Report TSD-234-76
A TRAFFIC ACCIDENT ANALYSIS
IN JACKSON COUNTY

TRAFFIC and SAFETY DIVISION

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DEPARTMENT OF STATE HIGHWAYS
STATE OF MICHIGAN
Michigan Department
of
State Highways and Transportation

Report TSD-234-76
A TRAFFIC ACCIDENT ANALYSIS
IN JACKSON COUNTY

JOSEPH L. MESZAROS
TRAFFIC ENGINEERING SERVICES

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Director

John P. Woodford

March 1974
ACKNOWLEDGMENTS

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Assisting Technician

MICHIGAN OFFICE OF HIGHWAY SAFETY PLANNING

Noel C. Bufe - Director

FHWA Project MCD-73-001B
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<td>30</td>
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<td>31</td>
</tr>
<tr>
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<td>Photo - Sutton Road</td>
<td>32</td>
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</tr>
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<td>36</td>
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</tr>
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<td>42</td>
</tr>
<tr>
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<tr>
<td>27</td>
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<td>44</td>
</tr>
<tr>
<td>28</td>
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<td>46</td>
</tr>
</tbody>
</table>
INTRODUCTION

The Highway Safety Act of 1966 was enacted by the Congress of the United States in order to promote highway safety. Highway safety standards were then developed to assure the orderly implementation of the Act.

Purpose

Highway Safety Standard 4.4.13, Traffic Engineering Services, is one of those standards. The purpose of Standard 4.4.13 is "to assure the full and proper application of modern traffic engineering principles and uniform standards for traffic control to reduce the likelihood and severity of traffic accidents."

This standard includes the identifying of specific locations or sections of streets and highways which have a high accident experience or potential as a basis for establishing priorities for improvement, selective enforcement or other practices that will eliminate or reduce the hazards.

The State of Michigan carries out a service of this type on the state trunkline system; however, many of the city and county agencies lack the financial and technical prerequisites necessary to pursue similar programs with similarly defined objectives. To insure that this additional highway safety standard is met and to improve the overall evaluation of the accident picture in Michigan, the Michigan Department of State Highways and Transportation requested and received through the Office of Highway Safety Planning in the Department of State Police, a federally funded project entitled "Traffic Engineering Services 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 corrections to those conditions which may be contributing to accidents.

Scope

The intent of this program is to improve traffic safety on all Michigan streets and roads by expanding the traffic engineering evaluation of factors causing accidents.

Study Procedures

The study procedures for this project involve a review of high accident locations. This review includes: basic data collection,
identifying and locating high accident locations, an accident analysis of these high accident locations, technical evaluation of accident facts, and consequent remedial recommendations.

Study Area

Jackson County is located in the south central portion of the state. It is bordered on the north by Ingham and Eaton Counties, on the east by Washtenaw County, on the west by Calhoun County and on the south by Hillsdale and Lenawee Counties (Figure 1).

The population of Jackson County in 1970 was 143,274 which is an increase of 8.5 percent over the 1960 census. This increase is not uncommon as the population of the county has been steadily increasing since 1920.

The road system in Jackson County, according to the Twenty Second Annual Progress Report as compiled by the Local Government Division of the Michigan Department of State Highways and Transportation, is made up of 157.30 miles of state trunkline, 529.29 miles of county primary roads and 1,011.95 miles of county local roads, for a total of 1,698.54 miles of roadway (Figure 2).
STUDY AREA

FIGURE 1
FIGURE 2

ROAD TYPES IN JACKSON COUNTY

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS
HIGHWAY PLANNING SURVEY
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

JACKSON COUNTY
MICHIGAN
STATE HIGHWAY COMMISSION
DEPARTMENT OF CIVIL ENGINEERING
HIGHWAY PLANNING SURVEY
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

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STATE TRUNKLINE

COUNTY PRIMARY

COUNTY LOCAL
TRAFFIC ENGINEERING ANALYSIS

Collection and Analysis of Data

The Department of State Police examined their records and transmitted to the Traffic and Safety Division of the Michigan Department of State Highways and Transportation a list of the 10 high accident locations (Figure 3) on the county road system. An automated system of locating accidents on local roads has not yet been established on a statewide basis; therefore, the high accident locations for Jackson County were determined by manually extracting and compiling those locations with the highest number of accidents from the 1970 county accident reports.

