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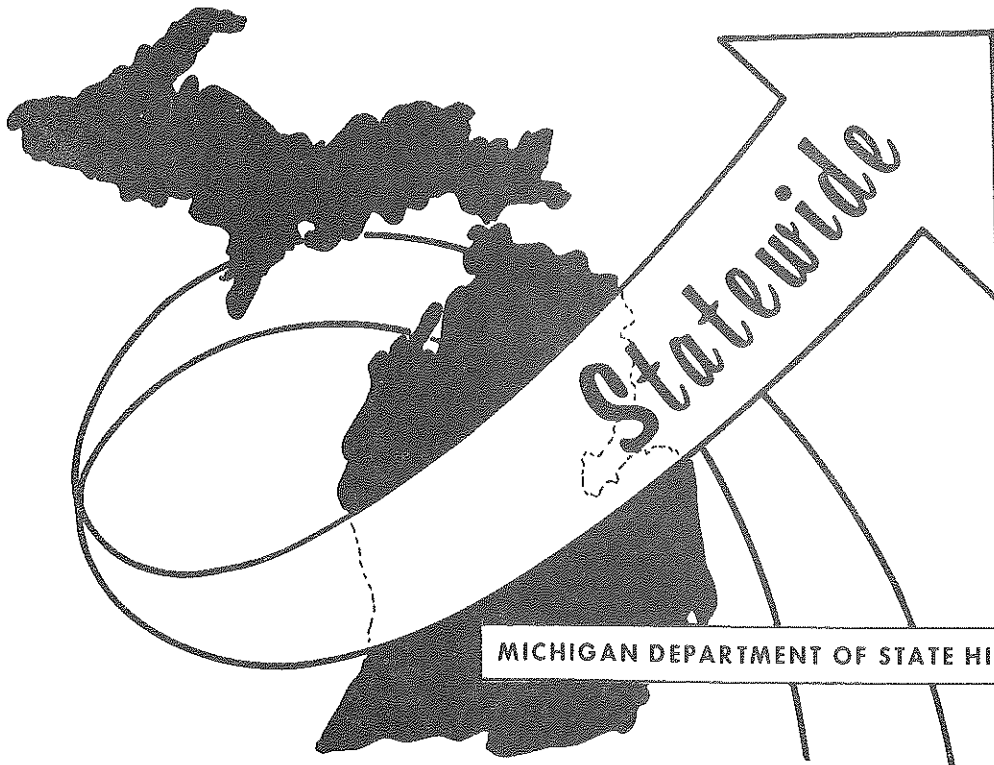
Statewide Transportation Analysis & Research

MICHIGAN'S STATEWIDE
TRANSPORTATION MODELING SYSTEM

MICHIGAN'S RAIL CROSSING INVENTORY
AND ANALYSIS PROCESS

STATEWIDE TRANSPORTATION
PLANNING PROCEDURES

VOLUME XIII-C
DECEMBER, 1976



MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

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HIGHWAYS AND TRANSPORTATION**

BUREAU OF TRANSPORTATION PLANNING

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STATE HIGHWAY COMMISSION

PETER B. FLETCHER

Chairman

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December 6, 1976

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Mr. Sam F. Cryderman, Deputy Director
Bureau of Transportation Planning
Michigan Department of State
Highways and Transportation
P.O. Box 30050
Lansing, Michigan 48909

Dear Mr. Cryderman:

The increasing need for an efficient transportation system in Michigan has initiated a change in the relationship between state government and the operation of the state's railroad network. In the past, the state was liable for public safety and regulation of rates and tariffs. It must now assume not only these responsibilities but also maintenance and implementation of rail service.

This report deals with the maintenance aspect of the rail network as related to accidents at railroad - highway crossing and safety conditions at such crossings. A major difficulty encountered was analyzing and collecting fragmented information from various agencies at the local, state, and federal level. The Transportation Planning Procedures Section has developed a systematic process, as documented in this report, for displaying and analyzing this crossing information. The system cannot only be used as a means of isolating high-risk crossings but also as a means of ranking crossing improvements for funding purposes. Through this function, preventive maintenance can effectively and economically be utilized.

This report was prepared by Mr. Richard E. Esch of the Transportation Planning Procedures Section.

Sincerely,

Richard J. Lilly
Highway Planning Division



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MICHIGAN'S RAIL CROSSING INVENTORY

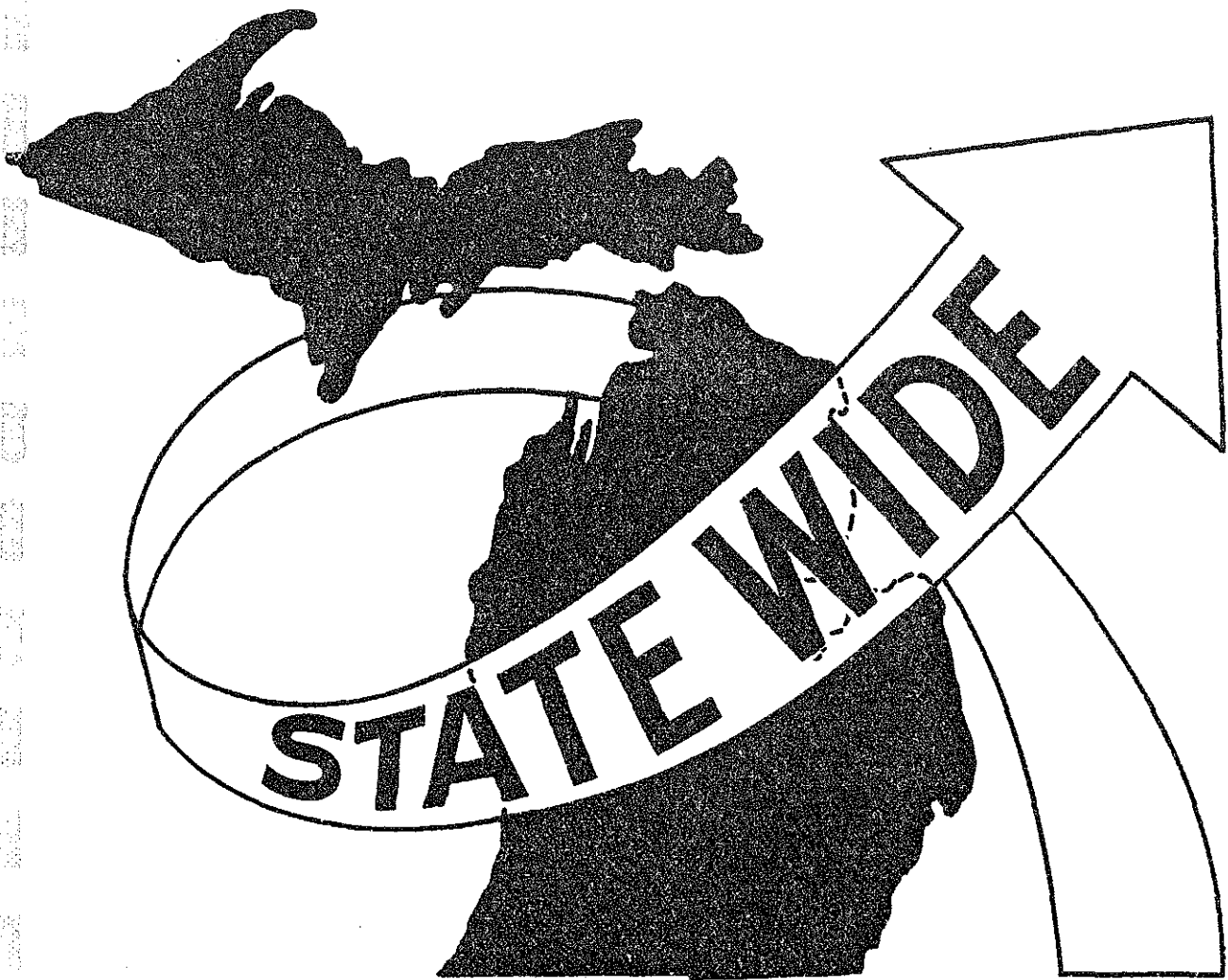
AND ANALYSIS PROCESS

BY

RICHARD E. ESCH

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PREFACE



PREFACE

The U. S. Department of Transportation submitted a report to Congress in August, 1972 entitled: Railroad - Highway Safety Part II: Recommendations For Resolving The Problem. The goal of this report was to provide recommendations for alternative courses of action which would lead to a significant reduction in accidents and property damage at railroad - highway grade crossings.

The report recommended the development of an adequate information system. Although information regarding highway - railroad grade crossings is collected and maintained by various local, state, and federal agencies and by individual railroad companies, most existing crossing information systems are fragmented and incomplete. It is essential that certain site-specific information be collected for each railroad - highway crossing in the United States to provide for a systematic approach to the planning and evaluation of programs for the improvement of railroad - highway crossing safety at both the state and federal level.

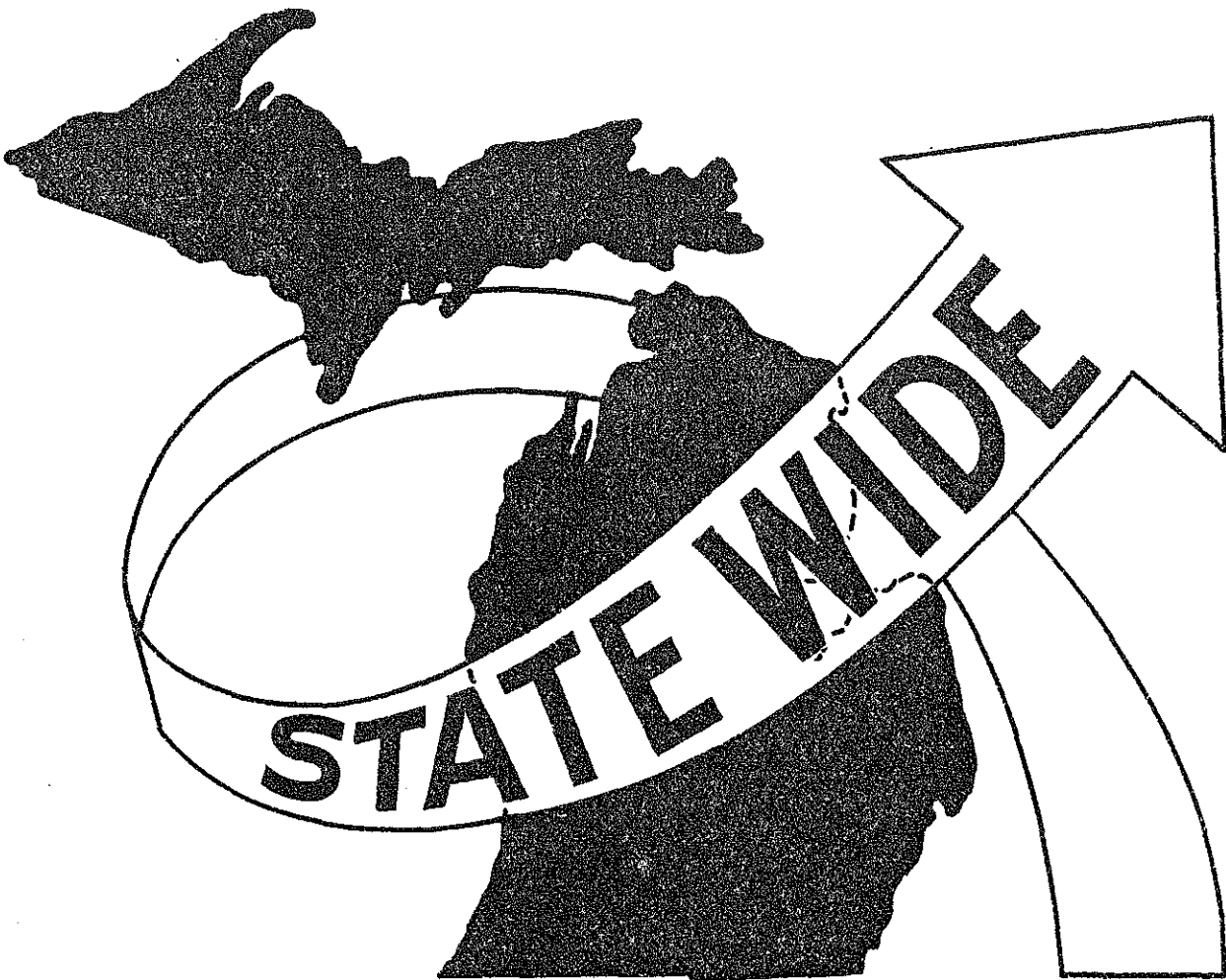
It is recognized that certain site-specific information is necessary even in the establishment of broad programs of railroad - highway grade crossing safety improvements.

Michigan is also confronted with the same type of difficulty and it appears that the National Rail Crossing Inventory is the most consistent data source at the present time. The creation of a rail crossing inventory is also a necessary part of the development of Michigan's Statewide Transportation Modeling System as this data will be used to test the impact of various statewide and regional plans on railroad crossing accident exposure

factors. This is an important part of the rail crossing analysis because it is used to evaluate possible locations for spending construction funds.

This report will, therefore, deal with the conversion of the National Railroad Inventory and the development of computer programs to display and analysis the crossing information.

INTRODUCTION



INTRODUCTION

Michigan's role in regards to the state's system of railroads has changed quite dramatically in recent years. In the past, the sole governmental function existed within the Railroad Section of the Public Service Commission, an agency responsible for railroad safety and the regulation of rates and tariffs. As private enterprise, rail freight transportation was totally a private market service in which the government's involvement served only to protect public safety and consumer rights. Since the early 1970's, however, the state's role has evolved into one of a direct leadership, decision-making responsibility. Due to the Regional Reorganization Act of 1973, state government must progressively plan, program, and implement the provision of rail service on bankrupt carrier trackage throughout the state.

The establishment of a railroad planning function adds an entirely new dimension to the Michigan Department of State Highways and Transportation's role. In the past, the Department concerned itself with railroads only where they interphased with highways, at railroad - highway crossings. Under this expanded role, the state must be concerned with the entire rail system as well as all crossings through a system perspective. This added dimension was enforced when the Railroad Section of the Public Service Commission was transferred, under Executive Order in early 1976, to the Department in an effort to coordinate all railroad functions. The railroad inspectors in this unit are largely responsible for the inspection of rail crossings when questions or complaints arise.

Concern over railroad - highway crossings has increased through the years. As more and more roads are built and additional vehicles are placed on the network, the exposure between the highway and rail system increases. Additionally, deferred maintenance has resulted in decreasingly poor physical conditions. Consequently, safety at crossings has become a real concern. Since crossings affect not only the highway system but also the functioning and efficiency of the railroad system, rail planning efforts must consider the crossing as a potential traffic trouble spot as well.

Information on grade crossings in the past has been collected in various formats and generally stored in file cabinets. While the form and content of this past information system was adequate in meeting the needs of the past, the expanded role requires a more complete and accessible data inventory on all crossings within the state. Being that many sections in the Department are now involved in various functions concerning railroads, the data base must be somewhat centralized with easy and quick accessibility to multiple users. The Department, for example, must be able to identify deficiencies in the transportation system at railroad crossings, account for public safety by being well informed, and responsible for the physical condition of all crossings in the state. Similarly, different types of analysis are often required to justify funding of transportation improvements; and, therefore, an adequate knowledge of railroad - highway crossings becomes an important element in the analysis.

In recognizing the expanding role of the Department in meeting a railroad planning and safety function, the Statewide Procedures Section, through

the cooperation of those directly concerned, began building a computer stored data base capable of storing large quantities of information on the railroad system consistent with other data files used in the Statewide Transportation Modeling System. The purchase and conversion of the National Railroad - Highway Crossing Inventory, which includes 78 items of information on all 13,000 crossings in Michigan, is an important component in the development of this data base.

