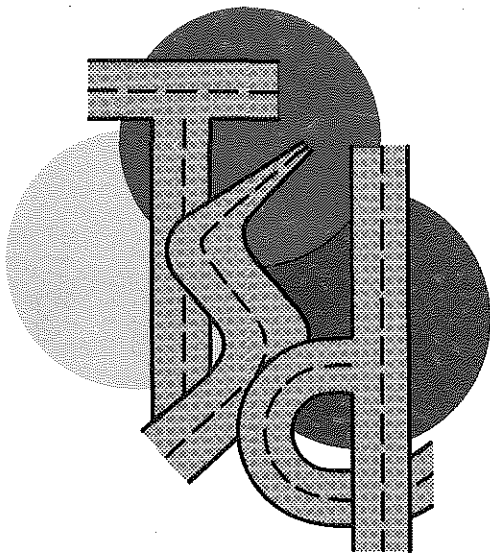


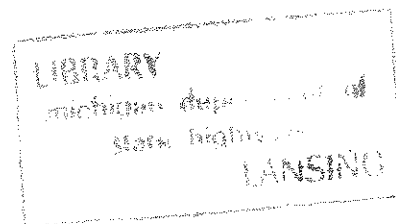
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A TRAFFIC ACCIDENT ANALYSIS
OF HIGH ACCIDENT LOCATIONS
IN THE CITY OF DOWAGIAC

Report TSD-SS-190-71



**TRAFFIC and
SAFETY
DIVISION**



**DEPARTMENT OF STATE HIGHWAYS
STATE OF MICHIGAN**

65-8946

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A TRAFFIC ACCIDENT ANALYSIS
OF HIGH ACCIDENT LOCATIONS
IN THE CITY OF DOWAGIAC

Report TSD-SS-190-71

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December, 1971

PREPARED BY THE

Safety & Surveillance Section
Traffic & Safety Division
Bureau of Operations
Michigan Department of State Highways

in cooperation with

The Michigan Office of Highway Safety Planning
and
The U. S. Department of Transportation
National Highway Traffic Safety Administration

"The opinions, findings and conclusions expressed in this publication are those of the authors and not necessarily those of the State or U. S. Department of Transportation, National Highway Traffic Safety Administration."

ACKNOWLEDGEMENTS

MICHIGAN DEPARTMENT OF STATE POLICE

Captain Amthor
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Sgt. Hayes

CITY OF DOWAGIAC

James H. Mosier - Former Mayor
James E. Burke - Mayor

Norman Gaffney - Former City Manager
Henry Graper - City Manager

George Grady - Chief of Police

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NHTSA PROJECT #MIS-69-3(F)

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
INTRODUCTION	1
Scope	2
Study Procedures	3
Study Area	4
TRAFFIC ENGINEERING ANALYSIS	9
SUMMARY	64
APPENDIX - I	
Collision Diagrams and Photographs for the Locations not Specifically Discussed	67
II	
Excerpts from the Michigan Manual of Uniform Traffic Control Devices	86

LIST OF FIGURES

Figure		Page
1	Map Showing Study Area	5
2	Population Projection	7
3	Map Showing Street Types in the City of Dowagiac	8
4	Spot Map for the City of Dowagiac	10
5	Collision Diagram - Commercial Street @ Pennsylvania Street	23
5a	Photo - Commercial Street @ Pennsylvania Street	24
6	Collision Diagram - Prairie Ronde @ Middle Crossing Road, Lowe Street and Green Street	27
6a	Photo - Prairie Ronde Street - Middle Crossing Road	28
6b	Photo - Lowe Street - Green Street	29
7	Collision Diagram - West Prairie Ronde Street @ Hastings Street	32
7a	Photo - West Prairie Ronde @ Hastings Street	33
8	Collision Diagram - Oak Street @ James Street and Telegraph Street	36
8a	Photo - Telegraph Street - James Street	37
8b	Photo - Oak Street	38
9	Collision Diagram - Lowe Street and Johnson Street @ Jefferson Street and Pokagon Street	41
9a	Photo - Lowe Street @ Pokagon Street and Jefferson Street	42
10	Collision Diagram - Commercial Street @ New York Street	45
10a	Photo - Commercial Street @ New York Street	46
11	Collision Diagram - Prairie Ronde Street @ East and West Railroad Street	49

List of Figures Continued		Page
11a	Photo - Prairie Ronde Street @ West Railroad Street	50
11b	Photo - Prairie Ronde Street @ East Railroad Street	51
12	Collision Diagram - Prairie Ronde Street and Marcellus Highway @ Colby Street	54
12a	Photo - Prairie Ronde Street	55
12b	Photo - Colby Street	56
13	Collision Diagram - Elm Street @ Madison Street	59
13a	Photo - Elm Street @ Madison Street	60
14	Collision Diagram - First Street @ Paris Street	62
14a	Photo - First Street @ Paris Street	63

LIST OF TABLES

Table		Page
1	Accident and Registration Data - City of Dowagiac	14
2	Annual Accident Summary	15
3	Monthly and Daily Accident Occurrence	16
4	Daily and Hourly Accident Occurrence	17
5	Age of Drivers Involved in Accidents	18
6	Residence of Drivers Involved in Accidents	18
7	Weather Conditions at the Scene of Accidents	19
8	Pavement Conditions at the Scene of Accidents	19

INTRODUCTION

The Highway Safety Act of 1966 was enacted by the Congress of the United States in order to promote highway safety programs. Subsequently, various Highway Safety Standards were developed to assure the orderly implementation of the Act.

Highway Safety Standard 4.4.9, Identification and Surveillance of Accident Locations, is one of those standards. The purpose of Standard 4.4.9 is to identify specific locations or sections of streets and highways which have high or potentially high accident experience as a basis for establishing priorities for improvement, selective enforcement or other operational practices that will eliminate or reduce accidents and potential hazards at the location so identified.

The State of Michigan carries out a program of this type on the State trunkline system; however, many of the State's city and county agencies lack the financial and technical prerequisites necessary to pursue similar programs with similarly defined objectives. To insure that this Highway Safety Standard is met and to improve the overall evaluation of the accident picture in Michigan, the Michigan Department of State Highways requested and received through the Office of Highway Safety Planning in the Depart-

ment of State Police a federally funded project entitled "Traffic Accident Analysis for Cities and Counties". The intent of this new project is to provide a special traffic engineering field service for cities and counties. In cooperation with participating cities and counties, the proposed service under the direction of Department personnel will make a traffic engineering evaluation of the factors causing traffic accidents and will recommend engineering corrections to those conditions which may be contributing to accidents.

SCOPE

Highway engineers have very little influence on changing or correcting the motorist's ability to drive (driver education, experience and enforcement) or on the condition of the vehicle (manufacturer's design and owner responsibility). They have, however, the responsibility to construct, operate and maintain the roadway environment within feasible economic and design limits so that the driver and vehicle can function safely within the environment.

The intent of the "Traffic Accident Analysis for Cities and Counties" program is to improve traffic safety on all Michigan streets and roads by expanding the traffic engineering

evaluation of factors causing accidents. This is accomplished by conducting a traffic accident analysis of locations which experience high accident frequencies and then summarizing recommendations for corrective action.

STUDY PROCEDURES

The study procedures for the subject project involve several distinct phases. They may be described as follows: basic data collection, identifying and locating high accident locations, a traffic engineering analysis of accidents, technical evaluation of previously compiled facts and consequent recommendations for improvements.

Since a portion of the data collection phase involves accident records and reports and since the Michigan Department of State Police is responsible for keeping all accident records in Michigan, the task of identifying and locating high accident locations in the City of Dowagiac (and providing an inventory of those locations) was designated as State Police responsibility. Because of the fact that an automated system of locating accidents has not yet been established on a statewide basis, the high accident locations (city streets only) for the City of Dowagiac were determined by manually extracting and compiling those locations with the highest number of accidents from the city accident reports for the

study period 1966 through 1970. From this list the 17 highest accident locations were selected. Upon completion of this portion of data collection, the Department of State Police documented and transmitted to the Traffic and Safety Division of the Department of State Highways a list, along with the accident reports, of the high accident locations for the City of Dowagiac.

The second portion of the data collection phase which is the responsibility of the Department of State Highways, involves preparation of collision diagrams and, if necessary, physical condition diagrams and traffic counts for selected locations.

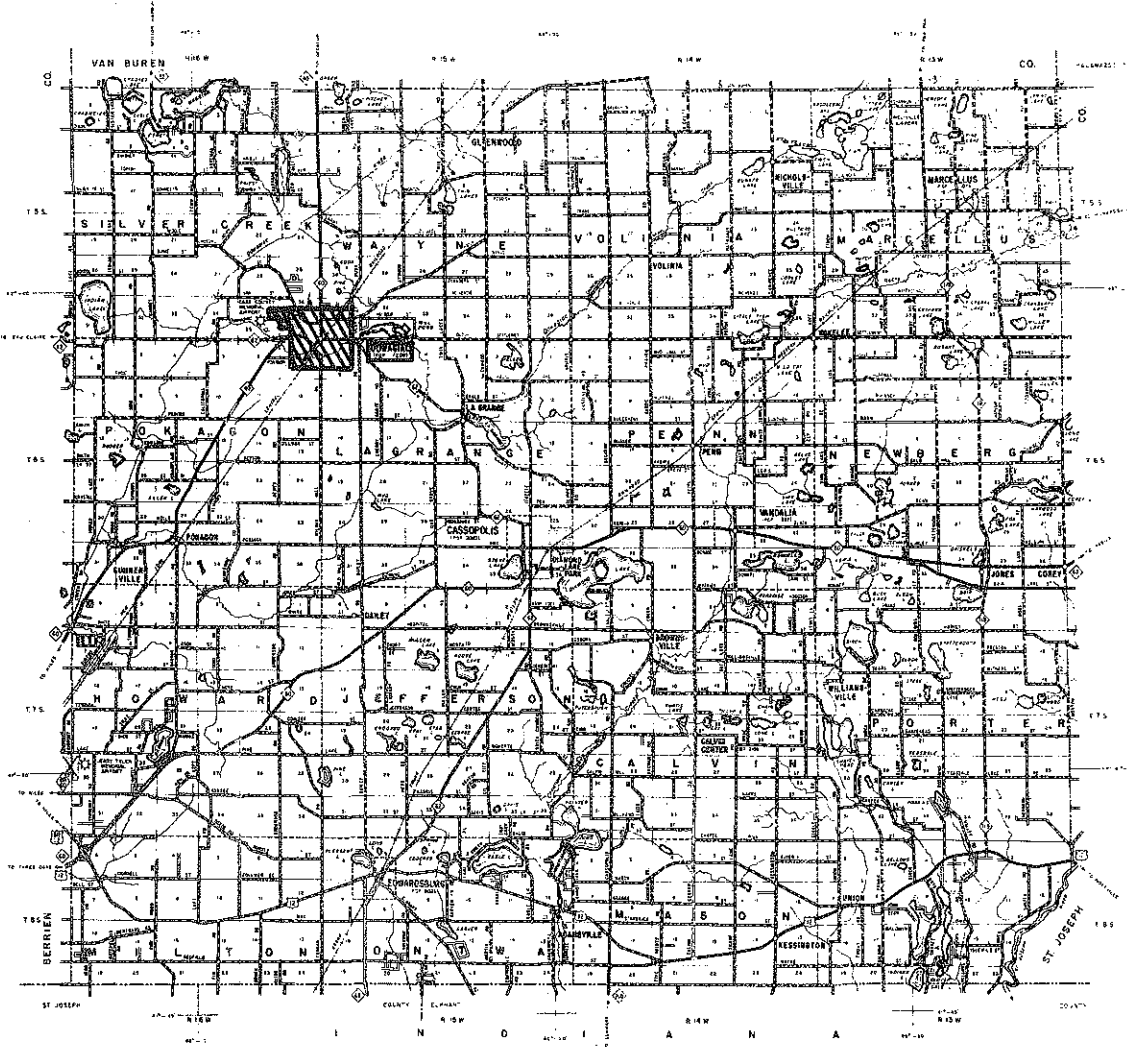
The accident analysis and traffic engineering evaluation phases involve the detailed analysis of the summarized facts and field data and prescribing the proper corrective treatment.

STUDY AREA

The City of Dowagiac is located in the southwestern portion of the state in the northwest quarter of Cass County (Figure 1). This part of the state being basically agricultural provides the community with an abundance of farm produce and orchard fruits.

Dowagiac was founded in 1848 as a shipping center by the Michigan Central Railroad. This enabled the area farmers and fruit growers to sell their produce to the larger cities

FIGURE 1



STUDY AREA

**GENERAL HIGHWAY MAP
CASS COUNTY**

MICHIGAN
STATE HIGHWAY COMMISSION
DEPARTMENT OF STATE HIGHWAYS

DATA OBTAINED FROM
HIGHWAY PLANNING SURVEY

CONDUCTED BY
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS

1:25,000
1:25,000
1:25,000

along the railroad. The city has grown and prospered ever since. New industry has developed and modern farming methods have caused agricultural production to increase greatly.

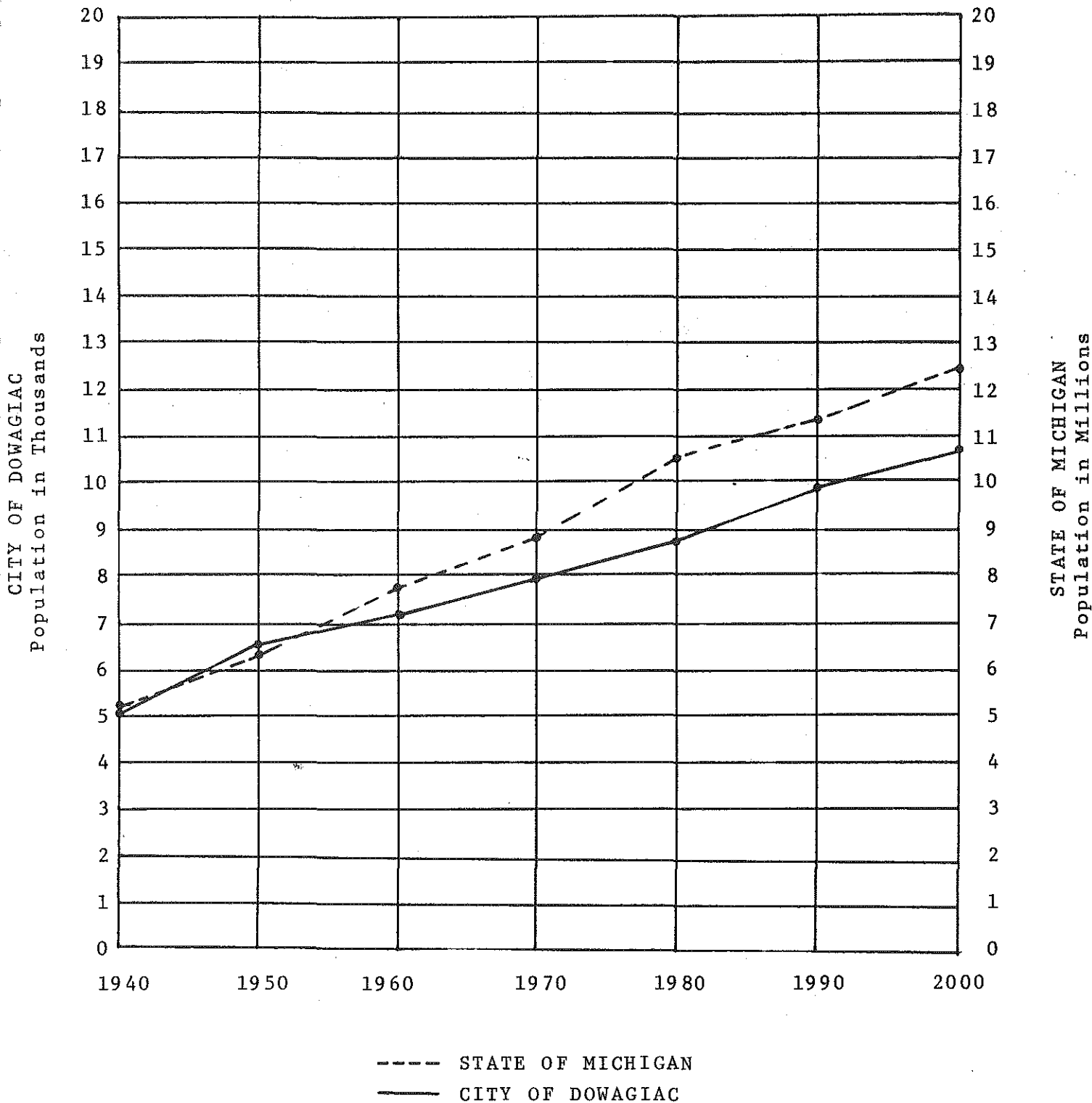
The population of the City of Dowagiac according to the 1970 census was 6,583. This is a decrease of 8.6% over the 1960 census. During this same period the state's population increased 13.4%. Although the City of Dowagiac's population decreased during the period 1960 - 1970, population projections predicted (Figure 2) that the City of Dowagiac would grow at a steady rate.

The City of Dowagiac is serviced by two state trunklines, M-62 and M-51 and by the Penn Central Railroad. The railroad facilities adequately maintain the freight traffic generated by the local factories and area farms. They also handle passenger service to the larger metropolitan areas of Niles and Kalamazoo.

According to the Nineteenth Annual Progress Report, as compiled by the Local Government Division of the Michigan Department of State Highways, the City of Dowagiac has a street system made up of 2.62 miles of state trunkline, 10.37 miles of major city streets and 23.50 miles of local city streets for a total of 36.29 miles of roadway within the city limits. A map of this street system is shown in Figure 3.

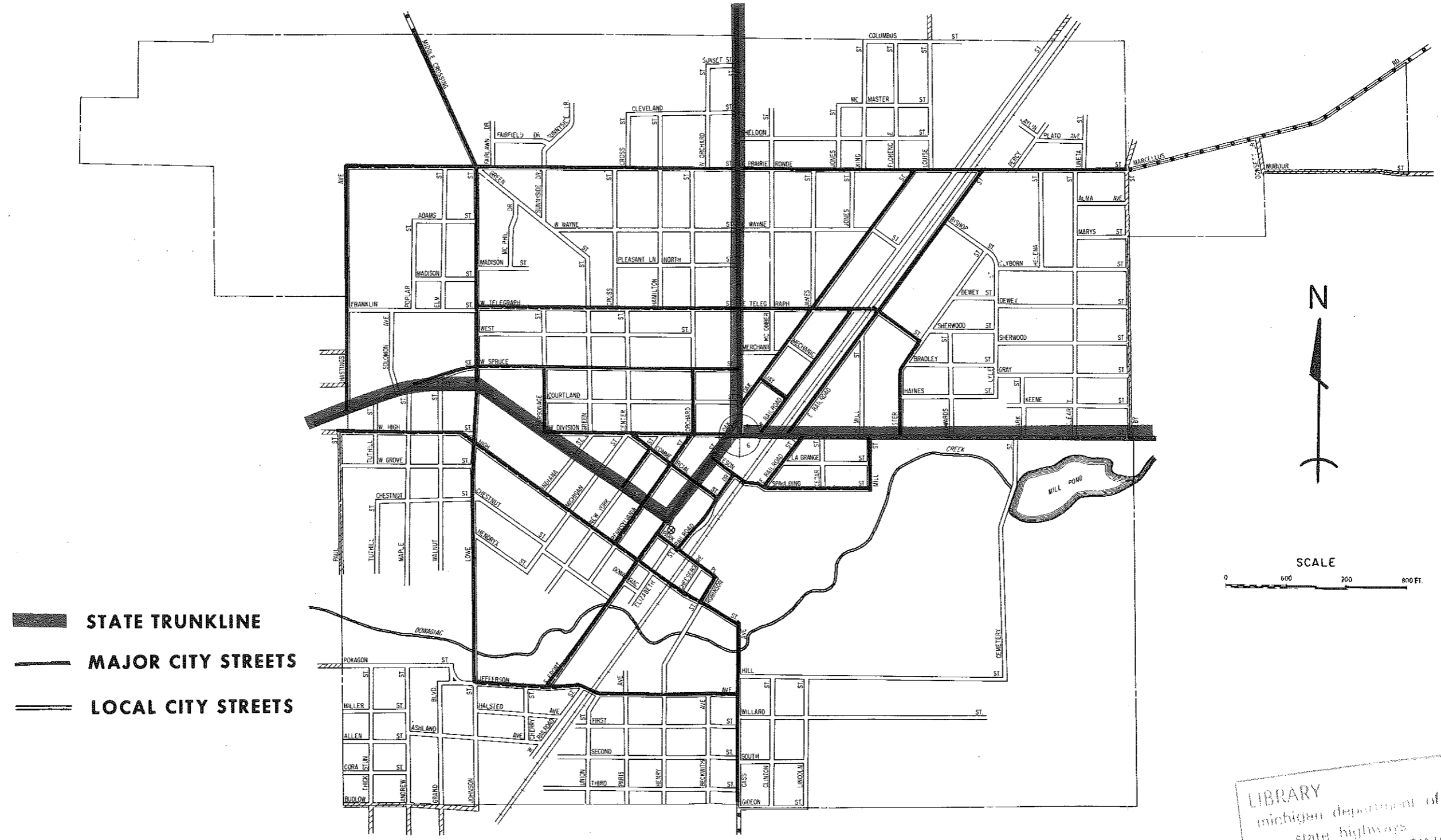
FIGURE 2

POPULATION PROJECTION
CITY OF DOWAGIAC 1940 - 2000



SOURCE: State Resource Planning Division
Office of Economic Expansion
Michigan Department of Commerce

