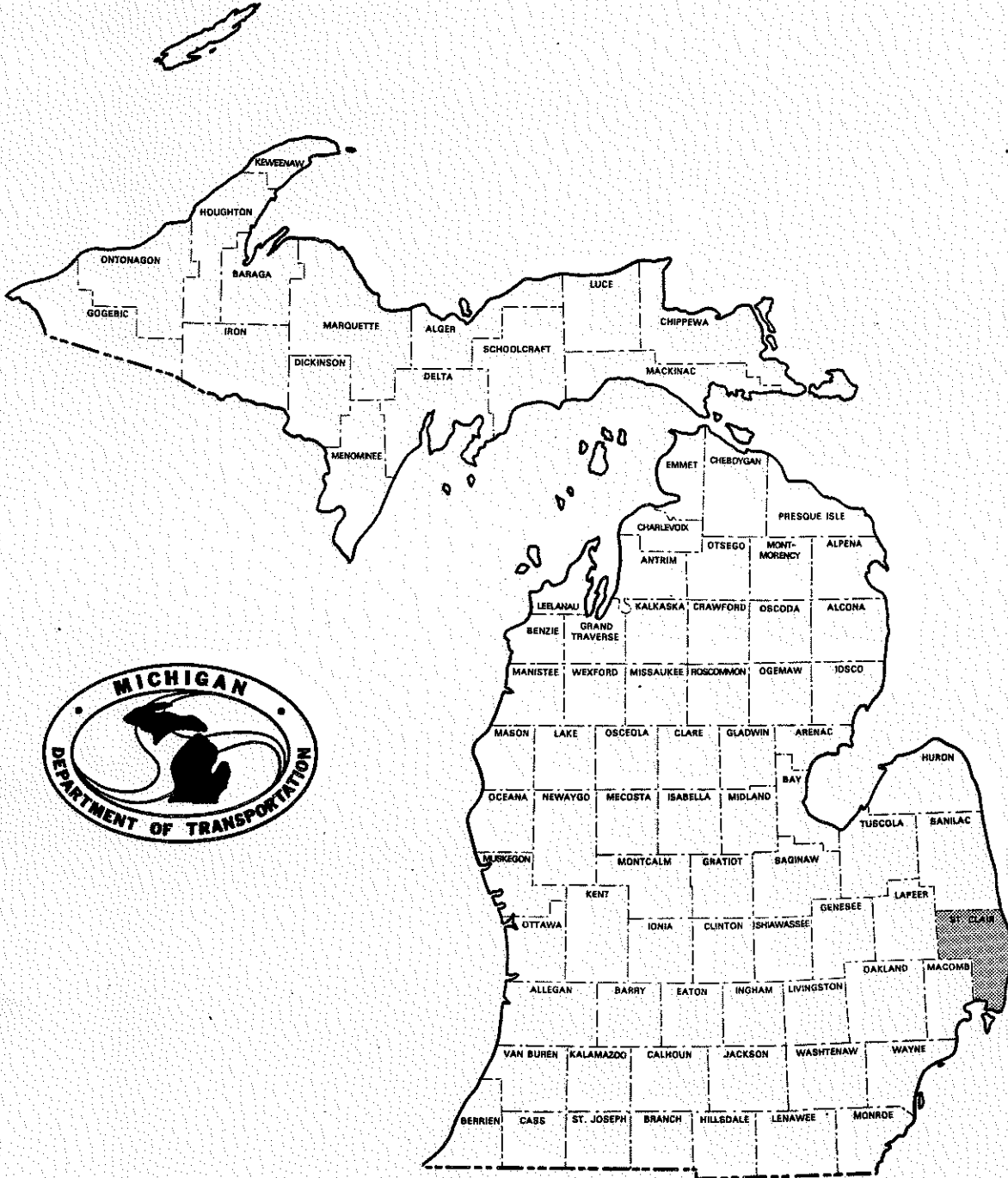


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TRAFFIC & SAFETY DIVISION

# TRAFFIC AND SAFETY DIVISION STATE TRUNKLINE ACCIDENT SURVEILLANCE PROGRAM



## ST. CLAIR COUNTY

**MICHIGAN DEPARTMENT  
OF  
TRANSPORTATION**

**State Trunkline Accident Surveillance Program**

**St. Clair County**

**TSD 578-90**

by

**Linn P. Smith, Student Technician  
Safety Programs Unit  
Traffic and Safety Division**

**William T. Lebel  
Unit Supervising Engineer**

**STATE TRANSPORTATION COMMISSION**

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James P. Pitz**

**January 1990**

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# INTRODUCTION

## Study Purpose

This study is the product of the Safety Programs Unit, located within the Traffic and Safety Division, of the Michigan Department of Transportation. The unit's goal is to reduce accidents, injuries, and fatalities on the state highway system to the maximum extent possible within the framework of available resources. In pursuing this goal, the unit analyzes accident data in a prioritized manner and develops traffic safety measures to reduce specific concentrations of accidents and accident types. These are documented in individual district wide reports. Metro District is divided further into reports for each county.

## Location

This report documents our review of St. Clair County as indicated on the cover. Accident data was reviewed for intersection and midblock locations using the methods identified below. Accident data for 1988 was also reviewed for each location.

## Study Methods

MALI (Michigan Accident Location Index) and MIDAS (Michigan Dimensional Accident Surveillance) computer programs were used to identify and analyze the study locations.

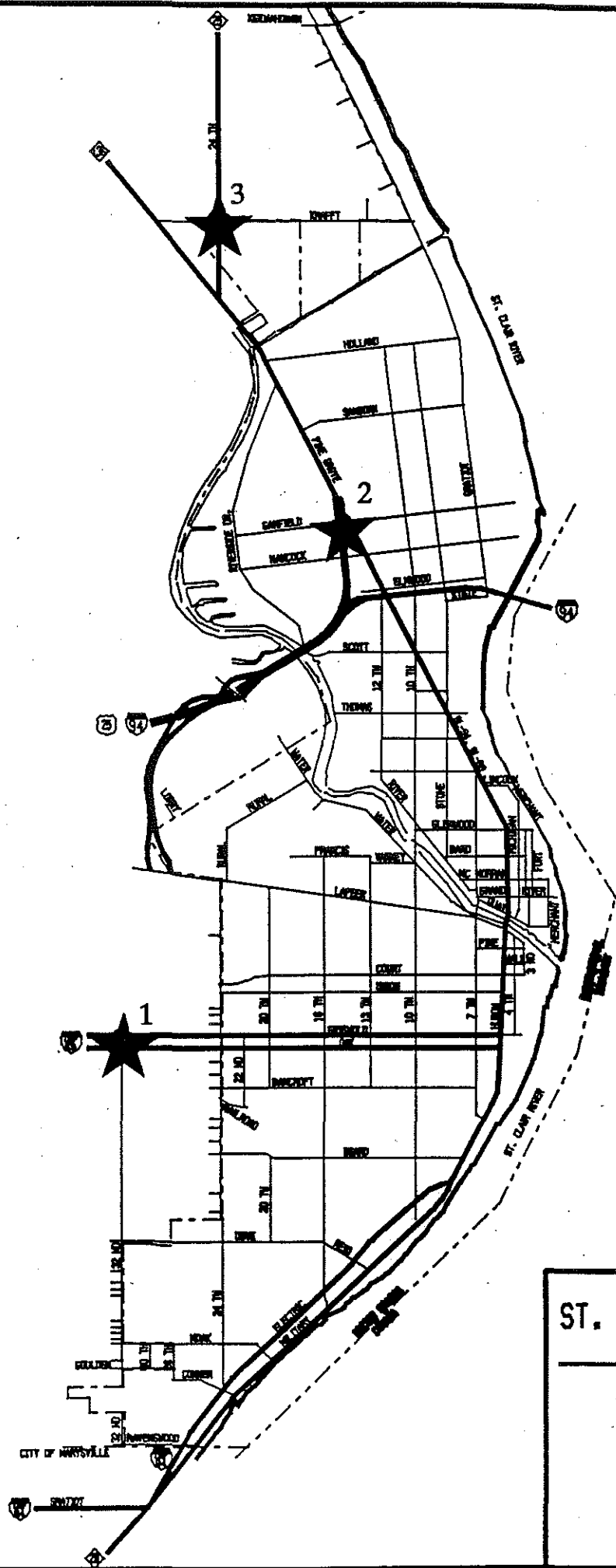
Locations selected included:

1. Intersection locations with right angle, head-on left turn and rear end accident patterns (using intersection accidents only) above predefined thresholds for 1985-1987. (See thresholds page 23.)
2. Midblock locations in half mile segments with accident patterns (using intersection and midblock accidents) above predefined thresholds for 1983-1987. (See thresholds page 23.)
3. Locations with three or more fatal accidents (using intersection and midblock accidents) for 1979-1987 in a half mile segment.

After identification, all locations were reviewed by the author in conjunction with the district traffic and safety engineer and other appropriate Traffic and Safety Division personnel. The review included a discussion of the significant accident patterns and potential accident countermeasures which are summarized in this report. Locations at which no countermeasures were recommended, for various reasons, are also included with minimal discussion.

## Implementation

Implementation of the recommended countermeasures is an essential element of this traffic safety improvement program. Every effort was made to ensure that all recommendations were deemed appropriate, desirable, feasible, and cost-effective by the review team and/or by those responsible for initiating implementation. The review team for this report was Joseph E. Bassil, Metro District, Patricia A. Schafer, Electronic Systems Unit, Leo L. Arens, Safety Programs Unit and Linn P. Smith, Safety Programs Unit.



**ST. CLAIR COUNTY SURVEILLANCE**

---

★ ACTION LOCATION NUMBER

FIGURE 1

## Summary of Recommended Actions

<u>Location</u>	<u>Recommended Action</u>	<u>Notes</u>	<u>Implementing Unit</u>
1. BL-69 @ 32nd Street	Signal Study	Counts Ordered 12-05-89	ESU
2. I-94 conn. @ Garfield	Signal Study	Counts Ordered 12-05-89	ESU
3. M-25 @ Krafft Road	All-Red Phase	New permit dated 11-22-89, sent out with memo dated 12-08-89	ESU

**"ACTION"  
LOCATIONS**

1. I-69 BL @ 32ND STREET  
(C.S. 77023; M.P. 16.68)

GEOMETRIC AND OPERATIONAL CHARACTERISTICS

The northbound and southbound traffic movement is on 32nd Street.

North Leg:            2 # of lanes            no left-turn lane  
                          35 speed limit (mph)        no right-turn lane

South Leg:            2 # of lanes            no left-turn lane  
                          35 speed limit (mph)        no right-turn lane

The eastbound and westbound traffic movement is on I-69 BL.

East Approach        4 # of lanes            yes left-turn lane  
                          55 speed limit (mph)        yes right-turn lane

West Approach        3 # of lanes            no left-turn lane  
                          55 speed limit (mph)        yes right-turn lane

Comments:        The eastbound and the westbound approaches are separated by a median.

DESCRIPTION OF TRAFFIC CONTROL DEVICES:

Presently 32nd Street is under stop control with stop signs placed in the median crossover. A flashing beacon is also present giving the right of way to vehicles traveling on I-69 BL.

ACCIDENT SUMMARY (1985-1987):

Reported accidents totaled 35 for the three years studied with 15 accidents resulting in injuries.

The following accident types exceeded their three-year predetermined thresholds:

<u>Accident Type</u>	<u>Threshold</u>	<u>Accidents/yr</u>			<u>Direction</u>				<u>Total</u>
		<u>85</u>	<u>86</u>	<u>87</u>	<u>N</u>	<u>S</u>	<u>E</u>	<u>W</u>	
Angle	10	7	8	11	7	10	4	5	26

RECOMMENDATIONS:

In agreement with the Electronic Services Unit and Metro District, a signal study will be performed.