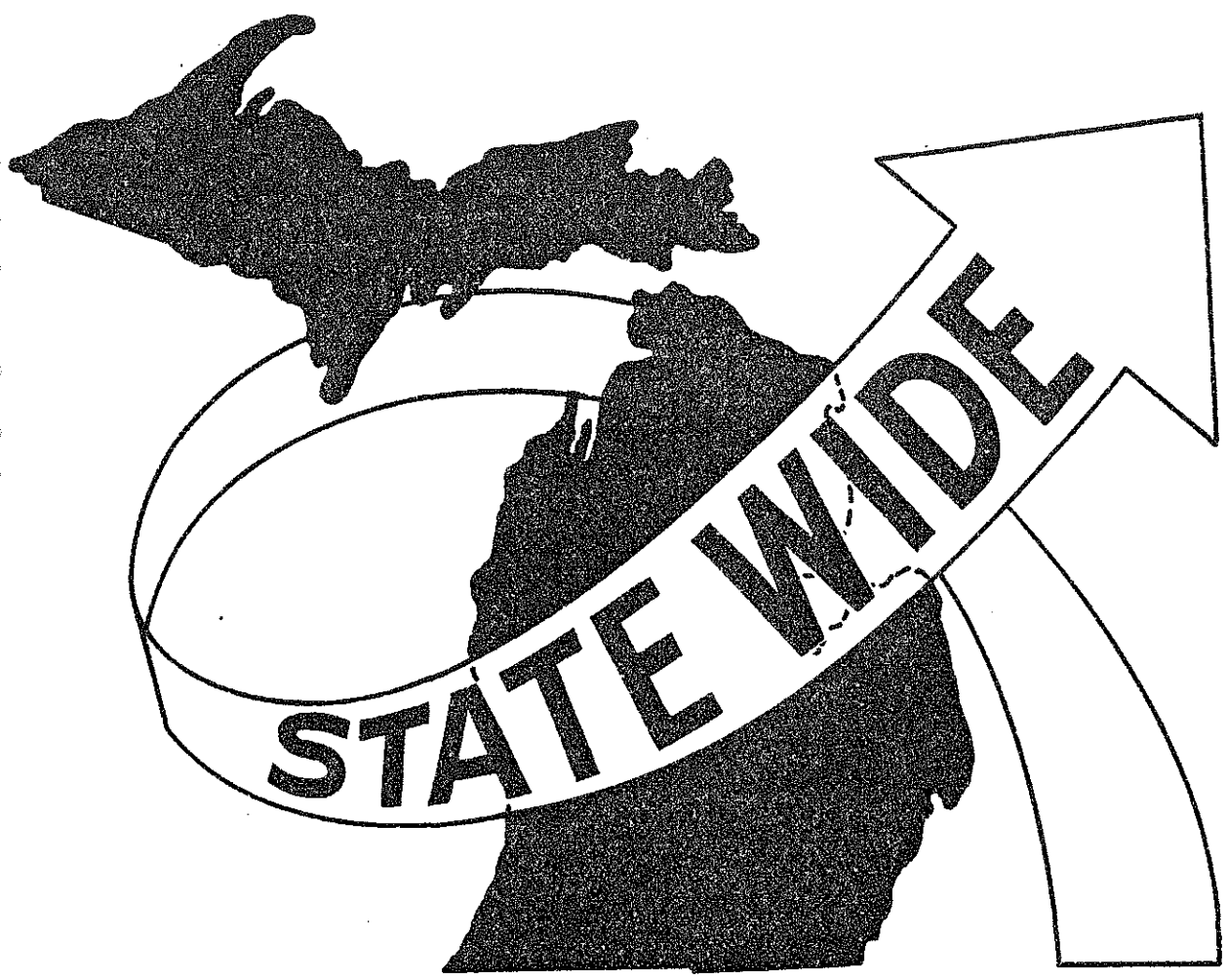
The ability to use this railroad crossing inventory gives the Department an informational tool on railroad crossings not currently available anywhere in the state in as consistent or complete a format. It basically allows for all the types of analysis dependent on crossing information to be completed with the development of computer programs to display and analyze the information.

This report documents the creation of the rail crossing data base and its conversion to the statewide system. This report will give the user an idea of the various types of applications possible with this file. It is worthwhile to note that many such applications have already been accomplished.

A partial listing is as follows:

1. Request by Saginaw County Planning Department of a listing of all crossings in Saginaw County at highway grade with all items of information on each crossing.
2. Request for a listing of the top 50 crossings with the highest train - car exposure (accident potential exposure factor) was developed from information on the file (ADT and trains).
3. A summary by type of the number of crossings with gates, flashing lights, wigwags, bells, etc.
4. A listing of all crossings on state trunklines at highway grades.
5. Recalculation of the accident exposure factor in the file to determine the priority order for a crossing improvement funding program.

**NATIONAL RAIL HIGHWAY
CROSSING INVENTORY**



NATIONAL RAIL HIGHWAY CROSSING INVENTORY

The DOT Report to Congress recommended the development of the following railroad - highway crossing information system on a national basis:

1. Assign and display identification numbers at all railroad - highway grade crossings based upon a uniform national standard to be prescribed by the Department of Transportation. Contract with all railroads to provide site-specific inventory data for all crossings on their respective lines.
2. Include all train-involved public and private grade crossing accidents.
3. A plan to have all grade crossing accidents reported through some central state agency and require the inclusion of the crossing identification number in the accident report form used by police officers.

The Federal Railroad Administration assumed principal responsibility for the development of the national railroad - highway grade crossing information system. They entered into a contract with the Association of American Railroads to develop a "Comprehensive National Railroad - Highway Grade Crossing Information and Numbering System."

The railroad companies would make a site-specific inventory of each of their railroad - highway grade crossings and would install a unique identifying number at each location.

Through the cooperative efforts of the Federal Highway Administration, each state highway department would be requested to assist in the project by providing site-specific highway locational and traffic characteristic data where possible.

The project was initiated in June of 1972. Phase I, completed in November, 1972, included the design of the numbering system, number boards, inventory

forms and procedures, and the design of the test phase. Phase II, completed in June, 1973, included the testing of the number boards, inventory forms and procedures, cost of field implementation, and the design and testing of computer files and data handling procedures. Phase III is the project implementation phase which is further described in this manual.

The project was organized on the basis of a cooperative effort between the railroad industry and the U.S. Department of Transportation as Figure 1 from the National Railroad - Highway Crossing Inventory Procedural Manual indicates.

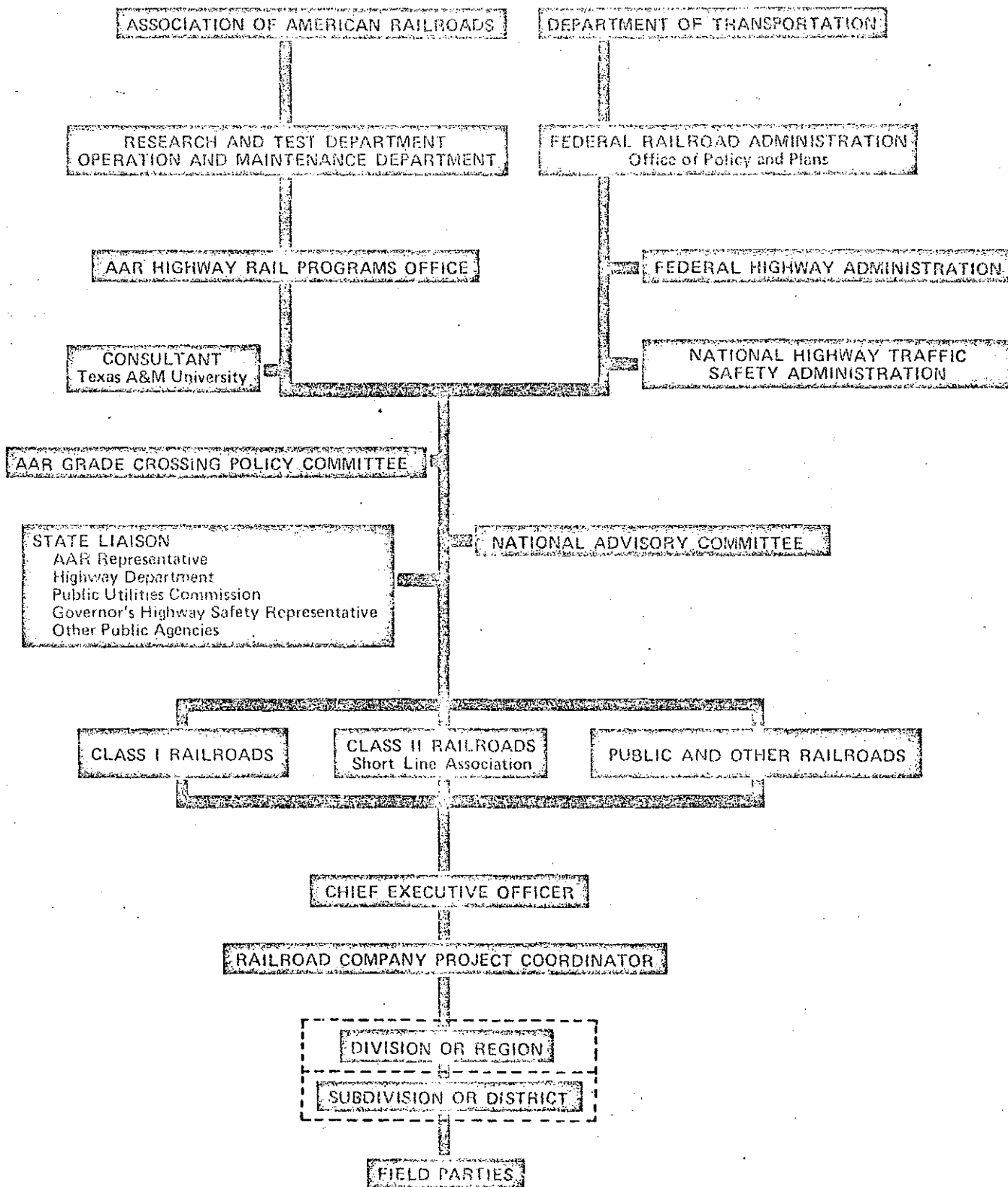
Within DOT, project management was assigned to the F.R.A. Office of Policy and Plans. Staff of the F.R.A. Office of Economics and Office of Safety, the Federal Highway Administration, and National Highway Traffic Safety Administration provided technical assistance to the project manager.

The chief executive office of each operating railroad has designated a representative to coordinate the project. Engineering field parties were assigned the duties of crossing inventory and number board placement.

Through the Federal Highway Administration, state highway department planning and survey divisions were requested to provide data and technical assistance necessary to complete highway oriented data requirements of the inventory form.

The national railroad - highway crossing inventory data file provides site-specific information regarding the location of all railroad - highway intersections, both public and private, in the United States. In addition,

Organization Chart



the file provides information describing the physical and operational characteristics of all public at-grade railroad - highway crossings.

The national inventory data file has the capability for providing computerized data for use by state and local governments as well as railroad companies in developing railroad - highway grade crossing safety improvement programs. It was anticipated that this file will serve the basic grade crossing information requirements of these groups. This file is the source of data Michigan will use in developing its own data base.

At the national level, railroad - highway grade crossing accident data will be integrated with the inventory file to construct the railroad - highway grade crossing information system. The system can then be used for the development of federal programs and goals; funding alternatives for grade crossing improvement; and studies related to rail line relocation and abandonment, effectiveness of protective devices, rail high-speed corridors, accident costs, specialized vehicle involvement, public awareness and driver training, and other safety program development and research opportunities. Here again, Michigan hopes to use this data in a similar manner after development of display and analysis programs which this report discusses.

The principal advantage of having the number board displayed at the crossing is that each and every crossing in the United States will have its own unique identification. By referencing this number, all inventory and accident data on file, including data collected by state and local agencies and railroad companies, will have a common link. The identification number will also allow law enforcement agencies to provide accident data from police reports.

Michigan is also creating an equivalent list between the railroad crossing number and the highway control section mile point so that future updating of this file with highway data will be more systematic.

To begin the inventory process, the project officer for each railroad requested from the state highway department's contact two copies of the county maps for all counties in which his railroad operates. These maps were provided to the field party and the DOT-AAR crossing identification number entered on the maps by the field party when inventorying the crossing. One set of maps with the crossing identification numbers shown was returned to the highway department with the partially completed inventory forms.

The railroad project officer received inventory forms, identification number labels, and identification number boards directly from the manufacturer.

The field party received from the railroad project officer sufficient inventory forms to inventory each crossing within a specified segment of track.

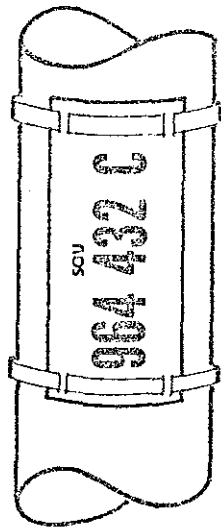
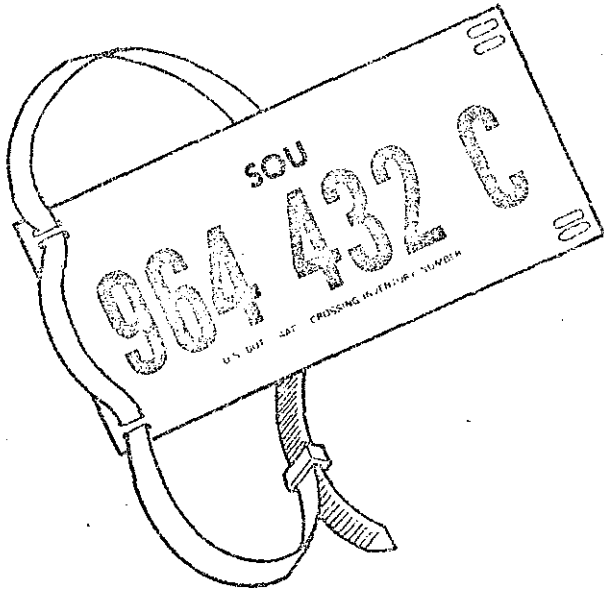
The number boards were made available to the field party by the railroad project officer. A sample of the number boards and typical installation appear in Figure 2.

After each rail crossing had been tagged, the following procedures for handling completed inventory forms were suggested. Each railroad company conducted the field work and it was important that the completed inventory forms were grouped according to the state in which the crossings are located.

Three copies of all completed inventory forms were mailed to the state highway department contact along with the county maps with crossing identified

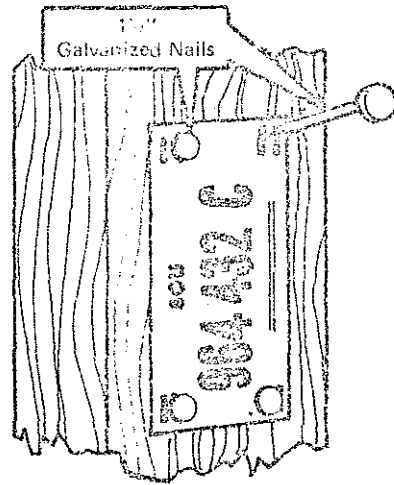
Number Board Mountings

METAL MOUNT

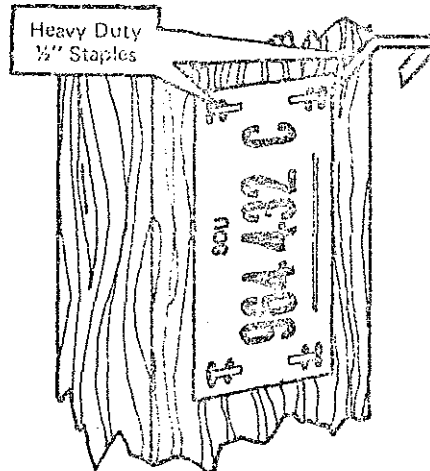


WOOD MOUNT

WITH NAILS



WITH STAPLES



by location and number. The state highway department completed these inventory forms and mailed the original copy to the technical consultant and returned one copy that included highway data for public at-grade crossings to the railroad company.

The actual methods of collecting the crossing information and the type of numerical data entered on the coding forms is available in Appendix A.

This information is a copy of specific sections of the National Railroad - Highway Crossing Inventory Procedural Manual.

CONVERSION OF NATIONAL RAIL
CROSSING TAPE



CONVERSION OF NATIONAL RAIL CROSSING TAPE

The railroad - highway crossing data file was obtained from Texas A & M University under contract to F.H.W.A. Although it was created on an AMDAHL computer, which is an IBM-370 and Burroughs B-7700 compatible machine, two physical characteristics of the file had to be altered to allow it to be used more conveniently on this Department's machine. First, the file contained several "packed-decimal" fields, that is two numbers were packed into one byte. Since a FORTRAN program cannot read packed decimal fields naturally, they had to be unpacked as integers. Second, the records were of variable length, from 153 to 299 bytes. At the same time that the packed decimals were unpacked, the record length was extended to a constant 300 bytes. This was done to simplify programming of routines used to read the file. A copy of the original Texas tape description appears in Table 1.

The following list in Table 1 identifies the location (LOC), the length (LEN), and the type of field for each of the pieces of data for each crossing. The three types of field information are:

1. CH - character data (1 character per byte)
2. PD - packed decimal data (2 decimal digits per byte)
3. ZD - zoned decimal data (1 decimal digit per byte)

This conversion process resulted in a final computer tape where there are 78 data fields in a fixed length record. The type of data available in each of these fields is also identified in Table 1. The next section will explain what type of analysis may be applied to each of these data fields.