Once the problem locations were identified, additional accident information for the years 1971 and 1972 was compiled in order to expand the accident base at each location.

The 10 high accident locations accounted for 286 accidents during the three-year study period. Traffic volumes on the County Primary Road System in Jackson County vary from moderate in outlying areas to heavy near the City of Jackson. It is understandable then that the high concentration of accidents will be in this area (Figure 4).

The data collection, for which the Department of State Highways and Transportation is responsible, involves the following basic steps: 1) preparation of collision diagrams and, if necessary, physical condition diagrams for each selected location; and 2) obtaining traffic and speed study counts where necessary.

The analysis portion of the high accident location review involves the analysis of the summarized facts and field data 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. Thus, at each high accident location, individual accident reports were reviewed in detail and collision diagrams were prepared for each location in order to identify accident patterns and to locate the accident in relation to the intersection or approaches to the intersection. The analysis results in evaluating the total information and prescribing the proper treatment at each location.

County-Wide Recommendations

Approach Lanes

Field observation revealed that a few signalized locations in Jackson County had only one lane per approach. When an intersection is signalized there often develops a need for
SPOT MAP
OF HIGH ACCIDENT LOCATIONS IN
JACKSON COUNTY
(1970-1972)

LEGEND

● 0-20 ACC.
○ 21-30 ACC.
● 31-45 ACC.

FIGURE 3
FIGURE 4

ADT MAP OF COUNTY ROADS IN JACKSON COUNTY

LEGEND

TRAFFIC FLOW BAND

0-499  2500-3999
500-1499  4000-6999
1500-2499  7000-OVER

JACKSON COUNTY
MICHIGAN
STATE HIGHWAY COMMISSION
DEPARTMENT OF STATE HIGHWAYS
DATA OBTAINED FROM HIGHWAY PLANNING SURVEY
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS
additional intersection capacity. If the approaches have a single lane, then turning vehicles may cause extensive delay to other traffic on the same approach. A left turn may be delayed by opposing traffic or pedestrians in the crosswalk. Other traffic will then be held up in the same lane, until the turn can be completed. A right turn can be held up due to pedestrians in the crosswalk.

Since turning movements so readily create delay, there is a need for a minimum of two approach lanes on every approach to every signalized intersection. The second lane will allow bypassing of vehicles stopped or slowing to make turns, and will reduce unnecessary delays even if not actually needed for capacity. The widening of intersectional approaches to separate turning traffic from thru traffic is recommended to help reduce the delays caused by assignment of right-of-way at the intersections controlled by traffic signals. Widening also aids in the overall operation of the intersection, because more vehicles are able to negotiate the intersection per signal cycle. Additional width is also necessary on the leaving side as much as the approach side of the intersection to promote movement through the intersection.

Clear Vision Areas

In order to provide ample sight distance at intersections, the corners of these intersections must not be overgrown with foliage nor have other obstructions. Although sometimes buildings or other permanent obstacles create inadequate visibility, most of the time removable objects such as trees, signs, or parked vehicles prohibit adequate sight distances. It is therefore recommended that Jackson County not only establish a program to create clear vision corners at all intersections, but also begin a maintenance program to insure that all corners are kept clear of obstacles.

Estimated Costs

Since final construction plans are not available, in estimating the construction costs the lump sum of $5.00 per square foot of pavement has been used. The costs for all other recommendations are based on Department unit prices and using Department personnel for the work.

High Accident Locations

After the analysis of the 10 high accident locations was completed, it was apparent that no engineering recommendations would be
feasible for four of these locations. There were no accident patterns at two of these locations and no present driving hazards that could be controlled by traffic engineering. The remaining two locations involved one that will be corrected under another project and the other has undergone a recent change (signalization). Consequently, only the remaining six locations will be discussed in detail. The high accident locations for the study period (1970-1971) are as follows:

1. Morell Street, Spring Arbor Road, and Brown Street
2. Flansburg Road and South Street
3. Page Avenue and Falahee Road
4. Page Avenue and Dettman Road
5. Page Avenue and Sutton Road
6. Lansing Avenue and Parnell Road
7. Horton Road, Jackson Road, Ridgeway Road, and Badgley Road
8. Michigan Avenue and Dearing Road
9. Francis Street and Hinckley Boulevard
10. Wildwood Avenue and Laurance Street
SOUTH STREET AT FLANSBURG ROAD

Operational Analysis:

South Street intersects Flansburg Road to form a "T" intersection operating under stop control. There is a 36 in. "Stop" sign used to control traffic on Flansburg Road.

