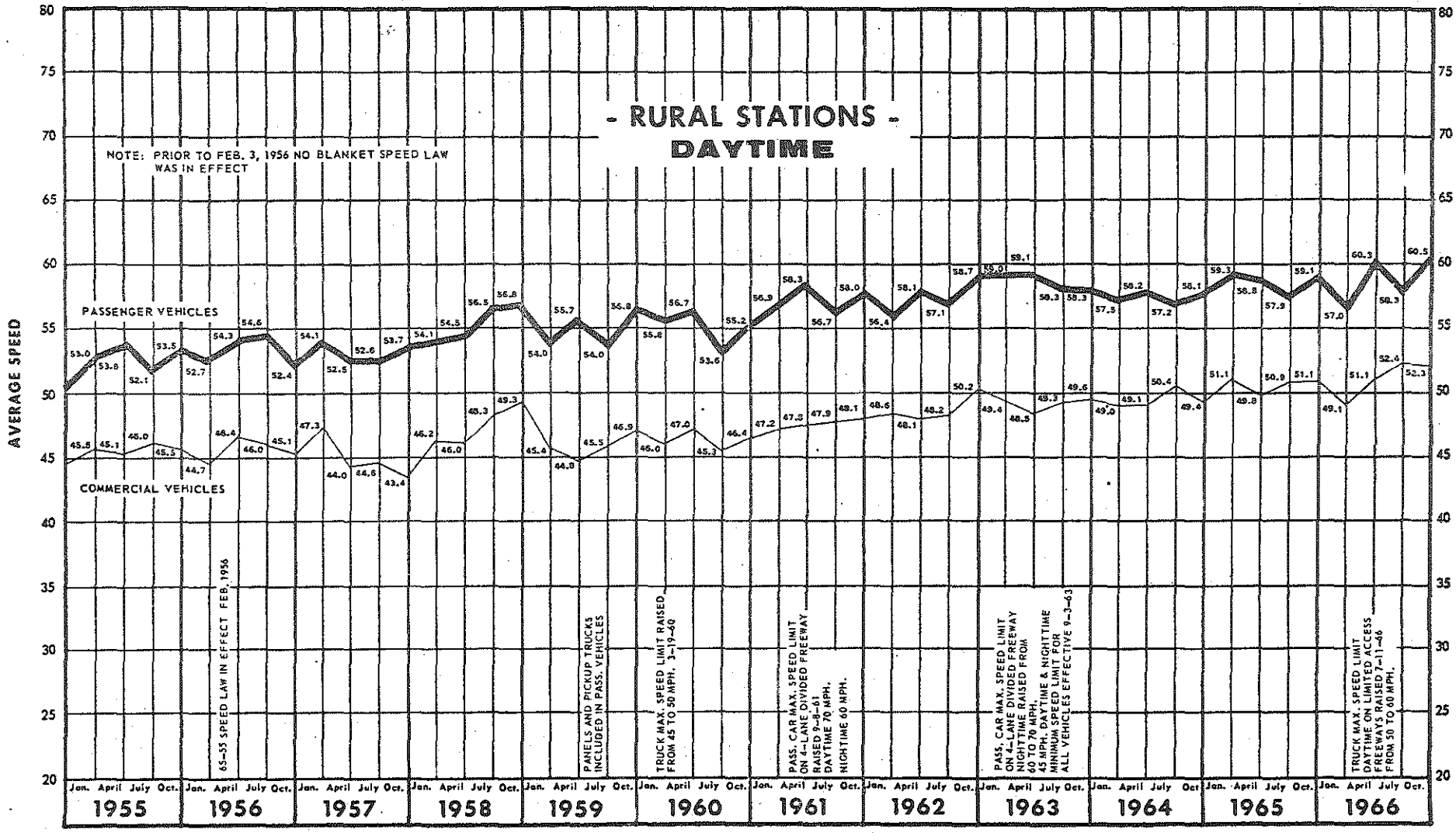


FIGURE 13B

MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

Bureau of Transportation Planning