TABLE 1

TAPE DESCRIPTION

| <u>LOC</u> | <u>LEN</u> | <u>TYPE</u> | <u>DESCRIPTION</u> |
|------------|------------|-------------|--|
| 1 | 7 | CH | Crossing number (6 digits & check character) |
| 8 | 4 | PD | Date sequence number (7 digits) |
| 12 | 2 | ZD | Numeric state code |
| 14 | 2 | PD | Numeric county code (3 digits) |
| 16 | 3 | PD | Numeric city code (4 digits) |
| 19 | 1 | ZD | Nearest city indicator (0-crossing in city, 1-crossing near city) |
| 20 | 4 | CH | Standard AAR railroad code |
| 24 | 4 | PD | Numeric timetable station code (6 digits) |
| 28 | 8 | CH | Railroad mile post |
| 36 | 10 | CH | Railroad ID number |
| 46 | 7 | CH | Highway number |
| 53 | 20 | CH | Street or road name |
| 73 | 10 | CH | County map reference number |
| 83 | 14 | CH | Railroad division or region |
| 97 | 14 | CH | Railroad subdivision or region |
| 111 | 15 | CH | Branch or line name |
| 126 | 1 | ZD | Pedestrian crossing type (0-not a pedestrian crossing, 1-at grade, 2-RR under, 3-RR over) |
| 127 | 1 | ZD | Private vehicle crossing location category (0-not a private vehicle crossing, 1-farm, 2-residential, 3-recreational, 4-industrial) |
| 128 | 1 | ZD | Private vehicle crossing type (0-not a private vehicle crossing, 5-at grade, 6-RR under, 7-RR over) |
| 129 | 1 | ZD | Private vehicle crossing protection type (0-none, 8-signs, 9-signals) |

| <u>LOC</u> | <u>LEN</u> | <u>TYPE</u> | <u>DESCRIPTION</u> |
|------------|------------|-------------|---|
| 130 | 15 | CH | Private vehicle crossing protection description |
| 145 | 1 | ZD | Public vehicle crossing type (0-not a public vehicle crossing, 1-at grade, 2-RR under, 3-RR over) |
| 146 | 1 | ZD | Continuation indicator (0-end of record, 1-153 more bytes in record) |

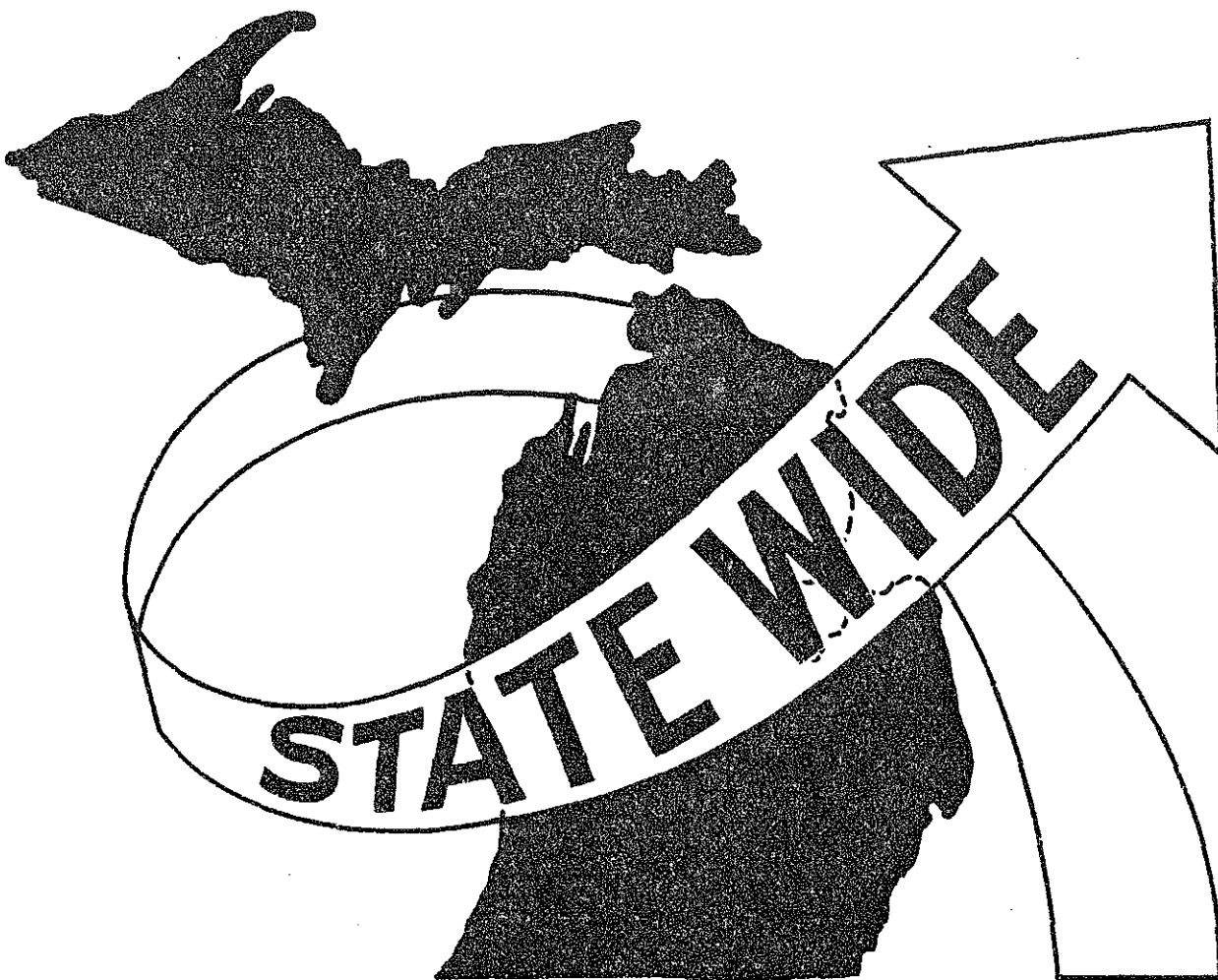
SECTION 2: ONLY PUBLIC VEHICLE CROSSINGS AT GRADE

| <u>LOC</u> | <u>LEN</u> | <u>TYPE</u> | <u>DESCRIPTION</u> |
|------------|------------|-------------|---|
| 147 | 2 | ZD | Number of daylight thru train movements |
| 149 | 2 | ZD | Number of daylight switching movements |
| 151 | 2 | ZD | Number of night thru train movements |
| 153 | 2 | ZD | Number of night switching movements |
| 155 | 1 | ZD | Less than 1 train movement per day? (0-no, 1-yes) |
| 156 | 2 | PD | Maximum time table speed of trains at crossing (3 digits) |
| 158 | 2 | PD | Minimum typical speed of trains at crossing (3 digits) |
| 160 | 2 | PD | Maximum typical speed of trains at crossing (3 digits) |
| 162 | 1 | ZD | Number of main tracks |
| 163 | 2 | ZD | Number of tracks other than main tracks |
| 165 | 10 | CH | Description of other tracks, if any |
| 175 | 1 | ZD | Does another railroad operate a separate track at crossing? (0-don't know, 1-yes, 2-no) |
| 176 | 16 | CH | AAR codes of railroads operating separate tracks at crossing (divided into four 4-byte codes) |
| 192 | 1 | ZD | Does another railroad operate over your track at crossing? (0-don't know, 1-yes, 2-no) |
| 193 | 16 | CH | AAR codes of railroads operating over your track at crossing (divided into four 4-byte codes) |
| 209 | 1 | ZD | Number of reflectorized crossbucks |

| <u>LOC</u> | <u>LEN</u> | <u>TYPE</u> | <u>DESCRIPTION</u> |
|------------|------------|-------------|--|
| 210 | 1 | ZD | Number of nonreflectorized crossbucks |
| 211 | 1 | ZD | Number of standard highway stop signs |
| 212 | 1 | ZD | Number of other stop signs |
| 213 | 1 | ZD | Number of other signs first type |
| 214 | 10 | CH | Description of other signs first type |
| 224 | 1 | ZD | Number of other signs second type |
| 225 | 10 | CH | Description of other signs second type |
| 235 | 1 | ZD | Number of red and white reflectorized gates |
| 236 | 1 | ZD | Number of other colored gates |
| 237 | 1 | ZD | Number of cantilevered flashing lights over traffic lane |
| 238 | 1 | ZD | Number of cantilevered flashing lights not over traffic lane |
| 239 | 1 | ZD | Number of mast-mounted flashing lights |
| 240 | 1 | ZD | Number of other flashing lights |
| 241 | 9 | CH | Description of other flashing lights |
| 250 | 1 | ZD | Number of highway traffic signals |
| 251 | 1 | ZD | Number of wigwags |
| 252 | 1 | ZD | Number of bells |
| 253 | 20 | CH | Description of special protection not train activated |
| 273 | 1 | ZD | Signs or signals present? (0=yes, 1=no) |
| 274 | 1 | ZD | Commercial power available? (0-don't know, 1=yes, 2-no) |
| 275 | 1 | ZD | Does crossing signal provide speed selection for trains? (0-don't know, 1=yes, 2-no, 3-not applicable) |
| 276 | 1 | ZD | Is track equipped with signals for train operation? (0-don't know, 1=yes, 2-no) |
| 277 | 1 | ZD | Type of development (0-don't know, 1-open space, 2-residential, 3-commercial, 4-industrial, 5-institutional) |

| <u>LOC</u> | <u>LEN</u> | <u>TYPE</u> | <u>DESCRIPTION</u> |
|------------|------------|-------------|--|
| 278 | 1 | ZD | Smallest crossing angle between road and track (0-don't know, 1-0 to 29 degrees, 2-30 to 59 degrees, 3-60 to 90 degrees) |
| 279 | 1 | ZD | Number of traffic lanes crossing railroad |
| 280 | 1 | ZD | Truck pullout lanes present? (0-don't know, 1-yes, 2-no) |
| 281 | 1 | ZD | Highway paved? (0-don't know, 1-yes, 2-no) |
| 282 | 1 | ZD | Pavement stoplines present? (0-no, 1-yes) |
| 283 | 1 | ZD | Pavement RR crossing symbol present? (0-no, 1-yes) |
| 284 | 1 | ZD | Pavement markings present? (0-yes, 1-no) |
| 285 | 1 | ZD | RR advance warning signs present? (0-don't know, 1-yes, 2-no) |
| 286 | 1 | ZD | Type of crossing surface (0-don't know, 1-sectional timber, 2-full wood plank, 3-asphalt, 4-concrete slab, 5-concrete pavement, 6-rubber, 7-metal sections, 8-other metal, 9-unconsolidated) |
| 287 | 1 | ZD | Does track run parallel to and within a street? (0-don't know, 1-yes, 2-no) |
| 288 | 1 | ZD | Is the highway at this crossing intersected by another highway within 75 feet of the crossing? (0-don't know, 1-yes, 2-no) |
| 289 | 2 | ZD | Highway system code |
| 291 | 1 | ZD | Is crossing on state highway system? (0-don't know, 1-yes, 2-no) |
| 292 | 2 | ZD | Functional classification of road over crossing |
| 294 | 4 | PD | Estimated present average daily traffic (AADT) (6 digits) |
| 298 | 2 | ZD | Estimated percentage of trucks in the traffic system |

MICHIGAN SUMMARY PROGRAM



MICHIGAN SUMMARY PROGRAM

A computer program which reads and prints selected data from the railroad crossing file has been written and used quite extensively within the Department. Using this program, the analyst may select and print any or all of the 78 data items identified in Table 2. In addition to the 78 volume fields, two calculated accident exposure factors have also been added in 79 and 80 and these can also be displayed. The items may be printed in any desired order. Thus one may list similar items in adjacent columns for ease in analyzing the data. If the selected items cannot all be printed on one line, they will be continued on another page. Pages are numbered beginning at 1000. An example of this appears in Figure 3. If a crossing appears on page 1015, it will appear again on pages 2015, 3015, 4015, 5015, and 6015 or until all the selected items have been printed. The national rail crossing number will appear on each page. The items are printed in columns on each page and each column contains a heading to identify that data.

If only a few crossings are desired, it is also possible to obtain a partial list. Any five of the crossing data items, including the accident exposure factors, may be used to select the desired crossings. For example, if the user is interested in C & O public vehicle at-grade crossings without signs or signals in Wayne County, the program will check field numbers 4, 7, 22, and 58 to determine if that crossing data should be printed. Only those crossings satisfying all given conditions will be listed. For these crossings, one could print all the crossing data items or select any desired items as explained in the previous paragraph.

TABLE 2

1. READ IN AS I6,A1
CROSSING NUMBER
2. READ IN AS I7
DATE SEQUENCE NUMBER
3. READ IN AS I2
NUMERIC STATE CODE
4. READ IN AS I3
NUMERIC COUNTY CODE
5. READ IN AS I4
NUMERIC CITY CODE
6. READ IN AS I1
NEAREST CITY INDICATOR (0-CROSSING IN CITY, 1-CROSSING NEAR CITY)
7. READ IN AS A4
STANDARD AAR RAILROAD CODE
8. READ IN AS I6
NUMERIC TIMETABLE STATION CODE
9. READ IN AS A8
RAILROAD MILE POST
10. READ IN AS 2A5
RAILROAD ID NUMBER
11. READ IN AS A6,A1
HIGHWAY NUMBER
12. READ IN AS 4A5
STREET OR ROAD NAME
13. READ IN AS 2A5
COUNTY MAP REFERENCE NUMBER
14. READ IN AS 2A6,A2
RAILROAD DIVISION OR REGION
15. READ IN AS 2A6,A2
RAILROAD SUBDIVISION OR REGION
16. READ IN AS 3A5
BRANCH OR LINE NAME
17. READ IN AS I1
PEDESTRIAN CROSSING TYPE (0-NOT A PEDESTRIAN CROSSING, 1-AT GRADE, 2-RR
UNDER, 3-RR OVER)

18. READ IN AS I1
PRIVATE VEHICLE CROSSING LOCATION CATAGORY (0-NOT A PRIVATE VEHICLE CROSSING, 1-FARM, 2-RESIDENTIAL, 3-RECREATIONAL, 4-INDUSTRIAL)
19. READ IN AS I1
PRIVATE VEHICLE CROSSING TYPE (0-NOT A PRIVATE VEHICLE CROSSING, 5-AT GRADE, 6-RR UNDER, 7-RR OVER)
20. READ IN AS I1
PRIVATE VEHICLE CROSSING PROTECTION TYPE (0-NONE, 8-SIGNS, 9-SIGNAL)
21. READ IN AS 3A5
PRIVATE VEHICLE CROSSING PROTECTION DESCRIPTION
22. READ IN AS I1
PUBLIC VEHICLE CROSSING TYPE (0-NOT A PUBLIC VEHICLE CROSSING, 1-AT GRADE, 2-RR UNDER, 3-RR OVER)
23. READ IN AS I1
CONTINUATION INDICATOR (0-END OF RECORD, 1-153 MORE BYTES IN RECORD)
24. READ IN AS I2
NUMBER OF DAYLIGHT THRU TRAIN MOVEMENTS
25. READ IN AS I2
NUMBER OF DAYLIGHT SWITCHING MOVEMENTS
26. READ IN AS I2
NUMBER OF NIGHT THRU TRAIN MOVEMENTS
27. READ IN AS I2
NUMBER OF NIGHT SWITCHING MOVEMENTS
28. READ IN AS I1
LESS THAN 1 TRAIN MOVEMENT PER DAY? (0-NO, 1-YES)
29. READ IN AS I3
MAXIMUM TIMETABLE SPEED OF TRAINS AT CROSSING
30. READ IN AS I3
MINIMUM TYPICAL SPEED OF TRAINS AT CROSSING
31. READ IN AS I3
MAXIMUM TYPICAL SPEED OF TRAINS AT CROSSING
32. READ IN AS I1
NUMBER OF MAIN TRACKS
33. READ IN AS I2
NUMBER OF TRACKS OTHER THAN MAIN TRACKS
34. READ IN AS 2A5
DESCRIPTION OF OTHER TRACKS, IF ANY

35. READ IN AS I1
DOES ANOTHER RAILROAD OPERATE A SEPARATE TRACK AT CROSSING? (0-DON'T
KNOW, 1-YES, 2-NO)
36. READ IN AS 4A4
AAR CODES OF RAILROADS OPERATING SEPARATE TRACKS AT CROSSING
37. READ IN AS I1
DOES ANOTHER RAILROAD OPERATE OVER YOUR TRACK AT CROSSING? (0-DON'T
KNOW, 1-YES, 2-NO)
38. READ IN AS 4A4
AAR CODES OF RAILROADS OPERATING OVER YOUR TRACK AT CROSSING
39. READ IN AS I1
NUMBER OF REFLECTORIZED CROSSBUCKS
40. READ IN AS I1
NUMBER OF NON-REFLECTORIZED CROSSBUCKS
41. READ IN AS I1
NUMBER OF STANDARD HIGHWAY STOP SIGNS
42. READ IN AS I1
NUMBER OF OTHER STOP SIGNS
43. READ IN AS I1
NUMBER OF OTHER SIGNS FIRST TYPE
44. READ IN AS 2A5
DESCRIPTION OF OTHER SIGNS FIRST TYPE
45. READ IN AS I1
NUMBER OF OTHER SIGNS, SECOND TYPE
46. READ IN AS 2A5
DESCRIPTIONS OF OTHER SIGNS, SECOND TYPE
47. READ IN AS I1
NUMBER OF RED AND WHITE REFLECTORIZED GATES
48. READ IN AS I1
NUMBER OF OTHER COLORED GATES
49. READ IN AS I1
NUMBER OF CANTILEVERED FLASHING LIGHTS OVER TRAFFIC LANE
50. READ IN AS I1
NUMBER OF CANTILEVERED FLASHING LIGHTS NOT OVER TRAFFIC LANE
51. READ IN AS I1
NUMBER OF MAST-MOUNTED FLASHING LIGHTS
52. READ IN AS I1
NUMBER OF OTHER FLASHING LIGHTS