Accidents:

<table>
<thead>
<tr>
<th>Type</th>
<th>1970</th>
<th>1971</th>
<th>1972</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ran Off Roadway</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Head On</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Misc.</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>18</td>
<td>11</td>
<td>44</td>
</tr>
</tbody>
</table>

The miscellaneous types included four rear ends, three right-angles and one improper turning accident. The accident rate at this location was 6.3 acc/MV during the study period.

Eighteen of the accidents occurred at night. Seventeen of the accidents occurred on wet pavement and 20 occurred on snowy and icy pavement. Twenty-three of the ran off roadway accidents occurred on wet or snowy pavement.
**LEGEND**

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

**MICHIGAN DEPARTMENT OF STATE HIGHWAYS**
TRAFFIC AND SAFETY DIVISION

**Location:** FLANSBURG AT SOUTH JACkSON CO.

**Period:** 1970 THRU 1972

- **Accidents - Total:** 44
- **P.D.:** 27
- **Injury:** 1
- **Fatal:** 1
- **C.S. Miles:**
- **Drawn:** D.J.M.
- **Plan No. LOCATION:**

**FIGURE 5**
EASTBOUND SOUTH STREET

WESTBOUND SOUTH STREET

FIGURE 6
NORTHBOUND FLANSBURG ROAD

SOUTHBOUND FLANSBURG ROAD

FIGURE 7
### RECOMMENDATIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Replace the Bi-Directional Target Arrows on South Street with Directional Target Arrows to indicate a change in alignment.</td>
<td>$ 89.52</td>
</tr>
<tr>
<td>2. Erect delineators at 50 ft intervals along South Street on both sides of the road for a distance of 500 ft each direction from Flansburg Road to provide visibility during the periods of darkness.</td>
<td>372.00</td>
</tr>
<tr>
<td>3. Apply pavement markings at this location to aid visibility during the periods of darkness.</td>
<td>40.00</td>
</tr>
<tr>
<td>4. Install guardrail along each approach to the bridge to prevent vehicles from landing in the river. The installation of the guardrail supersedes the Type III Object Markers (Obstruction Panels).</td>
<td>6,200.00</td>
</tr>
<tr>
<td>5. Install an overhead street light at the intersection to illuminate this area during the periods of darkness.</td>
<td>265.22</td>
</tr>
<tr>
<td>6. Erect a modified Side Road Warning sign (W2-2) with an accompanying Road Name sign (D3-2a) on South Street on both sides of this intersection to indicate the presence of this side road.</td>
<td>152.80</td>
</tr>
<tr>
<td>7. Replace the two Reverse Curve Warning signs on South Street with 30 MPH Speed Panels and 36 in. Turn Warning signs. Our field testing indicates that the safe negotiable speed for this turn is 30 MPH.</td>
<td>91.52</td>
</tr>
</tbody>
</table>

**TOTAL** $ 7,211.06
PAGE AVENUE AT FALAHEE ROAD

Operational Analysis:

Page Avenue intersects Falahee Road to form a right-angle intersection operating under traffic signal control. The right-of-way assignment is based on a 50 second cycle with a 50-50 percent split, and yellow clearance intervals of seven percent (3.5 seconds). Other controls include two right turn flashing red arrows, one for eastbound Page Avenue and one for northbound Falahee Road traffic.

