ANNUAL REPORT

OF

MICHIGAN'S OVERALL HIGHWAY

SAFETY IMPROVEMENT PROGRAM

AUGUST 31, 1974

MICHIGAN DEPARTMENT

OF

STATE HIGHWAYS AND TRANSPORTATION

STATE HIGHWAY COMMISSION

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This Report was prepared by the Traffic and Safety Division, the Local Government Division, and the Railroad Contact Section, Bureau of Highways.

Michigan's Overall Highway Safety Improvement Program

Michigan's Overall Highway Safety Improvement Program report is separated into three major sections.

The first section contains the annual report required by the Highway Safety Act of 1973 and includes the procedures, methods, priority criteria, implementation progress, and evaluation of the following five categorical programs:

Section 203 - Rail-Highway Crossing Improvements

Section 205 - Pavement Marking Demonstration Program (23 U.S.C. 151)

Section 209 - High Hazard Locations (23 U.S.C. 152)

Section 210 - Elimination of Roadside Obstacles (23 U.S.C. 153)

Section 230 - Safer Roads Demonstration Program (23 U.S.C. 405)

The second section of this report contains similar information relative to the Safety Improvement Program for State Trunkline Highways which is funded solely with State funds.

The third section of this report contains information relative to highway construction projects primarily intended to increase highway safety which are funded with Federal-Aid Interstate, Primary, Secondary, TOPICS, Urban System, and Michigan funds.

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SECTION 1

ANNUAL REPORT

HIGHWAY SAFETY ACT OF 1973

FISCAL YEAR 1973-74

Introduction

A major consideration in implementing the Highway Safety Act of 1973 in Michigan is the involvement of local governmental agencies in the program. There are 531 cities and villages having jurisdiction over 18,530 miles of roads and streets and 83 county road commissions with 88,013 miles of primary and local roads. In February of 1974, a letter was addressed to all counties, cities and villages in the State which explained the principal sections and intent of the Highway Safety Act of 1973 and encouraged participation in the program (see Appendix A-1).

It is clearly the intent of the Highway Safety Act of 1973 to reduce the number of highway collisions, fatalities and injuries through the application of traffic engineering safety techniques. In order to make a measurable impact in terms of a reduction in accidents and the severity of accidents, it is necessary to determine the locations on the State's highways where concentrations of accidents are occurring, the roadway factors which are contributing to the accident problem and the corrective measures which will eliminate or reduce the number and the severity of accidents which do occur. The key to a prudent expenditure of public funds in a cost-effect manner involves the systematic evaluation and identification of concentrations of accidents which are susceptible to correction through the application of traffic engineering safety techniques. This will permit maximum effort and funding to be concentrated in areas where high payoffs in terms of accident reduction can be expected. Michigan's strategy is a systematic approach consisting of five phases:

1. Location of high accident areas
2. Development of corrective measures
3. Scheduling of corrective measures
4. Implementation of corrective measures
5. Evaluation of corrective measures.

Location of High Accident Areas

Jurisdiction over the total highway network in Michigan is shared by the Michigan Department of State Highways and Transportation, 531 cities and villages and 83 county road commissions. Each agency is responsible for developing and funding projects on routes under its jurisdiction. Federal safety funds expended on non-state trunkline routes are administered by the Michigan Department of State Highways and Transportation. In order to expend the safety monies in a prudent manner so as to receive the greatest benefit (reduction in accidents) for the least cost, a three-level analysis procedure is conducted separately for state trunkline routes and non-trunkline routes to locate safety deficiencies.

The first level of analysis for local roads and streets consists of a statewide analysis of cities and townships to determine those jurisdictions which have above-average accident experience. The second level of analysis involves a review of the jurisdictions which are experiencing an abnormally high number of accidents relative to the average in order to locate concentrations of accidents. These accident concentrations (route segments and/or spot locations) are then analyzed in detail in order to develop corrective measures.