53. READ IN AS A6,A3
DESCRIPTION OF OTHER FLAHSING LIGHTS
54. READ IN AS I1
NUMBER OF HIGHWAY TRAFFIC SIGNALS
55. READ IN AS I1
NUMBER OF WIGWAGS
56. READ IN AS I1
NUMBER OF BELLS
57. READ IN AS 4A5
DESCRIPTION OF SPECIAL PROTECTION NOT TRAIN ACTIVATED
58. READ IN AS I1
SIGNS OR SIGNALS PRESENT? (0-YES, 1-NO)
59. READ IN AS I1
COMMERCIAL POWER AVAILABLE? (0-DON'T KNOW, 1-YES, 2-NO)
60. READ IN AS I1
DOES CROSSING SIGNAL PROVIDE SPEED SELECTION FOR TRAINS? (0-DON'T KNOW, 1-YES, 2-NO)
61. READ IN AS I1
IS TRACK EQUIPPED WITH SIGNALS FOR TRAIN OPERATION? (0-DON'T KNOW, 1-YES, 2-NO)
62. READ IN AS I1
TYPE OF DEVELOPMENT (0-DON'T KNOW, 1-OPEN SPACE, 2-RESIDENTIAL, 3-COM-
MERCIAL, 4-INDUSTRIAL, 5-INSTITUTIONAL)
63. READ IN AS I1
SMALLEST CROSSING ANGLE BETWEEN ROAD AND TRACK (0-DON'T KNOW, 1-0 TO
29 DEGREES, 2-30 TO 59 DEGREES, 3-60 TO 90 DEGREES)
64. READ IN AS I1
NUMBER OF TRAFFIC LANES CROSSING RAILROAD
65. READ IN AS I1
TRUCK PULLOUT LANES PRESENT? (0-DON'T KNOW, 1-YES, 2-NO)
66. READ IN AS I1
HIGHWAY PAVED? (0-DON'T KNOW, 1-YES, 2-NO)
67. READ IN AS I1
PAVEMENT STOPLINES PRESENT? (0-NO, 1-YES)
68. READ IN AS I1
PAVEMENT RR CROSSING SYMBOL PRESENT? (0-NO, 1-YES)

69. READ IN AS I1
PAVEMENT MARKINGS PRESENT? (0-YES, 1-NO)
70. READ IN AS I1
RR ADVANCE WARNING SIGNS PRESENT? (0-DON'T KNOW, 1-YES, 2-NO)
71. READ IN AS I1
TYPE OF CROSSING SURFACE (0-DON'T KNOW, 1-SECTIONAL TIMBER, 2-FULL WOOD
PLANK, 3-ASPHALT, 4-CONCRETE SLAB, 5-CONCRETE PAVEMENT, 6-RUBBER,
7-METAL SECTIONS, 8-OTHER METAL, 9-UNCONSOLIDATED)
72. READ IN AS I1
DOES TRACK RUN PARALLEL TO AND WITHIN A STREET? (ODON'T KNOW, 1-YES,
2-NO)
73. READ IN AS I1
IS THE HIGHWAY AT THIS CROSSING INTERSECTED BY ANOTHER HIGHWAY WITHIN
75 FEET OF THE CROSSING? (0-DON'T KNOW, 1-YES, 2-NO)
74. READ IN AS I2
HIGHWAY SYSTEM CODE
75. READ IN AS I1
IS CROSSING ON STATE HIGHWAY SYSTEM? (0-DON'T KNOW, 1-YES, 2-NO)
76. READ IN AS I2
FUNCTIONAL CLASSIFICATION OF ROAD OVER CROSSING
77. READ IN AS I6
ESTIMATED PRESENT AVERAGE DAILY TRAFFIC (AADT)
78. READ IN AS I2
ESTIMATED PERCENTAGE OF TRUCKS IN THE TRAFFIC SYSTEM
79. READ IN AS I9
ACCIDENT EXPOSURE FACTOR (24+25+26+27) x 77
80. READ IN AS I9
ACCIDENT EXPOSURE FACTOR WITH PROTECTION (24+25+26+27) x 77

| CROSSING NUMBER | DATE SEQUENCE NUMBER | STATE CODE | COUNTY CODE | CITY CODE | NFAR CITY INDC | AAR RR CODE | TIMETABLE STATION CODE | RAILROAD MILEPOST | RAILROAD ID NUMBER | HIGHWAY NUMBER | STREET OR ROAD NAME | COUNTY MAP REFERENCE NUMBER |
|-----------------|----------------------|------------|-------------|-----------|----------------|-------------|------------------------|-------------------|--------------------|----------------|---------------------|-----------------------------|
| 543752Y | 8501112 | 26 | 15 | 3470 | 1 | PC | 31782 | .60 | | COUNTRY | DEVINE ROAD | 8 |
| 543753F | 8501113 | 26 | 15 | 3470 | 1 | PC | 31782 | .30 | | | | 8 |
| 543754H | 8501114 | 26 | 15 | 3470 | 1 | PC | 31782 | .54 | | | | 8 |
| 543755U | 8501115 | 26 | 15 | 3470 | 1 | PC | 31782 | .73 | GRAND RAPI | CITY | VILLAGE STREET | 8 |
| 543756B | 8501116 | 26 | 15 | 3470 | 1 | PC | 31782 | .90 | | | | 8 |
| 543757H | 8501117 | 26 | 15 | 3470 | 1 | PC | 31782 | .10 | | COUNTRY | MORGAN ROAD | 8 |
| 543758P | 8501118 | 26 | 15 | 3470 | 1 | PC | 31782 | .20 | | | | 8 |
| 543759W | 8501119 | 26 | 15 | 3470 | 1 | PC | 31782 | .35 | | | | 8 |
| 543760R | 8501120 | 26 | 15 | 3470 | 1 | PC | 31782 | .55 | | | | 8 |
| 543761X | 6501121 | 26 | 15 | 3470 | 1 | PC | 31782 | .70 | | | | 8 |
| 543763L | 8501122 | 26 | 15 | 3470 | 1 | PC | 31785 | .82 | | | | 8 |
| 543764T | 8501123 | 26 | 15 | 3470 | 1 | PC | 31785 | .18 | | | | 8 |
| 511460N | 9470440 | 26 | 17 | 200 | 1 | PC | 31374 | 48 | | COUNTY | FRASER | 9 |
| 511461V | 9470439 | 26 | 17 | 200 | 1 | PC | 31374 | 47 | | COUNTY | SEVEN MILE | 9 |
| 511462C | 9470438 | 26 | 17 | 200 | 1 | PC | 31374 | 37 | | COUNTY | EIGHT MILE | 9 |
| 511463J | 9470437 | 26 | 17 | 200 | 0 | PC | 31374 | 37 | | CITY | AUBURN | 9 |
| 512058X | 9470435 | 26 | 17 | 200 | 1 | PC | 31374 | .35 | | COUNTY | ELEVEN MILE | 9 |
| 512059E | 9470436 | 26 | 17 | 200 | 0 | PC | 31374 | .37 | | CITY | GARFIELD | 9 |
| 512063U | 9470434 | 26 | 17 | 200 | 1 | PC | 31374 | .35 | | COUNTY | CARTER | 9 |
| 232793U | 8162801 | 26 | 17 | 320 | 0 | CO | 31373 | 14 | | | 34TH | 9 |
| 232794B | 8162802 | 26 | 17 | 320 | 0 | CO | 31373 | 21 | | | STANTON | 9 |
| 232795H | 8162803 | 26 | 17 | 320 | 0 | CO | 31373 | 26 | | | BROADWAY | 9 |
| 232796P | 8162804 | 26 | 17 | 320 | 0 | CO | 31373 | 29 | | | ALLEY | 9 |
| 232797W | 8162805 | 26 | 17 | 320 | 0 | CO | 31373 | 32 | | | 33RD - MARSAC | 9 |
| 232798D | 8162806 | 26 | 17 | 320 | 0 | CO | 31373 | 35 | | | ALLEY | 9 |
| 232799K | 8162807 | 26 | 17 | 320 | 0 | CO | 31373 | 37 | | | WILSON | 9 |
| 232800C | 8162808 | 26 | 17 | 320 | 0 | CO | 31373 | 40 | | | ALLEY | 9 |
| 232801J | 8162809 | 26 | 17 | 320 | 0 | CO | 31373 | 43 | | | MCCORMICK | 9 |
| 232802R | 8162810 | 26 | 17 | 320 | 0 | CO | 31373 | 48 | | | WEBSTER | 9 |
| 232803X | 8162811 | 26 | 17 | 320 | 0 | CO | 31373 | 53 | | | TAYLOR | 9 |
| 232804E | 8162812 | 26 | 17 | 320 | 0 | CO | 31373 | 58 | | | POLK | 9 |
| 232805L | 8162813 | 26 | 17 | 320 | 0 | CO | 31373 | 63 | | | HARRISON | 9 |
| 232806T | 8162814 | 26 | 17 | 320 | 0 | CO | 31373 | 74 | | | | 9 |
| 232807A | 8162815 | 26 | 17 | 320 | 0 | CO | 31373 | 90 | | | CASS | 9 |
| 232808G | 8162816 | 26 | 17 | 320 | 0 | CO | 31373 | 96 | | | | 9 |
| 232809N | 8162817 | 26 | 17 | 320 | 0 | CO | 31373 | 00 | | | | 9 |
| 232810H | 8162818 | 26 | 17 | 320 | 0 | CO | 31373 | 03 | | | | 9 |
| 232811P | 8162819 | 26 | 17 | 320 | 0 | CO | 31373 | 06 | | | | 9 |
| 232812W | 8162820 | 26 | 17 | 320 | 0 | CO | 31373 | 09 | | | | 9 |
| 232813D | 8162821 | 26 | 17 | 320 | 0 | CO | 31373 | 32 | | | | 9 |
| 232814K | 8162822 | 26 | 17 | 320 | 0 | CO | 31373 | 34 | | | | 9 |
| 232826E | 8162823 | 26 | 17 | 320 | 0 | CO | 31373 | 56 | | | MCGRAW | 9 |
| 232827L | 8162824 | 26 | 17 | 320 | 0 | CO | 31373 | 85 | | | 38TH | 9 |
| 232828T | 8162825 | 26 | 17 | 320 | 0 | CO | 31373 | .05 | | | CASS | 9 |
| 232829A | 8162826 | 26 | 17 | 320 | 0 | CO | 31373 | .21 | | | 34TH | 9 |
| 232830U | 8162827 | 26 | 17 | 320 | 0 | CO | 31373 | .28 | | | 33RD | 9 |
| 232831B | 8162828 | 26 | 17 | 320 | 0 | CO | 31373 | .34 | | | 32ND | 9 |
| 232832H | 8162829 | 26 | 17 | 320 | 0 | CO | 31373 | .56 | | | FRMONT | 9 |
| 232833P | 8162830 | 26 | 17 | 320 | 0 | CO | 31373 | .63 | | | 29TH | 9 |
| 232834W | 8162831 | 26 | 17 | 320 | 0 | CO | 31373 | .84 | | | 26TH | 9 |
| 232835D | 8162832 | 26 | 17 | 320 | 0 | CO | 31373 | 13 | | | MICHIGAN | 9 |
| 232836K | 8162833 | 26 | 17 | 320 | 0 | CO | 31373 | 23 | | | MONROE | 9 |
| 232837S | 8162834 | 26 | 17 | 320 | 0 | CO | 31373 | 29 | | | JACKSON | 9 |
| 232838Y | 8162835 | 26 | 17 | 320 | 0 | CO | 31373 | 34 | | | VAN BUREN | 9 |
| 232839F | 8162836 | 26 | 17 | 320 | 0 | CO | 31373 | 40 | | | GRANT | 9 |
| 232840A | 8162837 | 26 | 17 | 320 | 0 | CO | 31373 | 45 | | | FARRAGUT | 9 |
| 232841G | 8162838 | 26 | 17 | 320 | 0 | CO | 31373 | 64 | | | LINCOLN | 9 |

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| CROSSING NUMBER | RR DIVISION OR REGION | RR SUBDIVISION OR REGION | BRANCH OR LINE NAME | PED XING TYPE | PRIV VEH XING LOC | PRIV VEH XING TYPE | PRIV VEH XING PROT | PRIVATE VEHICLE XING PROTECTION DESCRIPTION | PUB VEH XING TYPE | CONT INDC | DAYLT THRU TRAIN MOVE | DAYLT SWITC MOVE | NIGHT THRU TRAIN MOVE |
|-----------------|-----------------------|--------------------------|---------------------|---------------|-------------------|--------------------|--------------------|---|-------------------|-----------|-----------------------|------------------|-----------------------|
| 543752Y | MICHIGAN | | GRAND RAPIDS | 0 | 0 | 0 | 0 | | 1 | 1 | 1 | 0 | 0 |
| 543753F | MICHIGAN | | GRAND RAPIDS | 0 | 1 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 543754M | MICHIGAN | | GRAND RAPIDS | 0 | 1 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 543755U | MICHIGAN | | DS | 0 | 0 | 0 | 0 | | 1 | 1 | 1 | 0 | 0 |
| 543756B | MICHIGAN | | GRAND RAPIDS | 0 | 2 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 543757H | MICHIGAN | | GRAND RAPIDS | 0 | 0 | 0 | 0 | | 1 | 1 | 1 | 0 | 0 |
| 543758P | MICHIGAN | | GRAND RAPIDS | 0 | 2 | 5 | 8 | CROSSBUCK | 0 | 0 | 0 | 0 | 0 |
| 543759W | MICHIGAN | | GRAND RAPIDS | 1 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 543760R | MICHIGAN | | GRAND RAPIDS | 1 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 543761X | MICHIGAN | | GRAND RAPIDS | 0 | 2 | 5 | 8 | CROSSBUCK | 0 | 0 | 0 | 0 | 0 |
| 543763L | MICHIGAN | | GRAND RAPIDS | 0 | 2 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 543764T | MICHIGAN | | GRAND RAPIDS | 0 | 1 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 511460N | NORTHERN | DETROIT | MIDLAND | 0 | 0 | 0 | 0 | | 1 | 1 | 1 | 1 | 0 |
| 511461V | NORTHERN | DETROIT | MIDLAND | 0 | 0 | 0 | 0 | | 1 | 1 | 1 | 1 | 0 |
| 511462C | NORTHERN | DETROIT | MIDLAND | 0 | 0 | 0 | 0 | | 1 | 1 | 1 | 1 | 0 |
| 511463J | NORTHERN | DETROIT | MIDLAND | 0 | 0 | 0 | 0 | | 1 | 1 | 1 | 1 | 0 |
| 512058X | NORTHERN | DETROIT | MIDLAND | 0 | 0 | 0 | 0 | | 1 | 1 | 1 | 1 | 0 |
| 512059E | NORTHERN | DETROIT | MIDLAND | 0 | 0 | 0 | 0 | | 1 | 1 | 1 | 1 | 0 |
| 512063U | NORTHERN | DETROIT | MIDLAND | 0 | 0 | 0 | 0 | | 1 | 1 | 1 | 1 | 0 |
| 232793U | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232794B | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232795H | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232796P | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232797W | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232798D | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232799K | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232800C | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232801J | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232802R | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232803X | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232804E | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232805L | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232806T | NORTHERN | SAGINAW | SOUTH WATER | 0 | 4 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 232807A | NORTHERN | SAGINAW | SOUTH WATER | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 0 |
| 232808G | NORTHERN | SAGINAW | SOUTH WATER | 0 | 4 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 232809N | NORTHERN | SAGINAW | SOUTH WATER | 0 | 4 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 232810H | NORTHERN | SAGINAW | SOUTH WATER | 0 | 4 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 232811P | NORTHERN | SAGINAW | SOUTH WATER | 0 | 4 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 232812W | NORTHERN | SAGINAW | SOUTH WATER=NOR | 0 | 4 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 232813D | NORTHERN | SAGINAW | SOUTH WATER=NOR | 0 | 4 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 232814K | NORTHERN | SAGINAW | SOUTH WATER=NOR | 0 | 2 | 5 | 0 | | 0 | 0 | 0 | 0 | 0 |
| 232826E | NORTHERN | SAGINAW | BAY CITY | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 4 | 1 |
| 232827L | NORTHERN | SAGINAW | BAY CITY | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 4 | 1 |
| 232828T | NORTHERN | SAGINAW | BAY CITY | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 4 | 1 |
| 232829A | NORTHERN | SAGINAW | BAY CITY | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 4 | 1 |
| 232830U | NORTHERN | SAGINAW | BAY CITY | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 4 | 1 |
| 232831B | NORTHERN | SAGINAW | BAY CITY | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 4 | 1 |
| 232832H | NORTHERN | SAGINAW | BAY CITY | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 4 | 1 |
| 232833P | NORTHERN | SAGINAW | BAY CITY | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 4 | 1 |
| 232834W | NORTHERN | SAGINAW | BAY CITY | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 4 | 1 |
| 232835D | NORTHERN | SAGINAW | BAY CITY BELT | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 1 |
| 232836K | NORTHERN | SAGINAW | BAY CITY BELT | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 1 |
| 232837S | NORTHERN | SAGINAW | BAY CITY BELT | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 1 |
| 232838Y | NORTHERN | SAGINAW | BAY CITY BELT | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 1 |
| 232839F | NORTHERN | SAGINAW | BAY CITY BELT | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 1 |
| 232840A | NORTHERN | SAGINAW | BAY CITY BELT | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 1 |
| 232841G | NORTHERN | SAGINAW | BAY CITY BELT | 0 | 0 | 0 | 0 | | 1 | 1 | 0 | 2 | 1 |

