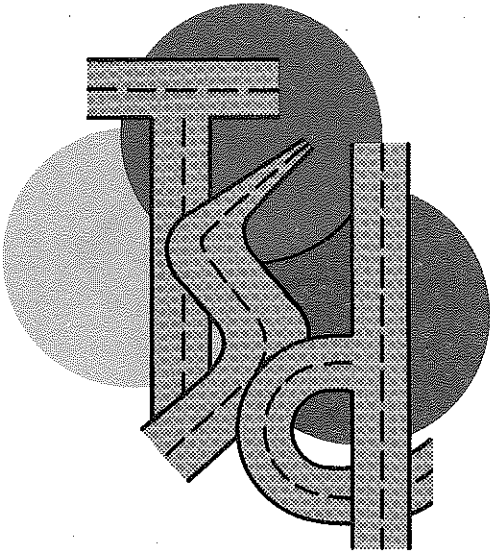


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AN EVALUATION OF THE STATES  
1971 ACCIDENT EXPERIENCE



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SAFETY  
DIVISION**

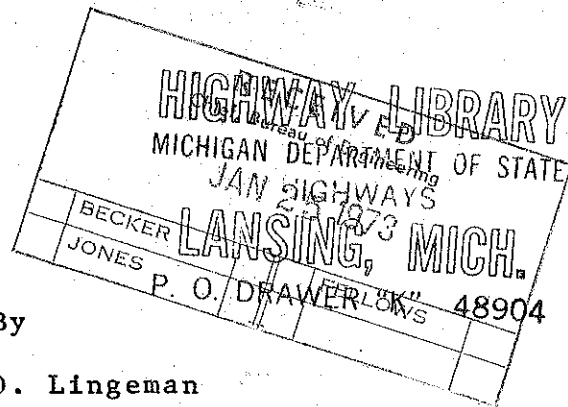
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MICHIGAN TRUNKLINE ACCIDENT FACTS,  
AN EVALUATION OF THE STATES  
1971 ACCIDENT EXPERIENCE



By

Stanley D. Lingeman

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

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January, 1973

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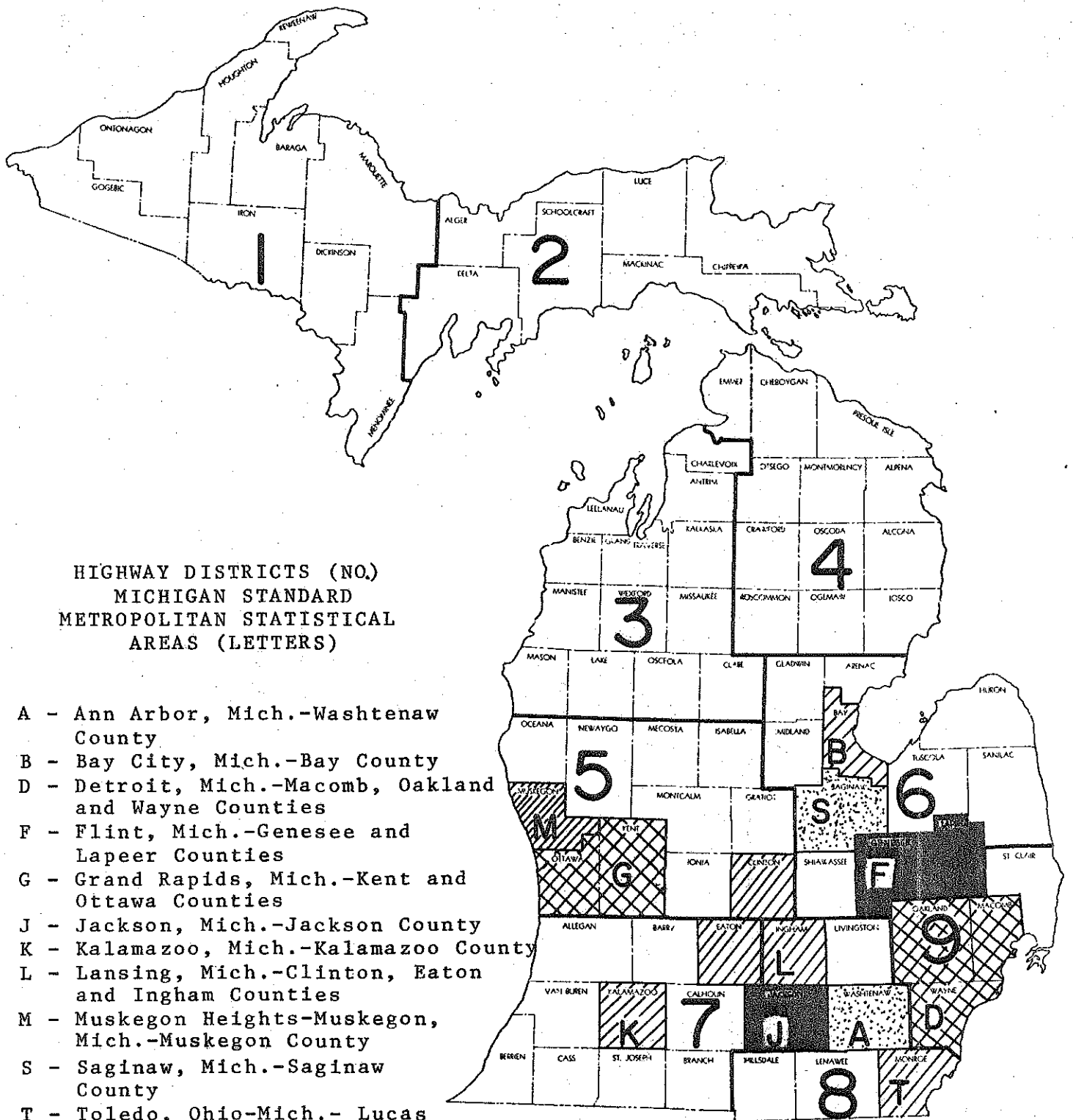
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HIGHWAY DISTRICTS (NO.)  
 MICHIGAN STANDARD  
 METROPOLITAN STATISTICAL  
 AREAS (LETTERS)

- A - Ann Arbor, Mich.-Washtenaw County
- B - Bay City, Mich.-Bay County
- D - Detroit, Mich.-Macomb, Oakland and Wayne Counties
- F - Flint, Mich.-Genesee and Lapeer Counties
- G - Grand Rapids, Mich.-Kent and Ottawa Counties
- J - Jackson, Mich.-Jackson County
- K - Kalamazoo, Mich.-Kalamazoo County
- L - Lansing, Mich.-Clinton, Eaton and Ingham Counties
- M - Muskegon Heights-Muskegon, Mich.-Muskegon County
- S - Saginaw, Mich.-Saginaw County
- T - Toledo, Ohio-Mich.- Lucas and Wood Counties, Ohio; Monroe County, Mich.