The Michigan Department of State Police maintains a computer accident file organized on a city and township basis. The basic procedure for the statewide local road analysis consists of a number-rate ranking of city and township jurisdiction on the basis of accidents and accidents per mile of roadway. The MDSH&T is evaluating the use of a surrogate accident rate (accidents/population/mile) which is intended to reflect a measure of the exposure of vehicles in the traffic stream and form a uniform basis for comparing the 1,775 city and township jurisdictions within the State. The number-rate-analysis procedure is used to analyze non-trunkline total accidents, fixed object accidents, railroad crossing accidents, pedestrian accidents, left-turn

type accidents, wet surface accidents, etc. The strategy is to define a type of accident which is correctable and select those jurisdictions which are experiencing an above-average number and rate of particular type of accident. This will serve to direct the highway safety improvement resources to jurisdictions which are experiencing accident problems which will result in the largest payoff for the expenditures made.

Accident files for state trunkline highways are computerized by control section number and mile point. The statewide search for concentrations of correctable accidents on trunklines is conducted on a control section basis, on the basis of each 0.2 mile section of roadway, and at spot locations. Control sections are evaluated and ranked on the basis of accidents per mile and accidents per 100 million vehicle miles. Spot locations are ranked on the basis of number of accidents and accidents per million vehicles entering the intersections.

Michigan is in the process of developing a Michigan Accident Locating Index (MALI) for all accidents within the State which will have the capability of identifying hazardous locations of roadway. At the present time, the MALI system is being tested in Kalamazoo County. When MALI is operational, procedures similar to that now being used on the State Trunkline System will be conducted statewide on a road segment basis. This will serve to direct funds and engineering effort to problem segments of roadway which will save wasted effort in analyzing areas which do not have a priority problem. It is anticipated that ultimately the MALI system will include an index of highway data so that causative factors, such as narrow bridges and other specific elements of the roadway environment, can be correlated with accident experience.

Development of Corrective Measures

The jurisdictions, which are determined to have an above-average accident experience on a statewide basis for each of the correctable type accident patterns, will be analyzed

in greater detail to determine the concentrations within the jurisdiction of that particular type of accident. The analysis will consist of reviewing the accidents within the jurisdiction on a route-by-route basis. Some counties and cities within the State, such as Oakland County and the Cities of Saginaw, Grand Rapids, Lansing and Ann Arbor currently have computerized accident files which will facilitate analysis. In areas which do not have computerized accident files, a more conventional analysis of the area will be undertaken.

In addition to systematically searching the State to find concentrations of correctable accidents, local jurisdictions are encouraged to program projects which will correct known safety deficiencies. The criteria used to evaluate such projects include a high number of accidents, a high accident rate and the presence of a correctable accident pattern. Many of these projects resulted from completed TOPICS and 402 funded studies.

Corrective measures at problem locations are evaluated in terms of cost and expected accident reduction. The potential gain in safety per dollar invested is the key to the proper and prudent expenditure of public safety funds. National Safety Council figures are used to estimate the potential gain in safety. Corrective measures will fall into one of the five funding categories of the Highway Safety Act of 1973.

Scheduling of Corrective Measures

There are a number of factors which affect the scheduling of projects. The actual programming of projects for implementation involves consideration of the following items:

1. A theoretical project priority rating based on accident deficiency and potential gain in safety from proposed corrective measures;
2. The grouping of projects to attain route continuity:
3. The need for right-of-way acquisition;

4. The grouping of like or related projects for contract lettings;
5. Accomplishing what can be accomplished as soon as possible;
6. The amount of local, State or federal funds available;
7. Distributing projects equitably between agencies relative to the need and ability to implement and fund projects;
8. Previous commitments or agreements and the coordination with other programs.

Local jurisdictions submit a listing of projects with supporting data to the State for approval and programming. The accident deficiency, the correctability of the problem, and the proposed corrective measure of each project is evaluated by the State in light of the aforementioned items and a determination made as to which projects should be programmed for federal funds.