Transportation Survey and Analysis Section

VEHICULAR SPEED TRENDS BY TYPES

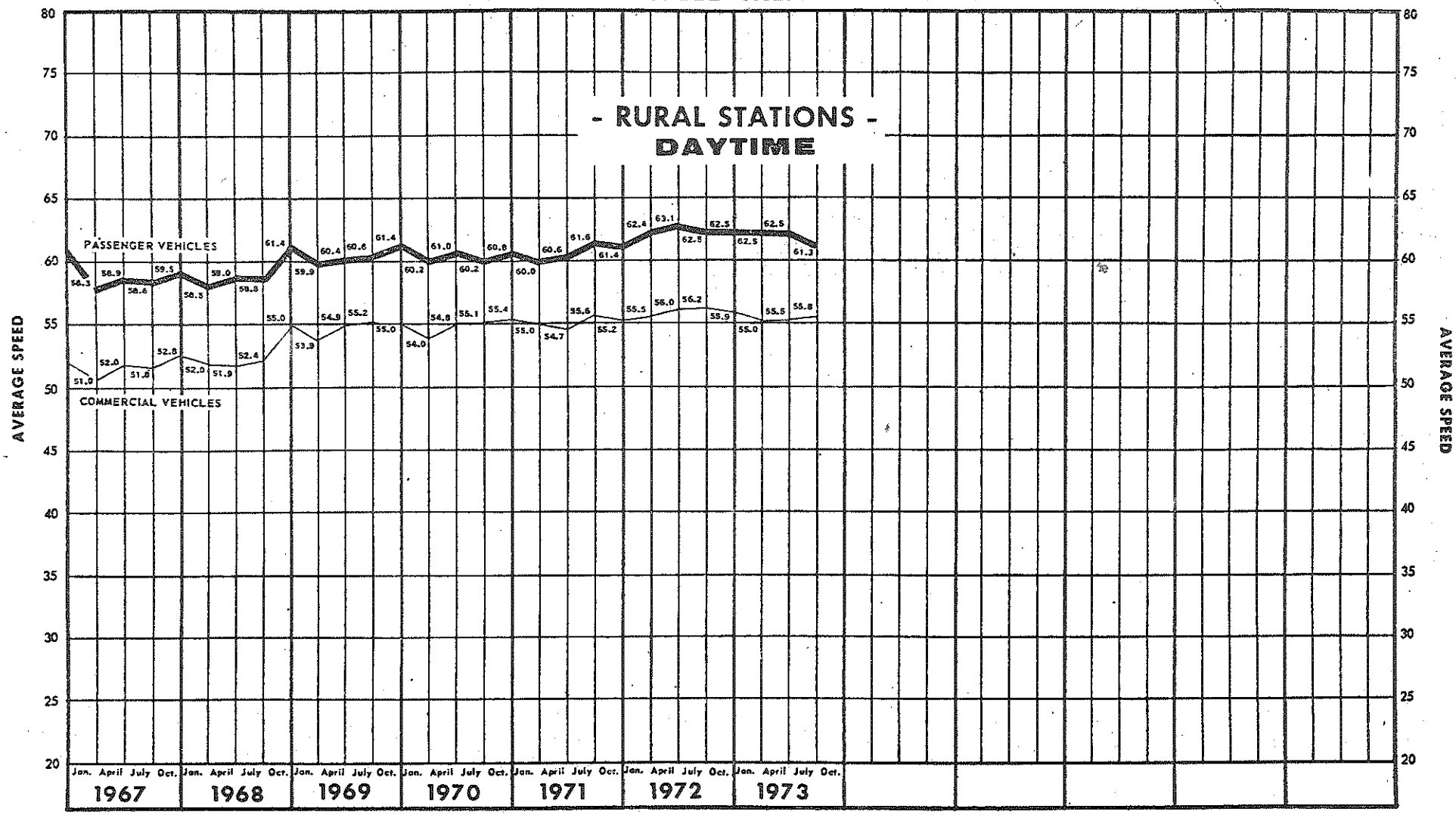


FIGURE 13C