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FIGURE 3-B

| CROSSING NUMBER | NIGHT SWITC MOVE | ONE TRAIN MOVE DAILY | MAX TIME TABLE SPEDD | MIN TYPICL SPEED | MAX TYPICL SPEED | NUMBER MAIN TRACKS | NUMBER N=MAIN TRACKS | DESCRIPTION OF NON=MAIN TRACKS | OTHER RR SEPAR TRACK | AAR CODES OF RRS OPERATING SEPARATE TRACKS AT CROSSING | OTHER RR ON YOUR TRACK | AAR CODES OF RRS OPERATING OVER YOUR TRACK AT CROSSING |
|-----------------|------------------|----------------------|----------------------|------------------|------------------|--------------------|----------------------|--------------------------------|----------------------|--|------------------------|--|
| 543752Y | 0 | 0 | 30 | 30 | 30 | 1 | 0 | | 2 | | 2 | |
| 543753F | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 543754M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 543755U | 0 | 0 | 30 | 30 | 30 | 1 | 0 | | 2 | | 2 | |
| 543756B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 543757H | 0 | 0 | 30 | 30 | 30 | 1 | 0 | | 2 | | 2 | |
| 543758P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 543759W | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 543760R | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 543761X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 543763L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 543764T | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 511460N | 1 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 511461V | 1 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 511462C | 1 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 511463J | 1 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 512058X | 1 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 512059E | 1 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 512063U | 1 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232793U | 0 | 0 | 10 | 5 | 10 | 0 | 1 | SPUR | 2 | | 2 | |
| 232794B | 0 | 0 | 10 | 5 | 10 | 0 | 1 | SPUR | 2 | | 2 | |
| 232795H | 0 | 0 | 10 | 5 | 10 | 0 | 1 | SPUR | 2 | | 2 | |
| 232796P | 0 | 0 | 10 | 5 | 10 | 0 | 1 | SPUR | 2 | | 2 | |
| 232797W | 0 | 0 | 10 | 5 | 10 | 0 | 1 | SPUR | 2 | | 2 | |
| 232798D | 0 | 0 | 10 | 5 | 10 | 0 | 1 | SPUR | 2 | | 2 | |
| 232799K | 0 | 0 | 10 | 5 | 10 | 0 | 1 | | 2 | | 2 | |
| 232800C | 0 | 0 | 10 | 5 | 10 | 0 | 1 | | 2 | | 2 | |
| 232801J | 0 | 0 | 10 | 5 | 10 | 0 | 1 | SPUR | 2 | | 2 | |
| 232802R | 0 | 0 | 10 | 5 | 10 | 0 | 1 | SPUR | 2 | | 2 | |
| 232803X | 0 | 0 | 10 | 5 | 10 | 0 | 1 | SPUR | 2 | | 2 | |
| 232804E | 0 | 0 | 10 | 5 | 10 | 0 | 1 | | 2 | | 2 | |
| 232805L | 0 | 0 | 10 | 5 | 10 | 0 | 1 | | 2 | | 2 | |
| 232806T | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 232807A | 0 | 0 | 10 | 5 | 10 | 0 | 4 | | 1 | PC | 1 | PC |
| 232808G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 232809N | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 232810H | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 232811P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 232812W | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 232813D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 232814K | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | |
| 232826E | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232827L | 0 | 0 | 10 | 5 | 10 | 1 | 2 | SDG&SPUR | 2 | | 2 | |
| 232828T | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232829A | 0 | 0 | 10 | 5 | 10 | 1 | 1 | SPUR | 2 | | 2 | |
| 232830U | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232831B | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232832H | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232833P | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232834W | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232835D | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232836K | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232837S | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232838Y | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232839P | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232840A | 0 | 0 | 10 | 5 | 10 | 1 | 0 | | 2 | | 2 | |
| 232841G | 0 | 0 | 10 | 5 | 10 | 1 | 1 | SPUR | 2 | | 2 | |

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| CROSSING NUMBER | NUMB REFL CROS BUCK | NON REFL CROS BUCK | STAN HWY STOP SIGN | NUMB OTHR STOP SIGN | OTHR SIGN 1ST TYPE | DESCRIPTION OF OTHER SIGNS FIRST TYPE | OTHR SIGN 2ND TYPE | DESCRIPTION OF OTHER SIGNS SECON TYPE | RED WHTE REFL GATE | NUMB OTHR CLOR GATE | CANT FLAS LITE OVER | CANT FLAS LITE -OVR | NUMB MAST FLAS LITE | NUMB OTHR FLAS LITE | DESCRIPT OF OTHER FLASHING LIGHTS | NUMB HWY TRAF SGNL | NUMB OF HIGH WAGS |
|-----------------|---------------------|--------------------|--------------------|---------------------|--------------------|---------------------------------------|--------------------|---------------------------------------|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-----------------------------------|--------------------|-------------------|
| 543752Y | 0 | 2 | 2 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 543753F | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 543754M | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 543755U | 0 | 2 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 543756B | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 543757H | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 2 | 0 | | 0 | 0 |
| 543758P | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 543759W | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 543760R | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 543761X | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 543763L | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 543764T | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 511460N | 2 | 0 | 2 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 511461V | 2 | 0 | 2 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 511462C | 2 | 0 | 2 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 511463J | 0 | 0 | 2 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 512058X | 2 | 0 | 2 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 512059E | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 2 | 0 | | 0 | 0 |
| 512063U | 2 | 0 | 2 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232793U | 0 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232794B | 0 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232795H | 2 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232796P | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232797W | 0 | 2 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232798D | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232799K | 1 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232800C | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232801J | 0 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232802R | 0 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232803X | 0 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232804E | 0 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232805L | 0 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232806T | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232807A | 0 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232808G | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232809N | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232810H | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232811P | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232812W | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232813D | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232814K | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232826E | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 2 | 0 | 2 | 0 | | 0 | 0 |
| 232827L | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 2 | 0 | | 0 | 0 |
| 232828T | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 2 | 0 | | 0 | 0 |
| 232829A | 1 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232830U | 1 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232831B | 0 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232832H | 0 | 2 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232833P | 1 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232834W | 2 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232835D | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 1 | 0 | | 0 | 0 |
| 232836K | 2 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232837S | 1 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232838Y | 1 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232839F | 1 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232840A | 1 | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 232841G | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |

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FIGURE 3-D

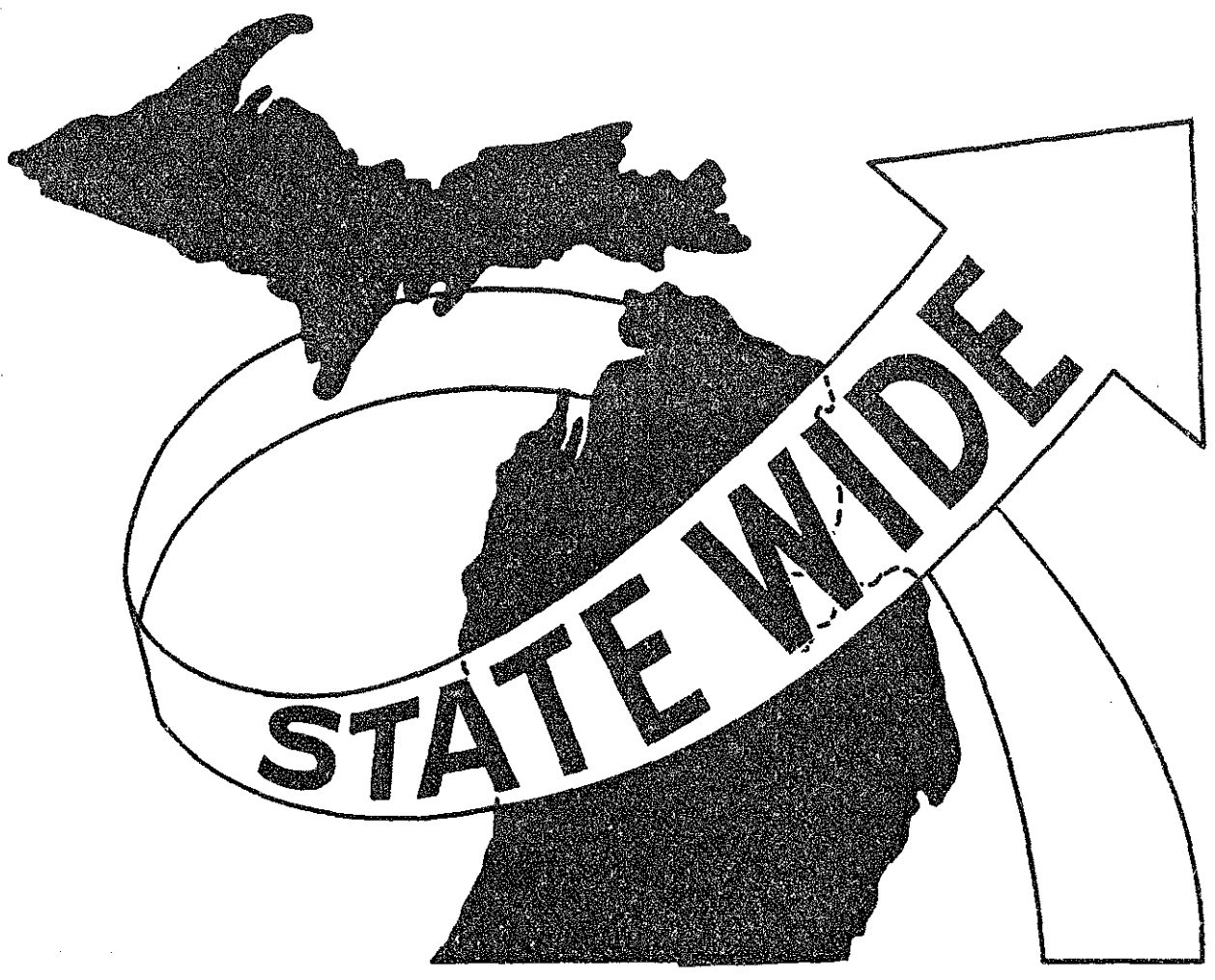
| CROSSING NUMBER | NUMB OF BELL | DESCRIPTION OF SPECIAL PROTECTION NOT TRAIN ACTIVATED | SIGN OR SGNL | COMM POWR AVAL | SGNL PROV SPD SEL | SGNL FOR TRAN OPR | TYPE OF DEVL | SHAL XING ANGL | NUMB TRAF LANE XING | TRCK PULL OUT LANE | HWY PAVE | PAVE MENT STOP LINE | PAVE RR XING SYMB | PAVE MENT MARK | RR ADVN WARN SIGN | TYPE OF XING SURF | RUN PARL IN ST |
|-----------------|--------------|---|--------------|----------------|-------------------|-------------------|--------------|----------------|---------------------|--------------------|----------|---------------------|-------------------|----------------|-------------------|-------------------|----------------|
| 543752Y | 0 | | 0 | 1 | 3 | 2 | 1 | 3 | 2 | 2 | 2 | 0 | 0 | 1 | 1 | 1 | 2 |
| 543753F | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 543754M | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 543755U | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 1 | 2 | 2 | 0 | 0 | 1 | 1 | 1 | 2 |
| 543756B | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 543757H | 2 | | 0 | 1 | 3 | 2 | 2 | 1 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 2 |
| 543758P | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 543759W | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 543760R | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 543761X | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 543763L | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 543764T | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 511460N | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 0 | 0 | 1 | 1 | 3 | 2 |
| 511461V | 0 | | 0 | 1 | 3 | 2 | 1 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 511462C | 0 | | 0 | 1 | 3 | 2 | 1 | 3 | 2 | 2 | 2 | 0 | 0 | 1 | 1 | 3 | 2 |
| 511463J | 0 | | 0 | 1 | 3 | 2 | 4 | 3 | 2 | 2 | 2 | 0 | 0 | 1 | 1 | 3 | 2 |
| 512058X | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 512059E | 2 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 0 | 1 | 3 | 2 |
| 512063U | 0 | | 0 | 1 | 3 | 2 | 1 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232793U | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232794B | 0 | | 0 | 1 | 3 | 2 | 5 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232795H | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 4 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232796P | 0 | | 1 | 1 | 3 | 2 | 2 | 3 | 1 | 2 | 2 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232797W | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232798D | 0 | | 1 | 1 | 3 | 2 | 2 | 3 | 1 | 2 | 2 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232799K | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232800C | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 1 | 2 | 2 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232801J | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232802R | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232803X | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232804E | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232805L | 0 | | 0 | 1 | 3 | 2 | 4 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232806T | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 232807A | 0 | | 0 | 1 | 3 | 2 | 4 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232808G | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 232809N | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 232810H | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 232811P | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 232812W | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 232813D | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 232814K | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 232826E | 2 | | 0 | 1 | 2 | 2 | 4 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232827L | 2 | | 0 | 1 | 2 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232828T | 2 | | 0 | 1 | 2 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232829A | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232830U | 1 | | 0 | 1 | 2 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232831B | 0 | | 0 | 1 | 3 | 2 | 5 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232832H | 1 | | 0 | 1 | 2 | 2 | 5 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232833P | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232834W | 0 | | 0 | 1 | 3 | 2 | 4 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232835D | 3 | | 0 | 1 | 2 | 2 | 4 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232836K | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232837S | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232838Y | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232839F | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232840A | 0 | | 0 | 1 | 3 | 2 | 4 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |
| 232841G | 0 | | 0 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 2 |

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| CROSSING NUMBER | OTHR HWY IN75 FEET | HWY SYST CODE | XING ON STAT HWY | FUNC CLAS OF ROAD | ESTIM AVERAG DAILY TRAFFIC | ESTM PERC TRCK TRAF |
|--------------------|-----------------------------|---------------------|---------------------------|----------------------------|-------------------------------------|------------------------------|
| 543752Y | 1 | 11 | 2 | 6 | 40 | 20 |
| 543753F | 0 | 0 | 0 | 0 | 0 | 0 |
| 543754M | 0 | 0 | 0 | 0 | 0 | 0 |
| 543755U | 1 | 11 | 2 | 6 | 40 | 5 |
| 543756B | 0 | 0 | 0 | 0 | 0 | 0 |
| 543757H | 2 | 7 | 2 | 5 | 500 | 10 |
| 543758P | 0 | 0 | 0 | 0 | 0 | 0 |
| 543759W | 0 | 0 | 0 | 0 | 0 | 0 |
| 543760R | 0 | 0 | 0 | 0 | 0 | 0 |
| 543761X | 0 | 0 | 0 | 0 | 0 | 0 |
| 543763L | 0 | 0 | 0 | 0 | 0 | 0 |
| 543764T | 0 | 0 | 0 | 0 | 0 | 0 |
| 511460N | 2 | 11 | 2 | 6 | 100 | 2 |
| 511461V | 2 | 7 | 2 | 4 | 1400 | 5 |
| 511462C | 2 | 11 | 2 | 6 | 220 | 2 |
| 511463J | 2 | 12 | 2 | 6 | 400 | 5 |
| 512058X | 2 | 11 | 2 | 6 | 870 | 2 |
| 512059E | 2 | 7 | 2 | 4 | 2100 | 9 |
| 512063U | 2 | 7 | 2 | 5 | 150 | 5 |
| 232793U | 2 | 12 | 2 | 36 | 600 | 5 |
| 232794B | 2 | 12 | 2 | 36 | 190 | 5 |
| 232795H | 1 | 4 | 1 | 33 | 13300 | 9 |
| 232796P | 1 | 12 | 2 | 36 | 50 | 5 |
| 232797W | 1 | 12 | 2 | 36 | 600 | 5 |
| 232798D | 1 | 12 | 2 | 36 | 50 | 5 |
| 232799K | 1 | 12 | 2 | 36 | 120 | 5 |
| 232800C | 1 | 12 | 2 | 36 | 50 | 5 |
| 232801J | 1 | 12 | 2 | 36 | 200 | 5 |
| 232802R | 1 | 12 | 2 | 36 | 150 | 5 |
| 232803X | 1 | 12 | 2 | 36 | 200 | 5 |
| 232804E | 1 | 12 | 2 | 36 | 300 | 5 |
| 232805L | 1 | 12 | 2 | 34 | 1800 | 7 |
| 232806T | 0 | 0 | 0 | 0 | 0 | 0 |
| 232807A | 2 | 12 | 2 | 36 | 2000 | 5 |
| 232808G | 0 | 0 | 0 | 0 | 0 | 0 |
| 232809N | 0 | 0 | 0 | 0 | 0 | 0 |
| 232810H | 0 | 0 | 0 | 0 | 0 | 0 |
| 232811P | 0 | 0 | 0 | 0 | 0 | 0 |
| 232812W | 0 | 0 | 0 | 0 | 0 | 0 |
| 232813D | 0 | 0 | 0 | 0 | 0 | 0 |
| 232814K | 0 | 0 | 0 | 0 | 0 | 0 |
| 232826E | 2 | 14 | 2 | 34 | 1500 | 7 |
| 232827L | 2 | 12 | 2 | 36 | 1000 | 5 |
| 232828T | 2 | 14 | 2 | 34 | 4500 | 7 |
| 232829A | 1 | 12 | 2 | 36 | 600 | 5 |
| 232830U | 1 | 12 | 2 | 36 | 600 | 5 |
| 232831B | 1 | 12 | 2 | 36 | 800 | 5 |
| 232832H | 2 | 12 | 2 | 35 | 3200 | 6 |
| 232833P | 1 | 12 | 2 | 36 | 300 | 5 |
| 232834W | 2 | 12 | 2 | 35 | 600 | 6 |
| 232835D | 1 | 12 | 2 | 34 | 8510 | 7 |
| 232836K | 1 | 12 | 2 | 36 | 600 | 5 |
| 232837S | 1 | 12 | 2 | 36 | 520 | 5 |
| 232838Y | 1 | 12 | 2 | 36 | 710 | 5 |
| 232839F | 1 | 12 | 2 | 36 | 650 | 5 |
| 232840A | 2 | 12 | 2 | 35 | 1300 | 6 |
| 232841G | 2 | 12 | 2 | 34 | 1490 | 7 |

This program prints crossings in the order they appear on the crossing file. However, it is possible to sort the crossing file in any desired order. In this way, for example, one may list the crossing data sorted by county, railroad, and an accident exposure factor. If one desires, a new page may be started each time a given item changes values. This option should be used only if the file is sorted by the desired item or many pages will contain only one or two crossings.