Implementation of Corrective Measures

Normal federal aid procedures are used to implement safety improvement projects. The projects are administered by the State with the agency having jurisdiction over the roadway providing the local matching funds, preparing plans and specifications, and exercising day-to-day project construction control.

Evaluation of Corrective Measures

The purpose of the evaluation phase of the safety program is as follows:

1. To measure the performance of various traffic engineering techniques in reducing the number and severity of certain types of accidents.
2. To develop and refine accident reduction techniques through the application of traffic engineering measures.
3. To measure the effectiveness of each of the five categories of the safety program.

The evaluation will be conducted by the State on a statewide basis since projects are distributed throughout the State on the basis of potential gain in safety. The evaluation studies will consist of a "before" and "after" accident evaluation of selected projects or groups of similar projects. Statistical control of the evaluation study will be provided by selecting routes or jurisdictions which are similar in character and evaluating the accidents during the "before" and "after" study periods.

Section 203 of the Highway Safety Act of 1973
Railroad-Highway Grade Crossings

In 1972, there was a total of 359,745 accidents in Michigan. Of this total, 656 were train-related accidents. There were six pedestrians injured as a result of pedestrian-train collisions. An analysis of the train-related accidents in 1972 indicated the following:

- Ninety percent of all train-related accidents are occurring on the non-trunkline system
- One out of every 34 urban train-related accidents is a fatal accident.
- One out of every 13 rural train-related accidents is a fatal accident
- In Michigan, the severity index (fatal+injury/total accidents) for train-related accidents is .467 as compared to .322 for all accidents. The National severity index for train-related accidents is estimated at .693.
- Fifty percent of all train-related accidents occurred during the hours of darkness.
- Sixty-one percent of the train-related accidents occurred in urban areas while 39 percent occurred in rural areas. These percentages are comparable to National figures.
- The ratio of persons killed in train-related accidents to the number of such accidents is ten times the ratio of all other motor vehicle accidents.
- It has been estimated that Nationally 20 percent of the crossings account for 67 percent of all accidents at crossings which have no protection or are protected with railroad crossbucks, advanced warning signs and pavement markings, or stop signs. It is also estimated that approximately 7 percent of all passive crossings have no protection.
- There are approximately 8,865 railroad crossings in Michigan of which 6,565 have passive protection. Of the 8,865 crossings, 2,339 are on the Federal-Aid System.

The Department of Transportation - Association of American Railroads National Grade Crossing Inventory and Numbering Project is currently underway in the State of Michigan and when completed will provide an inventory of all railroad crossings in the State. Usable results, however, are not expected to be available for a number of months.

In order to initiate a meaningful program in advance of the National Inventory results, the Michigan Department of State Highways and Transportation, in February, 1974, requested potential crossing improvement projects from the Michigan Public Service Commission (MPSC), all railroad companies and incorporated cities, and the 83 counties within the State. Recommendations from these sources are evaluated, on a continuing basis, using a priority system developed by the MDSH&T.

As directed by the Federal Highway Administration, first priority is being given to the correction of those railroad crossings having no warning signs or substandard signing. It is expected that the National Inventory will provide sufficient information to identify such substandard crossings. In advance of the availability of the inventory results, specific information regarding grade crossing signing projects is being requested from each county.

Early in the implementation of this section, the office of the Michigan Division of the FHWA reviewed and approved the MPSC procedures relative to the evaluation of crossings and the issuance of improvement orders. The priority ranking established by the MDSH&T reflects the emphasis placed on the MPSC actions. A priority listing of projects was established utilizing a rating form (see Appendix 203-1) which considers the following:

1. MPSC order
2. ADT and train and vehicular speed
3. Number of trains
4. Accident potential obtained from charts (see Appendixes 203-2; 203-3; 203-4)
5. Alignment and sight distance
6. Number of school bus crossings
7. Surface condition
8. Number of tracks
9. Extraordinary circumstances.