## FOREWORD

Accident statistics have become an important source of information for the Highway Department's engineers and planners. During each year hundreds of accident studies are performed by the Accident Analysis Unit for the Department. The purpose of this report is to preserve the knowledge gained from these studies for future use.

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## ACKNOWLEDGMENTS

The author desires to acknowledge with appreciation the use of the accident reports and computer tapes supplied by the Michigan Department of State Police and the systems design and computer programming work which was done by the Computer Services Division, Michigan Department of State Highways.



## ABSTRACT

This report considers the annual trunkline accident experience during the 1966-1971 period. The 1971 experience for the Detroit Trunkline System and special statewide trunkline studies include: wet surface accidents, hydroplaning accidents, construction zone accidents and high accident locations. A partial listing of high accident locations is given for each district, and a complete listing of collision diagrams is given for each district.

A summary of National Safety Council's report #113 concerning the estimation of traffic accident costs is also included in the report.

## Trunkline Accident Trend 1966-1971

Michigan trunkline system's accident experience has shown a 24.7 percent increase during the six-year period which parallels the growth in vehicular travel. The trunkline system in the City of Detroit has shown an improved accident experience with the opening of I-75 which included both the Chrysler and Fisher Freeways.

A reduction in accident experience of 18.6 percent was obtained on radial trunklines which include Grand River (BS-96), Woodward (M-1), Gratiot (US-25), Michigan (US-12) and Fort Street (US-25).

### Michigan Trunkline Accident Trend Data

1966-1971

<u>Year</u>	<u>Detroit</u>	<u>% Change</u>	<u>Outstate</u>	<u>% Change</u>	<u>Total</u>	<u>% Change</u>
1966	15,463	-	67,445	-	82,908	-
1967	15,486	0.1	69,796	3.5	85,292	2.9
1968	15,560	0.5	85,097	21.9	100,657	18.0
1969	16,004	2.9	92,182	8.3	108,186	7.5
1970	14,516	-9.3	92,469	0.3	106,986	-1.1
1971	14,080	-3.0	96,114	3.9	110,194	3.0

Michigan Statewide Trend

1966-1971

<u>Year</u>	<u>All Accs.</u>	<u>% Change</u>	<u>Annual V. M. (Millions)</u>	<u>% Change</u>	<u>M. V. Registrations (Millions)</u>	<u>% Change</u>
1966	302,880	-	43,940	-	4.13	-
1967	299,004	-1.3	45,054	2.5	4.16	0.7
1968	305,495	2.2	48,047	6.6	4.33	4.0
1969	331,223	8.4	50,905	5.9	4.56	5.4
1970	313,715	-5.3	53,148	4.4	4.68	2.6
1971	314,015	0.1	55,557	4.5	4.84	3.4

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1971 Detroit Trunkline Accidents \*

(Program 24050)

Route	Property Damage	Personal Injury	Persons Injured	Fatal Accs.	Fatal.	Total Accs.
M-14 (Plymouth)	275	228	386	2	2	505
M-29 (8 Mile)	16	21	28	0	0	37
M-39 (Southfield)	438	300	460	2	2	740
M-53 (Van Dyke)	350	276	471	1	1	627
M-85 (Fort)	70	50	85	1	1	121
M-97 (Hoover)	67	50	71	0	0	117
M-102 (8 Mile)	609	375	587	2	2	986
M-153 (Ford Road)	17	13	16	0	0	30
M-1 (Woodward)	<u>662</u>	<u>454</u>	<u>735</u>	<u>0</u>	<u>0</u>	<u>1116</u>
Sub-total	2504	1767		8		4279
US-12 (Michigan)	375	249	391	6	6	630
US-24 (Telegraph)	126	91	136	1	1	218
US-25 (Gratiot & Fort)	927	550	912	6	6	1483
US-25 (Randolph To Tunnel)	38	10	15	0	0	48
US-10 (Lodge)	<u>859</u>	<u>800</u>	<u>1393</u>	<u>6</u>	<u>9</u>	<u>1665</u>
Sub-total	2325	1700		19		4044
I-75 (Fisher)	462	283	430	3	3	748
I-94 (Ford)	1193	1062	1911	13	19	2268
I-75, I-375 (Chrysler)	<u>445</u>	<u>378</u>	<u>592</u>	<u>4</u>	<u>4</u>	<u>827</u>
Sub-total	2100	1723		20		3843
I-96BS (Grand River)	999	766	1359	8	8	1773
I-375 (BS) + I-696BS (Jefferson Ave.)	<u>95</u>	<u>46</u>	<u>68</u>	<u>0</u>	<u>0</u>	<u>141</u>
Sub-total	1094	812		8		1914
TOTAL	<u>8023</u>	<u>6002</u>		<u>55</u>		<u>14080</u>

\*Includes Service Drive Accidents

## Wet Surface Accidents

After a number of years of service a road's pavement surface may become smooth through tire wear and become slippery during wet weather. When this condition occurs an increased accident experience will usually develop.

The percentage of wet surface accidents (statewide) varies between 16.6 in rural districts to 19.2 in urban districts with an 18.3 percent average. The percent of wet surface accidents on the trunkline system is 20.1 with high accident locations having 22.5 percent.

The severity of the 1971 wet surface accidents is as follows:\*

	<u>Trunkline Accidents</u>	<u>No. of Wet Surface Trunkline Accidents</u>	<u>% Wet Surface Accidents</u>
Property Damage	66,333	13,221	19.9
Personal Injury	28,931	5,928	20.5
Fatal Accidents	<u>850</u>	<u>138</u>	<u>16.2</u>
Total	96,114	19,287	20.1

\*Excluding City of Detroit

## Hydroplaning Accidents

Hydroplaning accidents can be generally defined as those accidents which occur on wet pavement at relatively high speeds (43 to 59 miles per hour) in rural areas during or shortly after rain storms.

A recent study, which was undertaken to determine if any concentrations of hydroplaning accidents existing on the trunkline system, reviewed 363 (.2 mile) road segments with 2,315 accidents. The highest location had 18 raining, wet surface accidents in 1971. The average road section had six of these type of accidents. The 2,315 accidents are being analyzed to determine those which involve hydroplaning. Hydroplaning is not thought to be a major cause of highway traffic accidents at the present time.