Accidents:

<table>
<thead>
<tr>
<th>Type</th>
<th>1970</th>
<th>1971</th>
<th>1972</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear End</td>
<td>9</td>
<td>7</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>Head On-Left Turn</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Sideswipe</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Misc.</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>21</td>
<td>12</td>
<td>10</td>
<td>43</td>
</tr>
</tbody>
</table>

The miscellaneous types included three improper turning, two ran off roadways, one deer, one head on, one improper backing, one vehicle struck a manhole and one right-angle accident. The accident rate at this location was 3.6 acc/MV during the study period.
### LEGEND

<table>
<thead>
<tr>
<th>Event</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop &amp; Go Signal</td>
<td>S</td>
</tr>
<tr>
<td>Flashing Beacon</td>
<td>F</td>
</tr>
<tr>
<td>Pedestrian</td>
<td>X</td>
</tr>
<tr>
<td>Fatal</td>
<td>E</td>
</tr>
<tr>
<td>Injury</td>
<td>O</td>
</tr>
<tr>
<td>Skidding</td>
<td></td>
</tr>
<tr>
<td>Jackknife</td>
<td></td>
</tr>
<tr>
<td>Overturned</td>
<td></td>
</tr>
<tr>
<td>Backing</td>
<td></td>
</tr>
<tr>
<td>Tree</td>
<td></td>
</tr>
<tr>
<td>Out of Control</td>
<td></td>
</tr>
<tr>
<td>Driver Intent</td>
<td></td>
</tr>
<tr>
<td>Deer</td>
<td></td>
</tr>
<tr>
<td>Violator</td>
<td></td>
</tr>
</tbody>
</table>

### MICHIGAN DEPARTMENT OF STATE HIGHWAYS
TRAFFIC AND SAFETY DIVISION

**Location**: FALAHEE AT PAGE
JACKSON CO.

**Period**: 1970 THRU 1972
3.57 ACC/MV

<table>
<thead>
<tr>
<th>Event</th>
<th>Total</th>
<th>P.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accidents</td>
<td>43</td>
<td>33</td>
</tr>
<tr>
<td>Injury</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

**C.S.**
Miles: Drawn: DJM

**Plan No.** LOCATION
Date: 10-24-73
FIGURE 10

EASTBOUND PAGE AVENUE

WESTBOUND PAGE AVENUE
RECOMMENDATIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Estimated Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Change the signal timing to an 80 second cycle with a 65-35 percent split favoring Page Avenue and yellow clearance intervals of five percent (4.0 seconds). The signal split is based on traffic counts which indicate a substantial amount of vehicle travel on Page Avenue as compared to Falahee Road. By using this cycle length progression can be achieved between this signal and the signal located at Page Avenue and Dettman Road. These two signals should operate simultaneously through synchronous action.</td>
<td>$ 50.00</td>
</tr>
<tr>
<td>2. Apply pavement markings including pavement arrows to define the function of each lane.</td>
<td>50.00</td>
</tr>
<tr>
<td>3. Provide a physical barrier between the north leg of this intersection and the parking lot.</td>
<td>1,500.00</td>
</tr>
<tr>
<td>4. If the head on-left turn pattern on westbound Page Avenue persists, consideration should be given to constructing a center left turn lane for westbound Page Avenue traffic.</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>$ 1,600.00</td>
</tr>
</tbody>
</table>
CLOSE DRIVE

PAGE AVE.

EXISTING W2-3

SIGNAL AHEAD

8" RIGHT TURN RED ARROWS

FIGURE 12

PROPOSED INTERSECTION APPROACH DIAGRAM

AUTH. NO. DJM

DRAWN

DATE 1-24-74

STATE OF MICHIGAN DEPARTMENT OF STATE HIGHWAYS TRAFFIC & SAFETY DIVISION

PROPOSED INTERSECTION APPROACH DIAGRAM

FIGURE 12
Operational Analysis:

Page Avenue intersects Dettman Road to form a right-angle intersection operating under signal control. The right-of-way assignment is based on a 70 second cycle with a 60-40 percent split and yellow clearance intervals of five percent (3.5 seconds).

Accidents:

<table>
<thead>
<tr>
<th>Type</th>
<th>1970</th>
<th>1971</th>
<th>1972</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear End</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Head On-Left Turn</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Turning</td>
<td>2</td>
<td>1</td>
<td>--</td>
<td>3</td>
</tr>
<tr>
<td>Misc.</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>9</td>
<td>11</td>
<td>7</td>
<td>27</td>
</tr>
</tbody>
</table>

The miscellaneous types included two ran off roadways, one pedestrian, one sideswipe and one right-angle accident. The accident rate at this location was 2.2 acc/MV during the study period.
LEGEND

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

MICHIGAN DEPARTMENT OF STATE HIGHWAYS
TRAFFIC AND SAFETY DIVISION

Location: DETTMAN AT PAGE
JACKSON CO.