Locations receiving ratings between 70 and 100 are considered critical and are programmed as first priority projects. Once a crossing is identified as a high priority, the affected local agency and railroad are notified that crossing improvements are eligible for funding under this section and that agreements, plans, specifications, and estimates are required.

When the Michigan Accident Locating Index (MALI) becomes operational in the State, it will provide the capability of identifying those railroad crossings experiencing an above-average number of accidents. However, currently car-train accident information off the trunkline system is available only on a county basis. An analysis of this accident data (see Appendix 203-5) indicates that crossings in 18 counties did not experience any car-train accidents in 1973 while the crossings in 20 counties accounted for 80 percent of the 642 car-train accidents experienced during the year. The State trunkline system experienced 74, or only 11.5 percent, of the 642 accidents. A review of the accidents/crossing on the State trunklines (see Appendix 203-6) and non-trunkline system (see Appendix 203-7) indicates generally higher rates for the trunkline system; however, taking into account the higher traffic volumes on the trunklines and the low number of accidents, it can be seen that this program has to be directed primarily toward the non-trunkline system in a selected number of counties.

On July 1, 1974, there was a total of 45 railroad crossing projects costing approximately $1,296,700 underway within the State (see Appendix 203-8). The type of work at these 45 crossings includes furnishing signals, gates, rebuilding the crossing, advance warning signs, overhead cantilever flashers, pavement markings, and relocation of approaches. Several requests for railroad grade separations were refused because of insufficient funds in this program. Twenty-two of the crossing projects involved installation of warning devices at a total cost of $706,600 or an average of $32,120 per crossing. The total estimated cost of construction improvements involving 33 crossings is $590,100 or $17,880 per crossing. The average cost of a project in this program is $28,820 and 54.5 percent of the funds is being spent on warning devices. It is estimated that the total accident potential for all 45 crossings is 83 accidents per year.

Meetings were held with the railroad companies to discuss the program and encourage their participation. In many cases, the program will require an increase in their engineering staff and rail crossing crews to handle the additional work load.

In the State of Michigan, railroad companies generally are not participating in the 10 percent funding. Only in exceptional cases have they contributed partial funding. Scheduling of work has presented some problems to them as track repair crews cannot be assigned in a progressive manner and it has become necessary for crews to move about the State.

Legal agreements between parties involved have been generalized, making acceptance much quicker. Plans have been accepted on an 8 1/2" x 11" sheet with minimum detail. Work can be accomplished by force account or agreed unit price contracts. All of these items have been simplified to make the program more efficient. However, problems still exist with small communities not able to perform engineering requirements and properly prepare information for funding.

The requirement that the local road authority participate to the extent of 10 percent of the project cost dictates that a separate formal agreement be negotiated, for each project, between the local road authority, the railroad company and the State. This local cost participation requirement, coupled with the inclusion of minor crossing area approach work to be performed at project expense by the local road authority, results in a greatly expanded State force manpower requirement as compared to earlier Federal-aid railroad crossing improvement projects.

Considerably more time is required to administer the program and assist the local road authority in developing the work items, method of payment, etc., for the relatively minor approach work required in conjunction with the improvements to be accomplished by the railroad company. Many small communities are not able to provide even a simple survey or plan to indicate the nature and limits of the project.

It is suggested that in lieu of Federal funds being utilized to pay 90 percent of the cost of minor approach work, 100 percent of the railroad performed items be paid for with Federal funds and the local road authority be required to perform the necessary minor approach items at their own expense. This would greatly expedite the processing of projects in Michigan and would be consistent with the Federal Highway Administration decisions to fund 100 percent of such work as outlined in PPM 21-5-72 dated October 27, 1972 and FHWA Notice dated March 14, 1973.