The 1971 trunkline accident experience which occurred on wet pavement during rain is as follows:

	<u>*Total Acc.</u>	<u>*Wet Pav't &amp; Raining(1)</u>	<u>% of Total</u>	<u>*Wet Pav't, Raining &amp; Skidding(1)</u>	<u>% of Total</u>
Total Accs.	96114	9179	9.5	1252	1.3
P.D. Accs.	66333	6161	9.2	812	1.2
Inj. Accs.	28931	2950	10.1	432	1.4
Injs.	46882	4713	10.1	671	1.4
Fatal Accs.	850	68	8.0	8	.9
Fatal.	974	80	8.2	9	.9

\*Excludes Detroit P.D. and Injury Accidents

(1) Data includes both urban and rural accidents. It is thought that hydroplaning occurs under rural conditions.

## Construction Zone Accidents

Recent changes in construction zone signing practices instituted in 1972 have brought about a renewed interest in construction zone safety. During 1971, 1,294 motor vehicle accidents occurred in construction zones. 865 or 67 percent occurred during daylight hours, 429 or 33 percent occurred during dark hours. Table I gives a percentage distribution of accidents by day of week. Table II gives a percentage distribution of accidents by month of year.

Table I indicates that above average accident experience occurs on Friday, Saturday and Sunday nights and Monday, Wednesday, Thursday and Friday daylight periods. Table II indicates that above average accident experience occurs during the months of June thru November. The night period in October has an especially high concentration of accidents.

Table I

### Daily Accident Distribution

<u>Day</u>	<u>% Night</u>	<u>% Day</u>	<u>% Total</u>
Mon.	12.6	16.2	15.0
Tue.	10.0	13.9	12.6
Wed.	11.8	14.9	13.9
Thur.	12.4	17.2	15.6
Fri.	18.9	19.6	19.4
Sat.	16.8	11.6	13.3
Sun.	<u>17.5</u>	<u>6.6</u>	<u>10.2</u>
Total	100.0	100.0	100.0

Excluding City of Detroit

Mean = 14.3 Percent

Table II

## Monthly Accident Distribution

<u>Month</u>	<u>% Night</u>	<u>% Day</u>	<u>% Total</u>
Jan.	5.4	2.1	3.2
Feb.	3.9	3.6	3.7
Mar.	4.2	3.4	3.6
April	2.6	3.9	3.5
May	4.9	6.4	5.9
June	8.4	16.0	13.5
July	8.6	15.6	13.4
Aug.	10.7	14.6	13.3
Sept.	11.2	12.4	12.0
Oct.	20.5	10.9	14.0
Nov.	13.3	8.3	10.0
Dec.	<u>6.3</u>	<u>2.8</u>	<u>3.0</u>
Total	100.0	100.0	100.0

Mean = 8.33 Percent



1971

NIGHT CONSTRUCTION ZONE

ACCIDENTS

Month	Day of the Week							Monthly Total	Of Total
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.		
January	4	2	7		5	4	1	23	5.4
February		1	4	3	4	1	4	17	3.9
March	3	2	1	3	2	5	2	18	4.2
April	2	1			3	3	2	11	2.6
May	4	2	2	3	3	3	4	21	4.9
June	4	3	4	6	8	5	6	36	8.4
July	4	4	3	8	5	8	5	37	8.6
August	4	6	6	6	7	5	12	46	10.7
September	5	4	3	7	11	8	10	48	11.2
October	10	8	8	8	19	17	18	88	20.5
November	10	8	7	5	8	11	8	57	13.3
December	4	2	6	4	6	2	3	27	6.3
Day Total	54	43	51	53	81	72	75	429	
% of Total	12.6	10.0	11.8	12.4	18.9	16.8	17.5		

Peak Accident Day: Friday

Peak Accident Month: October

1971

DAY CONSTRUCTION ZONE

ACCIDENTS

Month	Day of the Week							Monthly Total	Of Total
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.		
January	3	2	2	3	4	4		18	2.1
February	7	4	4	5	7	4		31	3.6
March	2	6	5	4	8	3	1	29	3.4
April	3	5	7	9	8	1	1	34	3.9
May	10	9	5	9	16	5	1	55	6.4
June	20	17	25	24	25	15	13	139	16.0
July	16	19	24	30	30	10	7	136	15.6
August	23	23	11	17	23	18	11	126	14.6
September	21	7	19	22	14	16	8	107	12.4
October	13	15	19	8	27	8	4	94	10.9
November	20	11	5	11	5	12	8	72	8.3
December	2	2	3	7	3	4	3	24	2.8
Day Total	140	120	129	149	170	100	57	865	
% of Total	16.2	13.9	14.9	17.2	19.6	11.6	6.6		

Peak Accident Day: Friday

Peak Accident Month: June

1971  
TOTAL CONSTRUCTION ZONE  
ACCIDENTS

Month	Day of the Week							Monthly Total	Of Total
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.		
January	7	4	9	3	9	8	1	41	3.2
February	7	5	8	8	11	5	4	48	3.7
March	5	8	6	7	10	8	3	47	3.6
April	5	6	7	9	11	4	3	45	3.5
May	14	11	7	12	19	8	5	76	5.9
June	24	20	29	30	33	20	19	175	13.5
July	20	23	27	38	35	18	12	173	13.4
August	27	29	17	23	30	23	23	172	13.3
September	26	11	22	29	25	24	18	155	12.0
October	23	23	27	16	46	25	22	182	14.0
November	30	19	12	16	13	23	16	129	10.0
December	6	4	9	11	9	6	6	51	3.9
Day Total	194	163	180	202	251	172	132	1294	
% of Total	15.0	12.6	13.9	15.6	19.4	13.3	10.2		

Peak Accident Day: Friday

Peak Accident Month: October

## 1971 Trunkline Accident Rate Nomographs

The nomographs shown on the following pages were developed for the computation of accident rates for a given roadway if the length (miles), traffic volume (annual average daily traffic) and accident experience (accidents per year) were known. Guidelines were placed upon the chart to give a better understanding of the values which might be experienced on the various roadway systems. The data used to develop the guidelines is as follows:

	<u>Trunkline System</u>	<u>Trunkline System In* Detroit</u>	<u>I System</u>	<u>Freeway System In Detroit</u>
Length (Miles)	9249.6	44.1	961.3	56.7
A.A.D.T. (Annual Average Daily Traffic)	8226	29,900	23,607	110,296
Accidents Per Mile	12.0	125	18	95
Accident Rate (100 Million Vehicle Miles)	396.7**	1152.6	205.6	238.1