FIGURE 3
 DOWAGIAC
 CASS COUNTY
 T 56.6 S - R 15.6 W
 POP. 7,208 1960 CENSUS
 STREET SYSTEMS
 ACT 51 PUBLIC ACTS 1951



- STATE TRUNKLINE**
- MAJOR CITY STREETS**
- LOCAL CITY STREETS**

SCALE
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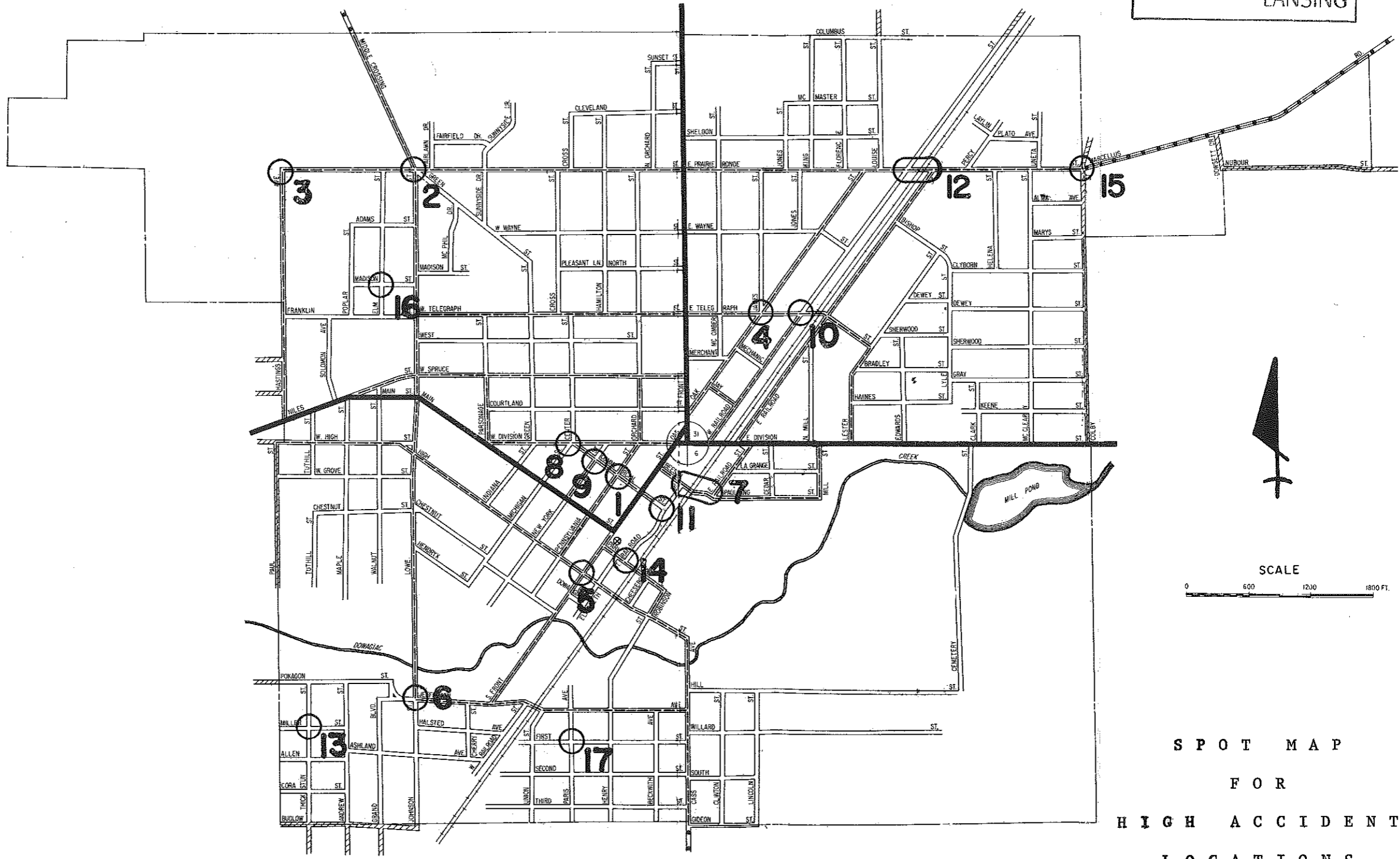
TRAFFIC ENGINEERING ANALYSIS

The solution of the traffic accident problem in any community requires, first of all, a definite and complete understanding of all the elements which make up the problem. Accidents don't just happen. They result from a failure in the driver-road-vehicle environment. Compared to the millions of vehicle miles traveled, accidents are very rare events. However, they are the only means presently available to indicate a failure in the driver-road-vehicle environment. Consequently, a detailed accident analysis is necessary before any effective accident reduction or prevention program can be developed. This analysis will provide a general outline of the traffic accident problem and indicate areas that require special attention.

The traffic engineering analysis began when the State Police, after compiling the accident data for the city streets in Dowagiac, transmitted to the Michigan Department of State Highways the 17 high accident locations in the city (Figure 4). Additional statistical information was collected on the reported traffic accidents in the City of Dowagiac and on the vehicle registrations in Cass County. Table 1 (see p. 14), which contains this information, shows there were a total of 716 accidents on Dowagiac's city streets during the study period 1966 through 1970 for an average of 143 accidents per year. This total

DOWAGIAC
CASS COUNTY
 T 5&6 S - R 15&16 W
 POP. 7,208 1960 CENSUS
STREET SYSTEMS
 ACT 51 PUBLIC ACTS 1951

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FIGURE 4

includes only accidents occurring on city streets and not those on state trunklines. Reported accidents in the City of Dowagiac increased steadily between the years 1966 and 1969 with the greatest increase occurring between 1967 and 1968. However, in 1970 there was a noticeable decrease in reported traffic accidents. The 17 high accident locations on city streets accounted for 155 of the total reported accidents in the city during the five-year study period. This figure is 21.6% of the reported accidents. It would appear from these figures that the greatest portion of the City of Dowagiac's reported accidents have not occurred at specific locations but are scattered throughout the entire city.

To further document the various facts present at the 17 high accident locations, the following tables were prepared to tabulate and chart specific data.

2. Annual Accident Summary
3. Monthly and Daily Accident Occurrence
4. Daily and Hourly Accident Occurrence
5. Age of Drivers Involved in Accidents
6. Residence of Drivers Involved in Accidents
7. Weather Conditions at the Scene of Accidents
8. Pavement Conditions at the Scene of Accidents

The information summarized in Table 2, page 15, shows that 41 of the 155 accidents occurring at the 17 high accident locations resulted in personal injury and 112 resulted in property damage. There were two fatal accidents during

the study period with both of them involving car-train collisions.

Table 3, page 16, shows that the peak accident month was December accounting for 14% of the accidents. It also shows that Friday was the peak accident day with Friday and Saturday accounting for 44.9% of the total accidents.

The figures in Table 4, page 17, indicate that the peak accident hour occurred between 4:00 p.m. and 5:00 p.m. This hour, together with the hours 1:00 p.m. to 2:00 p.m. and 3:00 p.m. to 4:00 p.m. accounted for 28.8% of the accidents.

The information contained in Table 6, page 18, shows that 75.9% of the drivers involved in the accidents at the study locations were local residents. Table 7, page 19, shows that 76.3% of the accidents occurred when the weather was generally clear. As shown in Table 8, page 19, 47.4% of the accidents occurred when the pavement was dry, 30.8% when the pavement was wet and 21.8% when it was either snowy or icy.

The accident information summarized in Tables 2 through 8 may yield some basic information needed by those agencies interested in highway safety from the standpoint of driver education, law enforcement and street patrol activities.

In the analysis of the traffic accident problem on the City of Dowagiac's street system, the contributing factors were examined from the viewpoint of a highway traffic engineer with special attention focused on the effect which the highway

environment may have had on the accident. At each high accident location, individual accident reports were reviewed in detail and the accident facts were tabulated and grouped in various tables. It was apparent that no unusually high concentration of accidents existed at any one location. In fact, the highest total at any one location for the five-year study period was 16 accidents.

The first step in the traffic engineering analysis phase of Dowagiac's high accident locations was the preparation of collision diagrams. At each location accidents were grouped in order to locate the accident in relation to the intersection, approaches to the intersection or section of roadway. The various methods of accident analysis are intended to probe into the detailed aspects of the accidents to determine the reasons for their occurrence.

The analysis of the 17 high accident locations showed that the first parking stalls from the intersections in many cases abuted the crosswalks. According to the Michigan Vehicle Code, Section 257.674 of Act 300, Public Acts of 1949 as amended (MSA 9.2374), "No person shall park a vehicle, except where necessary to avoid conflict with other traffic or in compliance with law or the directions of a police officer or traffic control device, within 20 ft of a crosswalk, or if none, then within 15 ft of the intersection of property lines at an intersection of highways." It is

Table 1
REPORTED TRAFFIC ACCIDENTS IN THE CITY OF DOWAGIAC

Year	Total	City Streets	Property Damage	Injury	Fatal	Persons Injured	Persons Killed
1966	141	91	71	67	2	107	3
1967	195	117	131	64	0	99	0
1968	303	159	240	63	0	96	0
1969	353	181	280	72	1	101	1
1970	353	168	284	69	0	93	0

COMPARISON OF ACCIDENT FREQUENCY

Year	Dowagiac City Streets	Cass County Roads	Total Accidents State of Mich.
1966	91	515	302,880
1967	117	507	299,004
1968	159	606	305,495
1969	181	619	331,223
1970	168	628	313,715

PERCENTAGE CHANGE FOR THE ABOVE TOTALS

1966 - 67	28.6	-1.6	-1.3
1967 - 68	36.1	19.52	2.2
1968 - 69	14.1	2.14	8.4
1969 - 70	-7.2	1.45	-5.58

VEHICLE REGISTRATIONS IN CASS COUNTY

Year	Pass.	Comm.	Farm Vehicle	Trailer	Trailer Coach	Motor-Cycle	Municipal	Total Plates
1966	17,261	3,627	478	2,026	322	425	254	24,393
1967	17,502	3,531	458	2,036	329	477	23	24,356
1968	18,048	4,047	490	2,270	426	573	55	25,909
1969	18,789	4,797	-	2,877	-	724	45	27,232
1970	19,065	5,192	-	3,082	-	946	36	28,321

Table 2

ANNUAL ACCIDENT SUMMARY

SEVENTEEN HIGH ACCIDENT LOCATIONS IN THE CITY OF DOWAGIAC

Period Studied: 1966 through 1970

Accident Type	Day	Night	Total
Fatal Accident	2	0	2
Personal Injury Acc.	22	19	41
Property Damage Acc.	84	28	112
Total	108	47	155

Month	Fatal		Injury		Prop. Damage		Sub. Total		Total
	Day	Night	Day	Night	Day	Night	Day	Night	
January			1	2	10	1	11	3	14
February				1	13	4	13	5	18
March	1			1	8	2	9	3	12
April			1	2	5	1	6	3	9
May			3	2	2	1	5	3	8
June			2	1	1	1	3	2	5
July			2		9	1	11	1	12
August	1		3	1	3	3	7	4	11
September			2	3	8	1	10	4	14
October			2	3	8	3	10	6	16
November			3	2	4	5	7	7	14
December			3	1	13	5	16	6	22
S. Total	2	0	22	19	84	28	108	47	155
Total	2		41		112		155		

ACCIDENT ANALYSIS

Table 3

MONTHLY AND DAILY ACCIDENT OCCURRENCE

SEVENTEEN HIGH ACCIDENT LOCATIONS IN THE CITY OF DOWAGIAC

Period Studied: 1966 through 1970

Month	Day of the Week							Monthly Total	Of Total
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.		
January	2	2	3	1	3	2	1	14	9.0
February	2	2	1	1	2	9	1	18	12.2
March		2		1	6	3		12	7.7
April	2	1	1	3		2		9	5.8
May		2	2	2	1		1	8	5.1
June					2	1	2	5	3.2
July		2	1	2	4	2	1	12	7.7
August	2		1	2	4	1	1	11	7.0
September	3	1	1	1	5	3		14	9.0
October	1	2	1	3	4	3	2	16	10.2
November	2		5		4	1	2	14	9.0
December	3	2	5	1	2	5	4	22	14.1
Day Total	17	16	21	17	37	32	15	155	100.0
% of Total	10.9	10.2	13.5	10.9	23.7	21.2	9.6	100.0	

Peak Accident Day: FridayPeak Accident Month: December

ACCIDENT ANALYSIS

Table 4

DAILY AND HOURLY ACCIDENT OCCURRENCE

SEVENTEEN HIGH ACCIDENT LOCATIONS IN THE CITY OF DOWAGIAC

Period Studied: 1966 through 1970

Hour	Day of the Week							Hour Total	% of Total
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.		
12-1 a.m.			1			1	2	4	2.6
1-2 a.m.			2		2	1		5	3.2
2-3 a.m.						1	1	2	1.4
3-4 a.m.			1			3		4	2.6
4-5 a.m.					1		1	2	1.4
5-6 a.m.						1		1	.7
6-7 a.m.		1	2	2				5	3.2
7-8 a.m.		1	1	2	1	1		6	3.9
8-9 a.m.	2			2	3	2		9	5.8
9-10 a.m.			1		1		1	3	2.0
10-11 a.m.	1	1	2	2	1	3	1	11	7.0
11-12 a.m.	1	1		2	1	2	1	8	5.1
12-1 p.m.	1		2		1	1	1	6	3.9
1-2 p.m.	1	3	1	1	4	4	1	15	9.6
2-3 p.m.	2		1	1	4	2		10	6.4
3-4 p.m.	3		3	2	3	1		12	7.7
4-5 p.m.	3	3	2	1	5	2	2	18	11.5
5-6 p.m.	1	1	2		3	1	2	10	6.4
6-7 p.m.	1	1			1	4		7	4.5
7-8 p.m.		2			1			3	2.0
8-9 p.m.						1		1	.7
9-10 p.m.				2	2			4	2.6
10-11 p.m.		1			1		2	4	2.6
11-12 p.m.	1	1			2	1		5	3.2
Not Stated									
Day Total	17	16	21	17	37	32	15	155	100.0
% of Total	10.9	10.2	13.5	10.9	23.7	21.2	9.6	100.0	

Peak Accident Hour: 4 - 5 p.m.

Peak Accident Day: Friday

Table 5

AGE OF DRIVERS INVOLVED IN ACCIDENTS

SEVENTEEN HIGH ACCIDENT LOCATIONS IN THE CITY OF DOWAGIAC

Period Studied: 1966 through 1970

Age Group	Number of Drivers Involved in				Percent
	Fatal	Injury	Property Damage	Total	
Under 16					
16 - 19		11	35	46	16.8
20 - 24	1	15	34	50	18.2
25 - 34		11	51	62	23.0
35 - 44		9	18	27	9.9
45 - 54		10	32	42	15.3
55 - 64	1	7	19	27	9.9
65 - 74	2	2	12	16	5.8
75 & Over			3	3	1.1
Not Stated					
TOTAL	4	65	204	273	100.0

Table 6

RESIDENCE OF DRIVERS INVOLVED IN ACCIDENTS

Residence	Number of Drivers Involved in				Percent
	Fatal	Injury	Property Damage	Total	
Local		50	158	208	75.9
Michigan	4	11	39	54	20.1
Out of State		4	7	11	4.0
Not Stated					
TOTAL	4	65	204	273	100.0

Table 7

WEATHER CONDITIONS AT SCENE OF ACCIDENTS

SEVENTEEN HIGH ACCIDENT LOCATIONS IN THE CITY OF DOWAGIAC

Period Studied: 1966 through 1970

Weather	Severity of Accident				Percent
	Fatal	Injury	Property Damage	Total	
Clear or Cloudy	1	33	84	118	76.3
Rain		6	12	18	11.5
Fog					
Snow or Sleet	1	2	16	19	12.2
Not Stated					
TOTAL	2	41	112	155	100.0

Table 8

PAVEMENT CONDITIONS AT SCENE OF ACCIDENTS

Pavement	Severity of Accident				Percent
	Fatal	Injury	Property Damage	Total	
Dry	1	25	47	73	47.4
Wet	1	13	34	48	30.8
Snowy/Icy		3	31	34	21.8
Icy					
Not Stated					
TOTAL	2	41	112	155	100.0

strongly recommended that the Vehicle Code Law concerning crosswalks be implemented as soon as possible.

This analysis also showed that the ratio of accidents occurring on wet pavement as compared to accidents occurring on dry pavement was extremely high (65%, see Table 8). This indicates that there might be a citywide problem of slippery-when-wet pavement conditions. This analysis further showed that in many cases trees partially or fully obscured from view existing traffic control devices. It is recommended that a citywide maintenance program be initiated by the city so that this problem can be eliminated.

After the analysis was completed, it was apparent that no recommendations would be feasible for 7 of the 17 locations. There were no accident patterns at these seven locations and no present or potential serious driving hazards that could be eliminated or controlled by traffic engineering. Consequently, this report will discuss in detail only the remaining ten locations. The collision diagrams and pictures for each of these will be found on the page following the discussion. The collision diagrams and pictures for the remaining seven locations are found in Appendix I.

LOCATION 1 COMMERCIAL STREET AT PENNSYLVANIA STREET

This location is a four-legged right-angle intersection located in the Central Business District of Dowagiac. Commercial Street is the through street and Pennsylvania Street the stop street. Both roadways have a 42 ft wide bituminous pavement with curb on both sides. There are no centerline markings on either street in the vicinity of the intersection. Metered parking is allowed on both sides of Commercial and Pennsylvania Streets. Traffic control consists of a 24 in. stop sign for each direction of traffic on Pennsylvania Street.

There were 16 accidents at this location during the years 1966 through 1970. Four of these accidents were right-angle collisions. The reported cause of these accidents was the inability of drivers to see vehicles approaching the intersection. Eight of the remaining accidents occurred during parking maneuvers. At the present time parking is permitted within 15 ft of the stop sign on southwestbound Pennsylvania Street and 13 ft back of the stop sign on the northeastbound roadway.

RECOMMENDATIONS:

It is recommended that parking on the south side of the east leg of Commercial Street be prohibited from the

crosswalk east for a distance of 40 ft. Additionally, it is recommended that the first parking space on the south side of Commercial Street west of the intersection be eliminated. This recommendation will greatly improve sight distance and reduce the incidence of right-angle accidents.

It is further recommended that the existing stop sign located on the southeast leg of Pennsylvania Street be replaced with a new sign, (R1-1-24, see Appendix II, p. 88), since the existing one has lost its reflective properties.

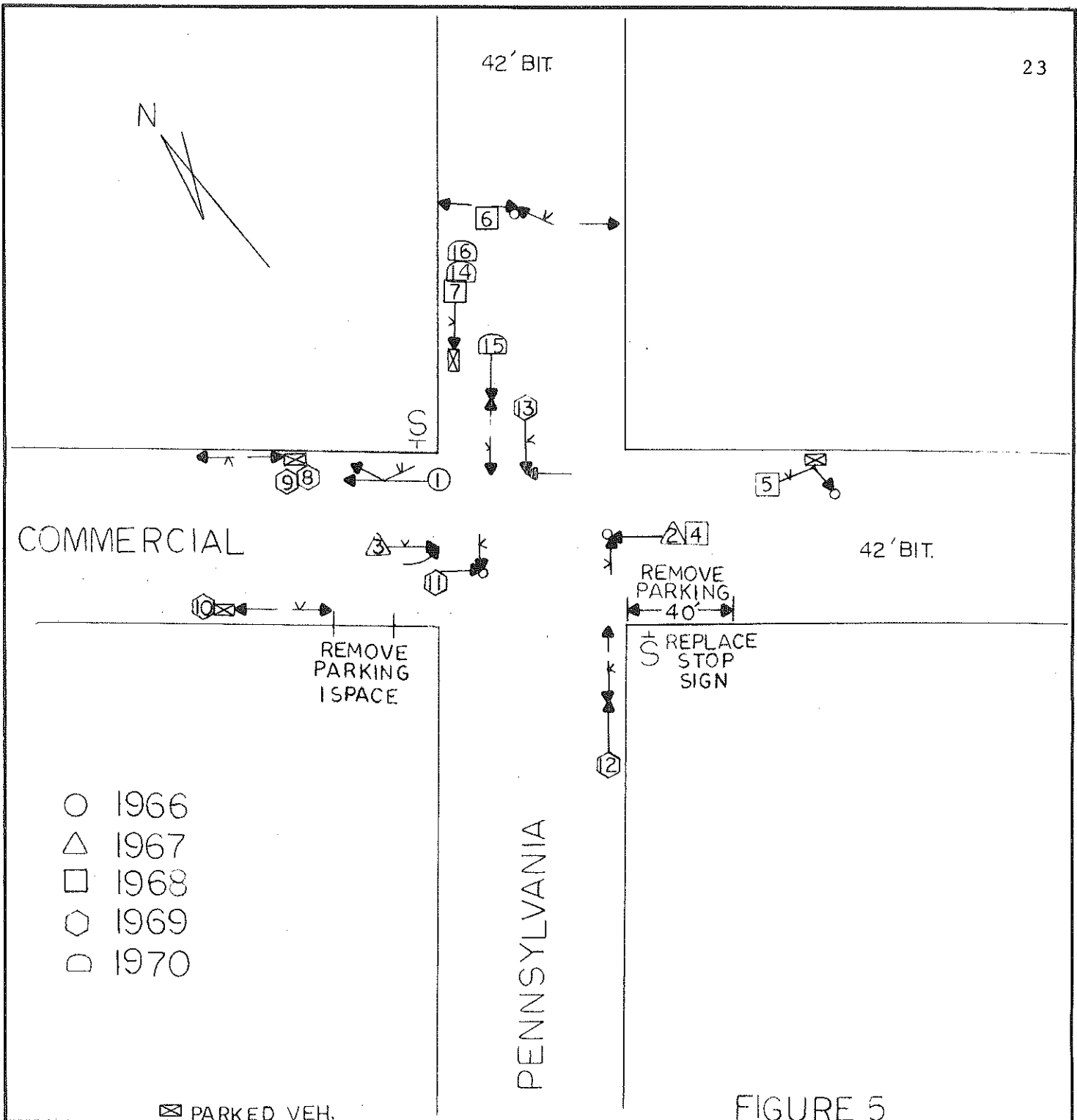


FIGURE 5

<p>LEGEND</p>	<p>MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION</p>
<p>Stop & Go Signal </p> <p>Flashing Beacon </p> <p>Stop Sign </p> <p>Yield Sign </p>	<p>Location COMMERCIAL AT PENNSYLVANIA CITY OF DOWAGIAC CASS COUNTY</p> <p>REV. 11-19-71</p>
<p>Fatal </p> <p>Injury </p> <p>Skidding </p> <p>Jackknife </p> <p>Overtaken </p> <p>Backing </p> <p>Pedestrian </p> <p>Tree </p> <p>Out of Control </p> <p>Driver Intent </p> <p>Deer </p> <p>Violator </p>	<p>Period: 1966 THRU 1970</p> <p>Accidents - Total <u>16</u> P.D. <u>11</u></p> <p>Injury <u>5</u> (8) Fatal <u>0</u> ()</p> <p>C.S. _____ Miles _____ Drawn <u>DJM</u></p> <p>Plan No. <u>LOCATION #1</u> Date <u>8-24-70</u></p>

LOCATION 2 PRAIRIE RONDE @ MIDDLE CROSSING STREET, LOWE
STREET AND GREEN STREET

The above location is a five-legged intersection located in the northwest section of the city. The major roadways are Prairie Ronde and Middle Crossing Streets. Prairie Ronde Street is a 30 ft bituminous roadway and is the through street. Green Street, Lowe Street and Middle Crossing are all 22 ft bituminous roadways.