CONCLUSION



CONCLUSION

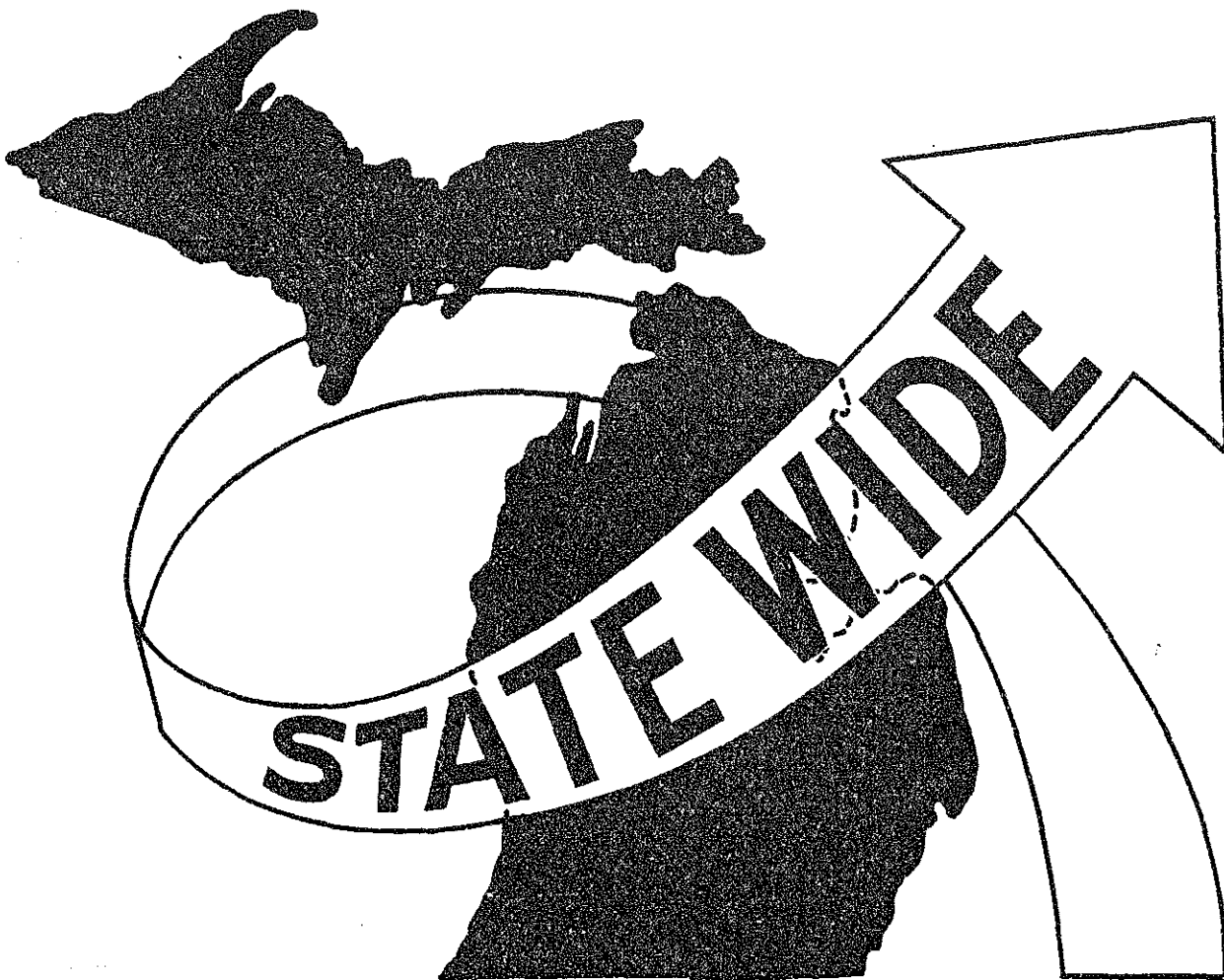
The preceding report documents the addition of statewide railroad crossing data to Michigan's Statewide Transportation Modeling System. This data base will resolve many present and future informational analysis problems facing this state's railroad planning process. Information assembled in this rail crossing data base is easily accessible, as is continuous updating, through computer analysis programs discussed in this report.

Through the use of the system's function of preventive maintenance, a methodology has been developed using this data to systematically identify and rank crossing problems so that better programming of construction funds can be accomplished. The system also provides a means for planning future railroad - highway crossing locations. This function can be performed through utilization of the railroad crossing data base and the equivalents list being completed to relate this data to highway data.

For further information regarding this report or any other applications of the Statewide Transportation Modeling System, contact:

Richard E. Esch
Michigan Department of State
Highways and Transportation
Bureau of Transportation Planning
P.O. Box 30050
Lansing, Michigan 48909

APPENDIX "A"



5

Definitions & Instructions

GENERAL

All highway crossings of tracks, both at-grade and grade separated are to be reported. An identification number shall be permanently placed at all locations, in accordance with instructions for mounting the number board as shown in Part 6 of this manual.

For *all* crossings and grade separations, the location and classification information (Part I of the OMB Form No. 04-S-73002) is to be completed. The remainder of the form (Parts II and III) is to be completed *for public at-grade crossings and questionable private crossings*. If field crew considers a crossing to be private but is not positive, then the crossing is to be designated private and the remainder of the form completed. It is important to complete the form in these questionable cases to avoid a return to the crossing if it is subsequently determined by the railroad and the public agency that the crossing is public.

Part IV of the form will be filled out by highway department personnel. Railroad employees will not fill out that portion of the form.

A railroad-highway grade crossing is to be regarded as a single crossing of all the tracks within the adjacent owned or leased railroad rights-of-way at the point of intersection with roadway at grade to the extent that the tracks are located within the limits of a single set of grade crossing signs or protective devices having an integrated set of actuating circuits.

All crossings of tracks at grade by public roads and streets are to be reported if any railroad operations are conducted. A grade crossing of a dual or multi-lane roadway is to be reported as a single crossing.

To avoid duplicate reporting of jointly owned, jointly maintained or jointly used crossings, the railroad which is designated as the reporting road for the current reports to ICC (Form 510B and 511) shall be the reporting road for this project unless otherwise mutually agreed.

After the crew has arrived at a crossing, a crossing number board is to be selected. The four miniature number labels should be removed from the number board and one placed on each copy of the inventory form in space provided at lower right hand corner. This number should also be marked

at the proper location on both copies of the county map.

The crew member filling out the form should date and initial form in upper right hand corner and complete remainder of form in accordance with the instructions in this manual.

Items on the inventory form that are intentionally left blank should be indicated by drawing a horizontal line through the space made available for recording information.

DEFINITIONS

Public Crossing: A public crossing is a location where the tracks cross a road which is under the jurisdiction of and maintained by a public authority and which is open to public travel.

Private Crossing: A private crossing is a location where a physical crossing is present but the road does not meet the conditions indicated above for a public crossing. Private crossings usually restrict public use by an agreement which the railroad has with the property owner, or by gates or similar barriers.

In some instances changes in land use have resulted in an expansion of crossing use to the extent that it has become a public crossing in fact, whether or not any public agency has accepted responsibility for maintenance or control of the use of the traveled way over the crossing. The railroad company and highway agency should make every effort to mutually resolve and agree on the appropriate classification (either public or private) of questionable crossings.

An area where vehicles trespass is not to be considered a crossing. Crossings used only by the railroads are not to be reported. Crossings created to serve specific temporary activities such as construction are not to be reported.

Pedestrian Crossing: A pedestrian crossing is a designated area where pedestrians but not vehicles may cross a track. An area where pedestrians trespass is not to be considered a crossing. The designation of a crossing may be by a sign, device, or filled materials between the rails.

PART I: Location of all Crossings

ITEM 1 State name of reporting company. Reporting company should be the "operating company" that owns and maintains the roadbed, tracks, and signal system controlling the crossing. If reporting company is other than owning company, enclose reporting company name in parenthesis.

ITEM 2 If railroad system, for operating administrative purposes, is divided into regions, lines, or districts under jurisdictions of general managers (or equivalent), state name of region, line, or district.

ITEM 3 If railroad system (and/or region, line, or district), for operating administrative purposes, is divided into divisions or similar classifications under jurisdiction of superintendents and division engineers (or equivalent), state name of division or other classification.

ITEM 4 Identify the state where the crossing is located. If the crossing is located on a state boundary so that parts of the crossing lay in two or more states, identify all states.

ITEM 5 Identify the county where the crossing is located. If the crossing is on a county line so that parts of the crossing lay in two or more counties, identify all counties.

ITEM 6 Enter county map identification or other reference number provided by the highway agency to specifically identify the crossing on the street and road system. If not available prior to field survey, leave blank.

ITEM 7 Identify the name of the incorporated city where the crossing is located. If the crossing is on a city line so that parts of the crossing lay in two or more cities, identify all cities. If not within a city, omit this item and complete Item 8.

ITEM 8 If not within an incorporated city, town or village, identify the name of the unincorporated city, town, or village or the nearest city, town, or village, whether or not on the railroad lines.

ITEM 9 Identify type of highway such as U.S. numbered, state, county, town, etc., and number of highway (please abbreviate). Number of highway should be posted on the highway or found on state or county maps. If there is more than one number, enter all numbers.

ITEM 10 If highway or street has a name/s enter the name/s. If private roadway has a name, state such name in parenthesis.

ITEM 11 If a crossing identification number other than the DOT-AAR number or highway agency number (e.g. a railroad or PUC assigned number) is posted at or assigned to the crossing, enter that number. If a unique number has previously been assigned to the crossing, although not displayed at the crossing, enter that number.

ITEM 12 State name of nearest timetable station of operating company.

ITEM 13 Line or branch name as used by railroad to describe this segment of track in conjunction with milepost. If track is an industry lead, industry spur, yard lead, wye, etc., state name of such track.

ITEM 14 State railroad milepost in miles and hundredths of miles. (53 feet is approximately 1/100 mile.) Enough descriptive material must be in Items 13 and 14 so that the crossing can be identified along a RR line.

ITEM 15 Enter appropriate pedestrian crossing type.

ITEM 16 For private crossings, at least three items must be checked, one in 16A., 16B., and 16C.

ITEM 16A Check the box which best describes the crossing usage based on the following categories:

1. A *farm crossing* is any crossing used for the movement of motor vehicles, farm machinery or livestock in connection with agricultural pursuits, forestry, or other land-productive purposes.
2. A *residential crossing* is any crossing used to provide vehicular access for occupants and their invitees to a private residence or residences.
3. A *recreational crossing* is any crossing used to provide access to otherwise isolated recreational facilities, such as parks or hunting and fishing areas.
4. An *industrial crossing* is any crossing used to provide access between industrial plant facilities or to an industrial or other commercial area.

ITEM 16B Check appropriate box for crossing type.

ITEM 16C Specify type of crossing protection.

ITEM 17 Check appropriate box for type of public crossing and *complete the remainder of the form for public vehicular crossings at-grade, and for those crossings which cannot be clearly identified as private.*

NOTE: Person completing Crossing Inventory Form please sign and date.

OMB-04-S-73002

U.S. DOT — AAR CROSSING INVENTORY FORM

INITIALS:

(PLEASE PRINT)

DATE: / /

Part I Location and Classification of All Crossings (Must Be Completed)

| | | | |
|----------------------------------|--------------------------------|-------------------------------------|--|
| 1. Railroad Operating Company | 2. Railroad Division or Region | 3. Railroad Subdivision or District | <p>DO NOT WRITE IN THIS SPACE</p> <p>State _____ County _____</p> <p>City _____ Nearest City _____</p> <p>RR Code _____ Timetable Station _____</p> |
| 4. State | 5. County | 6. County Map. Ref. No. | |
| 7. City | 8. Nearest City | 9. Highway Type and No. | |
| 10. Street or Road Name | 11. RR I.D. No. | | |
| 12. Nearest RR Timetable Station | 13. Branch or Line Name | 14. Railroad Mile Post | |
| 15. Pedestrian Crossing | 16. Private Vehicle Crossing | 17. Public Vehicle Crossing | |

1. at grade 2. RR under 3. RR over
 1. Farm 2. Residential 3. Recreational 4. Industrial
 5. at grade 8. signs—specify _____
 6. RR under 9. signals—specify _____
 7. RR over 0. none

COMPLETE REMAINDER OF FORM ONLY FOR PUBLIC VEHICLE CROSSINGS AT GRADE

PART II: Detailed Information for Public Vehicular At-Grade Crossing Only

ITEM 1A Typical means normal or average daily train movements. Through trains are trains whose primary responsibility is to move cars over the road, may have a limited number of pickups and setouts along the route. Classify all others, i.e., locals, industrial runs, switch engine as switching movements. *Include total number of train movements both for the reporting company and for any other railroad operating over the crossing.*

ITEM 1B Check if train frequency is less than one train per day.

ITEM 2 Both maximum timetable speed and the typical speed range of trains over the crossings are required.

ITEM 3 A track is considered main if through trains operate on track. Give number and specify all other types of track.

ITEM 4 Specify names of other railroads that *operate separate tracks* within the protective devices operating for your crossing.

ITEM 5 Specify names of other railroad companies that operate trains *over your track* at the crossing.

ITEM 6 *If more than one type of protection is present*, fill in all applicable types of protection.

ITEM 6A The number of masts with crossbucks is requested, not a count of all crossbucks signs. Two or more crossbucks mounted on a single

mount are counted as one crossbuck. If the crossing has a train activated device, do not count the crossbucks mounted on that device.

A standard highway stop sign is red with white letters and has eight sides. Classify all other stop signs as "other stop signs."

Also indicate number and type of any other passive signs at crossing.

ITEM 6B Make a separate count of gates with the red and white reflectorized arms from other marked gates.

Separate cantilevered flashers between those over traffic lanes of the approach roadway and those either not reaching the roadway or over only parking lanes, turnout lanes, or shoulders.

Count all flashers on a single mast as one flasher. Do not count flasher heads separately.

Flashing lights not in accord with the latest AAR Bulletin on Railroad - Highway Grade Crossing Protection should be reported as other flashing lights.

Highway signals refer only to train activated red-amber-green signals that control street traffic over the crossing. Do not count highway signals controlling a nearby intersection even if they are interconnected with the crossing protection.

Count all wigwags.

Count bells if present, either alone or in conjunction with other protection.

ITEM 6C Examples of special protection not train activated are: (1) Manually operated gates; (2) train crew flagging the crossing; (3) watchmen; and (4) floodlights. For watchmen and for manually operated gates, the number of hours daily in effect should also be indicated. For floodlighting, the number of masts with lights should be reported. Only floodlighting which is of a type distinctive in volume, distribution or color from ordinary street or other lighting is to be reported.

ITEM 6D Check if no signs or signals are present.

ITEM 7 Check Yes if commercial electric power is available within 500 feet of the crossing.

ITEM 8 Check Yes if the signal is equipped with a device to provide a uniform warning time for the speed range of trains listed in Part II, Item 2. Check N/A (not applicable) box in those cases where there are no automatic signals at the crossing.

ITEM 9 Check Yes if track has some type of automatic signals or interlocking to control train operation.

COMPLETE REMAINDER OF FORM ONLY FOR PUBLIC VEHICLE CROSSINGS AT GRADE

Part II Detailed Information for Public Vehicular at Grade Crossing

1A. Typical Number of Daily Train Movements

| Daylight (5 AM to 6 PM) | | Night (6 PM to 6 AM) | |
|-------------------------|-----------|----------------------|-----------|
| thru trains | switching | thru trains | switching |
| □ □ □ □ | □ □ □ □ | □ □ □ □ | □ □ □ □ |

1B. Check if Less Than One Movement Per Day

2. Speed of Train at Crossing

A. Maximum time table speed

B. Typical Speed Range Over Crossing from to mph

3. Type and Number of Tracks.

main other If other specify

4. Does Another RR Operate a Separate Track at Crossing?

Yes No Specify: RR

5. Does Another RR Operate Over Your Track at Crossing?

Yes No Specify: RR

6. Type of Protection at Crossing

A. Signs:

| | | | | |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Crossbucks | | Standard Highway Stop Sign | Other Stop Signs | Other Signs: Specify |
| reflectorized | non-reflectorized | | | |
| Number <input type="text"/> | Number <input type="text"/> | Number <input type="text"/> | Number <input type="text"/> | Number <input type="text"/> |

B. Train Activated Devices:

| | | | | | | | | |
|-----------------------------|-----------------------------|------------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Gates | | Cantilevered Flashing Lights | | Mast Mounted Flashing Lights | Other Flashing Lights | Highway Traffic Signals | Wigwags | Bells |
| red & white reflectorized | other colored | over traffic lane | not over traffic lane | | | | | |
| Number <input type="text"/> | Number <input type="text"/> | Number <input type="text"/> | Number <input type="text"/> | Number <input type="text"/> | Number <input type="text"/> | Number <input type="text"/> | Number <input type="text"/> | Number <input type="text"/> |

C. Specify Special Protection not Train Activated (List in instructions)

D. No Signs or Signals

7. Is Commercial Power Available? Yes No

8. Does Crossing Signal Provide Speed Selection for Trains? Yes No N/A

9. Method of Signaling for Train Operation: Is Track Equipped with Signals? Yes No

PART III: Physical Data

ITEM 1 Check box which best describes the predominant type of development in the vicinity (up to 1000 feet) of the crossing based on the categories below. (More than one may be checked if a combination clearly predominates.)