Q/430/74

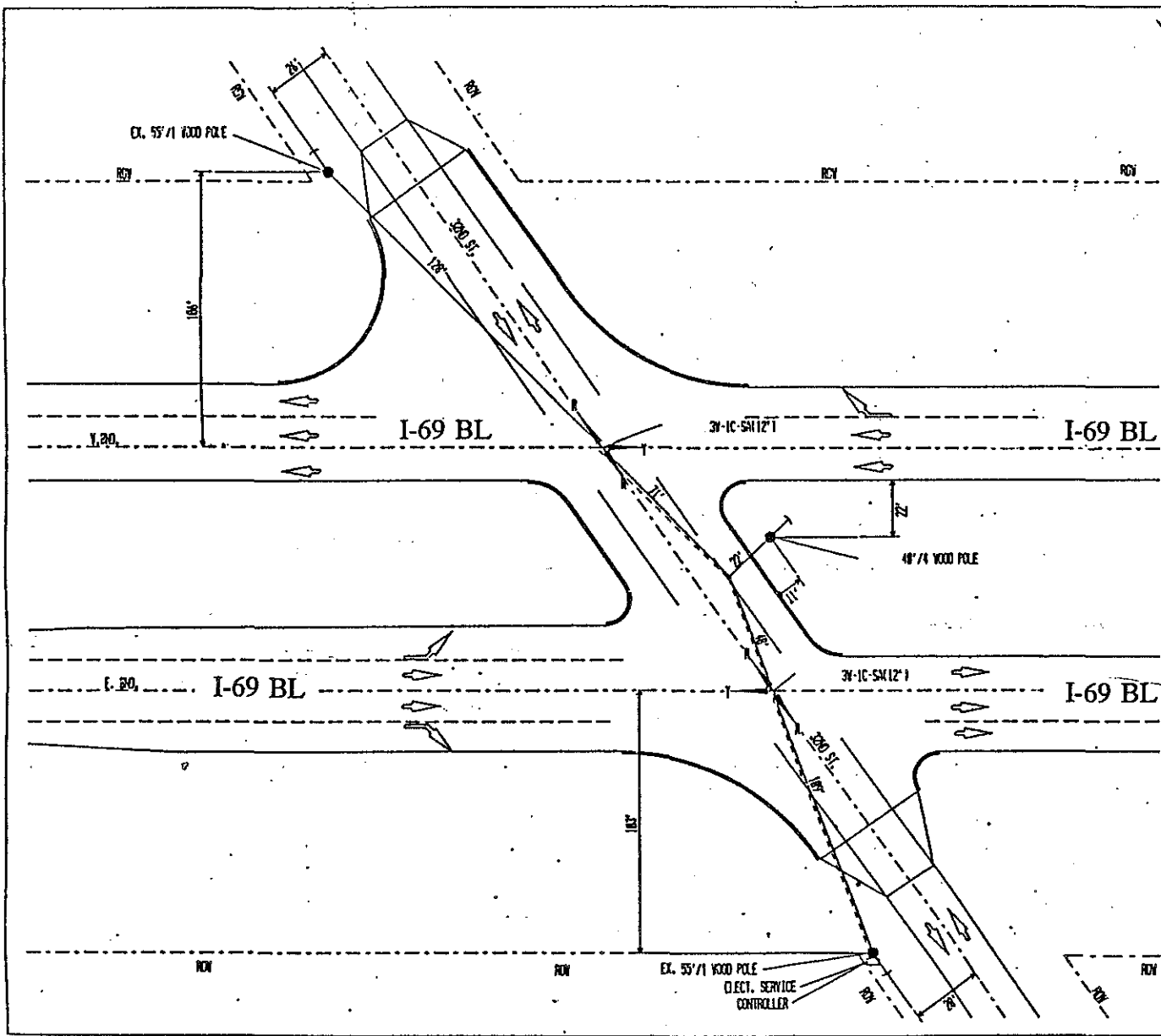
MICHIGAN DEPARTMENT OF TRANSPORTATION  
SUMMARY OF ACCIDENT CHARACTERISTICS

DATE RANGE: 1/01/85 - 12/31/87

LOCATION: I-69 BL @ 32ND STREET

77023 16.650-16.710

TYPE OF ACCIDENT	1985		1986		1987		NO.	%	TOTAL	
	NO.	%	NO.	%	NO.	%			NO.	%
LEFT TURN - SAME DIRECTION	1	8	0	0	0	0			1	3
OPPOSING LEFT TURN	1	8	0	0	0	0			1	3
REAR-END	2	17	0	0	2	15			4	11
ANGLE	7	58	8	80	11	85			26	74
SIDESWIPE	0	0	0	0	0	0			0	0
PEDESTRIAN	0	0	0	0	0	0			0	0
HEAD-ON	0	0	0	0	0	0			0	0
DRIVEWAY-RELATED	0	0	0	0	0	0			0	0
FIXED OBJECT	0	0	1	10	0	0			1	3
OTHERS	1	8	1	10	0	0			2	6
PAVEMENT CONDITION										
WET	2	17	1	10	1	8			4	11
DRY	9	75	8	80	12	92			29	83
SNOWY-ICY	1	8	1	10	0	0			2	6
LIGHT CONDITION										
DAY	11	92	6	60	13	0			30	86
DAWN OR DUSK	0	0	1	10	0	0			1	3
NIGHT	1	8	3	30	0	0			4	11
ACCIDENT SEVERITY										
FATAL ACCIDENTS (NO. OF PERSONS)	0	0	0	0	0	0			0	0
INJURY ACCIDENTS (NO. OF PERSONS)	6	50	4	40	5	38			15	43
PROPERTY DAMAGE ONLY	12		6		7				25	
TOTAL ACCIDENTS	6	50	6	60	8	62			20	57
TOTAL ACCIDENTS	12		10		13				35	
TOTAL INJURIES	12		6		7				25	



STATE OF MICHIGAN	
DEPARTMENT OF STATE HIGHWAYS	
TRAFFIC AND SAFETY DIVISION	
TRAFFIC SIGNAL INSTALLATION	
I-69 BL @ 32ND ST.	
PORT HURON TWP.	ST. CLAIR CO.
INSTALLATION PARTICIPATION	
STATE	100 %
COUNTY OF	%
TOWNSHIP OF	%
CITY OF	%
POWER COMPANY	DETROIT EDISON CO.
ENGINEER	L. GENSLEY
POWER CONSUMPTION	
CYCLIC WATTS	900
STEADY WATTS	
NO. OF ST. LIGHTS	
COMPLETED	
INSPECTED	
SIGNATURE	
ENGINEER OR TECHNICIAN	DRAWN MCL
DATE	SCALE
8-5-77	
AUTH. NO.	SHEET OF
PLAN	77023-02-008

7

**2. I-94 CONN. @ GARFIELD ST.**  
**(C.S. 77111; M.P. 27.78)**

**GEOMETRIC AND OPERATIONAL CHARACTERISTICS**

The northbound and southbound traffic movement is on I-94 conn.

North Approach:      3 # of lanes                      no left-turn lane  
                                  55 speed limit (mph)                      no right-turn lane

South Approach:      3 # of lanes                      no left-turn lane  
                                  55 speed limit (mph)                      no right-turn lane

Comments:      The I-94 conn. is a six lane divided roadway.

The eastbound and westbound traffic movement is on Garfield Street.

East Leg:                      2 # of lanes                      no left-turn lane  
                                  35 speed limit (mph)                      no right-turn lane

West Leg:                      2 # of lanes                      no left-turn lane  
                                  35 speed limit (mph)                      no right-turn lane

Comments:      Two way traffic is carried on this city street.

**DESCRIPTION OF TRAFFIC CONTROL DEVICES:**

Presently traffic is controlled by stop signs facing the eastbound and westbound approaches. Yield signs are in place in the median crossover also facing the eastbound and westbound approaches.

**ACCIDENT SUMMARY (1985-1987):**

Reported accidents totaled 34 for the three years studied with 9 accidents resulting in injuries.

The following accident types exceeded their three-year predetermined thresholds:

<u>Accident Type</u>	<u>Threshold</u>	<u>Accidents/yr</u>			<u>Direction</u>				<u>Total</u>
		<u>85</u>	<u>86</u>	<u>87</u>	<u>N</u>	<u>S</u>	<u>E</u>	<u>W</u>	
Angle	15	4	8	11	2	6	8	7	23

**RECOMMENDATIONS:**

In agreement with the Electronic Systems Unit and the Metro District, a signal study will be performed at this intersection. Along with the study at this location, a separate signal study will be performed at the intersection of M-25 @ Garfield. This additional study is of interest because the intersection of M-25 @ Garfield is within 1500 feet of the intersection of I-94 conn. @ Garfield.