The existing traffic controls at this location consist of two 30 in. stop ahead signs and two 36 in. stop signs for Middle Crossing Street, a "Do Not Pass" sign, a 30 in. stop ahead sign and a 30 in. stop sign for Lowe Street and a 30 in. stop sign for Green Street. Furthermore, there are two overhead flashing beacons at this location. One of the beacons has a single face (red lens) for traffic approaching the intersection on Green Street while the other beacon has four faces with two of these giving a yellow indication for Prairie Ronde Street and the other two giving a red indication for Lowe Street and Middle Crossing Street.

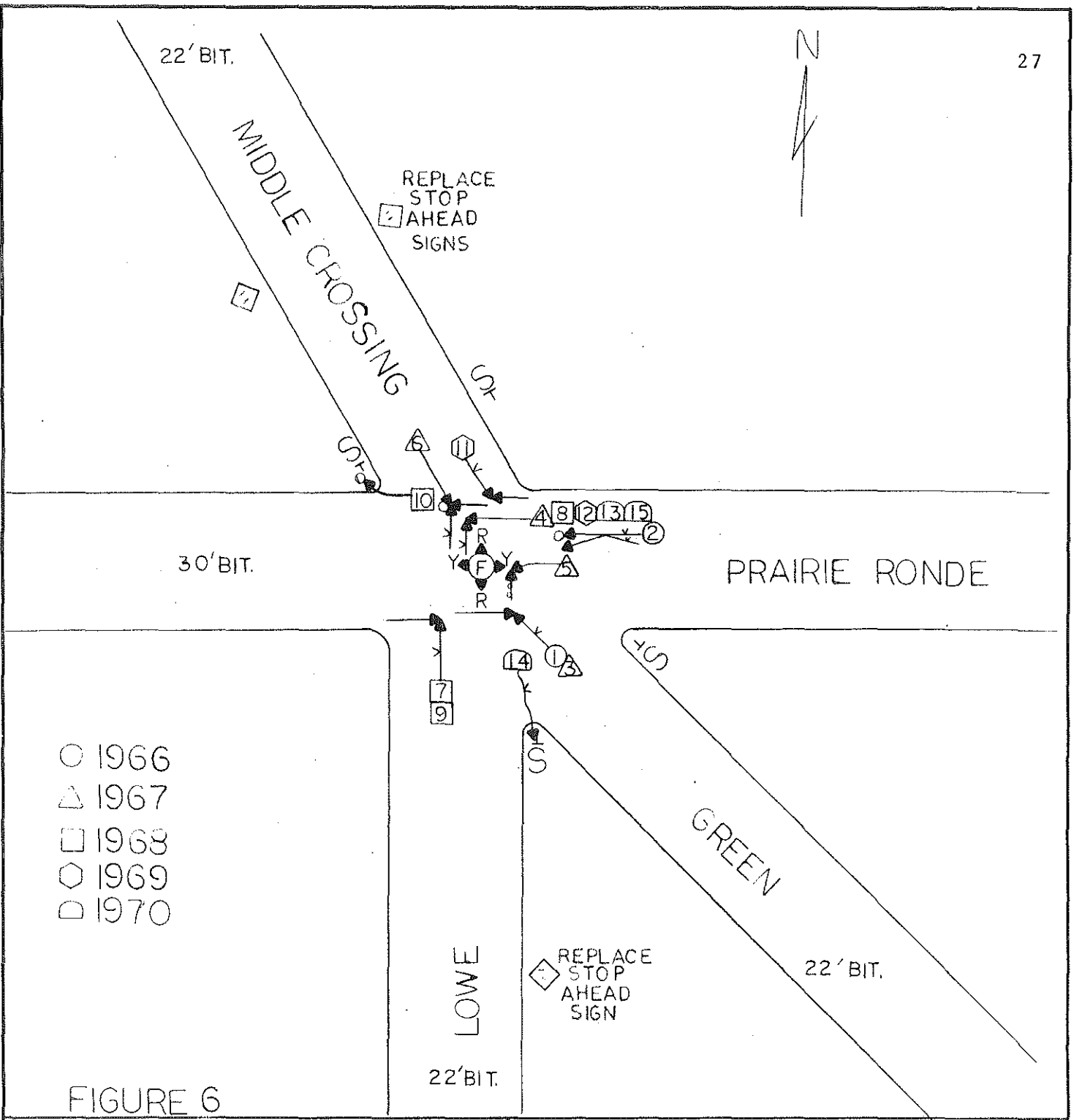
There were 15 accidents at this location during the study period. One of the accidents was a sideswipe (same direction) and two were ran-off the roadway accidents. The remaining 12 accidents were right-angle accidents. These accidents were caused when drivers on the stop streets failed to yield the right of way (even after stopping for the stop sign). This type of accident frequently occurs at multilegged

intersections. This is particularly true when one or more of the intersecting streets intersect at an acute angle. Sight distance usually is restricted and exposure time is increased due to the large expanse of pavement in the intersection area.

RECOMMENDATIONS:

Since visibility did not appear to be a problem at this intersection and since the accident frequency is not considered critical, realigning one or more of the intersection legs in order to improve the angle of crossing is not justified at this time. The city should, however, give consideration for such a realignment project when reconstruction is planned for any of these streets. Presently, however, it is recommended that Green Street be made one-way away from the intersection south to Sunnyside Street. This recommendation should improve the efficiency and safety of the intersection by removing some of the conflicting movements from the intersection.

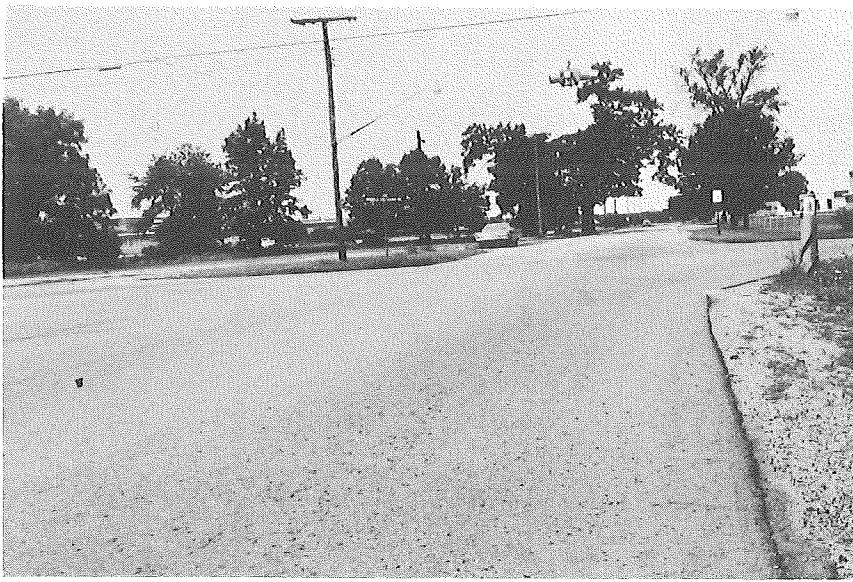
It is further recommended that the existing stop ahead signs on Middle Crossing and Lowe Streets be replaced with 36 in. stop ahead signs (W3-1-36, see Appendix II, p. 91). According to the Michigan Manual of Uniform Traffic Control Devices, a stop ahead sign where required shall be a W3-1-30 in advance of a 24 in. "Stop" sign and a W3-1-36 in advance of a 30 in. or 36 in. "Stop" sign.



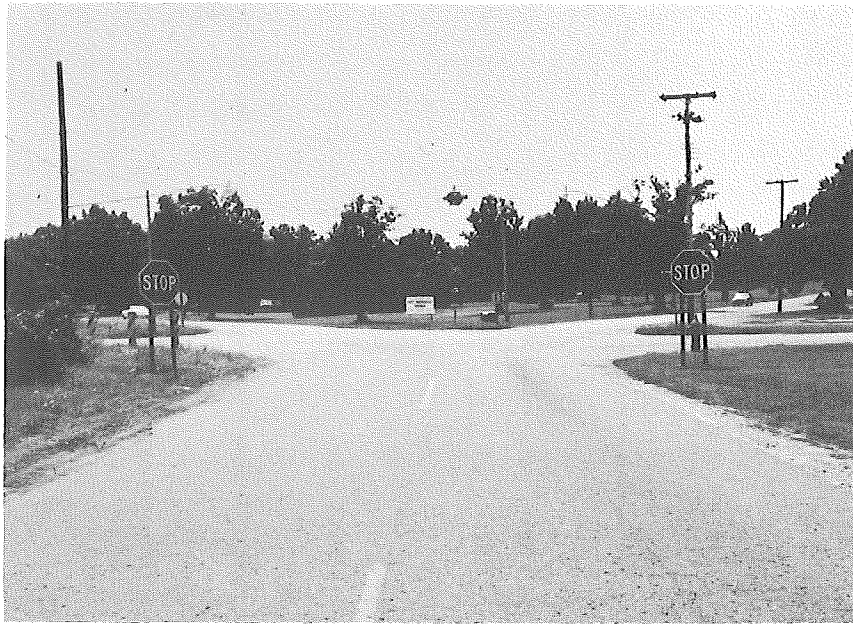
- 1966
- △ 1967
- 1968
- ◇ 1969
- ◇ 1970

FIGURE 6

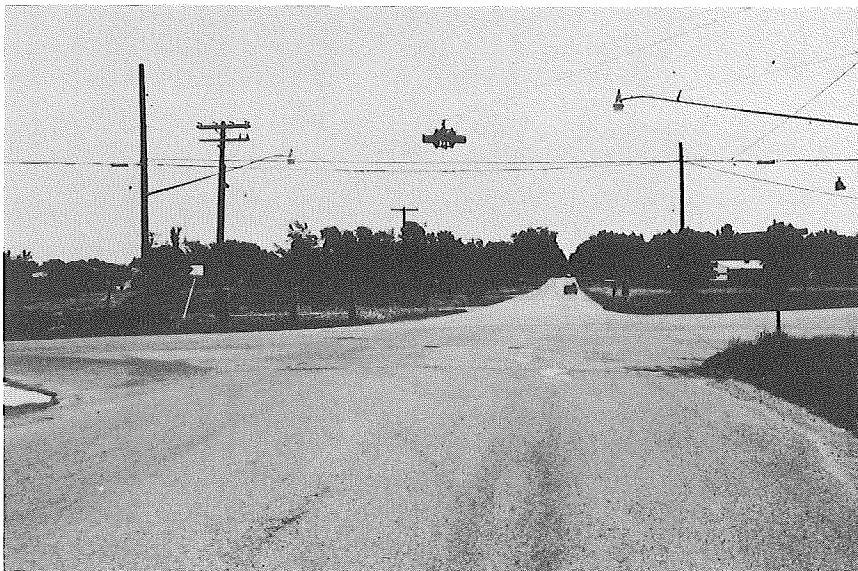
LEGEND	MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION
Stop & Go Signal Stop Sign S T Flashing Beacon Yield Sign Y T	Location MIDDLE CROSSING AT PRAIRIE RONDE CITY OF DOWAGIAC CASS COUNTY REV. 11-19-71
Fatal Pedestrian X Injury Tree Skidding Out of Control Jackknife Driver Intent Overturned Deer Backing Violator	Period: 1966 THRU 1970 Accidents - Total <u>15</u> P.D. <u>12</u> Injury <u>3</u> (5) Fatal <u>0</u> () C.S. _____ Miles _____ Drawn <u>DJM</u> Plan No. <u>LOCATION # 2</u> Date <u>9-24-70</u>



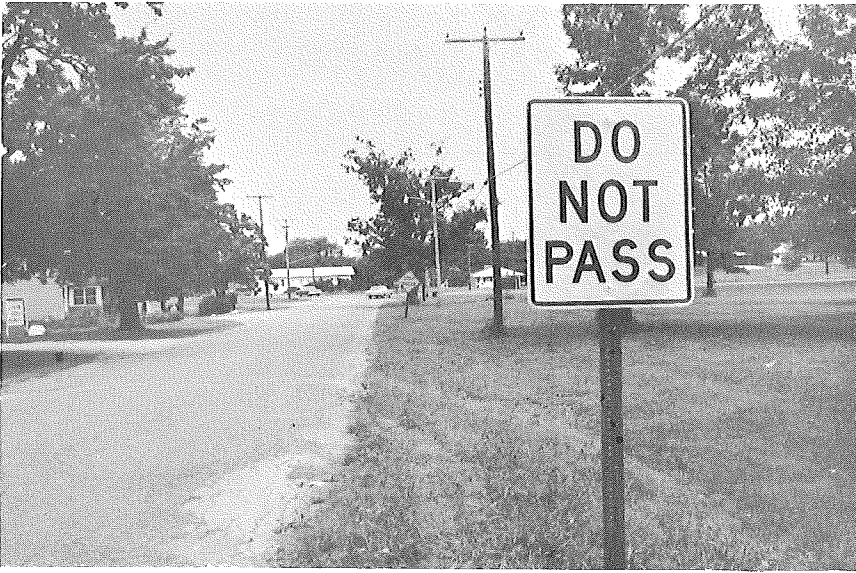
WESTBOUND
PRAIRIE RONDE STREET



SOUTHBOUND
MIDDLE CROSSING ROAD



EASTBOUND
PRAIRIE RONDE STREET



NORTHBOUND
LOWE STREET



NORTHBOUND
LOWE STREET



NORTHWESTBOUND
GREEN STREET

FIGURE 6b

LOCATION 3 WEST PRAIRIE RONDE STREET AND HASTINGS STREET

Prairie Ronde is a major city street that provides east-west access and is located at the northern edge of the City of Dowagiac. At its northwest terminus it makes a 90° turn to the south and continues southward as a continuation of Hastings Street. It is at this point that vehicular traffic has encountered difficulty in negotiating the 90° turn. West Prairie Ronde - Hastings Street in this area is a 30 ft wide bituminous roadway. There are no centerline markings throughout the location.

The traffic controls at this location are a 36 in. x 36 in. (square) curve sign in target position for westbound Prairie Ronde Street and a 24 in. x 48 in. target arrow for northbound Hastings Street. There is a 25 mph speed zone throughout this location for both directions of traffic. This speed zone accommodates the school which is located adjacent to and south of the subject location and the residential areas which are located on either side of this location.

A total of 13 accidents occurred at this location during the study period 1966 through 1970. Eleven of the 13 accidents pertained to failure of the drivers involved to negotiate the curve properly.

RECOMMENDATIONS:

It is recommended that turn signs (W1-1-30, Appendix II,

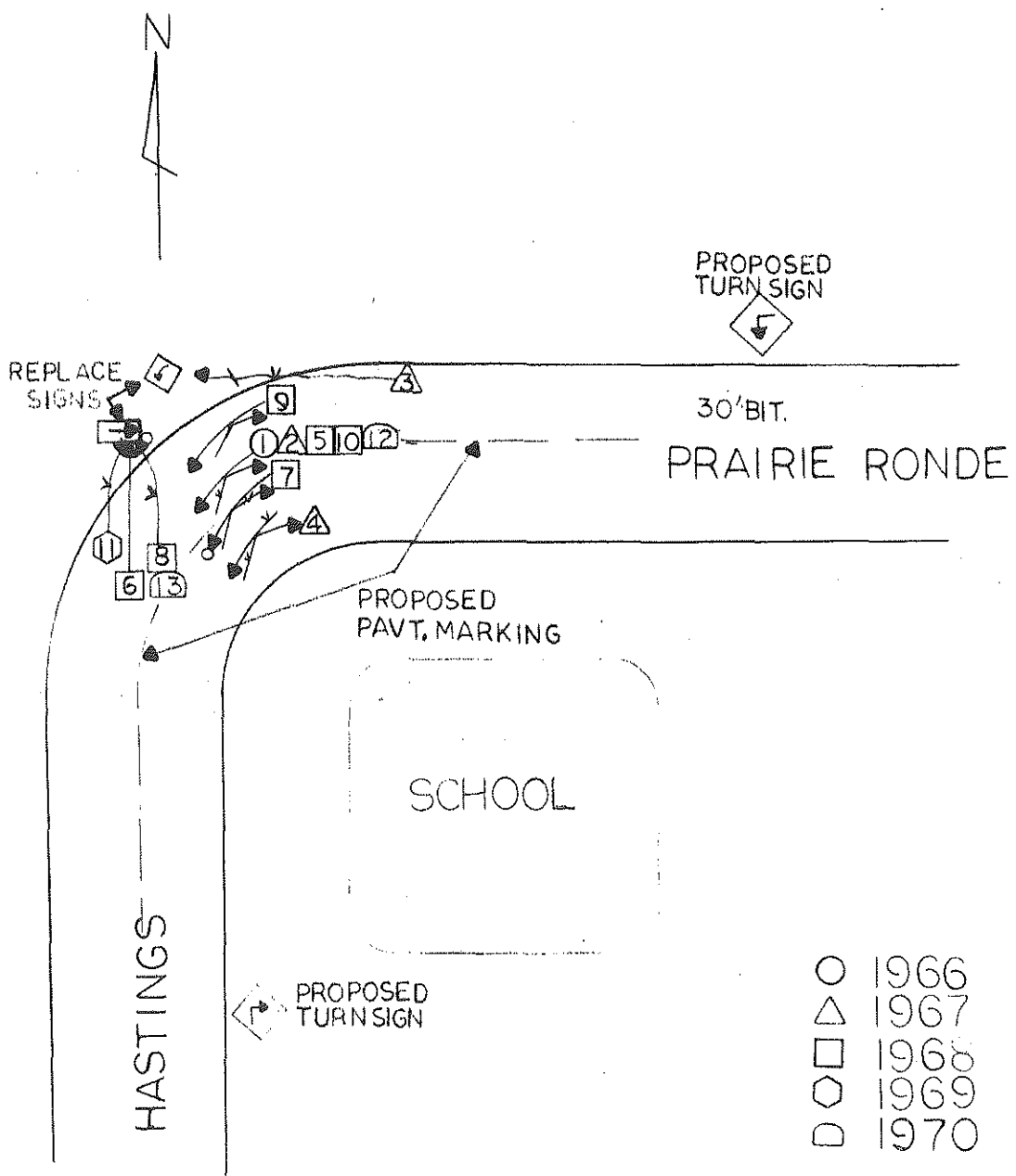
p. 95) be erected for each direction of traffic approaching the turn. It is also recommended that 15 mph advisory speed panels accompany the turn signs. The 15 mph advisory speed was chosen on the basis of devil level readings at this location. The devil level readings for the turns are as follows:

Southwest		Northeast	
Speed	Reading	Speed	Reading
23	28°	23	28°
20	21°	20	21°
15	15°	15	15°
10	8°	10	8°

(See Part I, Section C, pp. 132 - 133 of the Manual - Appendix II, pp. 98 - 99.)

















Furthermore, it is recommended that the existing square curve sign and nonstandard target arrow be replaced by target arrows (W1-6-48, Appendix II, p. 96). The new signs should be erected in target position, one for northbound Hastings Street and the other for westbound Prairie Ronde Street.

It is further recommended that centerline pavement markings be applied at the above location (see centerline markings, Appendix II, pp. 100 - 101).