\*Grand River, Woodward, Gratiot, Michigan and West Fort

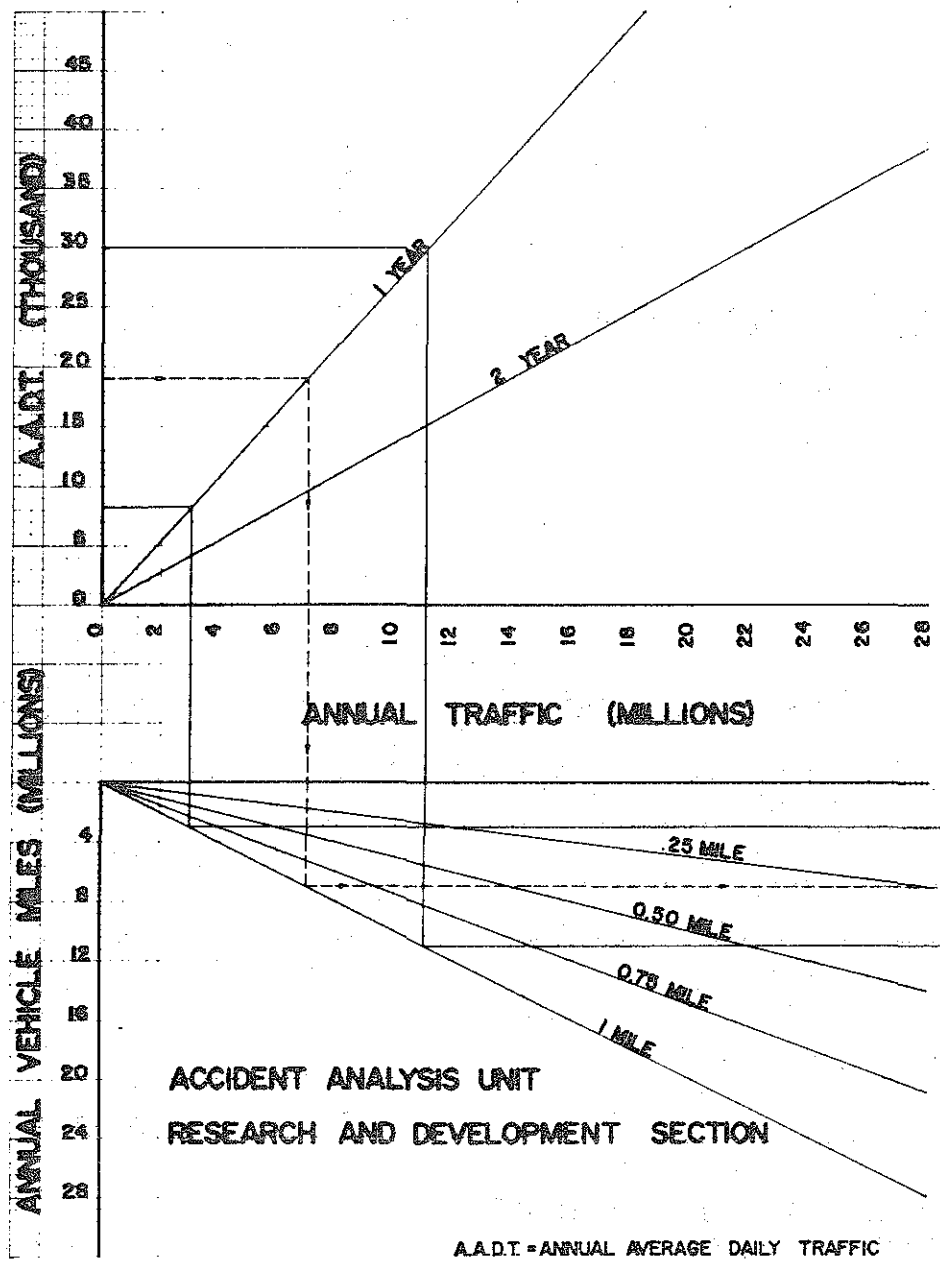
\*\*Accident Rate =  $\frac{\text{No. of Accidents} \times 10^8}{365 \times M \times \text{ADT}}$