Q/430/74

MICHIGAN DEPARTMENT OF TRANSPORTATION  
SUMMARY OF ACCIDENT CHARACTERISTICS

DATE RANGE: 1/01/85 - 12/31/87

LOCATION: I-94 CONN. @ GARFIELD STREET

77111 27.750-27.810

TYPE OF ACCIDENT	1985		1986		1987		NO.	%	TOTAL	
	NO.	%	NO.	%	NO.	%			NO.	%
LEFT TURN - SAME DIRECTION	0	0	0	0	0	0			0	0
OPPOSING LEFT TURN	0	0	1	8	1	6			2	6
REAR-END	1	20	3	23	3	19			7	21
ANGLE	4	80	8	62	11	69			23	68
SIDESWIPE	0	0	0	0	0	0			0	0
PEDESTRIAN	0	0	0	0	0	0			0	0
HEAD-ON	0	0	0	0	0	0			0	0
DRIVEWAY-RELATED	0	0	0	0	0	0			0	0
FIXED OBJECT	0	0	0	0	1	6			1	3
OTHERS	0	0	1	8	0	0			1	3
PAVEMENT CONDITION										
WET	2	40	4	31	2	13			8	24
DRY	3	60	9	69	13	81			25	74
SNOWY-ICY	0	0	0	0	1	6			1	3
LIGHT CONDITION										
DAY	5	0	9	69	13	81			27	79
DAWN OR DUSK	0	0	1	8	0	0			1	3
NIGHT	0	0	3	23	3	19			6	18
ACCIDENT SEVERITY										
FATAL ACCIDENTS (NO. OF PERSONS)	0	0	0	0	0	0			0	0
INJURY ACCIDENTS (NO. OF PERSONS)	2	40	3	23	4	25			9	26
PROPERTY DAMAGE ONLY	3	60	10	77	12	75			25	74
TOTAL ACCIDENTS	5		13		16				34	
TOTAL INJURIES	3		7		7				17	

**3. M-25 @ KRAFFT ROAD**  
**(C.S. 77132; M.P. 00.39)**

**GEOMETRIC AND OPERATIONAL CHARACTERISTICS**

The northbound and southbound traffic movement is on M-25.

<u>North Leg:</u>	<u>5</u> # of lanes <u>50</u> speed limit (mph)	<u>yes</u> left-turn lane <u>no</u> right-turn lane
<u>South Leg:</u>	<u>6</u> # of lanes <u>50</u> speed limit (mph)	<u>yes</u> left-turn lane <u>yes</u> right-turn lane

Comments: M-25 carries an ADT of 21,000.

The eastbound and westbound traffic movement is on Krafft Road.

<u>East Leg:</u>	<u>3</u> # of lanes <u>45</u> speed limit (mph)	<u>no</u> left-turn lane <u>no</u> right-turn lane
<u>West Leg:</u>	<u>4</u> # of lanes <u>45</u> speed limit (mph)	<u>no</u> left-turn lane <u>no</u> right-turn lane

**DESCRIPTION OF TRAFFIC CONTROL DEVICES:**

A solid state controller and 12 inch signal heads are in place at this intersection. The controller runs with two dials. Dial one operates Monday thru Friday 6:00 a.m. thru 11:00 a.m. as well as Saturday and Sunday from 6:00 a.m. thru 10:30 p.m. Dial two operates 11:00 a.m. to 10:30 p.m. Monday thru Friday. A flasher schedule operates from 10:30 p.m. thru 6:00 a.m. daily.

**ACCIDENT SUMMARY (1985-1987):**

Reported accidents totaled 49 for the three years studied with 15 accidents resulting in 30 injuries.

The following accident types exceeded their three-year predetermined thresholds:

<u>Accident Type</u>	<u>Threshold</u>	<u>Accidents/yr</u>			<u>Direction</u>				<u>Total</u>
		<u>85</u>	<u>86</u>	<u>87</u>	<u>N</u>	<u>S</u>	<u>E</u>	<u>W</u>	
Angle	15	3	1	12	7	2	2	4	16

**RECOMMENDATIONS:**

In agreement with the Electronic Systems Unit and the Metro District, all-red phases will be incorporated into the timing permit. The all-red phases will be placed after the M-25 green/yellow and also after the Krafft Road green/yellow.