It is the intent of the National Grade Crossing Inventory and Numbering project to provide specific site information to facilitate the improvement and evaluation of railroad highway crossing projects. When this inventory is completed and the data is received from the Texas Transportation Institute, it is expected that a computer file will be generated and updated as changes are made to individual crossings. A major problem in using the inventory to identify crossings which do not conform to the MUTCD is that the inventory is too general. The inventory should

have included the location, condition and effectiveness of advanced warning signs and pavement markings as well as similar information for other traffic control devices used at the crossing. In addition, the inventory does not provide sufficient information on the condition of the highway or the condition and location of highway appurtenances such as curb, guardrail, shoulders, etc., on the approaches to the crossing. This data will be obtained on non-federal aid routes as part of the state-wide project being initiated under the 230 Program to inventory and upgrade the traffic control devices on the local road system. Data at rail-highway crossings on federal-aid routes will be requested from the agency having jurisdiction over the roadway.

Section 205 of the Highway Safety Act of 1973
Pavement Marking Demonstration Program
(23 U.S.C. 151)

This program is oriented such that first priority is given to projects on rural two-lane highways both on the Federal-Aid Secondary System and those off the Federal-Aid System.

The program objective is to demonstrate the value of pavement markings in increasing vehicular and pedestrian safety on roadways which have not been previously marked in conformance with the 1971 Manual of Uniform Traffic Control Devices which has been established as a high National priority activity. To this end, the State developed and transmitted on April 3, 1974, to all county road commissions a guideline explaining the procedures for funding projects (see Appendix 205-1).

To facilitate early project implementation, Michigan chose to develop the Pavement Marking Demonstration Program in two stages. Stage I involves the field survey and establishment of "No Passing Zones" on a county-by-county basis on those roads requested by the individual county road commissions in accordance with the aforementioned guidelines. Stage II involves implementation on a county basis of those pavement markings requested by the counties which will assure compliance with National standards. Two statewide projects (Stage I and Stage II) have been programmed with the Federal Highway Administration. It is anticipated that these projects will completely utilize all of the funds apportioned to Michigan under this section of the 1973 Highway Safety Act. The estimated cost in federal funds for the Stage I and Stage II projects are listed in Appendix 205-2A. The types of markings specifically requested by counties include centerlines,edgelines, and no-passing zones. Several requests have also been received for thermoplastic pavement markings; however, this type of material would require additional justification for federal-aid participation in accordance with PPM 21-15.

Statewide response by the counties for the Pavement Marking Demonstration Program has been favorable, and it is expected that the survey of the no-passing zones (Stage I) will be completed by July, 1975, and that the actual painting of the county roads (Stage II) will be substantially completed by the fall of 1975. The markings will subsequently be renewed, utilizing federal-aid, during an evaluation period which will be of at least two years.

The actual marking contracts for the 205 Program will be awarded by the State to private contractors on low bid basis. Several of the 83 Michigan counties are equipped to perform this work and, as a result, they will mark their own roads on a force account or an agreed unit price basis.

The procedure proposed for evaluating the effectiveness of this program includes an analysis of the accident experience before and after the application of new markings as well as development of a cost-benefit ratio to enable proper assessment of the value of the new markings. Rather than evaluating all the individual counties which participate in the program, several counties with complete "before" data will be utilized as control counties. "Before" and "After" data for the control counties will thereby form the basis for the report on the effectiveness of the statewide program.

Although it is Michigan's intent to survey and provide pavement marking of no-passing zones which are requested by county road commissions and do not conform with the MUTCD, we have been notified by the Federal Highway Administration that companion signing is not eligible for federal-aid under the 205 program. This ruling seems inconsistent with the National policy established by Congress of promoting safety through the uniform application of traffic control devices.

Section 209 of the Highway Safety Act of 1973
High Hazard Locations
(23 U.S.C. 152)

Criteria generally utilized for project selection for this program is based on a combination of the number of accidents, accident rate, and a correctable accident pattern. Michigan has developed location lists (Appendixes 209-1, 209-2, 209-3, 209-4) which identify some 458 high-hazard locations from existing sources, such as area-wide TOPICS plans, 402 funded studies, the Department's Computer Accident Analysis Programs (State trunkline), and locations submitted from local jurisdictions.