$$365 \times M \times \text{ADT}$$

where M = length of roadway section

ADT = average daily traffic for roadway section

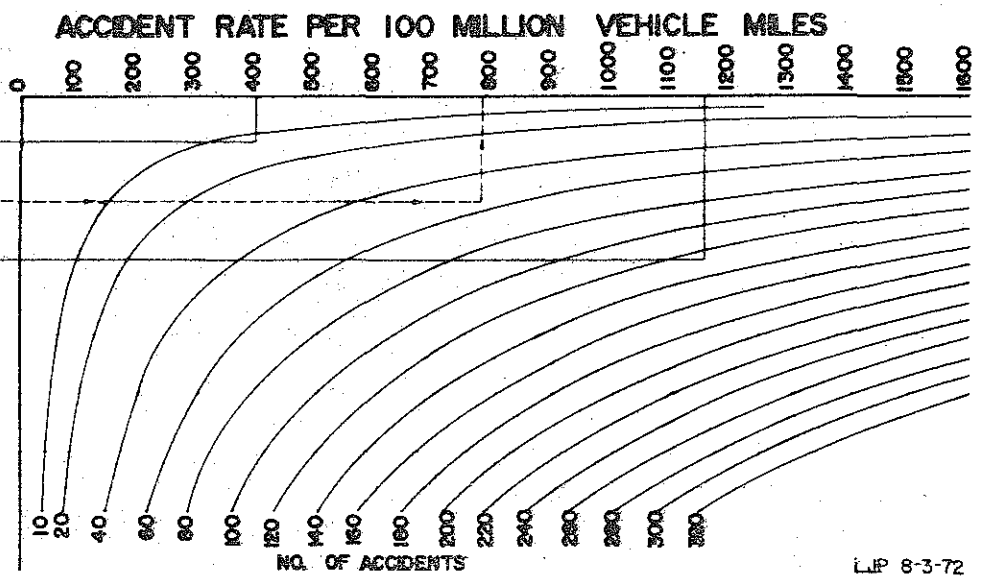
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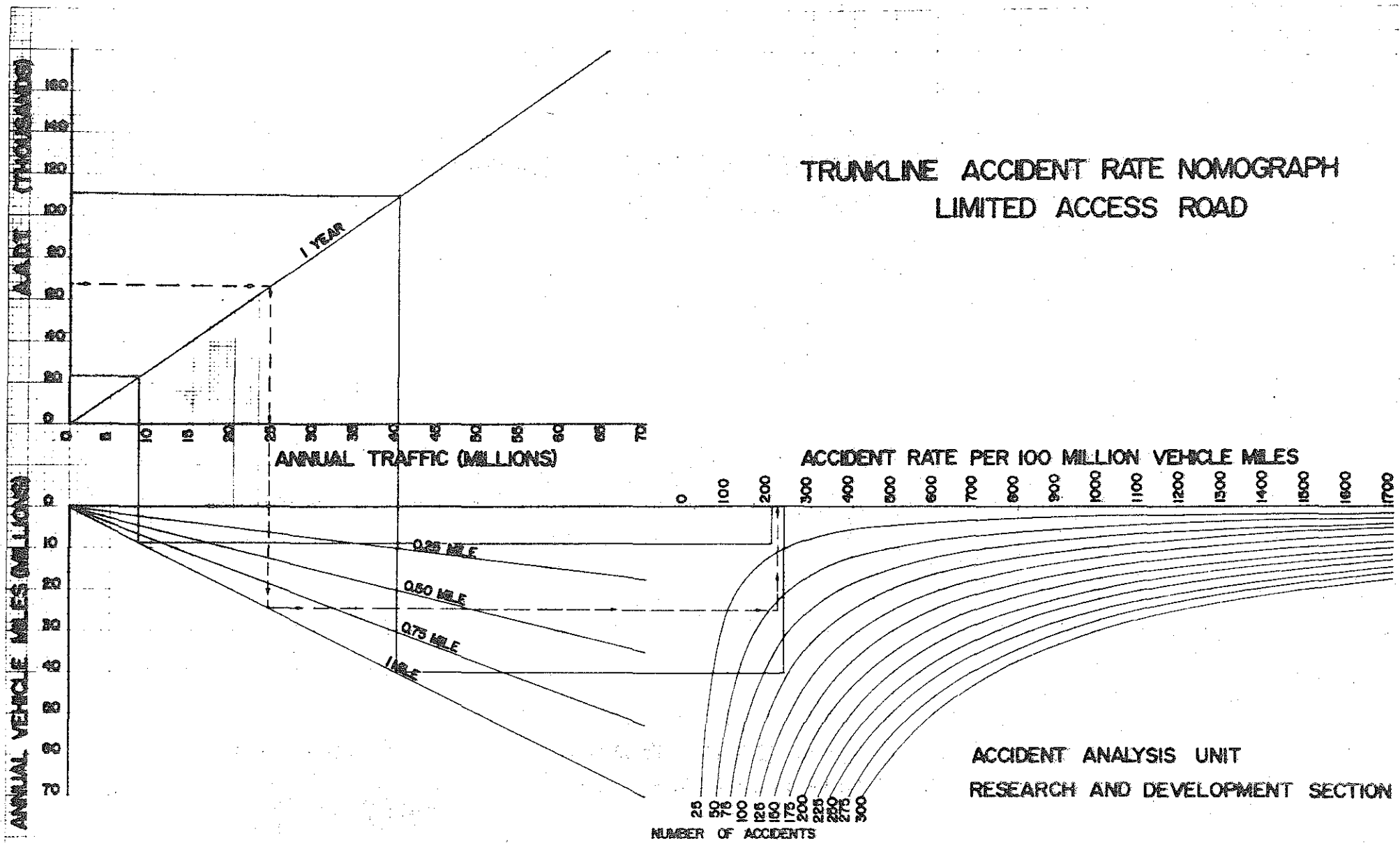
A.A.D.T. = ANNUAL AVERAGE DAILY TRAFFIC

### TRUNKLINE ACCIDENT RATE NOMOGRAPH FREE ACCESS ROAD



LIP 8-3-72

# TRUNKLINE ACCIDENT RATE NOMOGRAPH LIMITED ACCESS ROAD



A.A.D.T. ANNUAL AVERAGE DAILY TRAFFIC

ACCIDENT ANALYSIS UNIT  
RESEARCH AND DEVELOPMENT SECTION

## High Accident Locations

(Program Q24028)

High accident locations are those .2 mile sections of trunkline which have had abnormal accident experience. Critical thresholds of ten accidents per location in Districts 1-4 and 30 accidents per location in Districts 5-9 were used to define high accident locations. With these critical levels it was determined that there were 204 high accident locations in Districts 1-4 and 599 high accident locations in Districts 5-9. The number of high accident locations in each district are shown on page 17.

Twenty seven and 9/10 percent of the total accident experience at high accident locations involved personal injury. Districts 6 and 9 (Metro) have above average numbers of personal injury accidents.

Twenty two and 5/10 percent of the total accident experience at high accident locations occur on wet surfaces. The high accident locations in Districts 5, 7 and 9 (Metro) have above average numbers of wet surface accidents.

Distribution of High Accident Locations By District

1. Districts 1-4 10 or More Accidents Per .2 Mile Segment
2. Districts 5-9 30 or More Accidents Per .2 Mile Segment

Location Per District

No. of Accidents Per Location	Location Per District					Total 1-4	Location Per District					Total 5-9
	1	2	3	4	5		6	7	8	9		
10 - 19	46	21	57	37		161						
20 - 29	8	5	11	5		29						
30 - 39	2	2	2	1		7	42	45	39	66	177	369
40 - 49	3	1				4	16	22	17	21	57	133
50 - 59	1		1			2	8	3	3	6	21	41
60 - 69							1		2	2	17	22
70 - 79							2		1		14	17
80 - 89			1			1			1	1	6	8
90 - 99										2	1	3
100-109									1		3	4
110-119											1	1
120 +											1	1
<b>Total</b>	<b>60</b>	<b>29</b>	<b>72</b>	<b>43</b>		<b>204</b>	<b>69</b>	<b>70</b>	<b>64</b>	<b>98</b>	<b>298</b>	<b>599</b>