Period: 1970 THRU 1972
222 ACC/MV.

Accidents - Total 27
P.D. 22

Injury 5 ( ) Fatal 0 ( )

C.S. ______ Miles ______ Drawn DJM

Plan No. LOCATION Date: 10-24-73
FIGURE 14

EASTBOUND PAGE AVENUE

WESTBOUND PAGE AVENUE
RECOMMENDATIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Estimated Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Erect (2) Signal Ahead signs to warn traffic of the signal as  vehicles come around the horizontal curve on westbound Page Avenue and up the vertical curve on eastbound Page Avenue.</td>
<td>$ 74.56</td>
</tr>
<tr>
<td>2. Construct another lane to provide a two lane approach on the north leg of this intersection and improve capacity.</td>
<td>30,312.50</td>
</tr>
<tr>
<td>3. Change the signal timing to an 80 second cycle with a 65-35 percent split favoring Page Avenue and yellow clearance intervals of five percent (4.0 seconds). This signal split is based on traffic counts which indicate a substantial amount of vehicle travel on Page Avenue as compared to Dettman Road. By using this cycle length, progression can be achieved between this signal and the signal located at Page Avenue and Falahee Road. This signal should be operated simultaneously through synchronous action.</td>
<td>50.00</td>
</tr>
<tr>
<td>4. Apply pavement marking including pavement arrows to aid in defining the operation of each lane of this intersection.</td>
<td>50.00</td>
</tr>
<tr>
<td>5. If the head on-left turn pattern on eastbound Page Avenue persists, consideration should be given to a center left turn lane for eastbound Page Avenue traffic.</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL $ 30,487.06
EXISTING PAVEMENT

DETTMAN RD

24'

225'

250'

25'R

50'

12 12 15

50'

PROPOSED

W3-3

PROPOSED

W3-3

PAGE AVE.

FIGURE 16

PROPOSED INTERSECTION
APPROACH DIAGRAM

AUTH. NO. DJM

DRAWN

CONT. SEC.

DATE 1-24-74

REF.

SCALE

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS
TRAFFIC & SAFETY DIVISION

FORM 1900 (REV. 10-68)
SUTTON ROAD AT PAGE AVENUE

Operational Analysis:

Sutton Road intersects Page Avenue to form a "T" intersection operating under stop control. There is one 24 in. "Stop" sign used to control traffic on Sutton Road.

Accidents:

<table>
<thead>
<tr>
<th>Type</th>
<th>1970</th>
<th>1971</th>
<th>1972</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right-Angle</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Rear End</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Ran Off Roadway</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Misc.</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>9</strong></td>
<td><strong>9</strong></td>
<td><strong>9</strong></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

The miscellaneous types included three head on-left turns, two sideswipes, two improper turning and one improper backing accident. The accident rate at this location was 1.6 acc/MV during the study period.
### LEGEND

- **Stop & Go Signal**
  - S
- **Flashing Beacon**
  - F
- **Stop Sign**
  - R
- **Yield Sign**
  - Y
- **Pedestrian**
  - X
- **Tree**
- **Out of Control**
- **Driver Intent**
- **Deer**
- **Violator**

### MICHIGAN DEPARTMENT OF STATE HIGHWAYS
TRAFFIC AND SAFETY DIVISION

<table>
<thead>
<tr>
<th>Location</th>
<th>PAGE 40'</th>
<th>SUTTON 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>FELTER</td>
<td>1970 (9)</td>
<td>1.59 ACC/MV.</td>
</tr>
<tr>
<td>FELTER</td>
<td>1971 (9)</td>
<td>1.59 ACC/MV.</td>
</tr>
<tr>
<td>FELTER</td>
<td>1972 (9)</td>
<td>1.59 ACC/MV.</td>
</tr>
</tbody>
</table>