Q/430/74

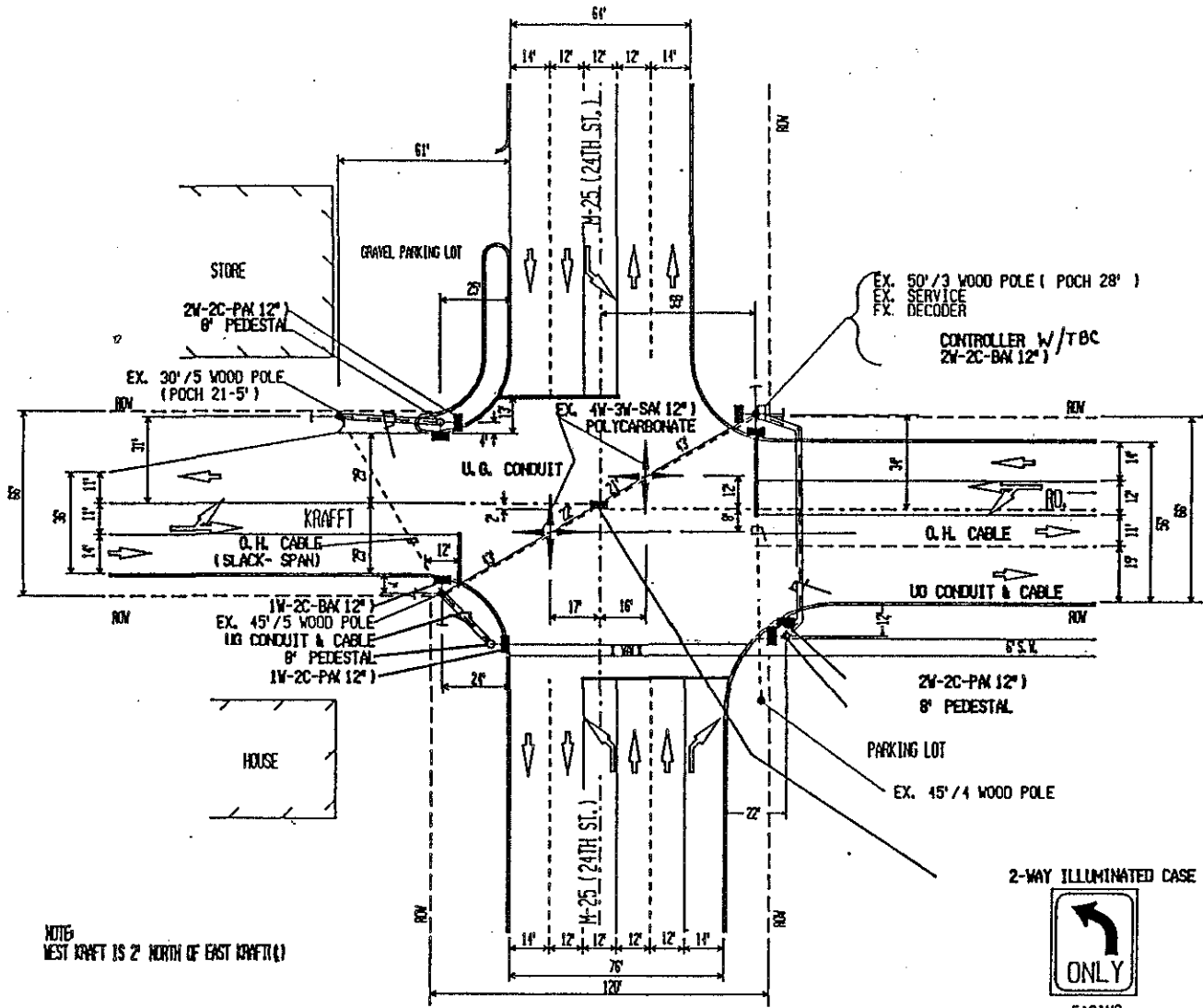
MICHIGAN DEPARTMENT OF TRANSPORTATION  
SUMMARY OF ACCIDENT CHARACTERISTICS

DATE RANGE: 1/01/85 - 12/31/87

LOCATION: M-25 @ KRAFFT ROAD

77132 00.360-00.420

TYPE OF ACCIDENT	1985		1986		1987		NO.	%	TOTAL	
	NO.	%	NO.	%	NO.	%			NO.	%
LEFT TURN - SAME DIRECTION	0	0	0	0	0	0			0	0
OPPOSING LEFT TURN	3	30	6	50	2	7			11	22
REAR-END	2	20	4	33	8	30			14	29
ANGLE	3	30	1	8	12	44			16	33
SIDESWIPE	0	0	0	0	0	0			0	0
PEDESTRIAN	0	0	1	8	0	0			1	2
HEAD-ON	0	0	0	0	0	0			0	0
DRIVEWAY-RELATED	0	0	0	0	1	4			1	2
FIXED OBJECT	0	0	0	0	1	4			1	2
OTHERS	2	20	0	0	3	11			5	10
PAVEMENT CONDITION										
WET	4	40	3	25	10	37			17	35
DRY	4	40	8	67	15	56			27	55
SNOWY-ICY	2	20	1	8	2	7			5	10
LIGHT CONDITION										
DAY	9	90	10	83	17	63			36	73
DAWN OR DUSK	1	10	0	0	1	4			2	4
NIGHT	0	0	2	17	9	33			11	22
ACCIDENT SEVERITY										
FATAL ACCIDENTS (NO. OF PERSONS)	0	0	0	0	0	0			0	0
INJURY ACCIDENTS (NO. OF PERSONS)	4	40	6	50	5	19			15	31
PROPERTY DAMAGE ONLY	6	60	6	50	22	81			34	69
TOTAL ACCIDENTS	10		12		27				49	
TOTAL INJURIES	7		9		14				30	



NOTE  
WEST KRAFFT IS 2' NORTH OF EAST KRAFFT(1)

STATE OF MICHIGAN DEPARTMENT OF TRANSPORTATION TRAFFIC AND SAFETY DIVISION	
TRAFFIC SIGNAL INSTALLATION M-25(24TH ST.) @ KRAFFT RD.	
FORT GRATIOT TWP.	ST. CLAIR CO.
INSTALLATION PARTICIPATION	
STATE	50 %
COUNTY OF ST. CLAIR	50 %
CITY OF F. H. W. A.	%
POWER DETROIT EDISON CO. COMPANY ENGINEER L. GENSLEY	
POWER CONSUMPTION	
CYCLIC WATTS	5200
STEADY WATTS	225
NO. OF ST. LIGHTS	
COMPLETED	
INSPECTED	
SIGNATURE	
ENGINEER OR TECHNICIAN L. GREGUS	DRAWN HDL
DATE 11-7-84	SCALE
AUTH. NO.	SHEET OF
PLAN 77132-01-007	

**"NO ACTION"  
LOCATIONS**



1985-1987 INTERSECTION HIGH-ACCIDENT LISTING (Stats & Threshold & %)

DISTRICT 9

CALCULATED AT 0.5 STD DEV

ACC TYPE	# ACC	STD DEV	MEAN	UCL	THRESHOLD NUMBER	PERCENT OF TOTAL
77023	16.68	BL-69	32ND ST	KIMBALL TWP	TOTAL ACCIDENTS	52
5 LOCATIONS		4 Lane-Divided	Urban/Flasher	Less than 10,000		
Right Angle	28				10	

REMARKS: See action location No 1.

77023	17.23	BL-69	24TH	KIMBALL TWP	TOTAL ACCIDENTS	65
53 LOCATIONS		1 Way	Urban/Signal	Less than 10,000		
Right Angle	29	9.411	12.189	16.89	10	
Left Turn	16	4.409	4.189	6.394	10	

REMARKS: All red phase ordered in timing permit issued 4-12-89. Left turn and right angle accidents should be reduced with all red phase installed.

LEFT TURN		RIGHT ANGLE	
NB- 7	85-14	NB- 3	85- 8
SB-13	86- 4	SB-14	86-12
WB- 0	87-10	* WB- 3	87- 9
EB- 6	88- 8	EB- 9	88-21

\*VEHICLE TRAVELING WRONG WAY

NO ACTION

77023	17.73	BL-69	16TH ST	PT.HURON CY	TOTAL ACCIDENTS	42
3039 LOCATIONS		1 Way	Urban/No Signal	Less than 10,000		
Right Angle	32	1.156	0.128	0.706	10	

REMARKS: Signal installation is scheduled for this intersection. This should reduce angle accidents below threshold limits. An all red phase has been included in timing permit.

RIGHT ANGLE	
NB-16	85-21
SB-15	86-19
WB- 0	87-29
EB- 1	88-38

NO ACTION

77023	18.24	BL-69	10TH ST	PT.HURON CY	TOTAL ACCIDENTS	75
53 LOCATIONS		1 Way	Urban/Signal	Less than 10,000		
Right Angle	21	9.411	12.189	16.89	10	
Left Turn	22	4.409	4.189	6.394	10	
Rear-End	26	8.946	9.962	14.44	20	

REMARKS: Accidents problems have been addressed with a change in the signal timing permit. New permit includes an all-red phase. Twelve inch signal heads to be installed also.

REAR-END		LEFT TURN		RIGHT ANGLE	
NB- 8	85- 7	NB- 2	85- 3	NB- 4	85- 6
SB- 7	86-14	SB- 1	86- 6	SB- 5	86- 7
WB- 0	87- 5	WB- 0	87-13	WB- 0	87- 8
EB- 7	88- 7	EB- 8	88- 5	EB- 5	88- 8

NO ACTION

1985-1987 INTERSECTION HIGH-ACCIDENT LISTING (Stats & Threshold & %)  
 DISTRICT 9

CALCULATED AT 0.5 STD DEV

ACC TYPE	# ACC	STD DEV	MEAN	UCL	THRESHOLD NUMBER	PERCENT OF TOTAL
77031	01.76	BL-94	MICHIGAN AVE	MARYSVILLE C	TOTAL ACCIDENTS	35
16 LOCATIONS	3 Lane-2 Way		Urban/Signal	10,000 to 20,000		
Right Angle	15	4.737	8.250	10.62	15	

REMARKS: Accidents just at threshold. Angle accidents may be do to the geometrics of the intersection. Timing permit includes adequate yellow time.