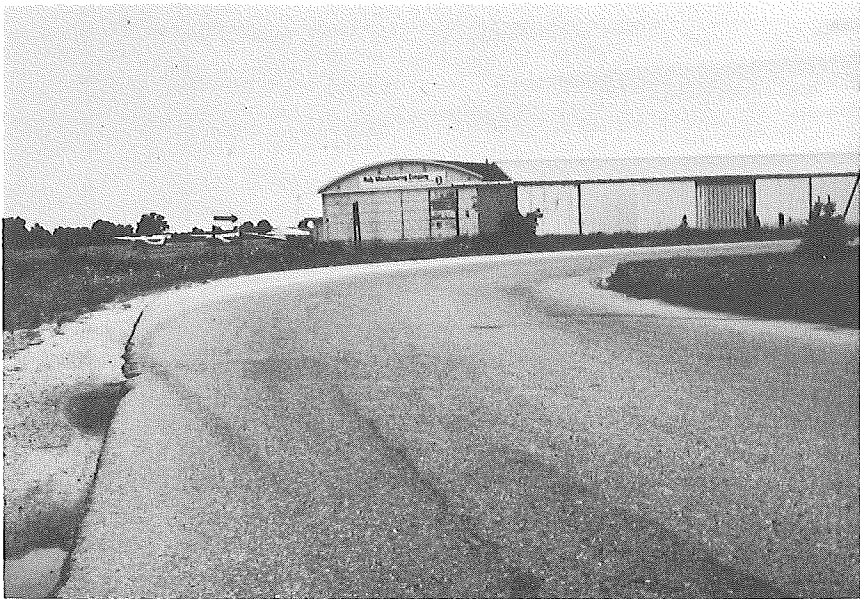
- 1966
- △ 1967
- 1968
- ⬡ 1969
- ◇ 1970

FIGURE 7

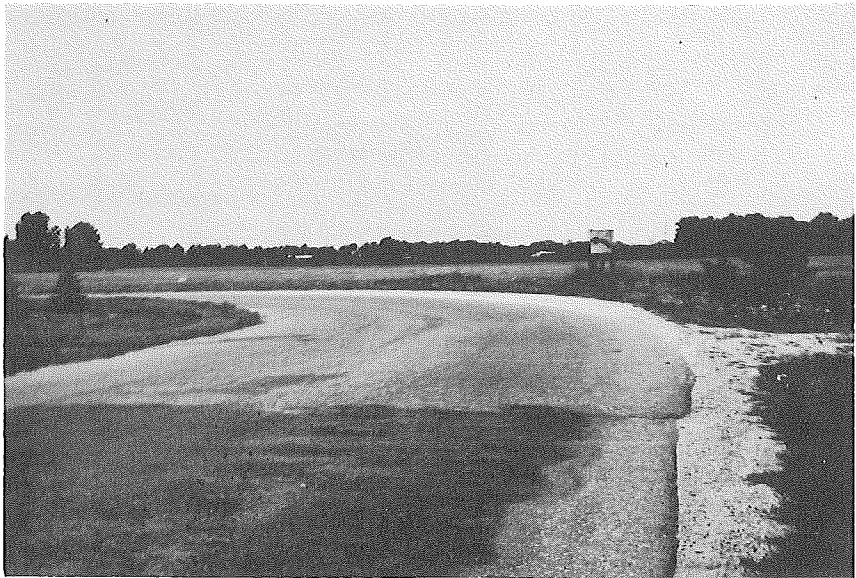
LEGEND		MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION	
Stop & Go Signal  Flashing Beacon 	Stop Sign  Yield Sign 	Location PRAIRIE RONDE AT HASTINGS CITY OF DOWAGIAC CASS COUNTY	
Fatal  Injury  Skidding  Jackknife  Overturned  Backing 	Pedestrian  Tree  Out of Control  Driver Intent  Deer  Violator 	Period: <u>1966 THRU 1970</u> Accidents - Total <u>13</u> P.D. <u>10</u> Injury <u>3 (3)</u> Fatal <u>0 ()</u> C.S. _____ Miles _____ Drawn <u>D. J. M.</u> Plan No. <u>LOCATION #3</u> Date <u>9-24-70</u>	



NORTHBOUND
HASTINGS AVENUE



NORTHBOUND
HASTINGS AVENUE



WESTBOUND
PRAIRIE RONDE STREET

FIGURE 7a

LOCATION 4 OAK STREET @ JAMES STREET AND TELEGRAPH STREET

The above mentioned intersection is located in a semi-residential area in the northeast section of the City of Dowagiac. Oak, James and Telegraph Streets form a five-legged intersection. Oak Street is the through street and all other streets are under stop control. Oak Street is a 36 ft wide bituminous roadway north of the intersection and 30 ft wide south of the intersection. James and Telegraph Streets are 30 ft wide bituminous roadways throughout the intersection.

Traffic controls at this location are a 24 in. stop sign (poor condition) for James Street, 24 in. stop signs (poor condition) for each direction of traffic on Telegraph Street and a 24 in. school sign (nonstandard) for northbound Oak Street. The school sign services the grade school located in the northwest quadrant of the intersection. There is also a flashing beacon with red lenses for Telegraph Street and yellow lenses for Oak Street. There is no signal indication for James Street. In addition the flashing beacon was inoperative.

There were 13 accidents at this location during the study period. Six of these accidents were caused when west-bound traffic on Telegraph Street failed to yield the right of way (even after stopping for the stop sign). This type of accident frequently occurs at multilegged intersections. This is particularly true when one or more of the intersecting streets intersect at an acute angle. Sight distance usually

is restricted and exposure time is increased due to the large expanse of pavement in the intersection area.

RECOMMENDATIONS:

Since overall visibility at this intersection is good and the accident frequency is not considered critical, we do not feel that realignment is justified at this time in order to improve the angle of crossing at this intersection. However, it is recommended that the existing stop signs be replaced with new signs (R1-1-24, Appendix II, p. 88).

Recent field investigations revealed that the existing flashing beacon at the subject location was inoperative. According to the Michigan Manual of Uniform Traffic Control Devices, intersection beacons where warranted shall be operated continuously throughout the 24 hours of the day. Therefore, it is recommended that this beacon be activated to operate 24 hours a day. It is further recommended that an additional signal lens (red) be provided for southbound James Street traffic. Additionally, it is recommended that the nonstandard school sign located on the south leg of Oak Street be replaced with a new school sign (S1-1, 30 x 30, Appendix II, pp. 102 - 103).

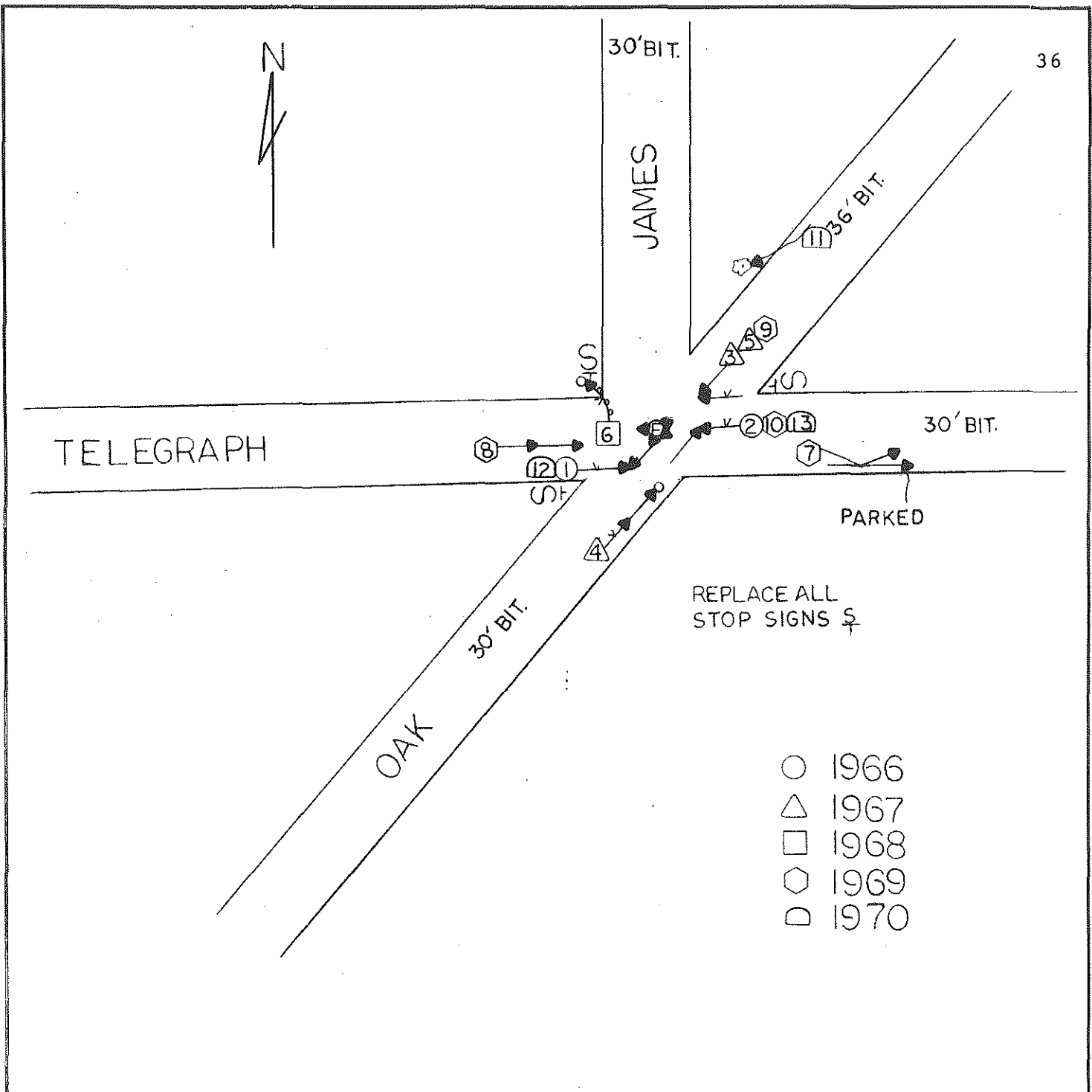
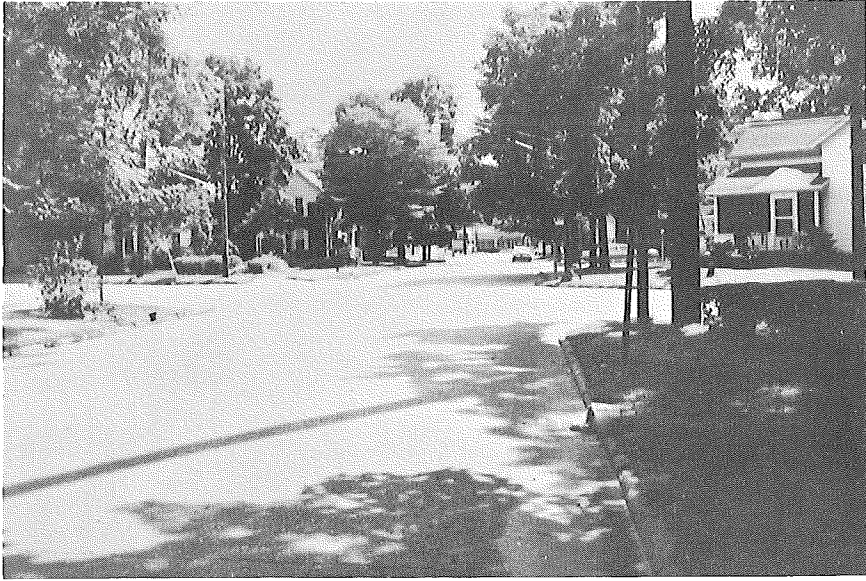


FIGURE 8

LEGEND		MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION	
Stop & Go Signal	Stop Sign	Location TELEGRAPH AT JAMES AND OAK CITY OF DOWAGIAC CASS COUNTY	
Flashing Beacon	Yield Sign		
Fatal	Pedestrian	Period: 1966 THRU 1970	
Injury	Tree	Accidents - Total <u>13</u> P.D. <u>8</u>	
Skidding	Out of Control	Injury <u>2 (2)</u> Fatal <u>0 ()</u>	
Jackknife	Driver Intent	C.S. _____ Miles _____ Drawn <u>DJM</u>	
Overturned	Deer	Plan No. <u>LOCATION # 4</u> Date <u>9-1-70</u>	
Backing	Violator		



EASTBOUND
TELEGRAPH STREET



SOUTHBOUND
JAMES STREET

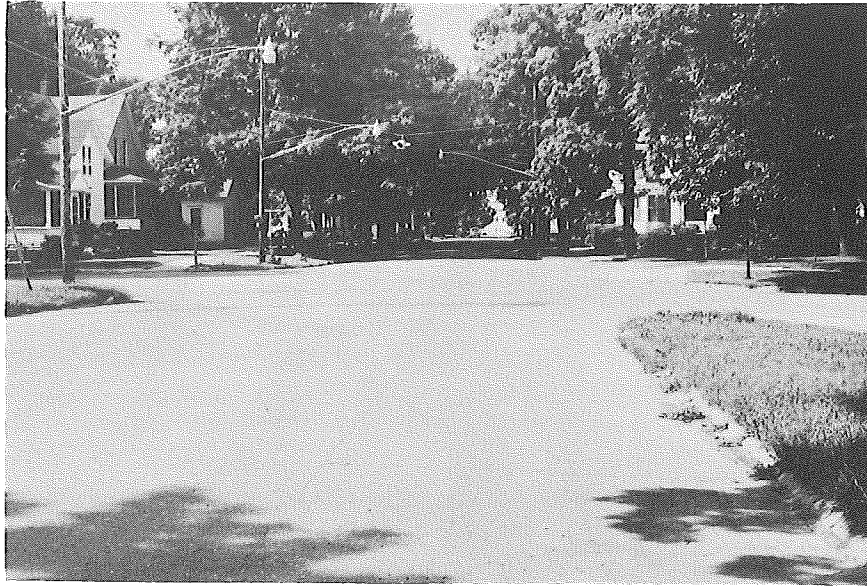


WESTBOUND
TELEGRAPH STREET

LIBRARY
michigan department of
state highways
LANSING



NORTHBOUND
OAK STREET



SOUTHBOUND
OAK STREET

LOCATION 5 FRONT STREET @ HIGH STREET (SEE APPENDIX I,
p. 68)

<u>Total</u>	<u>P.D.</u>	<u>Inj.</u>	<u>Fatal</u>
11	9	2	0

LOCATION 6 LOWE STREET AND JOHNSON STREET AT JEFFERSON
STREET AND POKAGON STREET

The four streets that comprise this location join together at right angles to form an offset intersection. Lowe Street and Johnson Street which provide north-south access are offset in relation to Jefferson Street and Pokagon Street which provide east-west access. Lowe Street has a 26 ft wide bituminous surface, Johnson Street an 18 ft wide bituminous surface and Jefferson and Pokagon both have 31 ft wide bituminous surfaces. Lowe Street is a major city street that serves the west side of the City of Dowagiac. The other three legs of the intersection are all required to stop, and this is indicated by 24 in. stop signs that are located on each corner.

There were nine accidents at this location during the study period. Four of the accidents were ran-off roadway, three were right angles and one was a left-turn accident. The single remaining accident occurred when a car hit an animal.

RECOMMENDATIONS:

It is recommended that a stop sign (R1-1-24, Appendix II, p. 88) and a stop ahead sign (W3-1-30, Appendix II, p. 91) be erected on Lowe Street at its approach to the intersection for southbound traffic. As a part of the installation of this stop control, it is recommended that the existing stop control for westbound Jefferson Street be eliminated. However, it is suggested that this change in stop control take place after a (30-day) transition period. During this period, both southbound and westbound traffic should be stopped. It is further recommended that a stop ahead sign (W3-1-30, Appendix II, p. 91) be erected on Pokagon Street for eastbound traffic. Additionally, the damaged stop sign (see photo, p. 42) located on Pokagon Street should be replaced with a new sign (R1-1-24) and relocated closer to the intersection. Also, the clear-vision areas should be maintained in the northeast and northwest quadrants of the intersection in order to provide adequate visibility for Lowe Street traffic entering the intersection.

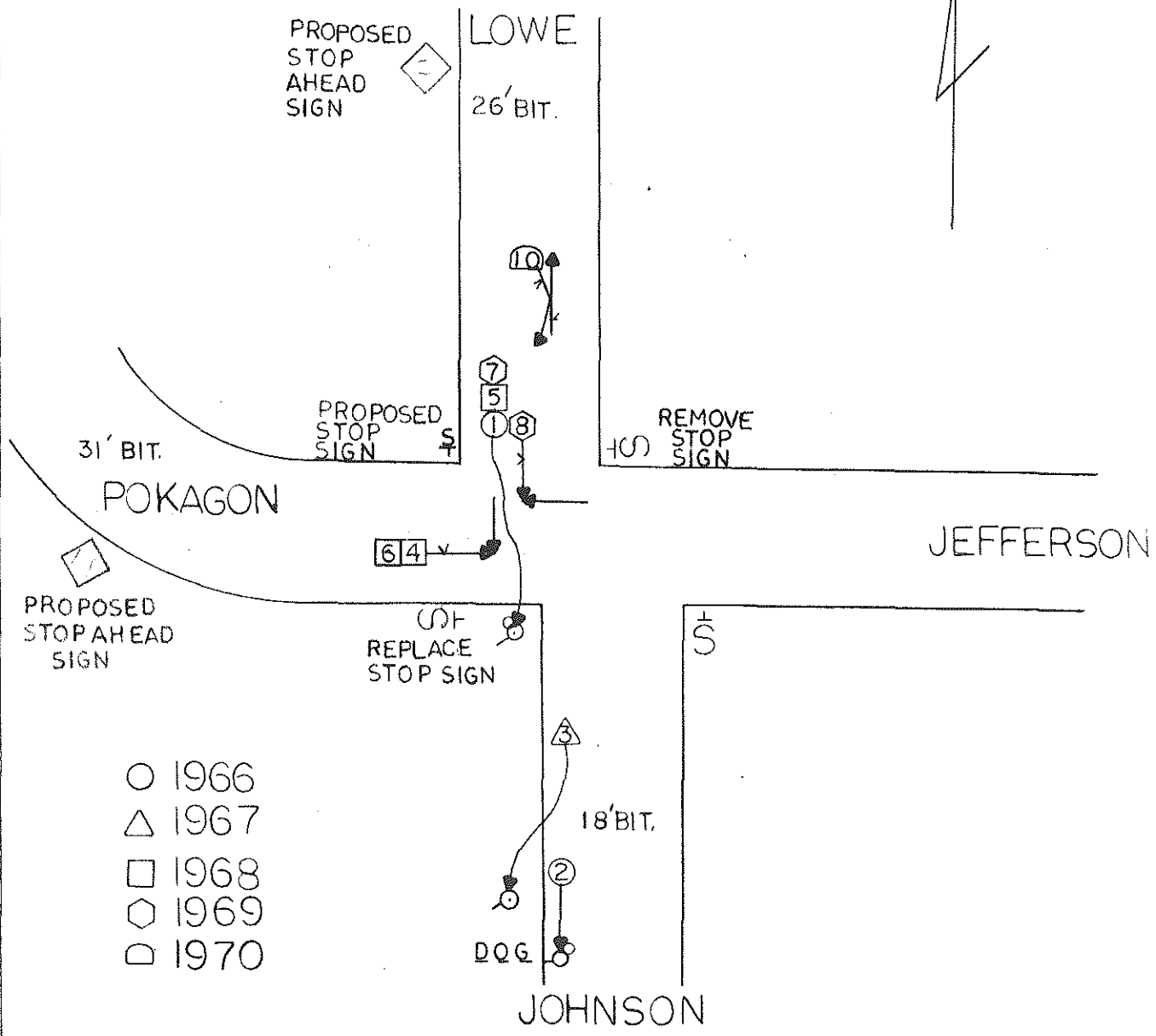
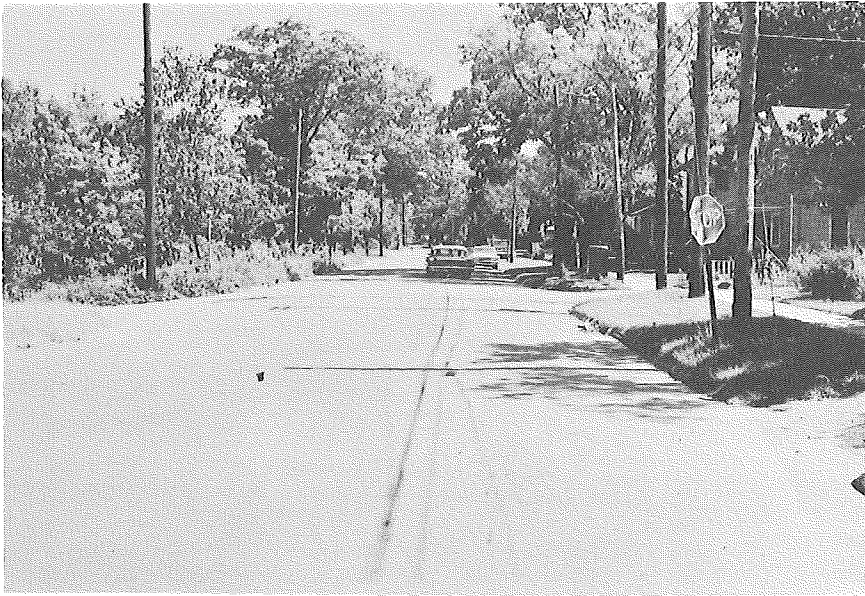


FIGURE 9

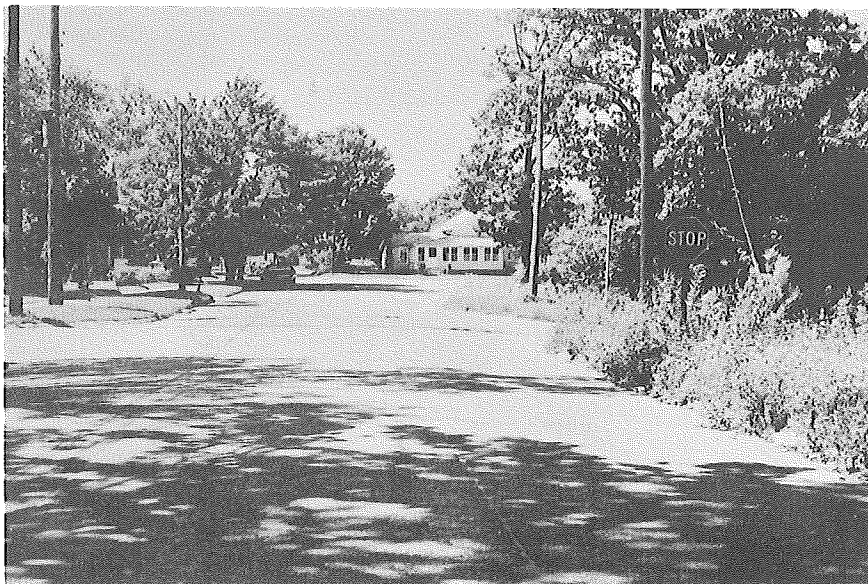
LEGEND		MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION	
Stop & Go Signal		Stop Sign	S
Flashing Beacon		Yield Sign	Y
Fatal		Pedestrian	
Injury		Tree	
Skidding		Out of Control	
Jackknife		Driver Intent	
Overtaken		Deer	
Backing		Violator	
		Location POKAGON AT JEFFERSON, JOHNSON, AND LOWE CITY OF DOWAGIAC CASS COUNTY	
		REV 11-22-71	
		Period: 1966 THRU 1970	
		Accidents - Total 10 P.D. 5	
		Injury 5 (7) Fatal 0 ()	
		C.S. _____ Miles _____ Drawn DJM	
		Plan No. LOCATION #6 Date 9-23-70	



EASTBOUND
POKAGON STREET



SOUTHBOUND
LOWE STREET



WESTBOUND
JEFFERSON AVENUE

FIGURE 9a

LOCATION 7 BEESON @ EAST AND WEST RAILROAD STREETS (SEE APPENDIX I, p. 70)

<u>Total</u>	<u>P.D.</u>	<u>Inj.</u>	<u>Fatal</u>
10	8	1	1

LOCATION 8 DIVISION STREET @ COMMERCIAL, MICHIGAN AND CENTER (SEE APPENDIX I, p. 73)

<u>Total</u>	<u>P.D.</u>	<u>Inj.</u>	<u>Fatal</u>
10	7	3	0

LOCATION 9 COMMERCIAL STREET AT NEW YORK STREET

The subject intersection is located in the Central Business District of the City of Dowagiac. Commercial Street and New York Street intersect at right angles. Commercial Street is a 40 ft wide bituminous roadway and New York Street is a 32 ft wide bituminous surface. Both streets have curb throughout this location.