**FIGURE 17**

<table>
<thead>
<tr>
<th>Period: 1970 THRU 1972</th>
<th>1.59 ACC/MV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accidents - Total</strong>: 27</td>
<td>P.D. 22</td>
</tr>
<tr>
<td><strong>Injury</strong>: 5</td>
<td>Fatal 0</td>
</tr>
<tr>
<td><strong>C.S.</strong>: Miles</td>
<td>Drawn RJM</td>
</tr>
<tr>
<td><strong>Plan No.</strong>: LOCATION</td>
<td>Date 10-29-72</td>
</tr>
</tbody>
</table>

---

**Stop & Go Signal**

- S

**Flashing Beacon**

- F

**Stop Sign**

- R

**Yield Sign**

- Y

**Pedestrian**

- X

**Tree**

- 

**Out of Control**

- 

**Driver Intent**

- 

**Deer**

- Y

**Violator**

-
NORTHBOUND SUTTON ROAD

SOUTHBOUND SUTTON ROAD

FIGURE 19
<table>
<thead>
<tr>
<th>Type</th>
<th>Estimated Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Erect 36 in. Side Road Warning signs east and west of the inter­­­</td>
<td>$ 74.56</td>
</tr>
<tr>
<td>section on Page Avenue.</td>
<td></td>
</tr>
<tr>
<td>2. Apply pavement markings.</td>
<td>50.00</td>
</tr>
<tr>
<td>3. Install a 12 in. flashing beacon at this location with the yellow</td>
<td>2,500.00</td>
</tr>
<tr>
<td>lens for Sutton Road and the red lens for Page Avenue to indicate</td>
<td></td>
</tr>
<tr>
<td>traffic on Page Avenue of possible conflict with vehicles on Sutton</td>
<td></td>
</tr>
<tr>
<td>Road.</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>$ 2,624.56</td>
</tr>
</tbody>
</table>
SIDE ROAD WARNING SIGN
PROPOSED W2-2

SUTTON RD.
STOP BAR

EXISTING RH

PAGE AVE.

FELTER RD.

12" FLASHING BEACON

EXISTING
R1-1

SIDE ROAD WARNING SIGN
PROPOSED W2-2

FIGURE 20

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

TRAFFIC & SAFETY DIVISION

AUTH. NO.

DRAWN
DJM

PROPOSED INTERSECTION
DIAGRAM

DATE
1-24-74

EDCO: 186M 5-71 45620

FORM 11011 (REV. 10-80)
HORTON ROAD AT JACKSON ROAD, RIDGEWAY ROAD, BADGLEY ROAD

Operational Analysis:

This location is a 0.1 mile segment of Horton Road. Jackson Road intersects Horton Road to form a "Y" intersection with Horton Road operating under stop (36 in. sign) control. Ridgeway Road and Badgley Road intersect Horton Road to form "T" intersections with Ridgeway Road and Badgley Road both operating under stop (24 in. sign) control.

Accidents:

<table>
<thead>
<tr>
<th>Type</th>
<th>1970</th>
<th>1971</th>
<th>1972</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ran Off Roadway</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Sideswipe</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Misc.</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>11</strong></td>
<td><strong>7</strong></td>
<td><strong>5</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

The miscellaneous types included three improper turnings, three head ons, three rear ends, three improper backings, one head on-left turn and one right-angle accident. The accident rate at this location was 3.72 acc/MV during the study period.
### LEGEND

<table>
<thead>
<tr>
<th>Traffic Sign</th>
<th>Graphic Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop &amp; Go Signal</td>
<td>🟢</td>
</tr>
<tr>
<td>Stop Sign</td>
<td>🟢</td>
</tr>
<tr>
<td>Yield Sign</td>
<td>🟢</td>
</tr>
<tr>
<td>Flashing Beacon</td>
<td>🟢</td>
</tr>
<tr>
<td>Pedestrian</td>
<td>🟢</td>
</tr>
<tr>
<td>Tree</td>
<td>🟢</td>
</tr>
<tr>
<td>Out of Control</td>
<td>🟢</td>
</tr>
<tr>
<td>Driver Intent</td>
<td>🟢</td>
</tr>
<tr>
<td>Deer</td>
<td>🟢</td>
</tr>
<tr>
<td>Violeter</td>
<td>🟢</td>
</tr>
</tbody>
</table>