Source	No. of Locations Identified
TOPICS Area-wide Plans (Appendix 209-1)	73
402 Funded Studies (Appendixes 209-2, 209-3) (Construction and Skidproofing Locations)	278
Computer Accident Analysis Program (State Trunklines) (Appendix 209-4)	107
Total	458

Using the aforementioned lists, Michigan programmed 25 projects under Section 209 (Appendix 209-5). Seven of these 25 projects were former TOPICS projects with sufficient accident justification and 17 are on the State's trunkline system. The total estimated cost of these projects is 2.8 million dollars. The correctable accident pattern at 18 of the 25 locations was head-on left-turn accidents and rear-end accidents involving left-turn vehicles. The solution at 14 of the 18 locations involved the construction of center left-turn lanes which will provide left-turning vehicles with increased visibility of oncoming traffic. Also, the construction of center left-turn lanes provide for the future installation of multiphase traffic signals. At four of the 18 locations, the street width already included center left-turn lanes and, as a result, the project consisted only of the installation of a multiphase traffic signal.

In a one-year period, there was a total of 907 accidents at these 25 locations. This is an average of 36 accidents per location. The average total cost of the corrective measures at each location is approximately $111,000. Construction of separate turning lanes at signalized intersections is Michigan's most predominant type of corrective measure. The average total cost of constructing the turning lanes amounted to $132,000 per location. The basic cost data in terms of federal funds for each type of corrective measure and the number of each type of improvement, along with the related accident information, is contained in Appendix 209-6.

Michigan has developed a computer program which ranks all cities and townships within the State by accidents per mile of roadway (see Appendix 209-7). Using this ranking, jurisdictions with a high density (Acc/Mile) are identified and investigations are conducted in order to locate concentrations of accidents at locations within the jurisdiction.

An analysis of all reported accidents for 1973 in Michigan (see Appendix 209-8) indicated the following:

- Six percent of the cities (30 of 531) experienced 75 percent of the total non-trunkline accidents occurring in all cities.
- Twenty-seven percent of the townships (340 of 1,244) experienced 75 percent of the total non-trunkline accidents occurring in all townships.
- Sixty-five percent of the 350,864 accidents occurring on all roads in the State were in an urban area (see Appendix 210-2). However, of this percentage, 62 percent of the accidents occurred in cities over 50,000 population.
- Within all cities, 73 percent of the total accidents are occurring on non-trunkline routes.
- Within all townships, 62 percent of the total accidents are occurring on non-trunkline routes.

- Of the total accidents, the split between trunkline and non-trunkline is 29 percent and 71 percent, respectively.
- Of the 1,776 city and township jurisdictions in Michigan, there were 24 cities and 5 townships which did not experience any reported accidents in 1973.

Section 210 of the Highway Safety Act of 1973
Program for the Elimination of Roadside Obstacles
(23 U.S.C. 153)

This section requires a statewide survey of roadside obstacles. The non-trunkline portion of this survey is currently underway and will be met in the following manner: each of the 83 counties will survey randomly selected segments of its federal-aid routes and local routes. Randomly selected small urban areas will be requested to survey all roads under their jurisdiction. Randomly selected area segments (based on political jurisdictions) will be selected from the 12 urbanized areas of the State and the affected local agencies will be requested to survey both the federal and non-federal aid routes under their jurisdiction within the selected area segment. The survey was based on a 10 percent random sample of the State's roadways. Survey guidelines were sent on April 22, 1974 to all counties (see Appendix 210-1). Approximately 70 of the 83 counties have completed the survey. The survey requirements on the trunkline system will be met by randomly selecting segments of the State's trunkline system and utilizing the Department's photolog file for the survey. Five mile segments will be randomly selected from the 8,100 miles of non-interstate trunklines. The Federal Highway Administration's "Recommended Sample Designs for Section 210 Surveys" will be used. It is estimated that 20 percent of the non-interstate trunkline system will be surveyed resulting in approximately 324 sample segments. As of August, 1974, 83 percent of the trunkline system had been photologged. The photologging and editing of the State's trunkline system is anticipated to be completed by March 1, 1975. The trunkline survey of roadside obstacle will be conducted upon completion of the State's photologging process.