The existing traffic controls consist of 24 in. stop signs for each direction of traffic on New York Street. The stop sign for northeastbound New York Street traffic is difficult to see because of its improper location (see photo, p. 46).

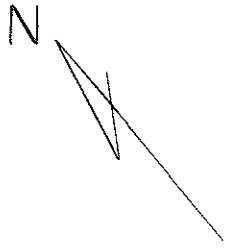
There were ten accidents at this location during the study period. Four of them were right angles. Four were sideswipes, one a rear-end and one a backing accident.

RECOMMENDATIONS:

It is recommended that parking on the south side of the west leg of Commercial Street be prohibited from the crosswalk west for a distance of 55 ft. It is also recommended that parking on both sides of the east leg of Commercial Street be prohibited easterly for an additional 25 ft.

It is further recommended that the existing yellow and black (nonstandard) stop sign on southwestbound New York Street (north leg of intersection) be replaced with a new sign (R1-1-24, Appendix II, p. 88). It is also recommended that the existing stop sign on the south leg of New York Street that is now located between two large trees be relocated so that it is in better view for northwestbound traffic. Additionally, it is recommended that pavement markings (centerline) be provided on all approaches to the intersection (see centerline markings, Appendix II, pp. 100 - 101).

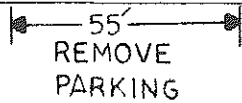
LIBRARY
michigan department of
state highways
LANSING



24' BIT.

REPLACE STOP SIGN S T

PROPOSED PAVT. MARKING,
COMMERCIAL ALL LEGS



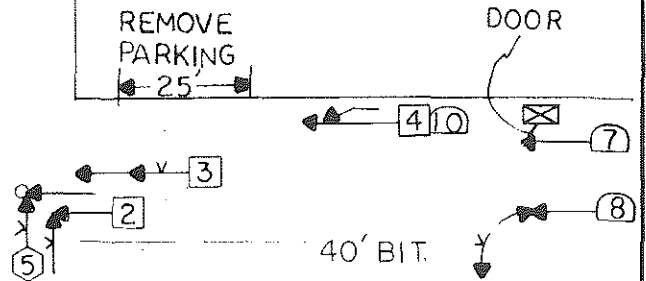
- 1966
- △ 1967
- 1968
- ◇ 1969
- ◇ 1970

NEW YORK

32' BIT.

REMOVE PARKING

DOOR

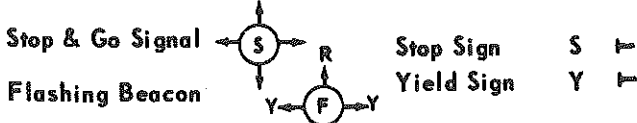


REMOVE PARKING
RELOCATE STOP SIGN FOR VISION

FIGURE 10

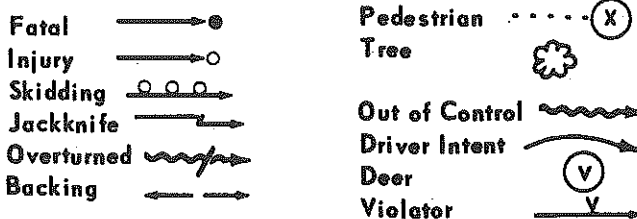
LEGEND

MICHIGAN DEPARTMENT OF STATE HIGHWAYS
TRAFFIC AND SAFETY DIVISION

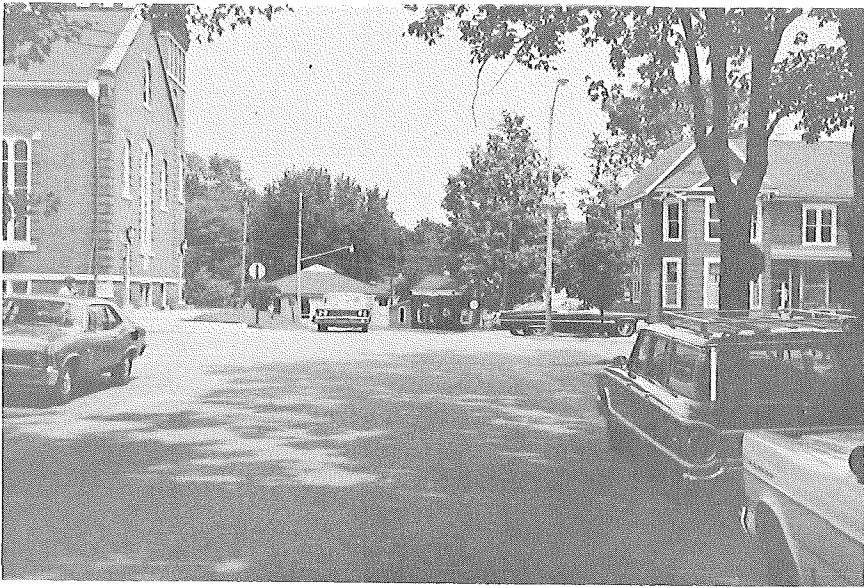


Location COMMERCIAL AT NEW YORK
CITY OF DOWAGIAC
CASS COUNTY

REV. 11-23-71



Period: 1966 THRU 1970
 Accidents - Total 10 P.D. 9
 Injury 1 (1) Fatal 0 ()
 C.S. _____ Miles _____ Drawn DJM.
 Plan No. LOCATION #9 Date 9-28-70



NORTHEASTBOUND
NEW YORK STREET



SOUTHEASTBOUND
COMMERCIAL STREET



SOUTHWESTBOUND
NEW YORK STREET

FIGURE 10a

LOCATION 10. TELEGRAPH STREET @ WEST RAILROAD STREET
(SEE APPENDIX I, p. 76)

<u>Total</u>	<u>P.D.</u>	<u>Inj.</u>	<u>Fatal</u>
8	5	3	0

LOCATION 11. COMMERCIAL STREET @ DEPOT STREET (SEE APPENDIX
I, p. 79)

<u>Total</u>	<u>P.D.</u>	<u>Inj.</u>	<u>Fatal</u>
9	7	2	0

LOCATION 12. PRAIRIE RONDE STREET @ EAST AND WEST RAIL-
ROAD STREET

The intersection of Prairie Ronde @ East and West Railroad Street is located in the northeast section of the City of Dowagiac. The intersection of Prairie Ronde and West Railroad Street forms a four-legged intersection while the intersection of Prairie Ronde and East Railroad Street forms a "T" intersection. Prairie Ronde is a major city street that provides east-west access. West Railroad which is a local city street and East Railroad which is a major city street both provide access in a northeast and southwest direction.

The traffic controls at these intersections consist of 24 in. stop signs on West Railroad Street for both directions of traffic and a 24 in. stop sign on East Railroad Street for northeastbound traffic. Other controls in the area are flashing beacons and automatic gates for the railroad crossing near the intersections.

There were a total of eleven accidents at this location during the study period 1966 through 1970. Three of the accidents involved vehicles hitting concrete abutments located in the center of Prairie Ronde Street. These concrete abutments have now been removed. The remaining accidents did not indicate the existence of an accident pattern and were property damage accidents only.

RECOMMENDATIONS:

We recommend that the existing stop signs located on the south leg of East Railroad and south leg of West Railroad Streets be replaced by new signs (R1-1-24, Appendix II, p. 88) because the existing stop signs have lost their reflectivity.

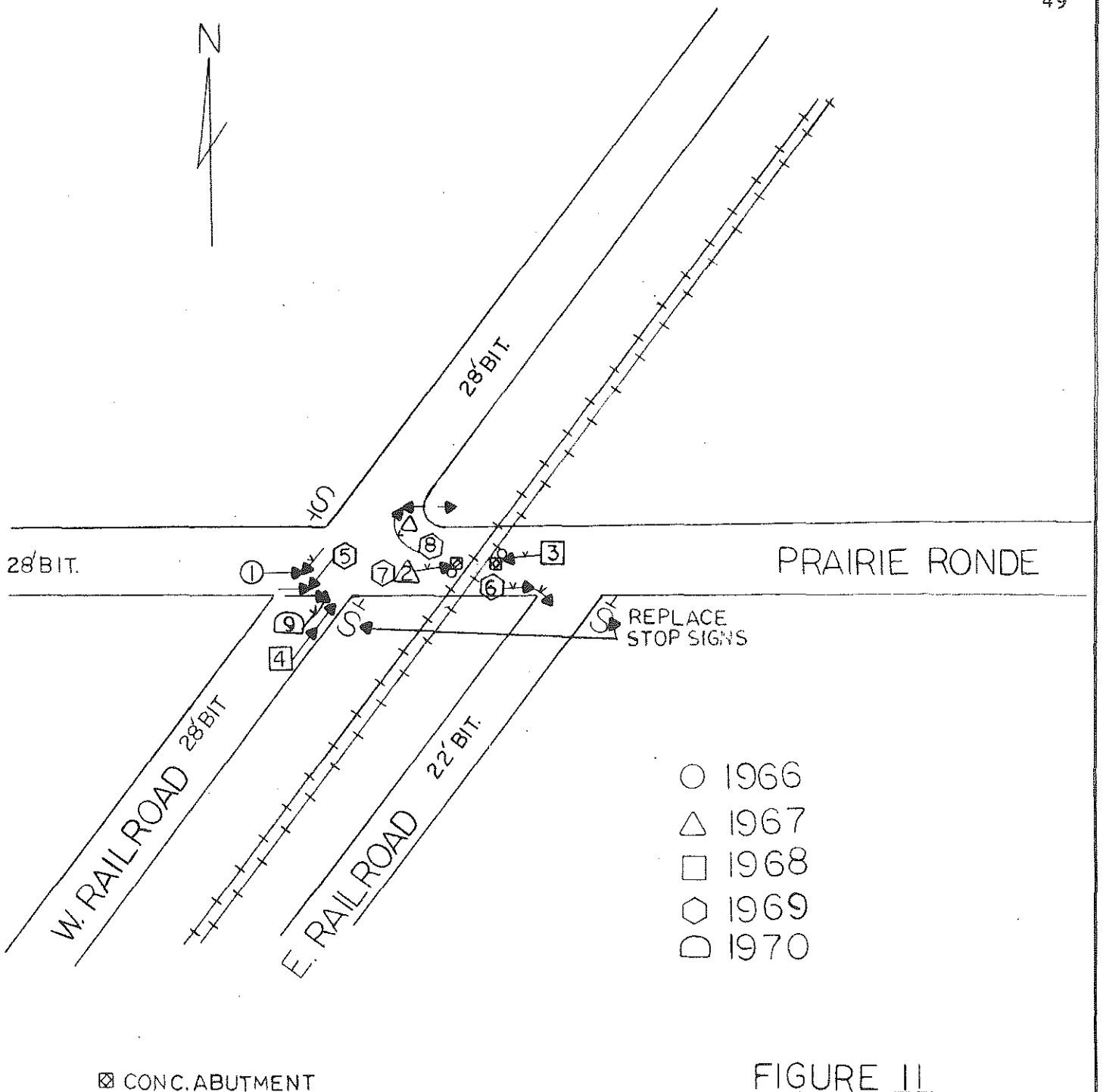


FIGURE 11

<p>LEGEND</p>	<p>MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION</p>
<p>Stop & Go Signal Stop Sign S T Flashing Beacon Yield Sign Y T</p>	<p>Location PRAIRIE RONDE AT E. RAILROAD AND W. RAILROAD CITY OF DOWAGIAC CASS COUNTY REV. 11-23-71</p>
<p>Fatal Injury Skidding Jackknife Overturned Backing Pedestrian Tree Out of Control Driver Intent Deer Violator </p>	<p>Period: 1966 THRU 1970 Accidents - Total <u>9</u> P.D. <u>6</u> Injury <u>3</u> (4) Fatal <u>0</u> () C.S. _____ Miles _____ Drawn <u>DJM</u> Plan No. <u>LOCATION #12</u> Date <u>9-1-70</u></p>



EASTBOUND
PRAIRIE RONDE STREET



EASTBOUND
PRAIRIE RONDE STREET

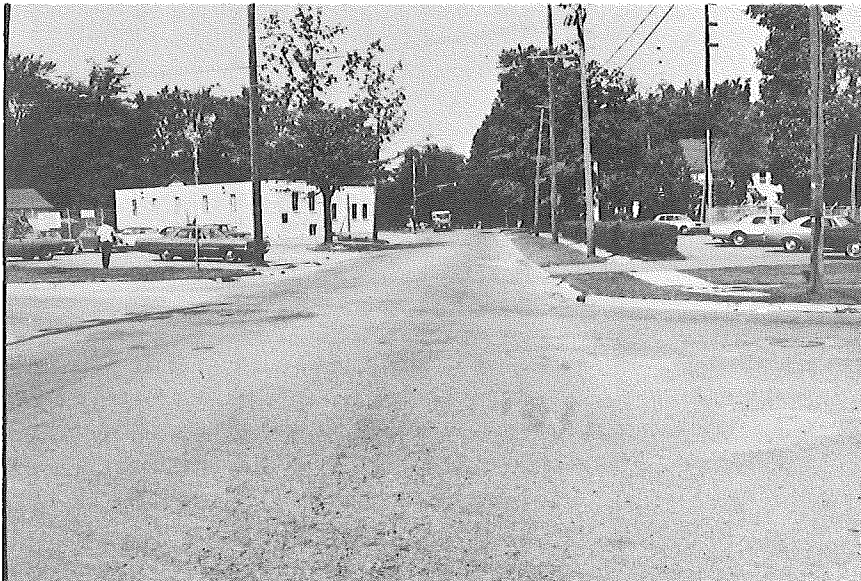


SOUTHBOUND
WEST RAILROAD STREET

FIGURE 11a



WESTBOUND
PRAIRIE RONDE STREET



WESTBOUND
PRAIRIE RONDE STREET



NORTHBOUND
EAST RAILROAD STREET

LOCATION 13 THICKSTUN STREET AT MILLER STREET (SEE APPENDIX I, p. 82)

<u>Total</u>	<u>P.D.</u>	<u>Inj.</u>	<u>Fatal</u>
4	2	2	0

LOCATION 14 RAILROAD STREET AT PARK PLACE (SEE APPENDIX I, p. 84)

<u>Total</u>	<u>P.D.</u>	<u>Inj.</u>	<u>Fatal</u>
4	2	1	1

LOCATION 15 PRAIRIE RONDE STREET AND MARCELLUS HIGHWAY @ COLBY STREET

Prairie Ronde Street intersects Colby Street at the northeast city limits. Colby Street which provides north-south access is offset to the west at its intersection with Prairie Ronde Street and is offset to the east at its intersection with Marcellus Highway. Colby Street is a 20 ft wide bituminous roadway with both legs under stop control. Prairie Ronde Street (west leg of intersection) is a 33 ft wide bituminous roadway with curb and gutter and Marcellus Highway (east leg of intersection) is a 22 ft wide bituminous roadway that has recently been resurfaced.

Traffic controls at this intersection consist of a 36 in. stop sign for each direction of traffic on Colby Street. There is also a 24 in. x 48 in. bi-directional target arrow in target position for northbound Colby Street traffic.

There were four accidents at this location during the study period 1966 through 1970. Two of the accidents were ran-off roadway, one a right angle and the remaining was a rear-end.

RECOMMENDATIONS:

Although the accident problem is not considered serious at this location, it is recommended that a W1-2-30 (Appendix II, p. 94) curve sign be erected for westbound traffic on Marcellus Highway in advance of the intersection.

It is also recommended that a W1-6-48 target arrow be erected in target position in the southeast quadrant of the intersection for eastbound traffic on Prairie Ronde Street.

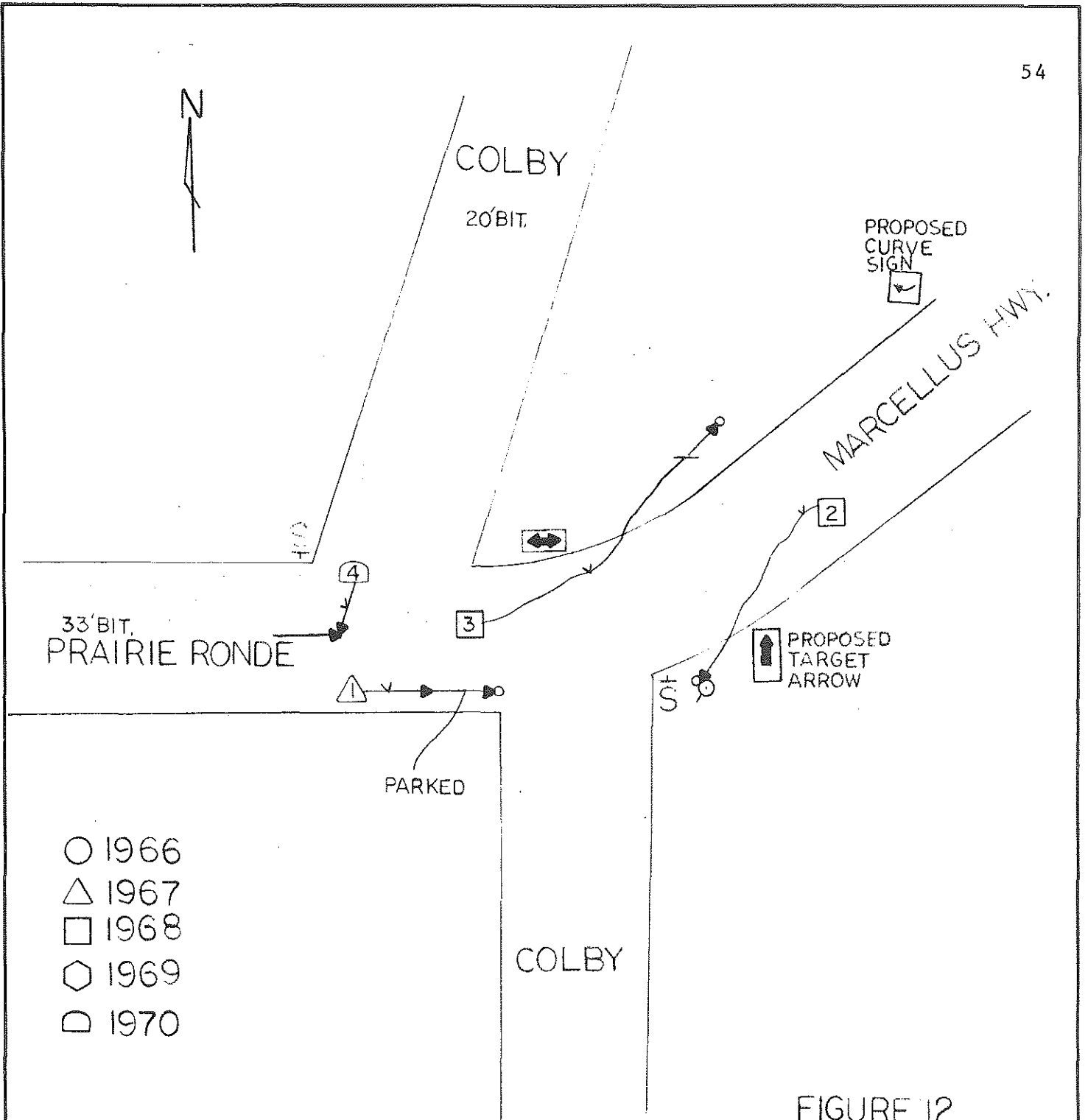
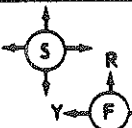









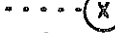





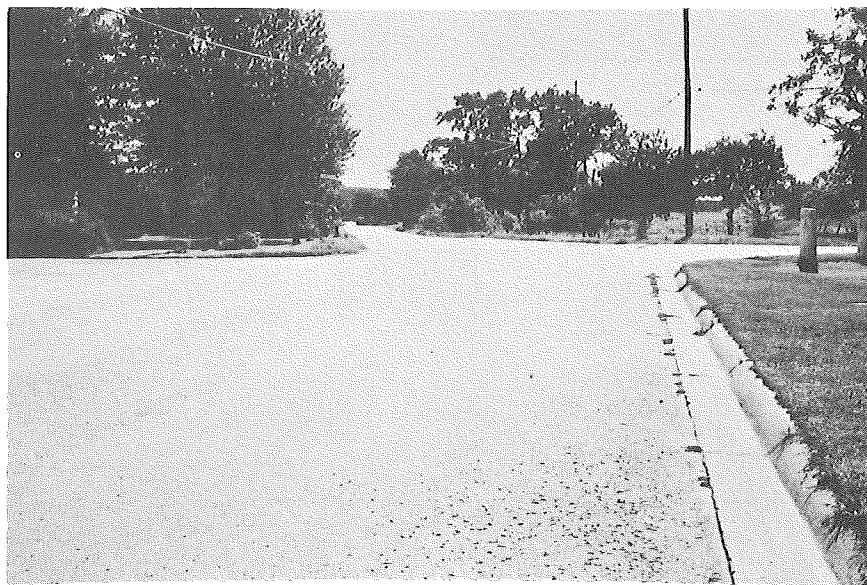


FIGURE 12

LEGEND		MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION	
Stop & Go Signal  Flashing Beacon 	Stop Sign S  Yield Sign Y 	Location PRAIRIE RONDE AT COLBY CITY OF DOWAGIAC CASS CO.	
Fatal  Injury  Skidding  Jackknife  Overturned  Backing 	Pedestrian  Tree  Out of Control  Driver Intent  Deer  Violator 	Period: 1966 THRU 1970 Accidents - Total 4 P.D. 1 Injury 3 (6) Fatal 0 () C.S. _____ Miles _____ Drawn DJM Plan No. LOCATION 15 Date 9-1-70	



EASTBOUND
PRAIRIE RONDE STREET



WESTBOUND
PRAIRIE RONDE STREET



NORTHBOUND
COLBY STREET



COLBY STREET

LOCATION 16 ELM STREET @ MADISON STREET

Elm and Madison are local streets serving a residential area in the northwest section of the City of Dowagiac. They intersect approximately at right angles. Both roads have 20 ft wide bituminous surfaces (seal coat). There are no traffic controls present at this location.