RIGHT ANGLE

NE- 2 85- 7

SW- 4 86- 3

W- 7 87- 5

E- 2 88- 3

NO ACTION

77032	04.15	BL-94, BL-69	QUAY ST	PT. HURON CY	TOTAL ACCIDENTS	58
220 LOCATIONS	4 Lane-2 Way		Urban/Signal	10,000 to 20,000		
Rear-End	32	8.787	13.427	17.82	25	

REMARKS: Timing revised and signal modernization completed in 1985. Of the 32 rear-end accidents, 20% were on wet pavement. No accident pattern formed; therefore, no recommendation at this time.

REAR-END

NB-15 85-14

SB-17 86- 8

WB- 0 87-10

EB- 0 88-12

NO ACTION

77032	05.25	BL-94, BL-69	STONE ST	PT. HURON CY	TOTAL ACCIDENTS	48
93 LOCATIONS	5 Lane-2 Way		Urban/Signal	10,000 to 20,000		
Rear-End	28	10.873	14.828	20.26	25	

REMARKS: Signal modernization completed in 1982 (included 12 inch signal heads). New timing permit includes adequate time and an all red phase. No correctable accident pattern; therefore, no recommendation.

REAR-END

N- 2 85- 8

S- 6 86- 6

W- 8 87-14

NW- 3 88-13

SE- 6

NO ACTION

1985-1987 INTERSECTION HIGH-ACCIDENT LISTING (Stats & Threshold & %)  
 DISTRICT 9

CALCULATED AT 0.5 STD DEV

ACC TYPE	# ACC	STD DEV	MEAN	UCL	THRESHOLD NUMBER	PERCENT OF TOTAL
77051	10.52	M-29	M154 HARSEN ISLAND	CLAY TWP.		TOTAL ACCIDENTS 45
15 LOCATIONS	2 Lane-2 Way		Rural/Signal		10,000 to 20,000	
Rear-End	25	8.727	12.200	16.56	25	

REMARKS: Traffic loop installed in 1987. Rear-end accidents have been reduced to five in 1987 and five in 1988; therefore, no recommendation is needed at this time.

REAR-END

SE- 1 85- 8  
 WB- 7 86-12  
 EB-16 87- 5  
 OT- 1 88- 5

NO ACTION

77091	00.35	BL-69, BL-94	10TH ST	PT. HURON CY.		TOTAL ACCIDENTS 105
238 LOCATIONS	5 Lane-2 Way		Urban/Signal		Greater than 20,000	
Rear-End	71	30.139	36.853	51.92	30	

REMARKS: New signal installed in 1985. This location is to have right turn arrows placed for two weeks during a detour that involves heavy traffic at this six-legged intersection. A review of the accident reports reveals that the accidents are well distributed in all directions. Of the 71 rear-end accidents, 30 were on wet pavement (42%). No recommendation at this time.

REAR-END

NW- 1 85-25  
 SW- 2 86-28  
 SE- 2 87-18  
 NE- 7 88-22  
 OT-59

NO ACTION

77091	00.84	BL-94, BL-69	HANCOCK ST	PT. HURON CY.		TOTAL ACCIDENTS 88
238 LOCATIONS	5 Lane-2 Way		Urban/Signal		Greater than 20,000	
Right Angle	38	10.090	14.239	19.28	20	

REMARKS: A review of the accident reports reveals accidents are distributed from all directions. Fifteen percent of the accidents are during flasher stage, while another fifteen percent are drive-way related. This intersection is involved with the Bluewater bridge project, and will have permanent phasing incorporated into signal timing permit. The signal phasing should reduce angle accidents below threshold levels.

RIGHT ANGLE

N-12 85-12  
 S- 8 86-13  
 E- 8 87-13  
 W-10 88-15

NO ACTION

1985-1987 INTERSECTION HIGH-ACCIDENT LISTING (Stats & Threshold & %)  
 DISTRICT 9

CALCULATED AT 0.5 STD DEV

ACC TYPE	# ACC	STD DEV	MEAN	UCL	THRESHOLD NUMBER	PERCENT OF TOTAL
77091	02.23	BL-69	N RIVER ROAD	FT.GRATIOT T	TOTAL ACCIDENTS	64
	4 LOCATIONS	5 Lane-2 Way	Urban/Flasher	Greater than 20,000		
Rear-End	39				30	

REMARKS: Rear-end accidents on the increase. Of the 39 rear-ends, 29% occurred on wet pavement. From a review of the accident reports, accidents are well distributed and are most likely caused from a trailing car watching the traffic on M-25 and not paying attention to the vehicle in front of them. Another 21% of the rear-end accidents occurred at the drive way before the intersection. Joe Bassil of Metro District office has requested a signal study at this location as a separate action from this surveillance review.

REAR-END

NW-15 85- 9  
 SE-18 86-10  
 E- 4 87-20  
 W- 2 88-20

NO ACTION

77091	02.36	US-25	24TH AVE	FT.GRATIOT T	TOTAL ACCIDENTS	52
	76 LOCATIONS	2 Lane-2 Way	Urban/Signal	Less than 10,000		
Rear-End	26	6.767	8.303	11.69	20	

REMARKS: This location was found to be the intersection of M-25/Lymburner @ M-136 Keewahdin, reference No. 77132-01-001. Concentration of rear-end accident are on the northbound approach. Of the 26 rear-end accidents, 38% were on a wet surface. Twelve inch signal heads already in place. No correctable accident pattern formed.

REAR-END

NW- 0 85- 6  
 SE- 2 86- 6  
 S- 2 87- 9  
 N-14 88- 5

NO ACTION

77091	02.75	M-136	KRAFFT ROAD	FT.GRATIOT T	TOTAL ACCIDENTS	44
	175 LOCATIONS	2 Lane-2 Way	Rural/Flasher	Less than 10,000		
Right Angle	20	5.718	4.846	7.705	10	

REMARKS: This intersection has been redesigned to make appropriate turn lanes in preparation for a signal to be installed in 1990 (project no. 29130). No further recommendation needed at this time.

RIGHT ANGLE

NW- 0 85- 3  
 SW- 3 86-10  
 E- 7 87- 7  
 W-10 88- 7

NO ACTION

1985-1987 INTERSECTION HIGH-ACCIDENT LISTING (Stats & Threshold & %)

DISTRICT 9

ACC TYPE	# ACC	STD DEV	MEAN	UCL	CALCULATED AT 0.5 STD DEV THRESHOLD NUMBER	PERCENT OF TOTAL
77111	25.83	I-94 CONN. LAPEER ROAD	PT.HURON CY.		TOTAL ACCIDENTS 72	
	2 LOCATIONS	4 Lane-Divided	Urban/Signal	Less than 10,000		
Right Angle	16				10	
Rear-End	30				20	

REMARKS: New timing permit installed 2-24-89. The permit included adequate yellow time. Due to miscoding of the accident reports, there were only six angle accidents at the intersection during the study period. No correctable accident pattern formed; therefore, no recommendation at this time.