The value of this survey appears to be limited since the data which is being collected cannot easily be transformed into the development of projects for the removal of roadside obstacles. In addition, it is unreasonable to expect that the roadside obstacles within a certain distance of the traveled roadway will be removed regardless

of their exposure to traffic or the incidence of accidents being experienced by similar type obstacles in similar type locations. It is not intended that an engineering survey systematically maintained of all highways in the State be undertaken to identify roadside obstacles which may constitute a hazard to vehicles or pedestrians. Such a survey would be costly and of limited value in establishing priorities and selecting sections of roadway for upgrading since it will be more prudent and cost effective to upgrade the sections of roadway which are experiencing the greatest accident problem. Therefore, Michigan's approach to the roadside obstacle problem will be to locate segments of roadway which are experiencing an abnormally high number of fixed-object accidents and conduct an engineering survey of these roadway sections to determine the physical features of the highway environment which lend themselves to correction and thereby reduce the number and severity of fixed-object accidents.

A summary of the statewide study of fixed-object ran-off-the-road type accident appears in Appendix 210-2. The following facts were obtained from the study:

Twelve percent of all highway accidents involve fixed objects.

Twenty-two percent of all rural highway accidents involve fixed objects.

A disproportionate share of the fixed-object accidents occur in the rural area (61 percent of the fixed-object accidents vs. 35 percent of the total accidents).

Sixty-eight percent of all fixed-object accidents occur on the non-trunkline highways.

The severity index (fatal + injury/total) is slightly greater for fixed-object accidents than for total accidents.

A computer program has been developed which ranks the townships and cities in terms of the number of fixed-object accidents and the number of fixed-object accidents per mile (see Appendix 210-3). These lists represent those jurisdictions that have an above-average fixed-object accident experience. A comprehensive study within each of the selected jurisdictions will be conducted to determine those roadway segments which contribute to the fixed-object accident problem in that jurisdiction.

Projects on those segments will then be developed based on the number of correctable fixed-object accidents and the fixed-object accidents per mile.

A graph (Appendix 210-4) of the cumulative percentage of all non-trunkline fixed-object accidents indicates the following:

Two percent of the cities experienced 80 percent of the fixed-object accidents occurring in all cities.

Thirty-five percent of the townships experienced 75 percent of the fixed-object accidents occurring in all townships.

Twelve percent of the townships experienced no more than one fixed-object accident per year.

Segments (control sections) of the trunkline system, other than Interstate routes, have been ranked in terms of fixed-object accidents by the number-rate method (see Appendix 210-5). In addition, a computer program has been used to rank 0.2 of a mile segments of trunkline routes based on the number of fixed-object accidents (see Appendix 210-6). In-depth analysis of those segments with above-average fixed-object accident rates are being made on a continuing basis and projects are being developed based on the number of correctable fixed-object accidents and the benefits which would result from the improvements.

An analysis of the frequency at which fixed objects were hit off roadways indicates the following (see Appendix 210-7):

1. Trees and ditches account for 53 percent of the fixed-object accidents in townships.
2. Utility poles account for 33 percent of the fixed-object accidents in cities.
3. Guardrail and ditches account for 41 percent of the fixed-object accidents on trunklines.
4. Utility poles, ditches, and trees account for 54 percent of the fixed-object accidents statewide.

An earlier study of fixed-object accidents on trunklines for the years 1969 and 1970 indicated the following:

Twenty-seven percent occurred on curves.

Fifty-three percent occurred during darkness.

Fifty percent occurred during adverse road conditions.

Trees and abutment/piers collected a disproportionate share of fatal accidents having 7.5 percent of the total accidents and 16.2 percent and 8.3 percent of the fatal accidents, respectively.