There were three accidents reported for this location during the study period (1966 through 1970). These three accidents involved southbound Elm and eastbound Madison Street traffic. A search for the cause of these accidents revealed that a major factor in their occurrence was the severe vision obstruction (one-story frame house) located in the northwest quadrant of the intersection.

RECOMMENDATION:

The solution to the problem at this location is the removal of the vision obstruction. However, since the accident frequency at this location cannot be considered critical and since the cost of removing the vision obstruction would be prohibitive, the following alternate solution is recommended-- that a yield sign (R1-2-36, Appendix II, p. 89) be erected for each direction of traffic on Madison Street. The assignment of right of way at this location will help prevent future angle accidents. Prevention of future angle accidents is

especially important at this location because of the school buses that regularly cross this intersection. This recommendation is being made because all of the accidents occurring at this location are of the type that an assignment of right-of-way yield sign might improve.

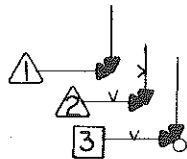
N



20' BIT.

PROPOSED YIELD SIGN

20' BIT.



MADISON

PROPOSED YIELD SIGN

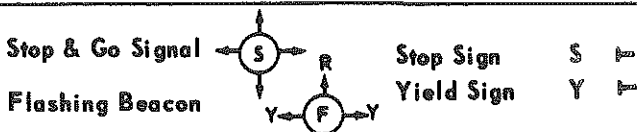
ELM

- 1966 ○
- 1967 △
- 1968 □
- 1969 ◊
- 1970 ◻

FIGURE 13

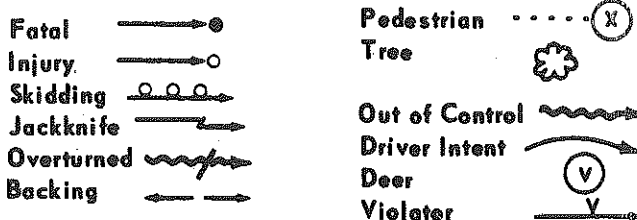
LEGEND

MICHIGAN DEPARTMENT OF STATE HIGHWAYS
TRAFFIC AND SAFETY DIVISION



Location ELM AT MADISON
CITY OF DOWAGIAC
CASS COUNTY

REV. 11-23-71



Period: 1966 THRU 1970
 Accidents - Total 3 P.D. 2
 Injury 1 (1) Fatal 0 ()
 C.S. _____ Miles _____ Drawn D.J.M.
 Plan No. LOCATION "16 Date 9-1-70



EASTBOUND
MADISON STREET



NORTHBOUND
ELM STREET



WESTBOUND
MADISON STREET

LIBRARY
michigan department of
state highways
LANSING

LOCATION 17 FIRST STREET AND PARIS STREET

First and Paris are local streets serving a residential area in the southwest section of the City of Dowagiac. These two streets intersect to form a "T" intersection. Both Paris and First Streets have 18 ft wide bituminous pavements. The only traffic control present at this location is a 24 in. x 24 in. nonstandard diamond shaped bi-directional target arrow that is located in target position for southbound Paris Street.

There were three accidents at this location during the study period 1966 through 1970. This total included two angle accidents and one rear-end.

RECOMMENDATIONS:

We believe that some type of traffic control assigning right of way should be present at this location although the accident frequency and the traffic volumes are not high. Therefore, it is recommended that a yield sign (R1-2-36, Appendix II, p. 89) be erected on Paris Street at its approach to First Street for southbound traffic. It is also recommended that the nonstandard bi-directional target arrow be replaced with a new sign (W1-7-48, see Appendix II, p. 97).

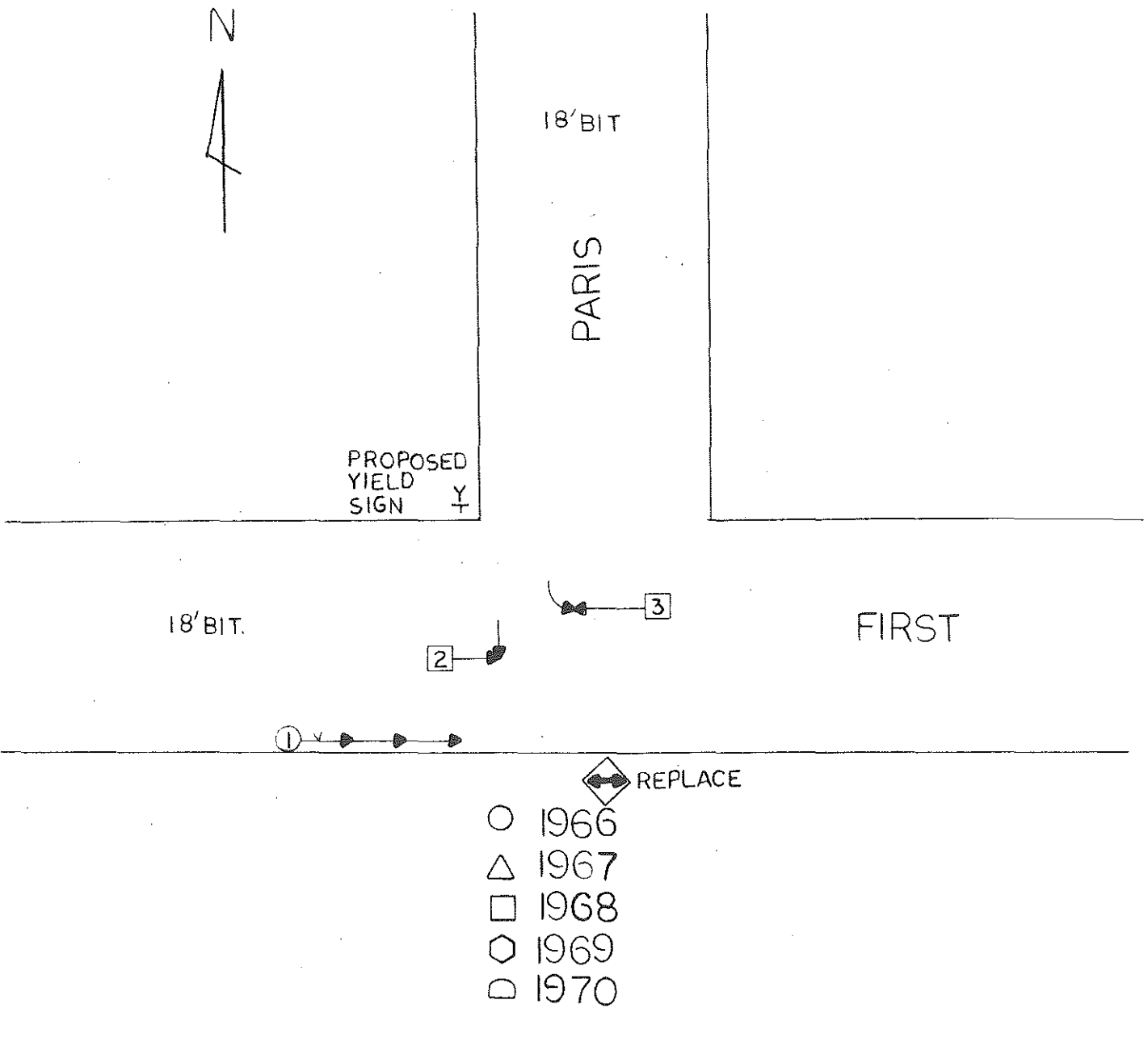
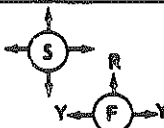















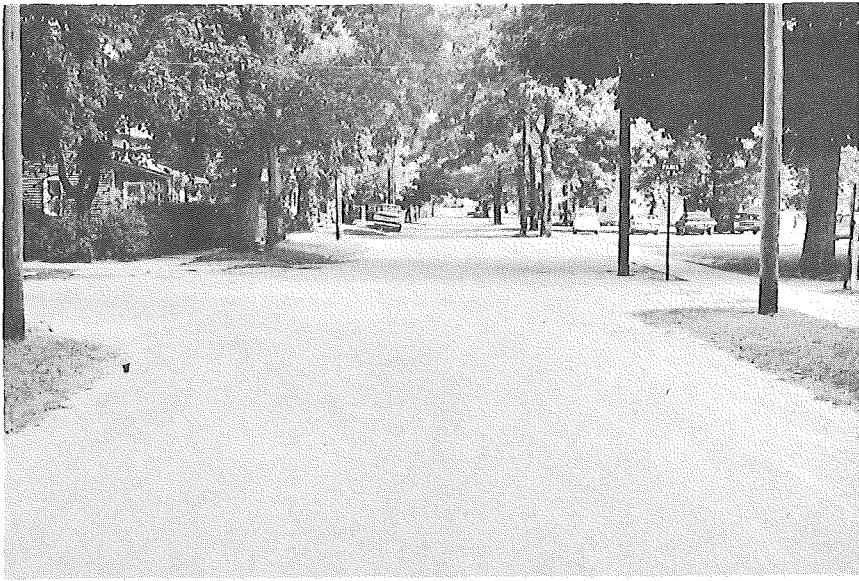


FIGURE 14

LEGEND		MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION	
Stop & Go Signal 	Stop Sign S 	Location FIRST AT PARIS CITY OF DOWAGIAC CASS COUNTY	REV 11-23-71
Flashing Beacon 	Yield Sign Y 	Period: 1966 THRU 1970	Accidents - Total <u>3</u> P.D. <u>3</u>
Fatal 	Pedestrian 	Injury 	Injury <u>0</u> () Fatal <u>0</u> ()
Skidding 	Tree 	Jackknife 	C.S. _____ Miles _____ Drawn <u>DJM</u>
Overturned 	Out of Control 	Backing 	Plan No. <u>LOCATION 17</u> Date <u>9-28-70</u>
Driver Intent 	Deer 	Violator 	



EASTBOUND
FIRST STREET



SOUTHBOUND
PARIS AVENUE



WESTBOUND
FIRST STREET

SUMMARY

The Michigan Department of State Police submitted 17 high accident locations for the City of Dowagiac to the Michigan Department of State Highways. After an indepth study of these locations, recommendations were formulated for ten of them. The locations and their recommendations are as follows:

<u>Location Number</u>	<u>Location Description</u>	<u>Quantity</u>	<u>Recommendations</u>
1	Commercial Street at Pennsylvania Street	1	(R1-1-24) and Parking Prohibition
2	Prairie Ronde @ Middle Crossing Street, Lowe Street and Green Street	2	(W3-1-36)
3	West Prairie Ronde Street @ Hastings Street	2 2	(W1-1-30) (W1-6-48) Pavement Markings
4	Oak Street @ James and Telegraph Streets	3 1 1	(R1-1-24) (S1-1, 30 x 30) Signal Head
5	Front Street @ High Street		None
6	Lowe Street and Johnson Street @ Jefferson Street and Pokagon Street	2 2 2	(R1-1-24) (W3-1-30) Clear Vision Corners in Northeast and Northwest Quadrants
7	Beeson Street @ Railroad Street		None
8	Division Street @ Commercial, Michigan and Center Streets		None

<u>Location Number</u>	<u>Location Description</u>	<u>Quantity</u>	<u>Recommendations</u>
9	Commercial Street @ New York Street	1	(R1-1-24) Pavement Markings (Center-line) Parking Prohibition
10	Telegraph Street @ West Railroad Street		None
11	Commercial Street @ Depot Street		None
12	Prairie Ronde Street @ East and West Railroad Streets	2	(R1-1-24)
13	Thickstun Street @ Miller Street		None
14	Railroad Street @ Park Place		None
15	Prairie Ronde Street and Marcellus Highway @ Colby Street	1 1	(W1-2-30) (W1-6-48)
16	Elm Street @ Madison Street	2	(R1-2-36)
17	First Street @ Paris Street	1 1	(W1-7-48) (R1-2-36)
		TOTALS 10	(R1-1-24)
		2	(W1-1-30)
		2	(W3-1-30)
		2	(W3-1-36)
		3	(W1-6-48)
		1	(W1-2-30)
		3	(R1-2-36)
		1	(W1-7-48)
		1	(S1-1, 30 x 30)
		1	Signal Head (Flasher)
			Paint for Pavement Markings
			R.O.W. for Clear Vision

Furthermore, recommendations were formulated that should be implemented at all locations throughout the City of Dowagiac. These recommendations are as follows:

1. All parking stalls should be located a minimum distance of 20 ft from a crosswalk, or if none, then a minimum of 15 ft from the intersection of property lines at an intersection of highways.
2. A citywide maintenance program be undertaken to keep trees, shrubs and other growth from obscuring clear vision at intersections.

APPENDIX I

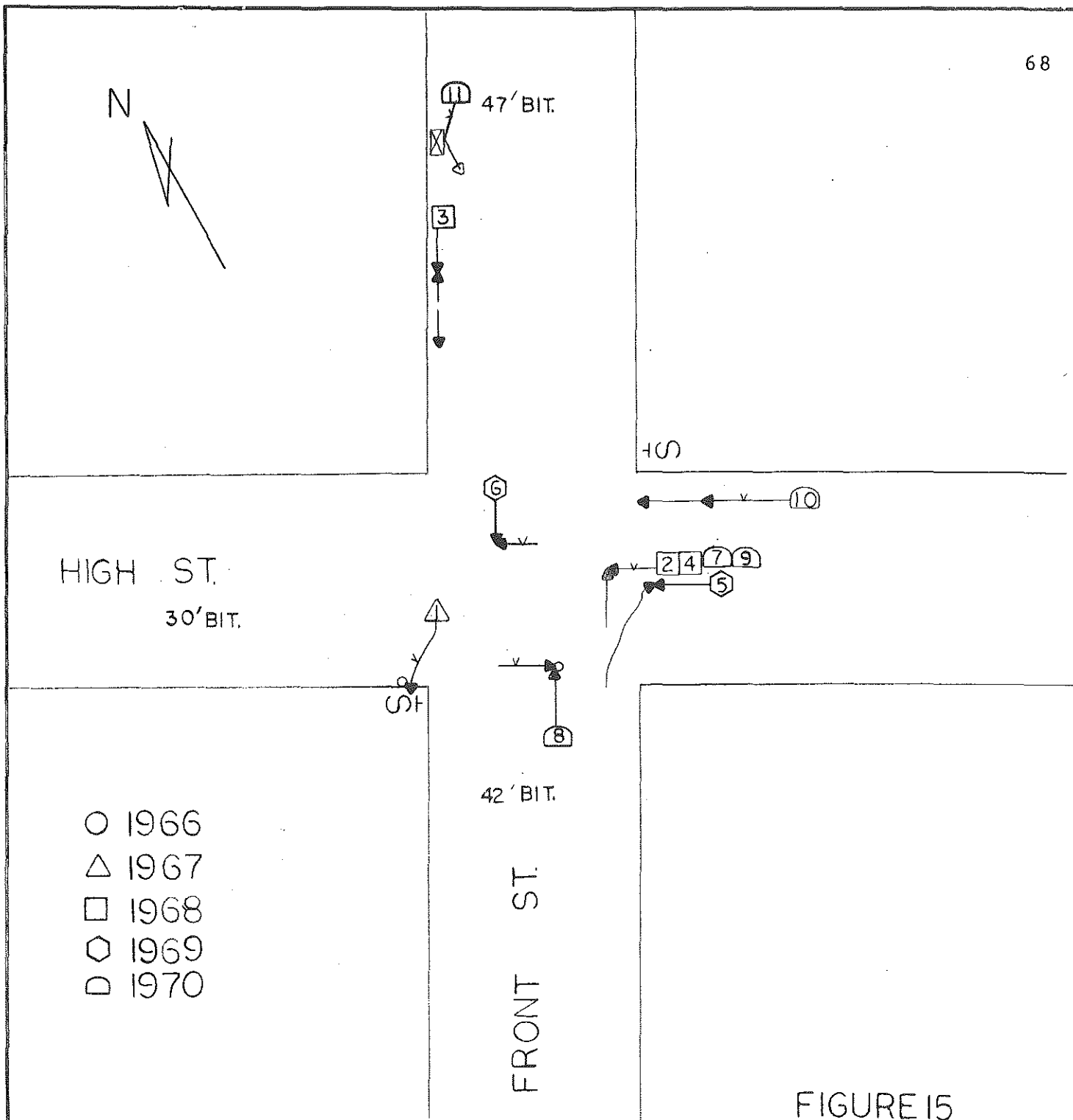
















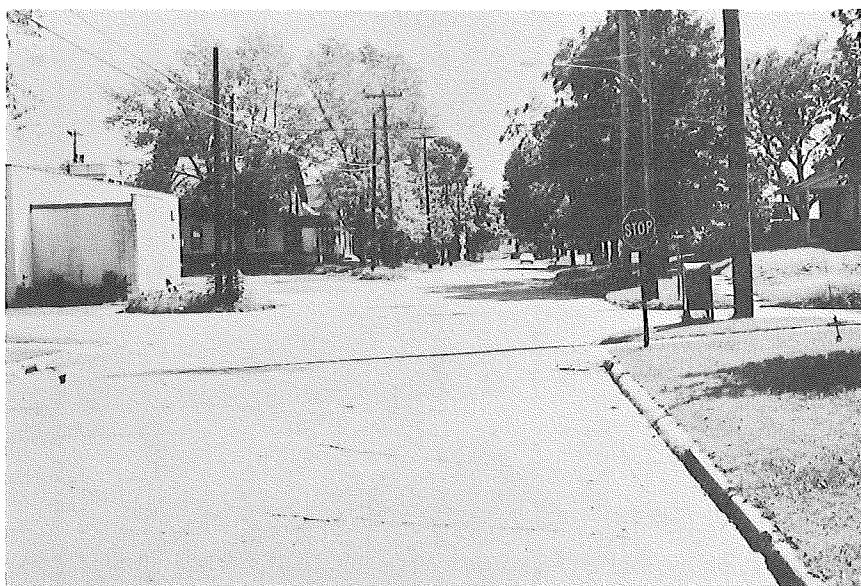


FIGURE 15

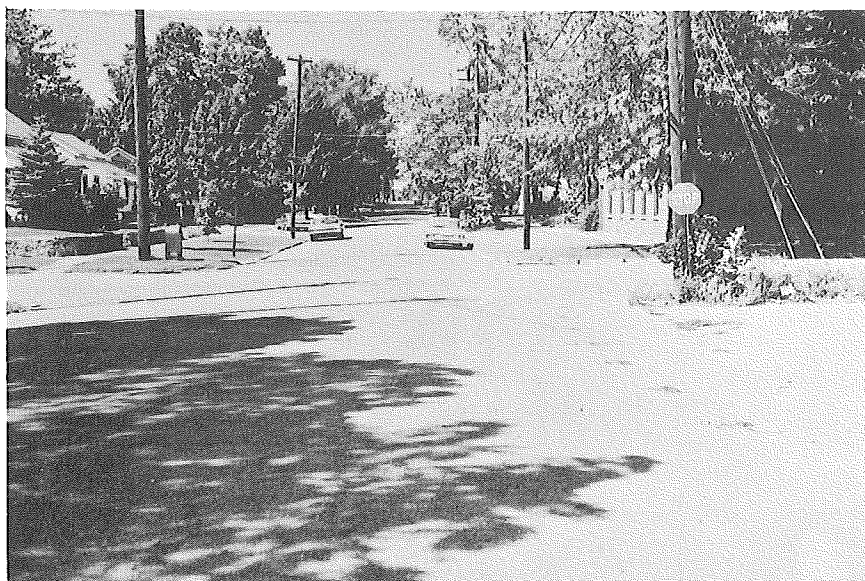
LEGEND		MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION	
Stop & Go Signal  Flashing Beacon 	Stop Sign  Yield Sign 	Location HIGH ST. AT FRONT ST. CITY OF DOWAGIAC CASS COUNTY	
Fatal  Injury  Skidding  Jackknife  Overturned  Backing 	Pedestrian  Tree  Out of Control  Driver Intent  Deer  Violator 	Period: 1966 THRU 1970 Accidents - Total <u>11</u> P.D. <u>9</u> Injury <u>2</u> (2) Fatal <u>0</u> () C.S. _____ Miles _____ Drawn <u>DJM</u> Plan No. <u>LOCATION #5</u> Date <u>9-23-70</u>	