REAR-END	RIGHT ANGLE
NB- 0 85- 3	NB- 9 85- 1
SB- 5 86- 7	SB- 2 86- 3
WB- 5 87-13	WB- 5 87- 3
EB-13 88- 4	EB- 0 88- 1

NO ACTION

77111	27.60	I-94 CONN. HANCOCK ST	PT.HURON CY.		TOTAL ACCIDENTS 27
	6 LOCATIONS	6 Lane-Divided	Urban/Signal	Less than 10,000	
Right Angle	11				10

REMARKS: Accidents are just over threshold. The right angle accident are evenly distributed from all directions. No correctable accident pattern formed. No recommendation at this time.

RIGHT ANGLE
NB- 2 85- 3
SB- 3 86- 4
WB- 3 87- 4
EB- 4 88- 3

NO ACTION

77111	27.78	I-94 CONN. GARFIELD ST	PT.HURON CY.		TOTAL ACCIDENTS 26
	397 LOCATIONS	4 Lane-Divided	Urban/No Signal	10,000 to 20,000	
Right Angle	22	3.400	1.146	2.846	15

REMARKS: See action location No. 2

77132	00.39	M-25 KRAFFT ROAD	FT.GRATIOT T		TOTAL ACCIDENTS 50
	9 LOCATIONS	5 Lane-2 Way	Rural/Signal	10,000 to 20,000	
Right Angle	16				15

REMARKS: See action location No. 3

1983-1987 MIDBLOCK HIGH-ACCIDENT LISTING (Stats & Threshold & %)  
 DISTRICT 9 CALCULATED AT 0.5 STD DEV

ACC TYPE	# ACC	STD DEV	MEAN	UCL	THRESHOLD NUMBER	PERCENT OF TOTAL
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77012	07.00	07.50	M-19	Non-Freeway	Less than 10,000	25 TOTAL ACCIDENTS
O-turn/F-Obj	16	15				

REMARKS: The alignment is curved within this half-mile location. No spot location of accidents. No correctable accident pattern formed; therefore, no further recommendation.

OVERTURNS FIXED OBJECT INJURIES FATALITIES

2, 4-INJ	8-SIGNS	A-6	0
	3-DITCH	B-6	
		C-4	

NO ACTION

77012	10.00	10.50	M-19	Non-Freeway	Less than 10,000	113 TOTAL ACCIDENTS
Parking	26	20				

REMARKS: Concentration of accidents south of Mechanic Street. No correctable accident pattern; therefore, no recommendation.

PARKING

NS- 9  
 SS-11

NO ACTION

77023	16.58	17.08	BL-69	Non-Freeway	Less than 10,000	95 TOTAL ACCIDENTS
O-turn/F-Obj	19	15				

REMARKS: No spot locations of accidents or objects. No correctable pattern.

<u>OVERTURNS</u>	<u>FIXED OBJECT</u>	<u>OBJECTS HIT</u>	
1	18	SIGN- 8	CURB- 1
		POLE- 1	ON/RD- 1
		DITCH- 1	
		TREE- 2	
		MAIL BOX- 1	

NO ACTION

77023	17.58	18.08	BL-69	Non-Freeway	Less than 10,000	149 TOTAL ACCIDENTS
Ped/Bike	10	6				

REMARKS: Four out of the five bicycle accidents were caused from the bike riders going the wrong way down a one way street. No correctable accident pattern found.

NO ACTION

1983-1987 MIDBLOCK HIGH-ACCIDENT LISTING (Stats & Threshold & %)

DISTRICT 9

CALCULATED AT 0.5 STD DEV

ACC TYPE	# ACC	STD DEV	MEAN	UCL	THRESHOLD NUMBER	PERCENT OF TOTAL
77023	18.08	18.58	BL-69	Non-Freeway	Less than 10,000	182 TOTAL ACCIDENTS
Ped/Bike	7	6				

REMARKS: All six bicycle accidents in different locations. Four out of the seven accidents were caused by the bike rider riding down the wrong way of a one way street.

NO ACTION

77031	00.00	00.50	BL-94	Non-Freeway	Less than 10,000	57 TOTAL ACCIDENTS
Wet	23	20		40% OF	57 = 22	

REMARKS: Concentration of accidents at the intersection of M-25 @ Range road. An analysis of the wet accidents was conducted. A reduction of two wet accidents per year was calculated assuming an overlay project would reduce wet accidents to the district average of 26%; therefore, a pavement friction test is not necessary at this intersection.

NO ACTION

77032	03.50	04.00	BL-94, BL-69	Non-Freeway	10,000 to 20,000	261 TOTAL ACCIDENTS
Parking	53	30				
Ped/Bike	9	8				

REMARKS: Only 43 parking accidents found at this location. Six pedestrian accidents occurred and one fatality. Three bicycle accidents occurred also.

PARKED VEHICLE ACCIDENTS

Griswold- 2  
 White- 6  
 Chestnut- 9  
 Court- 5  
 Nine- 9  
 Lapper- 3

NO ACTION

77032	04.00	04.50	M-25	Non-Freeway	10,000 to 20,000	426 TOTAL ACCIDENTS
Parking	76	30				
Ped/Bike	20	8				

REMARKS: Twenty one parking accidents between Quay and Grand River. Based on a field review and discussion with Joe Bassil of Metro District, no action is recommended.

PARKED VEHICLE ACCIDENTS

Pine-Lapeer- 2  
 Lapeer- 6  
 Quay- 6  
 Quay-Grand River-21  
 Grand River- 6  
 Grand River-McMoran- 7  
 McMoran- 6

NO ACTION

1983-1987 MIDBLOCK HIGH-ACCIDENT LISTING (Stats & Threshold & %)  
 DISTRICT 9  
 CALCULATED AT 0.5 STD DEV

ACC TYPE	# ACC	STD DEV	MEAN	UCL	THRESHOLD NUMBER	PERCENT OF TOTAL
77051	04.00	04.50	M-29	Non-Freeway	10,000 to 20,000	79 TOTAL ACCIDENTS
Dark	41	30	50% OF 79 = 39			
O-turn/F-Obj	26	20				

REMARKS: Streets lights at all city intersections. No concentration of accidents. No correctable accident pattern has been formed; therefore, no recommendation at this time.

DARK ACCIDENTS			FIXED OBJECT			OBJECTS HIT	
YR	ACC	INJ	YR	ACC	INJ	SIGN-	FENCE-
83	9	3	83	3	1	POLE-	CURB-
84	3	1	84	3	1	DITCH-	OFF.RD-
85	11	3	85	5	2	TREE-	ON/RD-
86	9	3	86	9	1	MAIL BOX-	
87	10	9	87	4	1		

NO ACTION

ACC TYPE	# ACC	STD DEV	MEAN	UCL	THRESHOLD NUMBER	PERCENT OF TOTAL
77051	07.50	08.00	M-29	Non-Freeway	10,000 to 20,000	58 TOTAL ACCIDENTS
O-turn/F-Obj	20	20				
Hd-On/SS-Mt	12	8				

REMARKS: Alignment for this half-mile stretch is slightly curved. The head-on accidents are caused from people crossing the yellow line into the path of oncoming traffic. No spot concentration of accidents of fixed object accidents. No action is recommended at this time.