1. Open space - undeveloped or sparsely developed, very lightly populated, agricultural

2. Residential - built-up residential area

3. Commercial - retail stores and businesses, offices, personal services

4. Industrial - manufacturing, construction, heavy products, factories, warehouses

5. Institutional - schools, churches, hospitals, parks, and other community facilities.

ITEM 2 Check box which most closely describes the smallest angle between the highway and the track. (The angle may be estimated by eye or with a simple device, such as a protractor.)

ITEM 3 Enter the number of traffic lanes crossing the track. Do not include shoulders or lanes that are typically used for parking.

ITEM 4 Check *Yes* only if special added lanes are provided to accommodate vehicles required to stop at crossings.

ITEM 5 Enter *Yes* if highway is paved with material on which pavement markings can be effectively maintained. Enter *No* if highway surface is gravel, dirt or surface treatment on which markings cannot be maintained.

ITEM 6 Check if pavement markings as prescribed or generally similar to those contained in highway traffic manuals are present. If both stop lines and RR crossing symbols are present, check both. If neither, check *None*.

ITEM 7 Check *Yes* if advance warning signs are present on any of the highway approaches. Check *No* if the crossing has no advance signs whatsoever.

ITEM 8 Check the box which most closely fits one of the descriptions below.

1. *Sectional Treated Timber*. Prefabricated units approximately 8 feet in length of treated timber individually installed and removable for maintenance and replacement purposes.

2. *Full Wood Plank*. Wood surface, other than sectional treated timber, covering the entire crossing area above the crossties.

3. *Asphalt*. Asphalt surface over the entire crossing area or in the area between planks or other material forming flangeway openings, with or without single planks on outside of running rails.

4. *Concrete Slab*. Precast concrete slabs, installed and removable, individually, for maintenance and replacement purposes.

5. *Concrete Pavement*. Concrete surface which is continuous over the track area and is not removable except by destruction of the surface.

6. *Rubber Slabs*. Preformed rubber sections, installed and removable, individually, for maintenance and replacement purposes.

7. *Metal Sections*. Preformed sections of steel or other metal, installed and removable, individually, for maintenance and replacement purposes.

8. *Other Metal*. Complete coverage of the crossing area with railroad rails or other metal materials not removable in limited sectional units.

9. *Unconsolidated*. Ballast or other unconsolidated material placed above the tops of crossties, with or without planks on one or both sides of the running rails.

ITEM 9 Check *Yes* if the crossing involves track running parallel to *and within a street or highway*.

ITEM 10 Check *Yes* if the highway at this crossing is intersected by another highway within 75 ft. of this crossing. Do not include railroad service roads or other incidental ways.

Part III Physical Data

- 1. Type of Development 1. Open Sp. 2. Res. 3. Comm. 4. Ind. 5. Inst.
- 2. Smallest Crossing Angle 0°-29° 30°-59° 60°-90°
- 3. Number of Traffic Lanes Crossing Railroad Number
- 4. Are Truck Pullout Lanes Present? Yes No

- 5. Is Highway Paved? Yes No
- 6. Pavement Markings Stoplines RR Xing Sym. None
- 7. Are RR Advance Warning Signs Present? Yes No
- 8. Crossing Surface 1. Sec. Timber 2. Full Wd. Plank 3. Asphalt 4. Concrete Slab 5. Concrete Pave. 6. Rubber 7. Metal Sections 8. Other Metal 9. Unconsolidated

- 9. Does Track Run Down A Street? Yes No
- 10. Nearby Intersection Highway? Yes No

PART IV: Highway Department Information

ITEM 1 Highway System - The highway system codes correspond to those necessary to prepare Table TA-1.

| <i>Code</i> | <i>System</i> |
|-------------|--|
| 01 | Interstate, rural, open to traffic |
| 02 | Interstate, urban, open to traffic |
| 03 | Other FA primary, rural |
| 04 | Other FA primary, urban |
| 05 | FA secondary rural, State jurisdiction |
| 06 | FA secondary urban, State jurisdiction |
| 07 | FA secondary rural, local jurisdiction |
| 08 | FA secondary urban, local jurisdiction |
| 09 | Other State highways, rural (Non-FA) |
| 10 | Other State highways, urban (Non-FA) |
| 11 | Local rural roads |
| 12 | Local city streets |
| 14 | Federal-aid urban |

The following adjustments to the codes above should be used to reflect truck prohibitions and toll roads:

For toll roads on which trucks are permitted, add 20 to the appropriate system code. For example, code 24 would be a toll facility on the Federal-aid primary urban system.

For toll parkways on which trucks are not permitted, 60 should be added to the appropriate system code.

For non-toll roads on which trucks are not permitted, add 80 to the appropriate system code.

ITEM 2 Is crossing on state highway system?
Enter *Yes* or *No*.

ITEM 3 Functional Classification - enter the appropriate code as shown below for the 1990 Functional Classification as developed in the National Highway Functional Classification and Needs Study (1970 to 1990).

| RURAL | | URBAN <i>Population (thousands)</i> | | | |
|--------------------------|---|-------------------------------------|-------|-------|---------|
| | | 5-10 | 10-25 | 25-50 | Over 50 |
| Interstate | 1 | 11 | 21 | 31 | 41 |
| Other Principal Arterial | 2 | 12 | 22 | 32 | 42 |
| Minor Arterial | 3 | 13 | 23 | 33 | 43 |
| Major Collector | 4 | 14 | 24 | 34 | 44 |
| Minor Collector | 5 | 15 | 25 | 35 | 45 |
| Local | 6 | 16 | 26 | 36 | 46 |

ITEM 4 Enter the estimated present average daily traffic (total both directions) based on available traffic information. A reasonable estimate of the ADT will be acceptable even though traffic counts are not available.

ITEM 5 Enter the estimated percentage of trucks in the traffic stream.

Part IV Highway Department Information

- 1. Highway System
- 2. Is Crossing on State Highway System? Yes No
- 3. Functional Classification of Road over Crossing.
- 4. Estimate AADT
- 5. Estimate Percent Trucks

Attach I.D. Number

6

Number Board Placement

NUMBER BOARD PLACEMENT

There are three important considerations in mounting the number board at the crossing.

1. The attachment of the number board will not interfere with the operation of the grade crossing protective device.
2. The number board should be placed (where possible) above the reach of would be vandals.
3. When attached to post or metal poles, the number board should be mounted so that it is parallel with the roadway.

Only one number board is to be placed at each crossing. Where more than one protective device mast is located at a crossing, company policy will determine which mast is to be used for attaching the number board.

The following sketches provide specific guidelines for number board mountings.

- Illustration 1 CROSSBUCKS
- Illustration 2 MAST MOUNTED
FLASHING LIGHTS
- Illustration 3 GATES
- Illustration 4 CANTILEVERED
FLASHING LIGHTS
- Illustration 5 WIGWAGS
- Illustration 6 STOP SIGN OR OTHER SIGN
POST MOUNT

NOTE: Where signals or signs are not present and post cannot be placed at the crossing, number board may be mounted on nearest railroad-owned signal or communication pole. If number board cannot be installed on a post or pole the railroad should inventory crossing, use the labels and store number board for installation at a later date.

Illustration 1

CROSSBUCKS

HIGHWAY CROSSING SIGN

Number board will be installed using either nails or long staples, or strapping for metal poles. The installation should be made just above eye level.

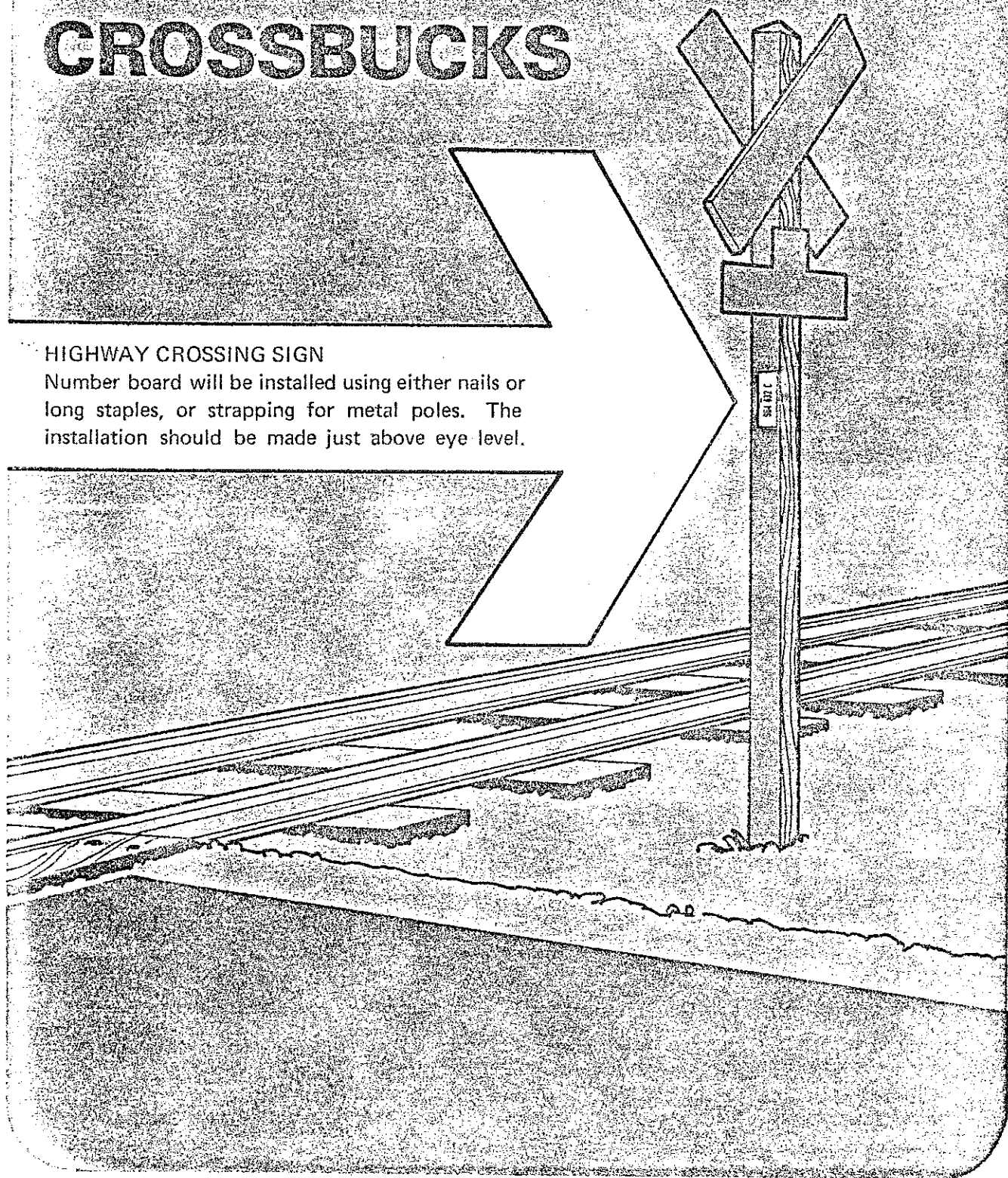


Illustration 2

MAST MOUNTED FLASHING LIGHTS

STANDARD FLASHING LIGHTS

Number board will be installed using strapping material. The installation should be made just above eye level.

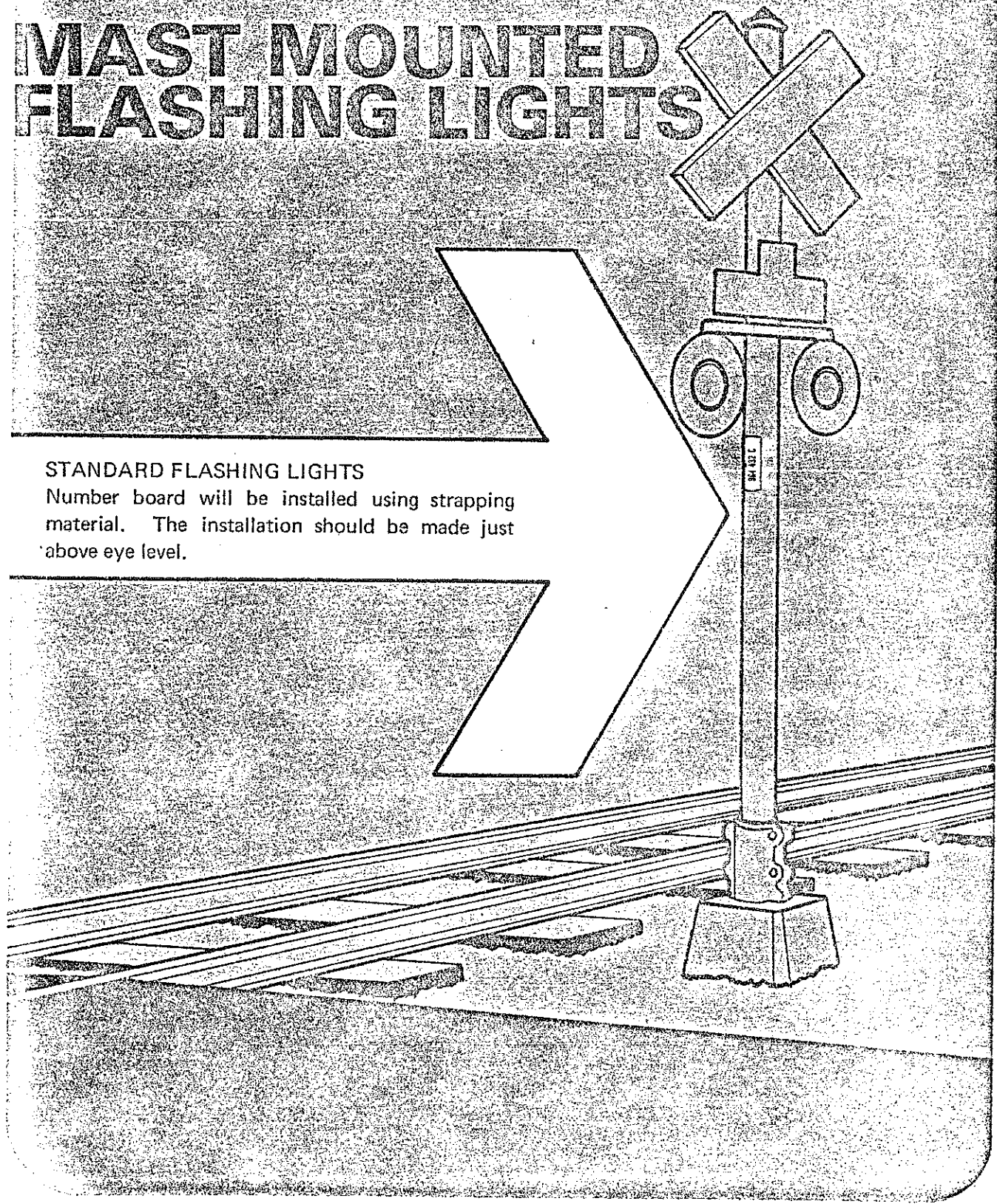


Illustration 3

GATES

AUTOMATIC GATES

Number board will be installed using strapping material. The installation should be made just above eye level.

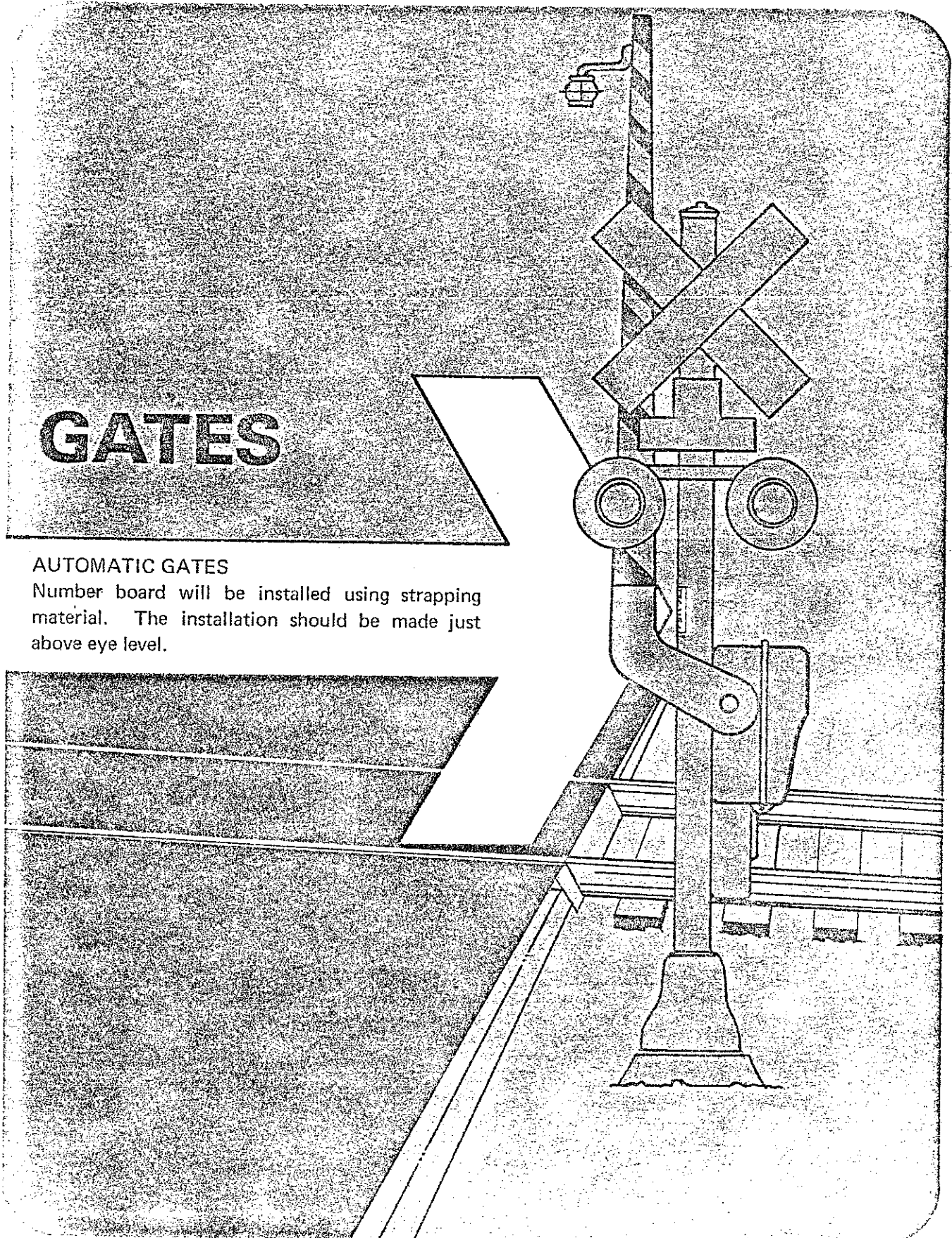


Illustration 4

CANTILEVERED FLASHING LIGHTS

CANTILEVER UNIT

Number board will be installed using strapping material. The installation should be made just above eye level.