EASTBOUND
HIGH STREET



SOUTHBOUND
FRONT STREET



WESTBOUND
HIGH STREET

FIGURE 15a

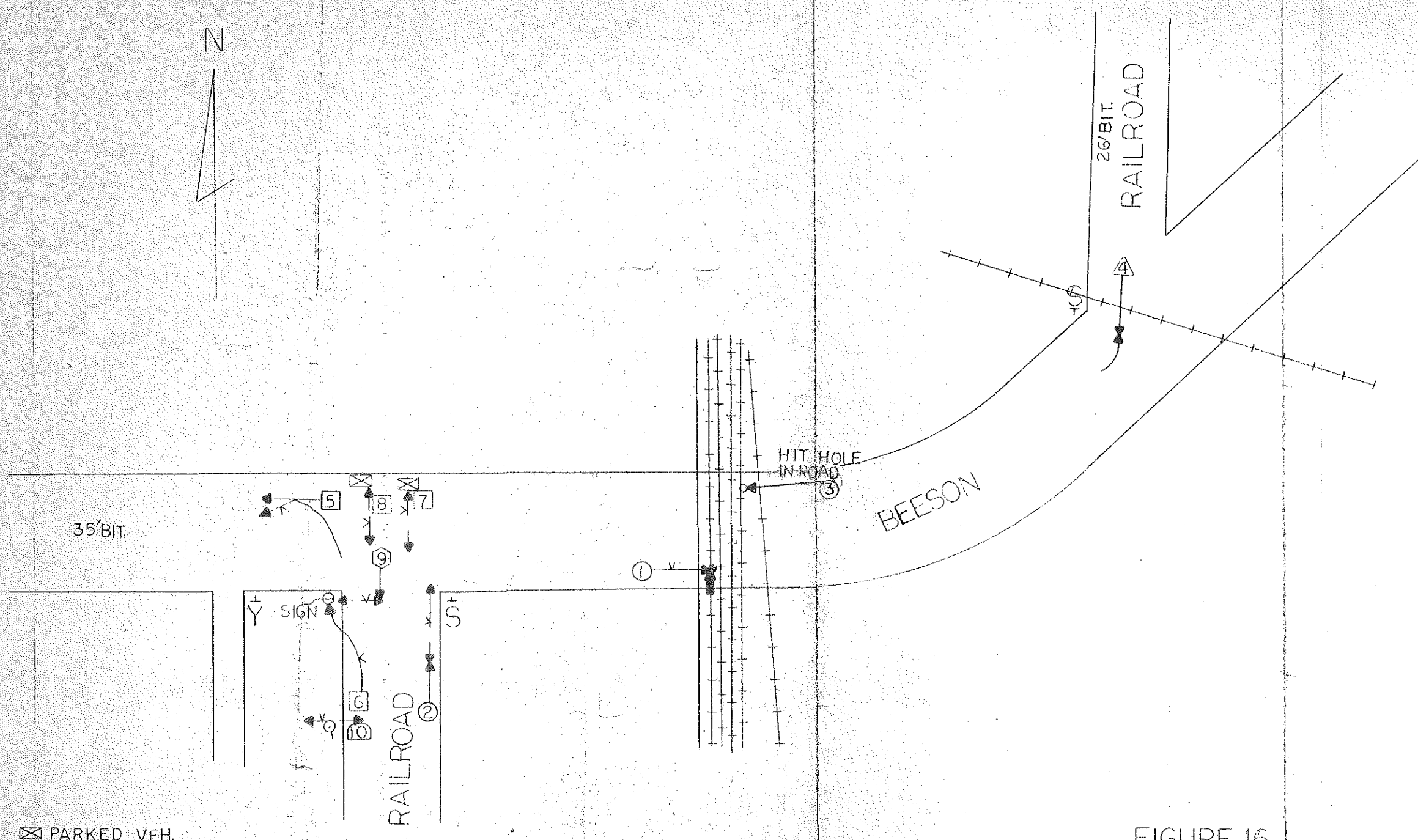


FIGURE 16

REMARKS

- 1966
- △ 1967
- 1968
- ⊙ 1969
- ◻ 1970

LEGEND

Stop & Go Signal		Stop Sign	
Flashing Beacon		Yield Sign	
Fatal		Pedestrian	
Injury		Tree	
Skidding		Out of Control	
Jackknife		Driver Intent	
Overturned		Deer	
Backing		Violator	

ACCIDENT STUDY COLLISION DIAGRAM

Period: 1966 THRU 1969

Accidents - Total 10

P.D. 8

Injury 1 (1)

Fatal 1 (2)

ADT _____
 Rate _____ /100 mvm
 Rate _____ / mv

MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION

Location BEESON AT RAILROAD
CITY OF DOWAGIAC,
CASS COUNTY

REV. 11-23-71

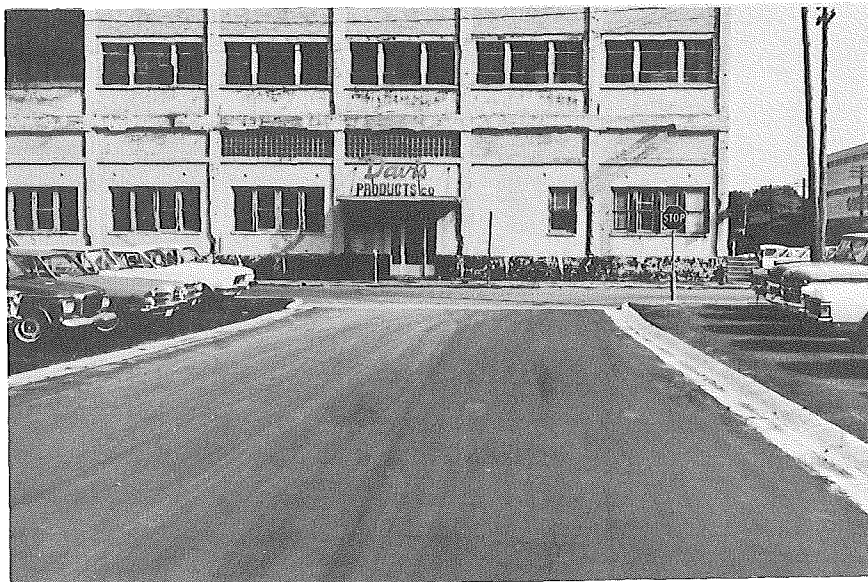
C.S. _____ Miles _____
 Drawn DJM Date 9-29-70
 Plan No. LOCATION #7



EASTBOUND
BEESON STREET



EASTBOUND
BEESON STREET



NORTHBOUND
RAILROAD STREET
(West Junction)



WESTBOUND
BEESON STREET



WESTBOUND
BEESON STREET



WESTBOUND
BEESON STREET

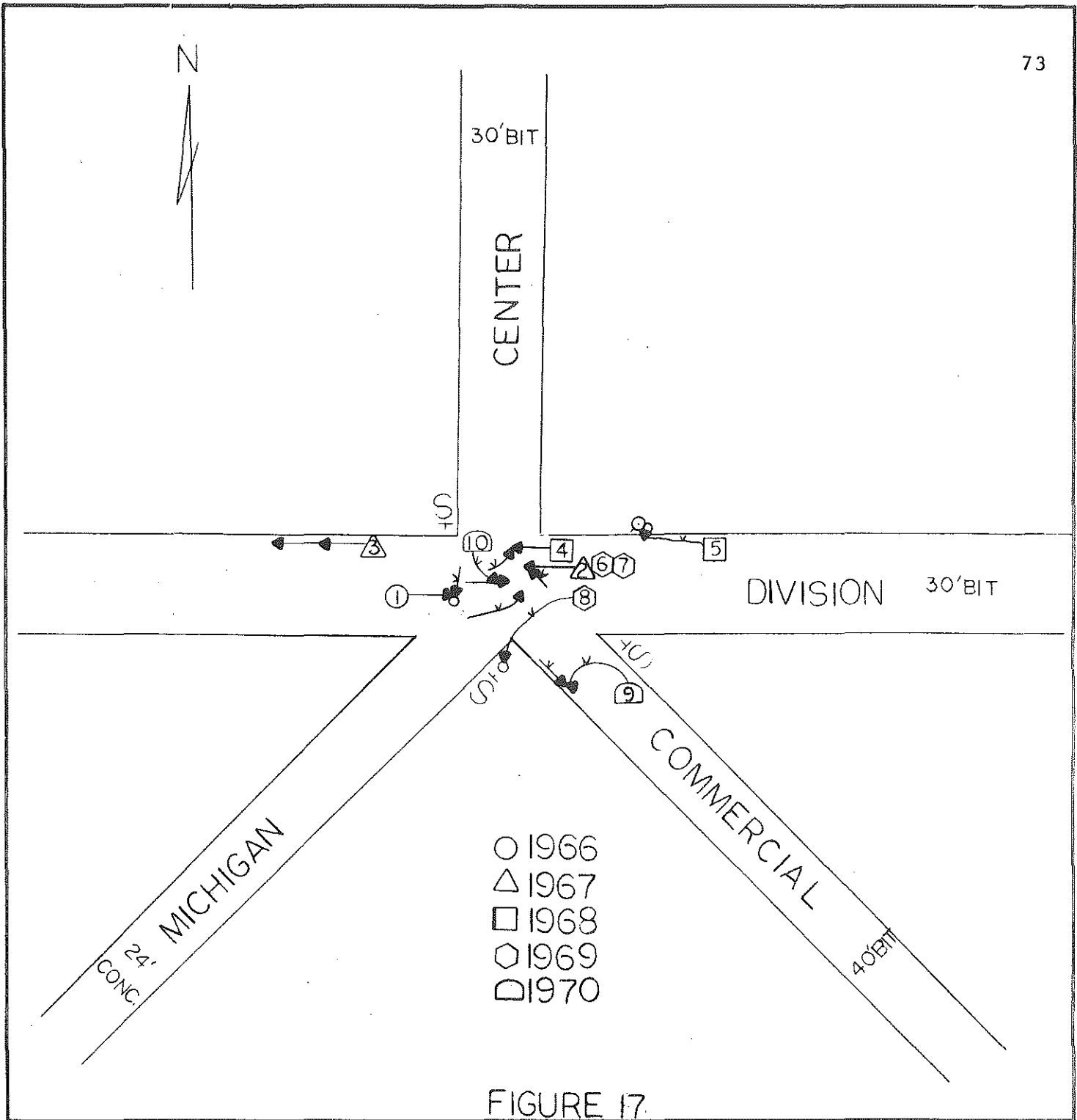


FIGURE 17

LEGEND		MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION	
Stop & Go Signal	Stop Sign	Yield Sign	Location COMMERCIAL, MICHIGAN AND CENTER AT DIVISION CITY OF DOWAGIAC CASS COUNTY
Flashing Beacon	Stop Sign	Yield Sign	REV. 11-23-71
Fatal	Pedestrian	Tree	Period: 1966 THRU 1970
Injury	Out of Control	Driver Intent	Accidents - Total 10 P.D. 7
Skidding	Deer	Violator	Injury 3 (5) Fatal 0 ()
Jackknife			C.S. _____ Miles _____ Drawn DJM
Overturned			Plan No. LOCATION # 8 Date 9-28-70
Backing			



NORTHBOUND
MICHIGAN STREET



NORTHBOUND
COMMERCIAL STREET



SOUTHBOUND
CENTER STREET



EASTBOUND
DIVISION STREET



WESTBOUND
DIVISION STREET



SOUTHBOUND
COMMERCIAL STREET

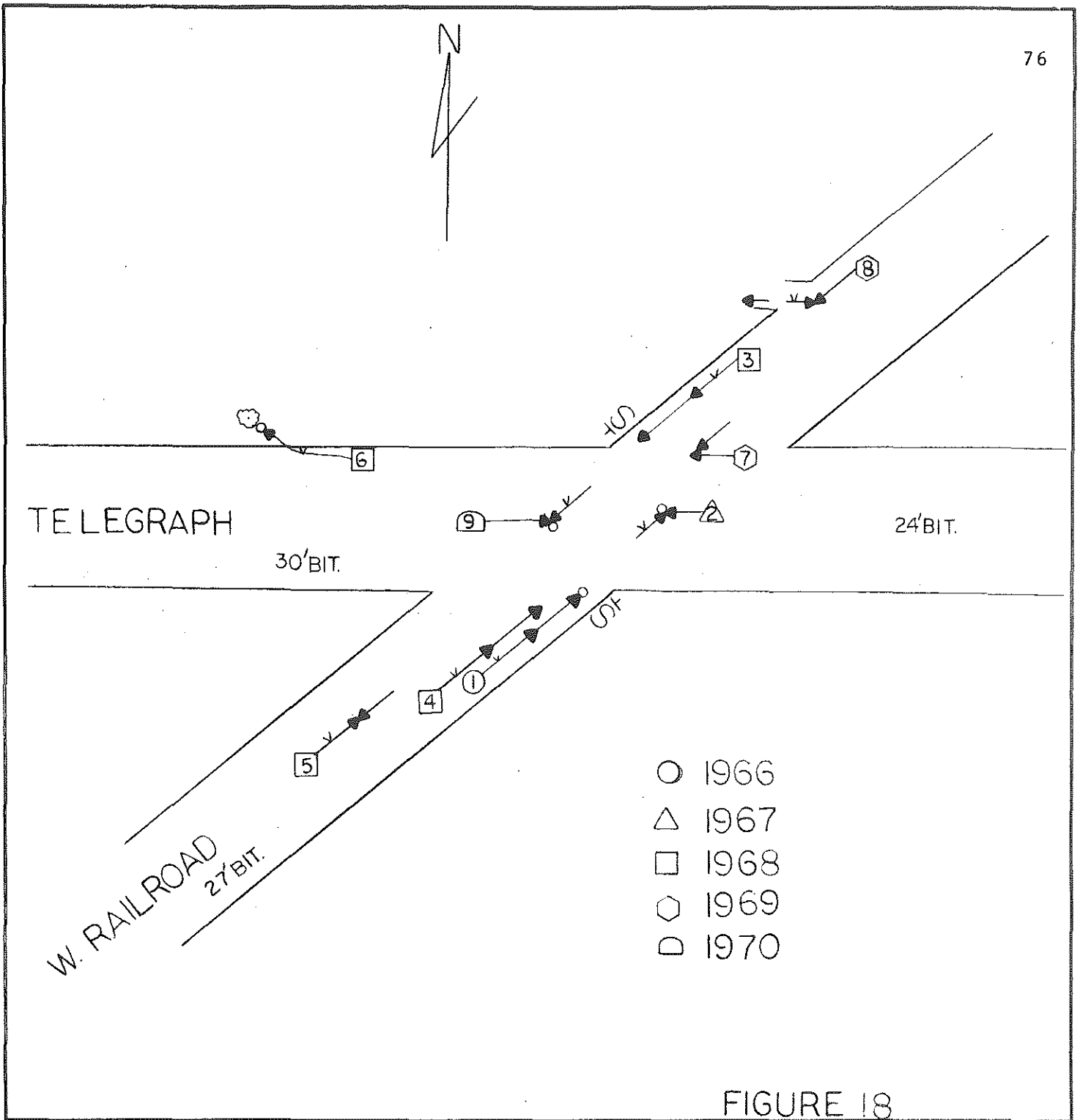


FIGURE 18

<p>LEGEND</p>	<p>MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION</p>
<p>Stop & Go Signal Stop Sign S T Flashing Beacon Yield Sign Y </p>	<p>Location TELEGRAPH AT W. RAILROAD CITY OF DOWAGIAC CASS COUNTY REV. 11-23-71</p>
<p>Fatal Pedestrian X Injury Tree Skidding Out of Control Jackknife Driver Intent V Overturned Deer V Backing Violator V</p>	<p>Period: 1966 THRU 1970 Accidents - Total <u>9</u> P.D. <u>5</u> Injury <u>4</u> (7) Fatal <u>0</u> () C.S. _____ Miles _____ Drawn <u>DJM</u> Plan No. <u>LOCATION #10</u> Date <u>9-1-70</u></p>



NORTHBOUND
RAILROAD STREET



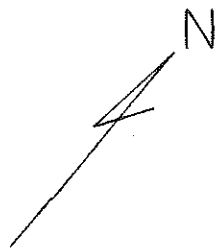
SOUTHBOUND
RAILROAD STREET



EASTBOUND
TELEGRAPH STREET



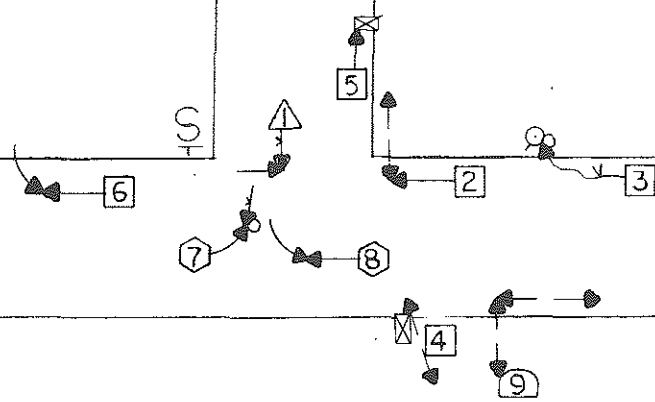
WESTBOUND
TELEGRAPH STREET



COMMERCIAL

- 1966
- △ 1967
- 1968
- ◇ 1969
- ◻ 1970

DEPOT



NOTE: DEPOT STREET WAS RECONSTRUCTED IN THE SUMMER OF 1970 SEE PHOTO FOLLOWING PAGE.

☒ PARKED VEH.

FIGURE 19

LEGEND		MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION	
Stop & Go Signal Flashing Beacon	Stop Sign Yield Sign	Stop Sign Yield Sign	Location COMMERCIAL AT DEPOT CITY OF DOWAGIAC CASS COUNTY REV 11-23-71
Fatal Injury Skidding Jackknife Overturned Backing	Pedestrian Tree Out of Control Driver Intent Deer Violator	Period: 1966 THRU 1970 Accidents - Total <u>9</u> P.D. <u>7</u> Injury <u>2</u> (4) Fatal <u>0</u> () C.S. _____ Miles _____ Drawn <u>DJM</u> Plan No. <u>LOCATION #11</u> Date <u>9-5-70</u>	



NORTHBOUND
RAILROAD STREET (DEPOT STREET)



SOUTHBOUND
RAILROAD STREET (DEPOT STREET)



EASTBOUND
COMMERCIAL STREET



EASTBOUND
COMMERCIAL STREET

THICKSTUN

MILLER

18' BIT.

18' BIT.

- 1966
- △ 1967
- 1968
- ◇ 1969
- ◇ 1970

☒ PARKED VEH.

FIGURE 20

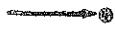










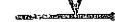
LEGEND

MICHIGAN DEPARTMENT OF STATE HIGHWAYS
TRAFFIC AND SAFETY DIVISION

Stop & Go Signal  Stop Sign **S** 
 Flashing Beacon  Yield Sign **Y** 

Location THICKSTUN AT MILLER
CITY OF DOWAGIAC
CASS COUNTY

REV 11-23-71

Fatal  Pedestrian 
 Injury  Tree 
 Skidding  Out of Control 
 Jackknife  Driver Intent 
 Overturned  Deer 
 Backing  Violator 

Period: 1966 THRU 1970
 Accidents - Total 4 P.D. 2
 Injury 2 (2) Fatal 0 ()
 C.S. _____ Miles _____ Drawn DJM
 Plan No. LOCATION #13 Date 9-23-70



WESTBOUND
MILLER STREET



SOUTHBOUND
THICKSTUN STREET



EASTBOUND
MILLER STREET



RAILROAD

2 1/2 BIT.

PARK PLACE

30' BIT.

SIGNAL SHACK

NYCRR

- 1966
- △ 1967
- 1968
- ⬡ 1969
- ◐ 1970

FIGURE 21

LEGEND		MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC AND SAFETY DIVISION	
Stop & Go Signal Flashing Beacon	Stop Sign Yield Sign	Location RAILROAD AT PARKPLACE CITY OF DOWAGIAC CASS COUNTY	
		REV. 11-23-71	
Fatal Injury Skidding Jackknife Overturned Backing	Pedestrian Tree Out of Control Driver Intent Deer Violator	Period: 1966 THRU 1970 Accidents - Total <u>4</u> P.D. <u>2</u> Injury <u>1</u> (1) Fatal <u>1</u> (1) C.S. _____ Miles _____ Drawn <u>DJM</u> Plan No. <u>LOCATION #14</u> Date <u>9-22-70</u>	



WESTBOUND
PARK PLACE



SOUTHBOUND
RAILROAD STREET



EASTBOUND
PARK PLACE

APPENDIX II

Section B. Regulatory Signs

Regulatory Signs shall be used to inform highway users of traffic laws or regulations that apply at given places or on given highways. They are essential to indicate the applicability of legal requirements that would not otherwise be apparent. Great care must be exercised to see that they are erected wherever needed to fulfill this purpose, but unnecessary mandates should be avoided.

Included among regulatory signs are some, like those marking the end of a restricted zone, that are related to operational controls though not in themselves imposing any obligations or prohibitions.

Regulatory signs shall be erected at those locations where the regulations apply and shall be mounted so as to be easily visible and legible to the motorist whose actions they are to govern. Signs that have been erected but are no longer applicable shall be removed. Regulatory signs cannot be expected to command respect and obedience unless the regulations thereon set forth are adequately enforced.

Regulatory signs are classified in the following groups:

- | | | |
|-----|-----------------|-------------|
| (1) | Right-of-Way | (R1 Series) |
| | a. "STOP" Sign | |
| | b. "YIELD" Sign | |
| (2) | Speed | (R2 Series) |
| (3) | Movement | (R3 Series) |
| | a. Turning | |
| | b. Alignment | |
| | c. One Way | |
| | d. Exclusion | |
| (4) | Parking | (R4 Series) |
| (5) | Pedestrian | (R5 Series) |
| (6) | Miscellaneous | (R6 Series) |

With few exceptions, hereinafter detailed in the specifications for individual signs, regulatory signs are rectangular in shape with the larger dimension vertical and have black legends on white backgrounds. The principal exceptions referred to are the "STOP" sign, the Yield sign, the One Way arrow, and the Parking signs.

STOP SIGN



Reflectorized

R1-1-24	24" x 24"	(8" letters)
R1-1-30	30" x 30"	(12" letters)
R1-1-36	36" x 36"	(12" letters)

All "STOP" signs shall be reflectorized or internally illuminated so that the shape, color, and legend will be comparable to that in day time conditions and will not produce detrimental glare to traffic.

The "STOP" sign may be supplemented by two alternating red flashing beacons in the face or by one red flashing beacon directly above the sign. Such beacon(s) shall be operated continuously.

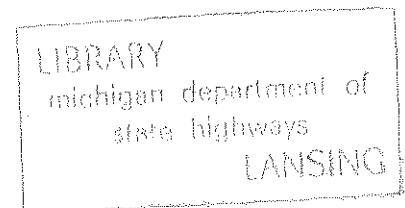
Place at the point where it is desired to have traffic stop, or as near thereto as possible at the following locations:

1. On streets or highways intersecting a through street or highway.
2. Railroad crossing where a stop is required by order of the appropriate public authority.
3. Opposite all Stop lines applied on the pavement, except at intersections controlled by a traffic control signal.
4. At intersections where a flashing red beacon exists.

There shall be no "STOP" signs on approaches to an intersection where such approaches are controlled by a traffic control signal.

An overhead internally illuminated "STOP" sign may be used in lieu of roadside "STOP" signs.

Secondary messages shall not be used on the face of a "STOP" sign. At a four-way stop intersection, each "STOP" sign may



be supplemented by a separate panel reading "4-WAY". Where this panel is used in conjunction with an R1-1-24, it shall be 24" x 9" with 5-inch legend. Where used with an R1-1-30 or R1-1-36, it shall be 30" x 12" with a 7-inch legend. Each panel shall have a black legend and border with a white reflectorized background. No additional sign shall be displayed with a "STOP" sign except one of the following: R3-1, R3-2, R3-3, R3-5, R3-6, or R3-23.