### MICHIGAN DEPARTMENT OF STATE HIGHWAYS

**Traffic and Safety Division**

- **Location:** HORTON AT JACKSON, RIDGEWAY & BADGLEY
- **Jackson Co.:**
- **Period:** 1970 THRU 1972
- **Accidents - Total:** 23
- **P.D.:** 10
- **Injury:** 7 ( ) Fatal 0 ( )
- **C.S.:** Miles Drawn DJW
- **Plan No. LOCATION:** Date 10-23-72

---

**Figure 21**

- **1970 (11)**
- **1971 (7)**
- **1972 (1)**
WESTBOUND
BADGLEY ROAD

SOUTHBOUND
HORTON ROAD

EASTBOUND
RIDGEWAY ROAD

FIGURE 23
RECOMMENDATIONS

1. Apply pavement markings to provide visibility during the periods of darkness.

2. Install an overhead street lighting system at each of these intersections to provide illumination at night.

3. Erect a D1-2 Directional Guide sign for southbound Horton Road north of Ridgeway Road.

<table>
<thead>
<tr>
<th>Type</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$20.00</td>
</tr>
<tr>
<td>2.</td>
<td>$791.06</td>
</tr>
<tr>
<td>3.</td>
<td>$60.87</td>
</tr>
</tbody>
</table>

**TOTAL** $871.93
Proposed Intersection Diagram

Existing

BADGLEY RD.

STOP BAR

EXISTING

JACKSON RD.

OVERHEAD LIGHTING SYSTEM

RH-1

EXISTING

STOP BAR

RH-1

HORTON RD.

STOP BAR

STOP BAR

RIDGEWAY RD.

HORTON RD.

RH-1

EXISTING

FIGURE 24

AUTH. NO.

CONT. SEC.

DATE

1-24-74

REFERENCES

SCALE

SHEET OF PLAN

DRAWN

DJM

PROPOSED INTERSECTION

DEPARTMENT OF STATE HIGHWAYS

STATE OF MICHIGAN

TRAFFIC & SAFETY DIVISION

FORM 1591 (REV. 10-66)

EDCO-156M 5-71 45820
FRANCIS STREET AT HINCKLEY BOULEVARD

Operational Analysis:

Francis Street intersects Hinckley Boulevard to form a "T" intersection operating under stop control. There is one 30 in. "Stop" sign controlling traffic on Hinckley Boulevard. Francis Street is a divided roadway at this location.

Accidents:

<table>
<thead>
<tr>
<th>Type</th>
<th>1970</th>
<th>1971</th>
<th>1972</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head On-Left Turn</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Right-Angle</td>
<td>3</td>
<td>1</td>
<td>--</td>
<td>4</td>
</tr>
<tr>
<td>Misc.</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>11</td>
<td>5</td>
<td>3</td>
<td>19</td>
</tr>
</tbody>
</table>

The miscellaneous types included two improper turning, one improper backing, one pedestrian, one parking, one ran off roadway and one rear end accident. Six of the head on-left turns and two right-angle accidents involved vehicles exiting a private driveway opposite Hinckley Boulevard.
FIGURE 25

LEGEND

Stop & Go Signal  Stop Sign  Yield Sign
Stop & Go Signal  Stop Sign  Yield Sign

MICHIGAN DEPARTMENT OF STATE HIGHWAYS
TRAFFIC AND SAFETY DIVISION

Location  FRANCIS AT HINCKLEY
JACKSON CO.

NO ACC RATES AVAILABLE

Period: 1970 THRU 1972

Accidents - Total  19  
P.D.  15

Injury  

Fatal  4  ( )  

Fatal Jackknife

Fatal Overturned

Fatal Backing

Pedestrian

Skidding

Jackknife

Overturned

Backing

Tree

Out of Control

Driver Intent

Deer

Violator

C.S.  Miles  

Drawn

Plan No. LOCATION

Date  10-23-73
THE ACCIDENT POTENTIAL

NORTHBOUND FRANCIS STREET

SOUTHBOUND FRANCIS STREET

FIGURE 26
EASTBOUND
HINCKLEY BLVD.