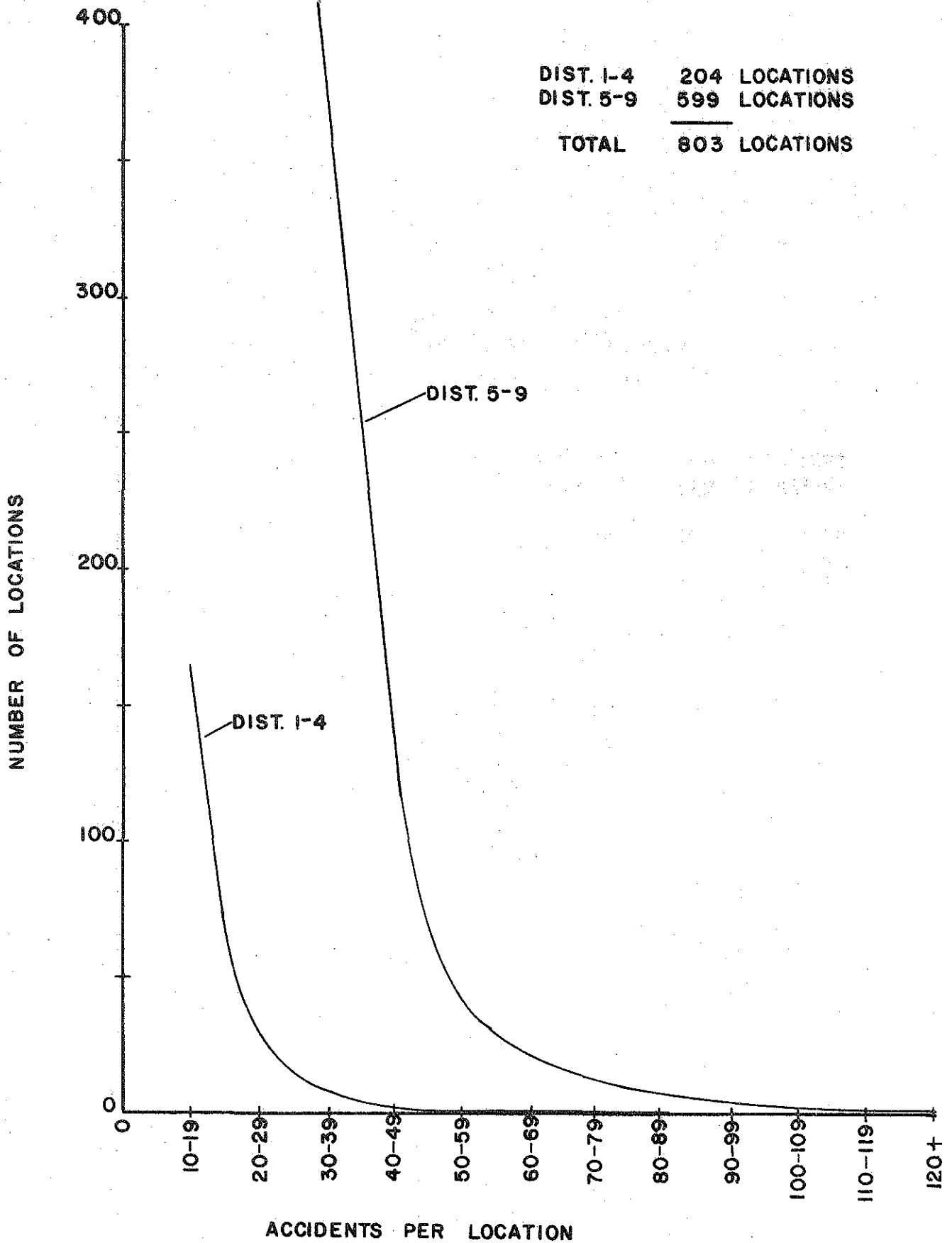
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**DISTRIBUTION OF THE  
1971 HIGH ACCIDENT LOCATIONS**

DIST. 1-4	204	LOCATIONS
DIST. 5-9	599	LOCATIONS
<b>TOTAL</b>	<b>803</b>	<b>LOCATIONS</b>



HIGH ACCIDENT STUDY

(10 or More Accidents Per 0.2 Mile Segment)

Percentage Distribution of Injury Accidents

Number of 0.2 Mile Locations

Percentage Range	District Number			
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
0 - 4	5	0	4	1
5 - 9	12	1	7	0
10 - 14	6	7	7	7
15 - 19	7	5	8	6
20 - 24	5	2	6	5
25 - 29	4	3	9	7
30 - 34	4	3	12	5
35 - 39	5	3	8	1
40 - 44	5	3	5	7
45 - 49	1	1	0	2
50 - 54	3	0	3	1
55 - 59	2	0	1	0
60 - 64	1	0	0	0
65 - 69	0	0	0	0
70 - 74	0	1	1	1
Mean %	20.9%	23.3%	22.9%	25.9%

HIGH ACCIDENT STUDY

(30 or More Accidents Per 0.2 Mile Segment)

Percentage Distribution of Injury Accidents

Number of 0.2 Mile Locations

Percentage Range	District Number				Metro
	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	
0 - 4	0	0	0	1	0
5 - 9	2	3	6	1	2
10 - 14	7	2	7	12	8
15 - 19	14	4	19	10	16
20 - 24	15	16	18	28	33
25 - 29	9	23	4	20	51
30 - 34	9	15	10	18	66
35 - 39	7	9	0	7	44
40 - 44	6	5	1	1	36
45 - 49	2	2	0	1	25
50 - 54	0	0	0	1	5
55 - 59	0	0	0	1	9
60 - 64	0	0	0	0	1
65 - 69	0	0	0	0	0
70 - 74	0	0	0	0	0
Mean %	25.5%	28.1%	20.1%	24.5%	32.4%

## HIGH ACCIDENT STUDY

(10 or More Accidents Per 0.2 Mile Segment)

### Percentage Distribution of Wet Surface Accidents

#### Number of 0.2 Mile Locations

Percentage Range	District Number			
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
0 - 4	6	1	6	1
5 - 9	12	4	10	3
10 - 14	7	7	12	6
15 - 19	8	5	9	9
20 - 24	8	6	8	8
25 - 29	7	3	13	7
30 - 34	6	1	8	6
35 - 39	4	2	3	2
40 - 44	1	0	3	0
45 - 49	2	0	0	1
Mean %	19.2%	20.2%	19.5%	20.4%

## HIGH ACCIDENT STUDY

(30 or More Accidents Per 0.2 Mile Segment)

### Percentage Distribution of Wet Surface Accidents

#### Number of 0.2 Mile Locations

Percentage Range	District Number				Metro
	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	
0 - 4	0	0	0	1	2
5 - 9	2	3	1	4	11
10 - 14	12	8	6	11	29
15 - 19	7	17	9	11	65
20 - 24	20	21	20	26	69
25 - 29	13	12	13	26	57
30 - 34	10	8	8	16	44
35 - 39	5	1	5	5	11
40 - 44	1	2	3	1	5
45 - 49	1	2	0	0	2
50 - 54	0	0	0	0	1
Mean %	24.6%	22.3%	24.4%	23.7%	22.9%

## HIGH ACCIDENT STUDY

(\*Number of Accidents Per 0.2 Mile Segment)

### Percentage Distribution of Wet Surface and Injury Accidents

<u>Percentage Range</u>	<u>Number of 0.2 Mile Locations</u>	
	<u>Wet Surface</u>	<u>Injury Accidents</u>
0 - 4	17	11
5 - 9	50	34
10 - 14	98	63
15 - 19	140	89
20 - 24	186	128
25 - 29	151	130
30 - 34	107	142
35 - 39	38	84
40 - 44	16	69
45 - 49	8	34
50 - 54	1	13
55 - 59	0	13
60 - 64	0	2
65 - 69	0	0
70 - 74	0	3
Mean %	22.5%	27.9%