A hand held "STOP" sign may be used by Traffic Regulators as provided in Part II, Section E. Drivers facing the hand held "STOP" sign shall come to a complete stop and remain standing until an indication is given to proceed.

For placement see figures 1-3 and 1-4 and for special interim application see page 409.

YIELD SIGN



Reflectorized

R1-2-36 36" Equilateral Triangle (8", 3" and 2½" letters)

All Yield signs shall be reflectorized or internally illuminated so that the shape, color, and legend will be comparable to that in day time condition and will not produce detrimental glare to traffic.

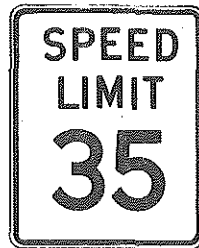
Place at the point where it is desired to have traffic yield or as near thereto as possible at the following locations:

1. At the approach to an intersection where it is necessary to assign right-of-way to the major road, but where a stop is not necessary at all times.
2. At any location where a special problem exists and where an engineering study indicates the problem to be susceptible to correction by use of the Yield sign.

An overhead internally illuminated Yield sign may be used in lieu of roadside Yield signs.

For placement see figures 1-3 and 1-4.

SPEED LIMIT SIGN



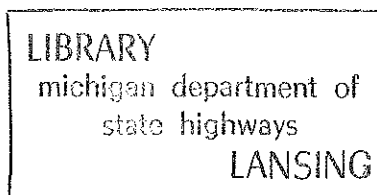
Reflectorized

R2-1-24 24" x 30" (4" letters and 10" numerals)

R2-1-48 48" x 60" (8" letters and 16" numerals)

The "SPEED LIMIT" sign shall be located at the point of change from one speed limit to another and at additional locations, as just beyond major intersections, where it is necessary to remind motorists of the applicable limit. Where the sign cannot be placed at the exact point of change in limit (such as at the center of an intersection), it shall be placed as near as practicable, but in advance of the point of change for a decrease, and beyond such point for an increase. Signs shall be installed at maximum intervals of $\frac{1}{2}$ mile within any Speed Control Zone to confirm the speed of that zone. On freeways, the R2-1-48 sign shall be used.

For placement see figures 1-5 and 1-35.



STOP AHEAD SIGN

Reflectorized

W3-1-30 30" x 30" (6" letters)

W3-1-36 36" x 36" (8" letters)

The "STOP AHEAD" sign shall be erected in advance of an intersection where traffic is required to stop and the "STOP" sign is not visible to motorists for a sufficient distance or where emphasis is needed because of poor observance of the stop. The "STOP AHEAD" sign may also be used in advance of a red flashing beacon.

Where required, the W3-1-30 shall be used in advance of a 24-inch "STOP" sign and the W3-1-36 in advance of a 30 or 36-inch "STOP" sign.

Except where used on State trunkline highways at junctions with other State trunkline highways, it shall be located in advance of the required stop at the approximate distance indicated below:

85th Percentile Speed			
35 & Below	36-45	46-55	56 & Over
250'	400'	550'	750'

For location on State trunkline highways see figures 1-17 and 1-26.

For placement see figure 1-11.

Section C. Warning Signs

Introduction

Warning signs shall be used for the purpose of warning traffic of existing or potentially hazardous conditions either on or adjacent to the roadway. Warning signs require caution on the part of the motorist and may call for reduction of speed or other maneuver in the interest of his own safety and that of other motorists and pedestrians. Adequate warnings are of great assistance to the vehicle operator and are valuable in safeguarding and expediting traffic. However, the use of warning signs should be kept to a minimum. Too frequent use of them or their unnecessary use to warn of conditions which are apparent tends to bring disrespect for all signs.

The conditions warranting warning signs are classified in the following groups according to the type of conditions to which they are applied:

1. Changes in Horizontal Alignments (W1 Series)
2. Intersections (W2 Series)
3. Advance Warning of Control Devices (W3 Series)
4. Converging Traffic Lanes (W4 Series)
5. Narrow Roadways (W5 Series)
6. Changes in Highway Design (W6 Series)
7. Grades (W7 Series)
8. Roadway Surface Conditions (W8 Series)
9. Schools and Pedestrians (W9 Series)
10. Railroad Crossings (W10 Series)
11. Entrances and Crossings (W11 Series)
12. Miscellaneous (W12 Series)
13. Construction and Maintenance (W13 Series)*

Warning signs with certain exceptions shall be diamond-shaped (square with one diagonal vertical) and shall have a "Highway Yellow" background with black legend. These exceptions are

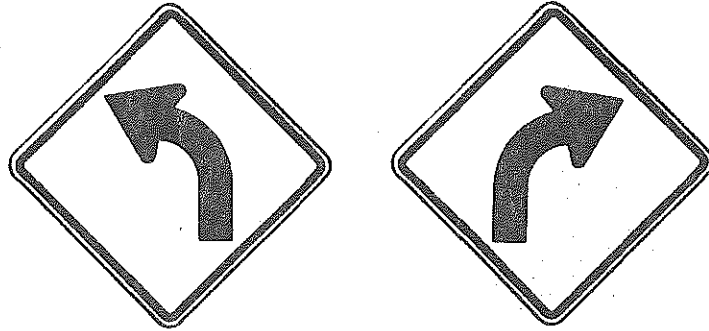
*Special warning signs for highway construction and maintenance projects are to be found in Part II of this Manual.

the Railroad Crossing signs, the Target Arrow signs, the Curve Speed panel, the Exit Speed sign, the Obstruction panel, and the Lattice Background. Other exceptions to the diamond shape are provided for in the case of temporary signs for highway construction and maintenance.

The use of warning signs should be limited to those standard signs set forth in this section. However, after the Engineer has exhausted all possibilities, it may be found that no standard sign fits the situation and warning signs, other than those specified, may be required. Such signs shall conform with the general specifications for size (30" minimum), shape, and color of warning signs. All warning signs having significance during hours of darkness shall be reflectorized or illuminated.

(Rev. 1)

CURVE SIGN



Reflectorized

W1-2-30 30" x 30"

W1-2-36 36" x 36"

W1-2-48 48" x 48"

The Curve sign shall be used to denote changes in alignment where a ball bank indicator or Devil Level registers 10° or more at speeds between 30 and 60 miles per hour, and at such other locations where the change in alignment of the roadway is not apparent to the driver. Additional protection may be provided by use of the Curve Speed panel (W12-1).

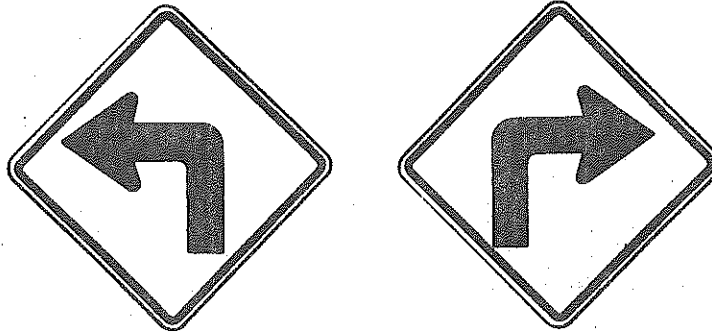
The Curve sign shall be located in advance of the point of curvature at the approximate distance indicated below:

85th Percentile Speed			
35 & Below	36-45	45-55	56 & Over
250'	400'	550'	750'

Curves that are less than 400 feet apart shall be designated by the W1-4 sign.

For placement see figures 1-11 and 1-35.

TURN SIGN



Reflectorized

- W1-1-30 30" x 30"
- W1-1-36 36" x 36"
- W1-1-48 48" x 48"

The Turn sign shall be used to denote changes in the horizontal alignment of all roads (except minor roads and streets where in the judgment of the engineer the use of this sign is unnecessary) where a ball bank indicator or Devil Level registers ten degrees or more at a speed of 30 miles per hour or less. Where this sign is warranted, consideration should be given to the use of a Target Arrow (W1-6). Additional protection may be provided by use of the Curve Speed panel (W12-1).

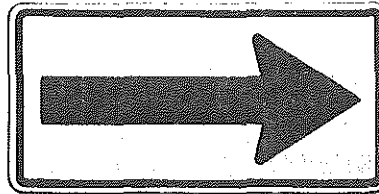
This sign shall be located in advance of the point of curvature at the approximate distance indicated below:

85th Percentile Speed			
35 & Below	36-45	46-55	56 & Over
250'	400'	550'	750'

Turns or a turn and a curve that are less than 400 feet apart shall be designated by the W1-3 sign.

For placement see figure 1-11.

(Rev. 1)

TARGET ARROW SIGN

Reflectorized

W1-6-48 48" x 24"

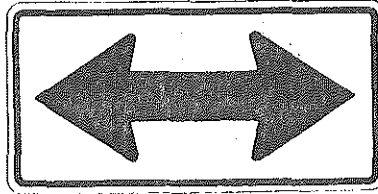
W1-6-96 96" x 48"

This sign may be used as a supplement to a Turn or Curve sign for potentially hazardous turns or curves. To increase its target value and to obscure misleading topography, the sign may be mounted on a Lattice Background (W12-10).

Where further emphasis of the required movement is desired, the W1-6-96 may be used in lieu of the unit consisting of the W1-6-48 and the W12-10.

This sign shall not be used to mark the ends of medians, centerpiers, etc., where there is no change in the direction of travel for all traffic. Further, it shall not be used as a route directional confirmatory marker or in any location where an intersecting street or highway of equal or nearly equal importance presents a choice of movement.

When used, the Target Arrow sign shall be erected in target position and, if possible, mounted high enough to be visible for at least 500 feet. It shall be placed at five feet minimum bottom height and two feet from the edge of the shoulder or curb face.

BI-DIRECTIONAL TARGET ARROW SIGN

Reflectorized

W1-7-48 48" x 24"

W1-7-96 96" x 48"

The Bi-Directional Target Arrow sign may be used at "T" or "Y" intersections to inform the driver of the abrupt changes in highway alignment. To increase its target value and to obscure misleading topography, the sign may be mounted on a Lattice Background (W12-10).

This sign shall not be used to mark the ends of medians, center-piers, etc., where there is no change in the direction of travel for all traffic.

When used, this sign shall be erected in target position and, if possible, it should be mounted high enough to be visible for at least 500 feet. It shall be placed at five feet minimum bottom height and two feet from the edge of the shoulder or curb face.

Where further emphasis of the required movements is desired, the W1-7-96 may be used in lieu of the unit consisting of the W1-7-48 and the W12-10.

CURVE SPEED PANEL



Reflectorized

W12-1-21 21" x 21" (10" and 3" letters)

W12-1-24 24" x 24" (12" and 3" letters)

The Curve Speed panel may be used as a supplement to the W1-1 through W1-5 signs only and shall display a speed legend in increments of five miles per hour. Since this legend is advisory, no Traffic Control Order is required. The W12-1-21 shall only be used with the appropriate 36 inch W1 sign and the W12-1-24 with the appropriate 48 inch W1 sign.

To determine the accurate negotiable speed on a turn or curve by the use of a ball bank indicator or Devil Level, several runs should be made in the same direction to obtain the most accurate reading possible. Readings obtained from several trial runs in the same direction shall determine the curve speed for that respective direction. Since the comfortable turn or curve speed on a specific turn or curve may vary, depending on direction of travel, the same procedure shall be used to obtain the curve speed for the opposite direction.

The following table indicates the speed to be used on the Curve Speed panel.

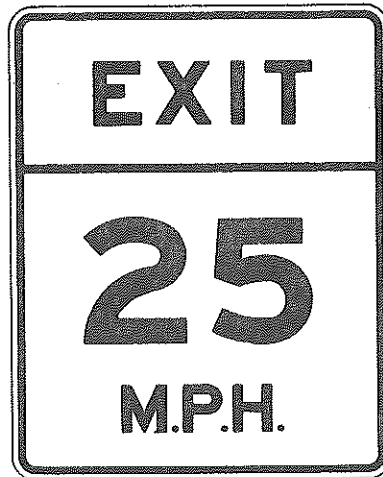
Indicator Reading	Speedometer Reading	Appropriate Panel Legend
10°	60, 59, or 58	60
10°	57, 56, 55, 54, or 53	55
10°	52, 51, 50, 49, or 48	50
10°	47, 46, 45, 44, or 43	45
10°	42, 41, 40, 39, or 38	40
10°	37, 36, 35, 34, or 33	35
12°	32, 31, 30, 29, or 28	30
12°	27, 26, 25, 24, or 23	25

Indicator Reading	Speedometer Reading	Appropriate Panel Legend
14°	22, 21, 20, 19, or 18	20
14°	17, 16, 15, 14, or 13	15
14°	12, 11, or 10	10

The speed legend displayed may equal but never exceed that of the posted speed limit in a Speed Control Zone.

For placement see figure 1-11.

EXIT _____ MILES PER HOUR SIGN



Reflectorized

W12-2-48 48" x 60" (8", 16", and 6" letters)

This advisory sign shall be used only at ramps exiting from freeways where the safe speed of the first curve on the off-ramp, as determined by conditions at each individual location, is found to be less than 70 percent of the design speed for the freeway.

If a safe speed indication is required for a second curve on an off-ramp well beyond the gore, a curve sign with a curve speed panel should be used.

For placement see figure 1-35.

OFFICE MEMORANDUM



MICHIGAN

DEPARTMENT OF STATE HIGHWAYS NOV 10 1971

To: All Holders on Record This Date of the 1963 Edition of the
"Michigan Manual of Uniform Traffic Control Devices"

From: Henrik E. Stafseth, Director John R. Plants, Director
Michigan Department of State Michigan Department of
Highways State Police

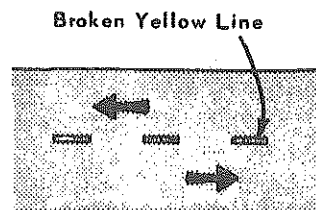
Subject: Change Memorandum No. 5

In order to more nearly conform to the design and application of traffic control devices prescribed by the 1971 edition of the National "Manual on Uniform Traffic Control Devices" (MUTCD) and to comply with recent revisions to the "Michigan Vehicle Code" (MVC), it is necessary that the following changes in the "Michigan Manual of Uniform Traffic Control Devices" (MMUTCD) be made. These and other changes to the 1963 edition of the MMUTCD will ultimately be encompassed in a revised edition of the MMUTCD. However, this Change Memorandum will serve to authorize interim changes of more urgent concern to state, county and municipal agencies.

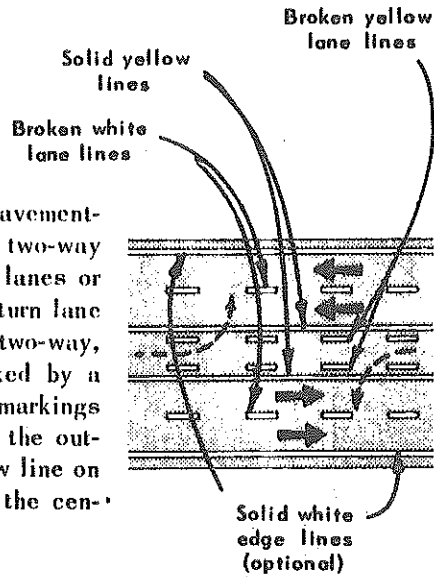
In instances where "may" is used in this memorandum, the 1971 edition of the MUTCD and forthcoming revised edition of the MMUTCD possibly will read "shall". The purpose of using "may" in this memorandum is to temporarily permit the extended use of existing sign inventories.

The interim changes, numerically designated, follow (code numbers shown beneath sign illustrations are from the MUTCD sign coding system):

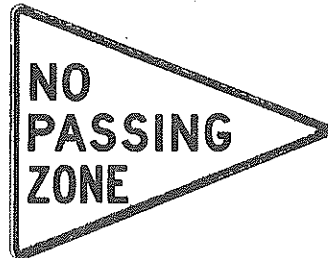
1. On all two-lane, two-way, hard-surface roadways, beginning with the 1972 pavement-marking season, any center-line marking placed shall be a broken yellow line. Line width, segment length, and the marking of "no-passing" zones shall be the same as currently specified by the MMUTCD.



2. Beginning with the 1972 pavement-marking season, on each two-way roadway consisting of three lanes or more, where a two-way, left-turn lane is to be designated, the two-way, left-turn lane shall be marked by a single-direction, no-passing markings (4-inch solid yellow line on the outside and 4-inch broken yellow line on the inside) on each edge of the center lane.

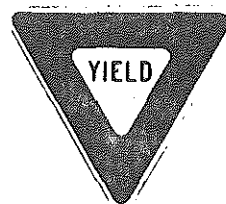


3. By December 31, 1972, the limits of no-passing zones at vertical curves, identified by pavement markings and/or "DO NOT PASS" and "PASS WITH CARE" signs, shall be established where the minimum sight distance measured between points 3.75 feet (maximum) above the roadway surface becomes less than that specified by the table on page 281 (MMUTCD).
4. In accordance with section 257.640 (MVC), a pennant-shaped sign, having a black legend "NO PASSING ZONE" and border on a yellow reflectorized background, shall be located on the left side of the roadway opposite the beginning of each no-passing zone identified by a "DO NOT PASS" sign and/or no-passing zone pavement markings. Consideration of item #3 should be taken into account when locating these signs.



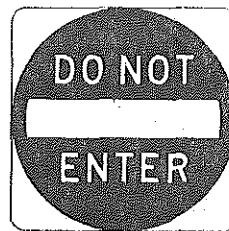
W14-3
36" x 48" x 48"

5. Where an R1-2-36 "YIELD" sign is to be replaced or added, a sign with a red legend and 5-inch red border on a white background may be used.



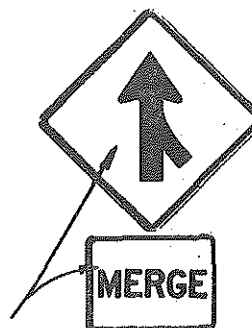
R1-2
36" x 36" x 36"

6. Where an R3-27-24 "DO NOT ENTER" sign is to be replaced or added, a 30-inch white square panel may be used, on which is inscribed a 29-inch diameter red circle with a white band 5 inches in width placed horizontally across the center of the circle. The legend "DO NOT ENTER" shall appear in white letters, with the words "DO NOT" above the band and "ENTER" below the band. If an R3-27-36 sign is to be replaced or added, a similar design, correspondingly larger, may be used. The use of an R3-36-24 "BULLSEYE" sign, as provided for by general revision number 2 to the MMUTCD, is hereby rescinded except for use as an illuminated sign suspended over the roadway at an intersection facing the "wrong-way" direction of travel.



R5-1
30" x 30"

7. Where a W4-1 "MERGING TRAFFIC" sign is to be replaced or added, a 30-inch or 48-inch diamond-shaped symbol sign, together with appropriate size "MERGE" panel, may be used.

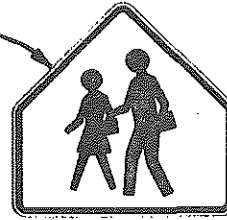


Block Legend
on a yellow
background

W4-1
30" x 30"
24" x 18"

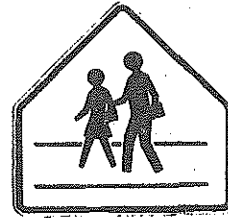
8. Where a W9-1 "SCHOOL" or a W9-2 "SCHOOL CROSSING" sign is to be

Black Legend
on a yellow
background



S1-1
30" x 30"

replaced or added, a 30-inch-by-30-inch pentagon-shaped sign, with figures to represent school children, may be used. When such sign includes crosswalk markings, it shall only be used at or adjacent to an established crosswalk and shall be preceded by a pentagonal sign which excludes crosswalk markings (School Advance Sign).



S2-1
30" x 30"

Black Legend
on a yellow
background

9. Where a "PEDESTRIAN CROSSING" or a W9-6 "WATCH FOR PEDESTRIANS" sign is to be replaced or added, a 30-inch diamond-shaped sign, bearing a black stylized human shape on yellow reflectorized background, together with a 24-inch-by-18-inch "PED XING" panel, may be used.



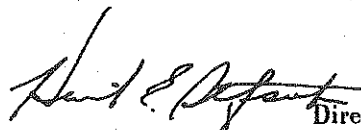
W11-2
30" x 30"
24" x 18"

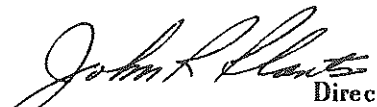
10. For construction, maintenance, or utility operations, warning signs may be designed with a black legend on a reflectorized orange background; barricades may be designed with alternate reflectorized orange and white stripes; barrels may be equipped with alternate reflectorized orange and white, circumferential stripes; and cones, having orange as a predominant color, may be used. The use of standard orange flags in conjunction with orange signs is permitted so long as they do not interfere with a clear view of the sign face. The use of the orange color devices, however, shall be limited to those operations where all warning signs, barricades, barrels, and cones pertaining to the same construction, maintenance, or utility operation are designed with the orange color.

11. On construction, maintenance, or utility operations, where orange is used for traffic control devices and flagmen are required, each flagman shall wear an orange vest and/or an orange cap, conforming to the designs specified by the 1971 edition of the MUTCD.

Standard plans for all signs described in this memorandum may be obtained from the Traffic and Safety Division, Michigan Department of State Highways.

We hereby certify that the provisions of this memorandum constitute an official change in the provisions of the "Michigan Manual of Uniform Traffic Control Devices", as adopted September 3, 1963 in accordance with Section 608, Act 300, P.A. 1949, as amended (MVC).


Director
Michigan Department of State Highways


Director
Michigan Department of State Police

Note for Change Memorandums Only

This change will be reflected in the next Manual Edition. Therefore, this memorandum should be discarded when you receive that Edition.

GLOSSARY

The term "Manual" when used in this report will refer to the "Michigan Manual of Uniform Traffic Control Devices"; publication prepared by the Michigan Department of State Highways in conjunction with the Michigan State Police.

Excerpts of the Manual are included in Appendix II.