FIGURE 27

PARKING AREA
ACE'S HARDWARE

WESTBOUND
HINCKLEY BLVD.
**RECOMMENDATIONS**

<table>
<thead>
<tr>
<th>Type</th>
<th>Estimated Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Close off the drive opening (Ace's Hardware) directly across from Hinckley Boulevard by erecting a physical barrier extending from Cass Street 190 ft south. This will provide two driveway openings to Ace's Hardware, one on Francis Street north of Meyer Street and one on Cass Street.</td>
<td>$ 1,900.00</td>
</tr>
<tr>
<td>2. Eliminate parking from the island dividing north and southbound Francis Street as per the Michigan Vehicle Code Section 644. Also, convert the angle parking on southbound Francis Street to parallel parking.</td>
<td>25.00</td>
</tr>
<tr>
<td>3. Relocate the stop sign on Hinckley Boulevard closer to the corner and the point of obedience.</td>
<td>13.25</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$ 1,938.25</strong></td>
</tr>
</tbody>
</table>
NOTE: FOR ESTIMATING PURPOSES
GUARD RAIL WAS USED IN
PROVIDING THE PHYSICAL
BARRIER IN FRONT OF THE
HARDWARE STORE

EXISTING
RI-1

CASS ST.

PARKING
AREA

FRANCIS ST.

NOTE:

HINCKLEY BLVD.

RELOCATE
RI-1

CONVERT ANGLE PARKING
TO PARALLEL PARKING.

REMOVE PARKING
IN MEDIAN

EXISTING
RI-1

MEYERS

FIGURE 28

PROPOSED INTERSECTION
APPROACH DIAGRAM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS
TRAFFIC & SAFETY DIVISION

AUTH. NO.

DRAWN

DJM

CONT. SEC.

DATE

1-25-74

REF.

SCALE

SHEET OF

PLAN

EDCO+ 1965M 5-71 48820
The Department of State Police submitted 10 high accident locations for Jackson County to the Department of State Highways and Transportation. After an in depth study of these locations, recommendations were formulated for six of these locations. The recommendations are as follows:

<table>
<thead>
<tr>
<th>Location Number</th>
<th>Location Description and Estimated Cost</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>South Street at Flansburg Road $7,211.06</td>
<td>Replace Bi-Directional Target Arrows with Directional Arrows. Erect Delineators. Apply Pavement Markings. Install Guardrail. Remove Type III Object Markers. Install Street Lighting System. Erect Side Road Warning signs with a Road Name sign. Erect Turn Warning signs with 30 mph Speed Panels. Remove Reverse Turn warning signs.</td>
</tr>
<tr>
<td>3</td>
<td>Page Avenue at Falahee Road $1,600.00</td>
<td>Increase the signal cycle length to 80 seconds. Apply pavement markings. Construct a physical barrier between the north leg and the parking lot.</td>
</tr>
<tr>
<td>4</td>
<td>Page Avenue at Dettman Road $30,487.06</td>
<td>Erect Signal Ahead signs. Construct another lane for the north leg of this intersection. Apply pavement markings. Increase the signal cycle length to 80 seconds.</td>
</tr>
<tr>
<td>5</td>
<td>Page Avenue at Sutton Road $2,624.56</td>
<td>Erect Side Road Warning signs. Apply pavement markings. Install flashing beacon.</td>
</tr>
<tr>
<td>7</td>
<td>Horton Road at Jackson Road, Ridgeway Road, Badgley Road $871.93</td>
<td>Apply pavement markings. Install street lighting system. Erect a D1-2 Guide Sign.</td>
</tr>
<tr>
<td>Location Number</td>
<td>Location Description and Estimated Cost</td>
<td>Recommendations</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>9</td>
<td>Francis Street at Hinckley Boulevard</td>
<td>Close off the drive across from Hinckley Blvd.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eliminate median parking.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Convert angle parking to parallel parking.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relocate the stop sign.</td>
</tr>
<tr>
<td></td>
<td>$ 1,938.25</td>
<td></td>
</tr>
</tbody>
</table>

Furthermore, a few general recommendations were formulated that should be implemented by Jackson County.

1. Two approach lanes should be provided per signalized approach.

2. A program should be initiated by the county for removing vision obstructions that are located in clear vision areas at intersections throughout the county.

TOTAL ESTIMATED COST $44,732.86