\*District 1-4      10 or more accidents per 0.2 mile segment

District 5-Metro 30 or more accidents per 0.2 mile segment

A Partial Listing of High Accident Locations

By District

1971 HIGH ACCIDENT LOCATIONS

TOP 10% OF HIGH ACCIDENT LOCATIONS - BY HIGHWAY DEPT. DISTRICT

District #1

<u>Route</u>	<u>TL Name</u>	<u>Location</u>	<u>City</u>	<u>County</u>	<u>Total Accs.</u>
US-41	Sheldon	Isle Royal St. to Pewabic St.	Houghton	Houghton	54
US-41BR	Washington	Fourth St. to Front St.	Marquette	Marquette	46
US-41	Sheldon	Pewabic St. to M-26 Jct. (Memorial)	Houghton	Houghton	43
US-41BR	Front	Washington Ave. to DSS & A RR	Marquette	Marquette	43
US-41	10th Ave.	11th St. (North) E. and N. to 13th Ave.	Menominee	Menominee	36
US-41	Quincy	Reservation to Ravine St.	Hancock	Houghton	36

District #2

I-75BS	Ashmun	Easterday Ave. to Leroy St.	Sault Ste Marie	Chippewa	45
US-2	Lincoln	S. Jct. M-35 to 400' N. of First Ave.	Escanaba	Delta	34
I-75BS	Ashmun	N. of Dawson N. to Ridge & Maple Streets	Sault Ste Marie	Chippewa	34

District #3

US-10	Ludington Ave.	Rath Ave. E. to Rowe St.	Ludington	Mason	84
US-31	Front-Munson	From 350' W. of Milliken to 200' S.E. of Front St.	Traverse City	Gd. Traverse	38
US-131	Mitchell	N. Jct. M-55 N. to 50' N. of Spruce St.	Cadillac	Wexford	37

District #3

<u>Route</u>	<u>TL Name</u>	<u>Location</u>	<u>City</u>	<u>County</u>	<u>Total Accs.</u>
US-31	Munson	150' W. of Huron to 300' E. of 8th	Traverse City	Gd. Traverse	29
US-31	Front	200' W. of Front (On Grandview) to 50' W. of Penn RR Spur	Traverse City	Gd. Traverse	28
US-31	Cypress	150' N. of Third St. to Clay St.	Manistee	Manistee	28
US-131	Mitchell	100' S. of North St. North to Clam River	Cadillac	Wexford	26
US-31	Front	200' W. of Penninsula Dr. E. to 50' W. of Gilbert St.	Traverse City	Gd. Traverse	26

District #4

M-32	Main	50' W. of Otsego Ave. E. to Elm St.	Gaylord	Otsego	36
US-23	Chisholm	Jct. M-32 to 100' Northwest	Alpena	Alpena	29
US-23	Chisholm	75' S.E. of Ninth Ave. to 85' N.W. of Eleventh Ave.	Alpena	Alpena	25
US-23	Huron Dr.	50' S. of Park St. N. to Michigan Ave.	Oscoda	Iosco	21

District #5

M-11	28th St.	From 1/10 Mile W. of, to 1/10 Mi. E. of Buchanan Ave.	Wyoming	Kent	76
M-21	8th St.	Michigan Ave. E. to Central Ave.	Holland	Ottawa	74
M-11	28th St.	1/10 Mi. E. of Hook Ave. E. to Doncaster Ave.	Wyoming	Kent	60

District #5

<u>Route</u>	<u>TL Name</u>	<u>Location</u>	<u>City</u>	<u>County</u>	<u>Total Accs.</u>
M-21	8th St.	150' W. of Columbia E. to Lincoln Ave.	Holland	Ottawa	56
US-31	Elliot	St. to Jackson St.	Gd. Haven	Ottawa	56
M-11	28th St.	100' W. of Riley Blvd. E. to 100' E. of Clyde Park Ave.	Wyoming	Kent	55
M-46	Apple Ave.	100' W. of Creston E. to Start of Divided Hwy. E. of Home Street	Muskegon	Muskegon	55

District #6

I-75	I-75	Pierson Rd. Interchange	Mt. Morris Twp.	Genesee	58
M-54BR	Saginaw St.	Hamilton Ave. N. to Baker St.	Flint	Genesee	56
M-46	Gratiot	From 2/10 Mi. W., E. to Center Road	Thomas Twp.	Saginaw	54
M-13	Washington	Weber St. to Rust Ave. (M-46)	Saginaw	Saginaw	48
M-13	Washington	Hoyt Park Dr. N. to 100' N. of Remington Ave.	Saginaw	Saginaw	48
M-56	Court	Oak St. E. to Buckham Alley	Flint	Genesee	45
M-13	Euclid	Vermont Ave. N. to 100' N. of NYC RR	Bangor Twp.	Bay	45

District #7

M-43	Michigan	Westnedge (BR131) E. to Rose St.	Kalamazoo	Kalamazoo	104
M-43	Michigan	Rose St. E. to 150' E. of Portage St.	Kalamazoo	Kalamazoo	86
M-43	Michigan	150' E. of Portage E. to Penn RR	Kalamazoo	Kalamazoo	71
	Riverview & Gull	200' E. of Hotop E/N.E. to Gull Rd. Turn Channel to Riverview	Kalamazoo	Kalamazoo	66



District #7

<u>Route</u>	<u>TL Name</u>	<u>Location</u>	<u>City</u>	<u>County</u>	<u>Total Accs.</u>
M-139	Scottsdale	200' S. of Napier (Henry's Dr.-In) N. to 800' N. of Napier Ave.	Benton Twp.	Berrien	62
BR131/94BL	Michigan	Lovell St. to Academy	Kalamazoo	Kalamazoo	56

District #8

M-43	Gd. River	College to Abbott Rd.	E. Lansing	Ingham	98
US-12BR	Michigan	Shady Trailer Park Drive E. to Huron-Whittaker	Ypsilanti	Washtenaw	90
US-12BR	Michigan	150' W. of Grove St. E. to Ecorse Rd. (M-17)	Ypsilanti	Washtenaw	87
M-52	Main	Front St. N. to 100' N. of Hunt St.	Adrian	Lenawee	62
M-99	Logan	Main St. to St. Joseph St.	Lansing	Ingham	61
US-12BR	Michigan	S. River St. E. to 200' W. of Grove St.	Ypsilanti	Washtenaw	59
M-43	Gd. River	Spartan Ave. E. to Hagadorn Rd.	E. Lansing	Ingham	55
I-94BL	Michigan	200' W. of Dettman Rd. to 600' E. of Dettman	Leoni Twp.	Jackson	54
M-43	Gd. River	Haslett St. E. to Bogue St.	E. Lansing	Ingham	52
M-43	Gd. River	Abbott Rd. E. to Charles St.	E. Lansing	Ingham	50