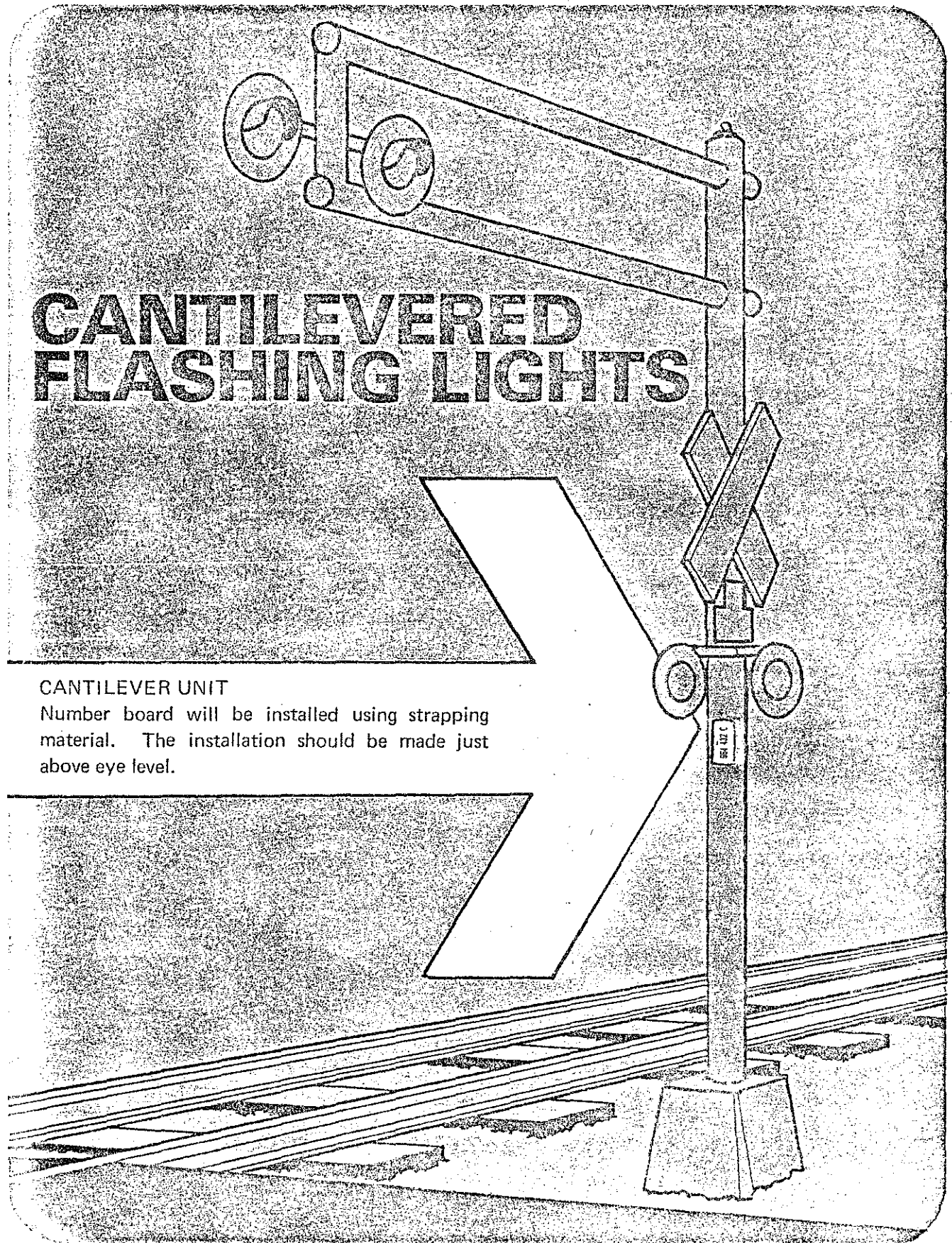


Illustration 5

WIG-WAGS

WIG-WAG SIGNAL

Number board will be installed using strapping material. The installation should be made just above eye level.

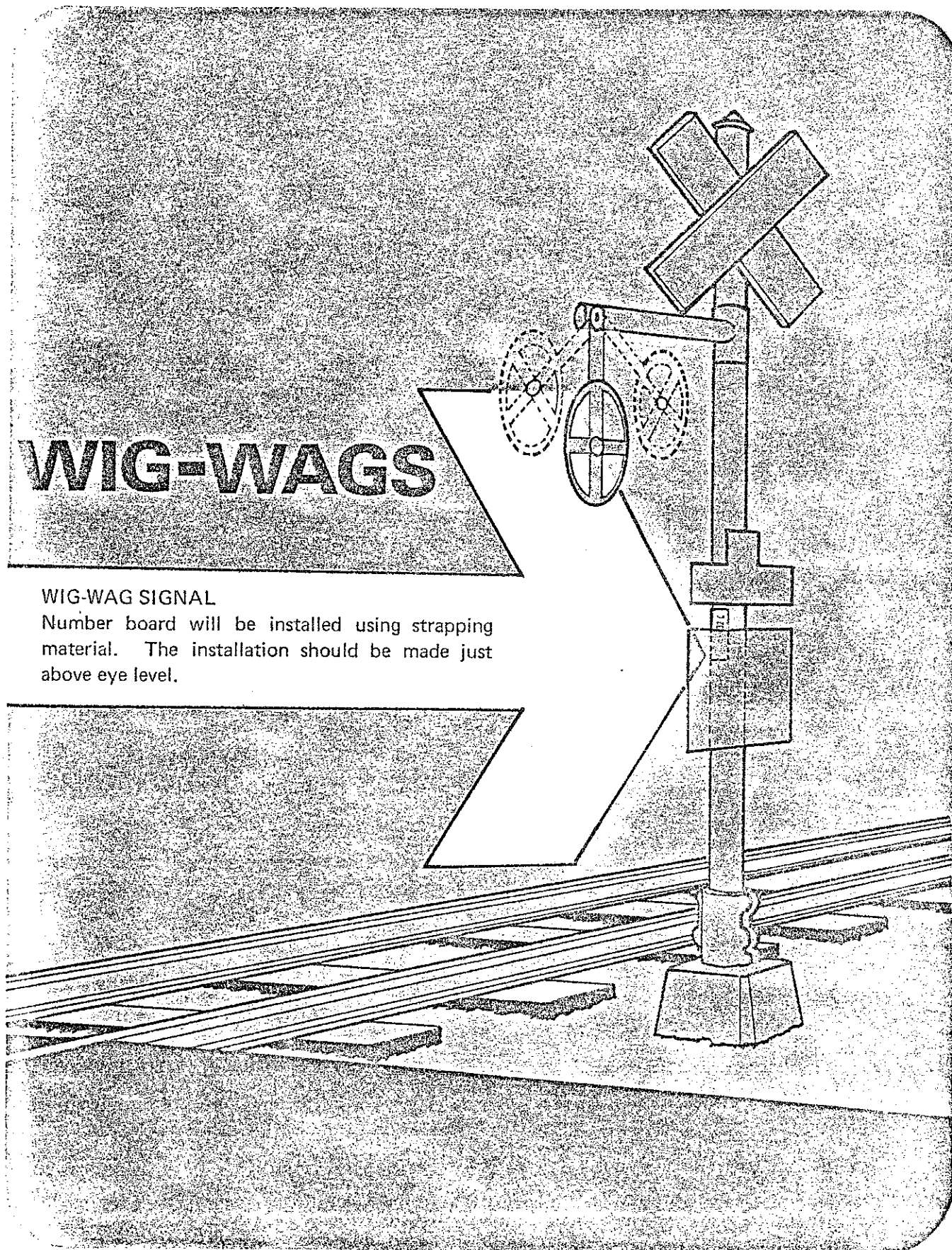
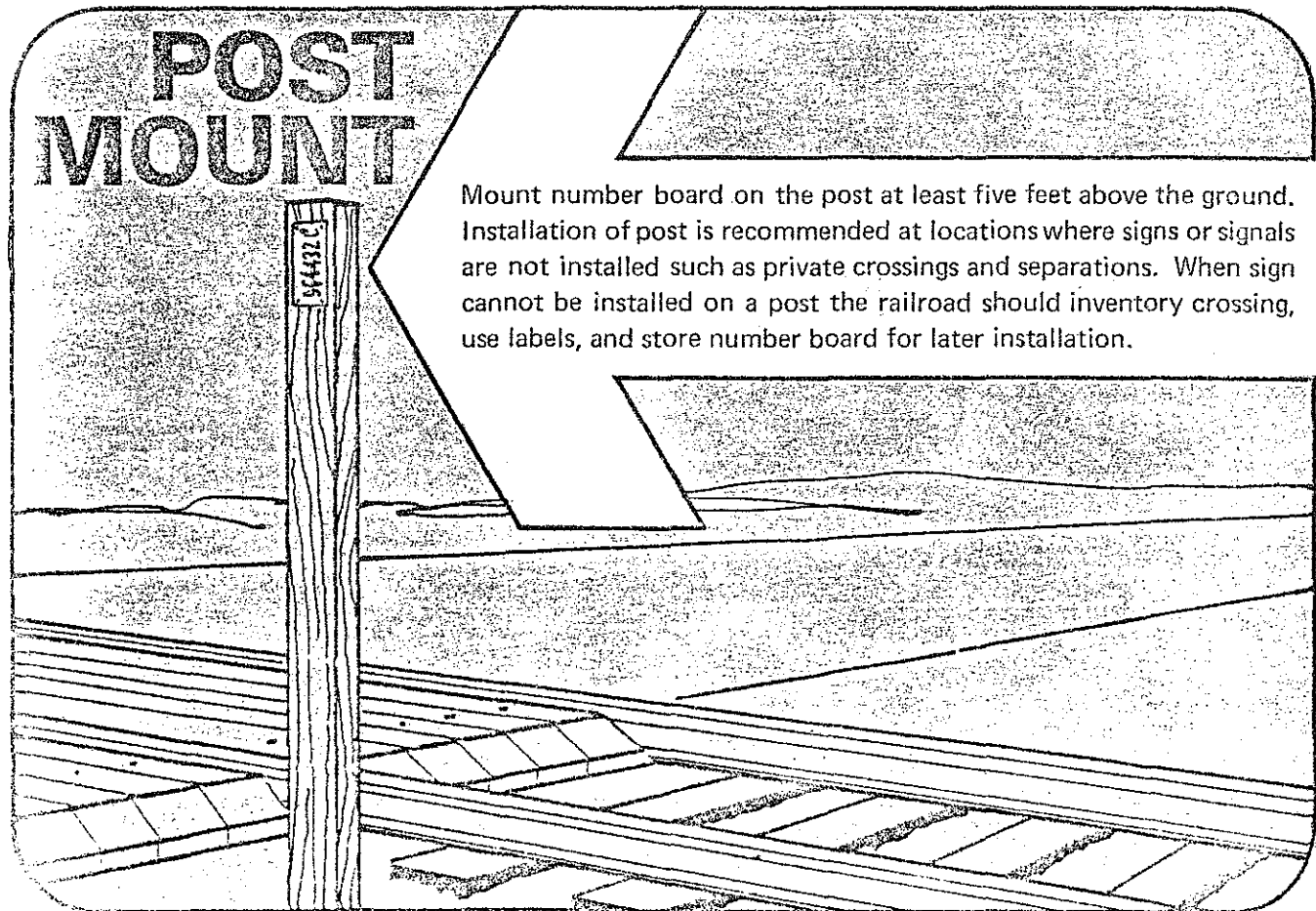
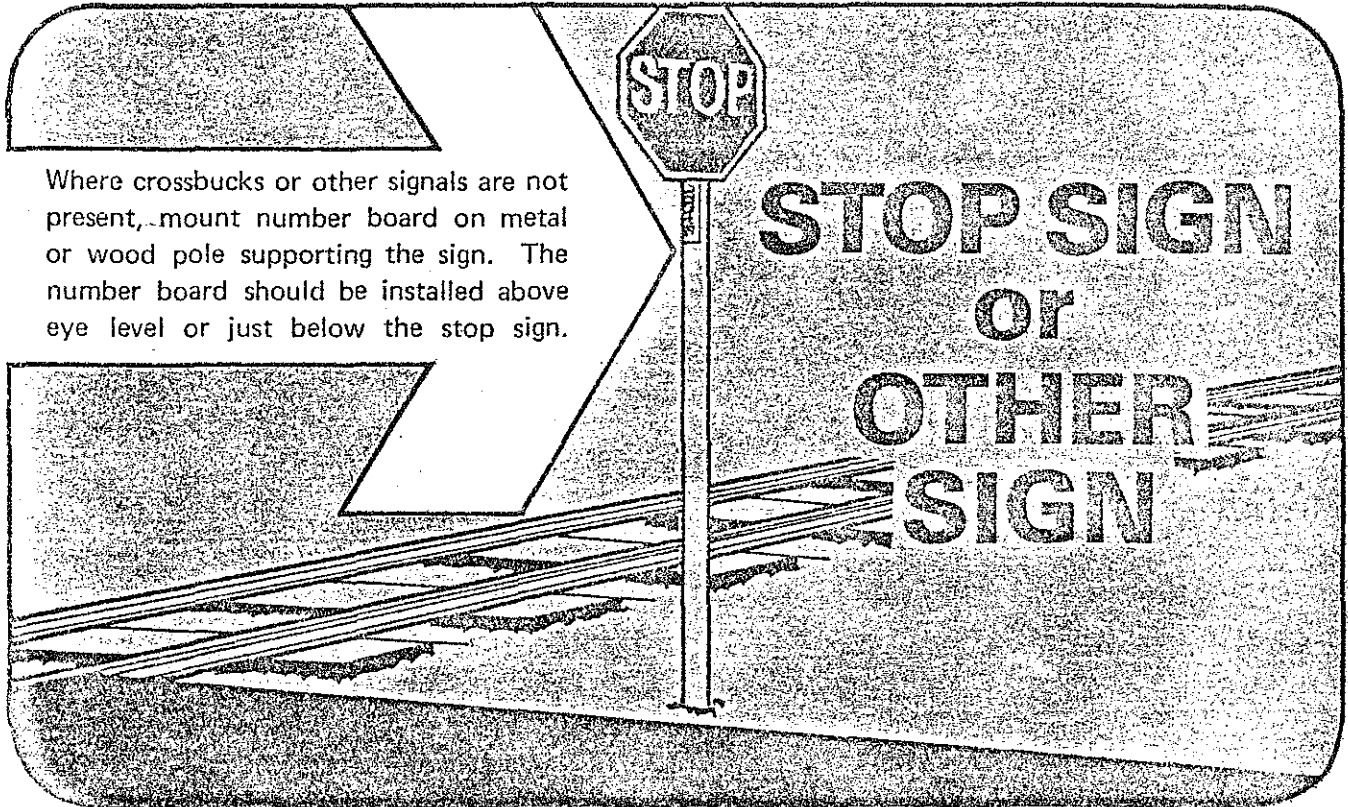


Illustration 6



7

Project Completion Information

PROCEDURES FOR HANDLING COMPLETED INVENTORY FORMS

Although railroad company field work will probably be conducted without regard to state boundaries, it is important that the completed inventory forms be grouped according to the state in which the crossings are located.

As a railroad company completes the project, within each state, the inventory forms are to be handled in the following manner:

For all completed inventory forms, mail three copies to the state highway department planning engineer (also include county maps with crossings identified by location and number.) Railroad should keep fourth copy for its records.

When the state highway department has completed the inventory form they will mail the original copy to the Texas Transportation Insti-

tute and return to the railroad company one copy that will include highway data for public at-grade crossings.

It is suggested that a cover letter accompany each group of inventory forms shipped. This letter should, among other things, give the total forms included in the mailing according to private crossings, pedestrian crossings, grade separations, and public at-grade crossings.

Additional information may be obtained by contacting the project staff listed on Appendix 1.

Appendix 3 includes the name and address of AAR state representatives in the event you wish to contact other railroad representatives concerning individual railroad representatives within a given state.