OVERTURN/FIXED OBJECT			HEAD ON			OBJECT HIT	
YR	ACC	INJ	YR	ACC	INJ	SIGN-	FENCE-
83	2	1	83	1	2	DITCH-	7
84	2	F-1,0	84	2	0	TREE-	1
85	5	4	85	3	0	MAILBOX-	6
86	3	0	86	7	8		
87	7	0	87	2	2		

NO ACTION

ACC TYPE	# ACC	STD DEV	MEAN	UCL	THRESHOLD NUMBER	PERCENT OF TOTAL
77052	00.50	01.00	M-29	Non-Freeway	10,000 to 20,000	89 TOTAL ACCIDENTS
O-turn/F-Obj	20	20				

REMARKS: Accidents just at threshold levels. A review of the accident reports reveals that there wasn't any spot concentrations of accidents. No correctable accident pattern formed; therefore, no recommendation at this time.

O-TURN/F-OBJ			OBJECTS HIT			
YR	ACC	INJ	SIGN-	CURB-	POLE-	OFF RD.-
83	8	4	7	3		
84	3	0	3			
85	1	1	1			
86	5	1	2			
87	3	1				

NO ACTION



1983-1987 MIDBLOCK HIGH-ACCIDENT LISTING (Stats & Threshold & %)  
 DISTRICT 9  
 ACC # STD MEAN UCL THRESHOLD PERCENT  
 TYPE ACC DEV  
 CALCULATED AT 0.5 STD DEV  
 OF TOTAL

77052 12.50 13.00 M-29 Non-Freeway Less than 10,000 31 TOTAL ACCIDENTS  
 Train 2 2

REMARKS: Each train accident occurred in a different location. One accident occurred at Wills Street, and the second accident occurred at Davis Road. The accident at Davis Road involved the injury of one person, while the accident at Wills Street was injury free.  
 NO ACTION

77111 24.00 24.50 I-94 Freeway 10,000 to 20,000 102 TOTAL ACCIDENTS

Icy 42 30 30% OF 102= 30

REMARKS: Concentration of accident occurred in 1985 (21). No spot location of accident within the half mile; therefore, no recommendation.

ICY  
 83- 6, 0 inj  
 84- 7, 3 inj  
 85-21, 7 inj  
 86- 9, 5 inj  
 87- 6, 2 inj

NO ACTION

77111 26.32 26.82 US-25 CONN. Non-Freeway Less than 10,000 38 TOTAL ACCIDENTS

Icy 21 20 30% OF 38 = 11  
 O-turn/F-Obj 22 15

REMARKS: During the five year study period, only four injuries occurred as a result of fixed object accidents, and only one as a result of icy road conditions. Of the 22 fixed object accidents, 12 occurred on icy pavement. No correctable accident pattern; therefore, no recommendation at this time.

OBJECTS HIT		ICY	
G.R.-	4	YR	INJ
SIGN-	4	83-	3 1
DITCH-	9	84-	2 0
PIER-	1	85-12	0
CONC. BAR.-	1	86-	2 0
ON. RD. -	2	87-	2 0

NO ACTION

77051 05.50 06.00 M-29 Non-Freeway 10,000 to 20,000 66 TOTAL ACCIDENTS

Fatal 4 3

REMARKS: One fatality was a pedestrian accident, one was a bicycle accident, and one was a motorcycle accident. The motorcycle and the pedestrian accident involved drunk drivers. Each accident occurred in a different location. No correctable accident pattern formed; therefore, no recommendation at this time.

NO ACTION

## SAFETY PROGRAMS UNIT THRESHOLDS

### Intersections Three Years 1985-1987 0.5 Standard Deviation Above Mean

Accident Type	Minimum ADT < 10,000	Threshold 10,000 < ADT < 20,000	ADT > 20,000
Angle	10	15	20
Head-On Left-Turn	10	15	20
Rear-End	20	25	30

### 0.5 Segments (including intersections) Five Years 1983-1987

Accident Type	ADT < 10,000	Minimum Threshold 10,000 < ADT < 20,000	ADT > 20,000	Minimum % of Total
Wet	20	30	40	40
Icy	20	30	40	30
Dark	20	30	40	50
O-Turn/F.Obj	15	20	25	
Train	2	3	4	
Parking/Parked Veh.	20	30	40	
Animal	25	25	25	
Hd-On/SS-Mt	6	8	10	
SS-Pass	4	6	8	
Backing	10	15	20	
Ped/Bike	6	8	10	

### 0.5 Segments (including intersections) Nine Years 1979-1987

Any 0.5 mile segment (including intersections) with a minimum of three fatal accidents in nine years.

DISTRICT WET ACCIDENT PERCENTAGES

YEAR	D/1	D/2	D/3	D/4	D/5	D/6	D/7	D/8	D/9	Stwd.
1976	10.6%	11.9%	16.5%	13.6%	21.9%	20.5%	20.3%	21.2%	23.4%	20.9%
1977	19.5%	17.8%	21.1%	18.7%	24.3%	24.1%	22.2%	23.9%	26.6%	24.3%
1978	16.0%	14.5%	19.7%	17.3%	21.2%	20.3%	18.8%	20.6%	22.9%	21.0%
1979	17.3%	16.9%	20.3%	17.2%	23.7%	22.1%	23.5%	23.9%	27.2%	24.2%
1980	16.8%	13.7%	18.4%	16.7%	23.5%	19.7%	20.1%	21.4%	23.7%	21.7%
1981	15.8%	14.3%	17.4%	16.2%	20.7%	20.9%	19.4%	22.4%	25.9%	22.2%
1982	17.1%	16.7%	19.9%	18.5%	22.1%	20.8%	19.6%	21.8%	25.6%	22.5%
1983	16.6%	15.6%	19.9%	18.9%	22.3%	20.7%	19.5%	21.1%	26.4%	22.7%
1984	15.4%	16.5%	19.6%	18.0%	22.6%	21.5%	21.7%	22.3%	27.2%	23.6%
1985	16.7%	14.8%	18.4%	18.2%	25.1%	22.9%	20.1%	21.8%	27.1%	23.8%
1986	18.7%	15.7%	20.9%	19.6%	24.5%	23.5%	21.8%	22.5%	26.3%	24.0%
1987	18.1%	16.7%	21.2%	18.4%	25.1%	21.8%	22.3%	22.0%	24.8%	23.1%
1988	15.1%	15.2%	20.2%	18.9%	23.3%	20.1%	19.3%	21.3%	22.6%	21.3%

\*Trunkline only

JDB/cjh  
10/19/89