District #9 (Metro)

M-1	Woodward	250' N. of 13 Mi. Rd. Southerly to 100' S. of Coolidge Hwy.	Royal Oak	Oakland	122
M-14	Plymouth	Drive #4 Wonderland Shopping Center E. to 200' W. of Haller Ave.	Livonia	Wayne	106

District #9 (Metro)

<u>Route</u>	<u>TL Name</u>	<u>Location</u>	<u>City</u>	<u>County</u>	<u>Total Accs.</u>
M-39	Southfield	Dix-Toledo Hwy. Westerly to Riopelle St.	Lincoln Park	Wayne	106
M-97	Groesbeck	From 600' S. of, to 300' N. of 12 Mi. Rd.	Roseville	Macomb	102
M-39	Southfield	Allen Rd. Westerly to Quandt St.	Allen Park	Wayne	94
US-24	Telegraph	Davidson Rd. N. to Shopping Center N. of Schoolcraft Rd.	Redford Twp.	Wayne	86
US-25BR	Huron	Pine St. N. to 150' N. of Quay St.	Port Huron	St. Clair	86
US-25	Gratiot	300' N. of Martin Rd. N. to 150' N. of Utica Rd.	Roseville	Macomb	85
M-153	Ford Rd.	100' W. of Moeller Easterly to Merriman Rd.	Garden City	Wayne	85
1 M-53	Van Dyke	Anna St. N. to 12 Mi. Rd.	Warren	Macomb	81
25 US-25BR	Huron	200' S. of Grand River Ave. N. to Andrew Murphy St.	Port Huron	St. Clair	80
1 M-153	Ford Rd.	Cardwell Ave. E. to Fairwood Ave. (Dearborn Hts.)	Garden City	Wayne	79
US-24	Telegraph	Warren Ave. N. to Rouge River	Dearborn Hts.	Wayne	79
M-153	Ford Rd.	Karle St. E. to Wayne Rd.	Westland	Wayne	76
M-153	Ford Rd.	Norborne St. E. to 100' E. of Whitefield St.	Dearborn Hts.	Wayne	75
M-1	Woodward	100' N. of Grand Ave. S. to Tyler St.	Highland Park	Wayne	74
M-1	Woodward	100' N. of 12 Mi. Rd. S. to 200' N. of Linwood Ave.	Royal Oak	Oakland	73
M-85	Fort	Emmons Blvd. N. to Buckingham	Lincoln Park	Wayne	73
M-53	Van Dyke	Trembleton Rd. N. to the Turn Loop N. of 14 Mi. Rd.	Warren	Macomb	72
US-25	Gratiot	300' N. of Oak St. N. to Park St. (N. & S. of 9 Mi. Rd.)	East Detroit	Macomb	72
M-59	Huron	Williams & State Sts. E. to 100' E. of W. Wide Track Drive	Pontiac	Oakland	71
M-53	Van Dyke	Edward St. N. to 10 Mi. Rd.	Centerline	Macomb	71

District #9 (Metro)

<u>Route</u>	<u>TL Name</u>	<u>Location</u>	<u>City</u>	<u>County</u>	<u>Total Accs.</u>
US-25	Gratiot	200' N. of Florence St. N. to Birmingham St.	Roseville	Macomb	71
M-59	Woodward	Webster Ave. S. to Humphrey Ave.	Birmingham	Oakland	71
US-24	Telegraph	200' N. of Fordson Hwy. N. to Joy Rd.	Dearborn Hts.	Wayne	70
M-14	Plymouth	Berwyn Ave. E. to Beech-Daly Rd.	Redford Twp.	Wayne	69
M-85	Fort	Moran-Goddard N. to 150' N. of Kings Hwy.	Lincoln Park	Wayne	68
M-1	Woodward	Sagimore Blvd. S. to Bamlet Rd.	Royal Oak	Oakland	68
US-24	Telegraph	Doxtator St. N. to, Crossover N. of Ford Rd.	Dearborn	Wayne	67
US-24	Telegraph	W. Bd. I-94 N. to Van Born Rd.	Taylor	Wayne	67

City of Detroit High Accident Locations

On Trunkline System

BS-96	Grand River	Livernois	Detroit	Wayne	128
US-12	Michigan	Livernois	Detroit	Wayne	66
M-53	Van Dyke	Outer Drive	Detroit	Wayne	64
M-14	Plymouth Rd.	Evergreen	Detroit	Wayne	47
US-25	Randolph	Jefferson (BS-375)	Detroit	Wayne	45
M-1	Woodward	Larned	Detroit	Wayne	41
US-25	Gratiot	McClellan	Detroit	Wayne	38

## Estimating The Cost of Accidents

The Michigan Department of State Highways Traffic and Safety Division personnel have for many years used National Safety Council Cost Data for the estimation of motor vehicle accident costs and have developed a firm basis for the projection of accident data to determine the benefits which will be achieved by an improvement project.

In July, 1972 the National Safety Council issued Traffic Safety Memo 113 with the following costs for those motor vehicle accidents which occurred in 1971:

Per Death . . . . .	\$52,000
Per Nonfatal Injury . . . . .	3,100
Each Property Damage Accident . . . . .	440

Since the National Safety Council's statistic of \$52,000 per death is based on cities which have had more than ten deaths in one year, the following cost scale should be used for deaths which occur in small cities, villages and rural areas:

Boy Under 15 Years . . . . .	\$34,500
Man 15 to 54 Years . . . . .	74,200
Man 55 Years Old and Older . . . . .	16,300
Girl Under 15 Years . . . . .	22,900
Woman 15 to 54 Years . . . . .	44,400
Woman 55 Years Old and Older . . . . .	12,100

According to the N.S.C. "The high cost of work accidents result from (1) the large size of the wage losses and (2) the administrative cost of compensation insurance, which alone amounted to \$90,000 per death in 1971".

Their definition of wage loss, medical expense and insurance administrative cost is as follows: "Wage loss" includes loss of wages (or the value of service) due to temporary inability to work, lower wages when returned to work due to permanent partial disability, and the present value of anticipated future earnings for permanent total disability or death. In the case of the death of a housewife it includes the present value of the wages of a housekeeper for the years the housewife probably would have lived. "Medical expense" includes doctors' and hospitals' fees. "Insurance administrative costs" includes all administrative, selling and claims settlement expenses for insurance companies and self-insurers, but not payments on claims. Claim payments are included in wage loss and medical expense.

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