Prompted by alarming tree accident statistics, the MDSH&T undertook a program of selective tree removal from 1965 to 1967. However, the tree removal programs of fiscal years 1965-66 and 1966-67 were not based on locations of known and documented car-tree accident experience. Each district was assigned a lump sum for tree removal by contract with district personnel identifying the trees to be removed. For the results of the program, see "An Evaluation of the 1965-66, 1966-67 Tree Removal Programs". Currently, we have identified 387 locations on the trunkline system with two or more car-tree accidents within 600' - 1000' which amounts to approximately 61 miles. These locations experienced 969 accidents or 30 percent of all car-tree accidents on the trunkline system in 1970-71-72. Using this data,we intend to institute a program of selective tree removal at the identified locations of car-tree accidents.

Appendix 210-8 provides information relative to the location, description, justification, and costs of the projects underway. Over $519,000 has been programmed in this category. We anticipate many more trunkline projects similar to the US-131 project.

Section 230 of the Highway Safety Act of 1973
Federal-Aid Safer Roads Demonstration Program
(23 U.S.C. 405)

This program provides federal funds for the elimination or correction of safety hazards which are not on the federal-aid highway system. The types of projects which are programmed include rail-highway crossing improvements, impact attenuators, sign modernization, and an inventory of roadside obstacles off the Federal-Aid System. A number of small communities have shown considerable interest in sign modernization as a result of a recent $400,000 liability suit involving improper signing in Wolverine Lake. The City of Wolverine Lake and the City of Saginaw have initiated projects to upgrade warning and regulatory signs on a city-wide basis.

A total of 23 projects estimated to cost $890,000 have been programmed under this section. A listing of individual projects by type of work and estimated cost is included in Appendix 230-1. Eighteen of the 23 projects involve the improvement of rail-highway crossings. The accident potential at these 18 crossings, as determined from the accident potential charts described in Section 203, amounts to over 25 accidents per year. Railroad grade crossings at which there are either no signs or signs and markings which are not in conformance with the MUTCD are given priority for improvement. Seven of the 18 grade crossing projects were for installation or upgrading of warning devices. The total estimated cost of the 18 railroad grade crossing projects is $559,000 of which $428,000,or 71 percent, is for installing or upgrading of warning devices.

The functional classification of the roads being improved under this section of the program are listed in Appendix 230-2. Thirteen of the 23 projects are on local roads, six projects are on collector roads, and four projects are on both local and collector roads.

The criteria used to select projects and establish priorities for funding under the 230 Program are identical to the criteria used to select projects for other categorical programs. Railroad crossing projects are scheduled for improvement if the crossing is rated between 70 and 100 priority points. Projects for the elimination or reduction in severity of roadside obstacle accidents will be selected on the basis of accident experience. When MALI is operational on a statewide basis, critical segments of roadway will be selected using a number-rate technique in a manner similar to that now being used on the State trunkline system. Prior to MALI being operational, jurisdictions which are experiencing high numbers and rates of total accidents and off-roadway fixed object accidents will be selected for further study to locate segments of roadway which need improvement. Signing projects will be selected on the basis of nonconformance with the MUTCD.

To achieve uniformity of traffic control devices within the State, a statewide project will be initiated to inventory and upgrade the traffic control devices on the local road system. The engineering survey and development of plans for upgrading the signing will be performed by local jurisdictional agencies. Instructional seminars will be conducted by the State for those local governmental personnel responsible for the placement and maintenance of traffic control devices on the road network under their jurisdiction. Time saving procedures, such as master agreements, local force account work for installation of signs, and signing contracts for upgrading the signing in a number of jurisdictions will be utilized.

It is clearly the intent of Congress to systematically reduce the severity and number of accidents on all highways. It seems inconsistent with this goal that spot-improvement projects are not eligible for funding under the 230 Program. Michigan has clearly demonstrated (see attached TOPICS Evaluation Studies) that significant progress can be made in reducing accidents through spot improvements. It is recommended that spot improvements at high hazard locations on local roads be made eligible for federal funds.

APPENDIX

SECTION 203

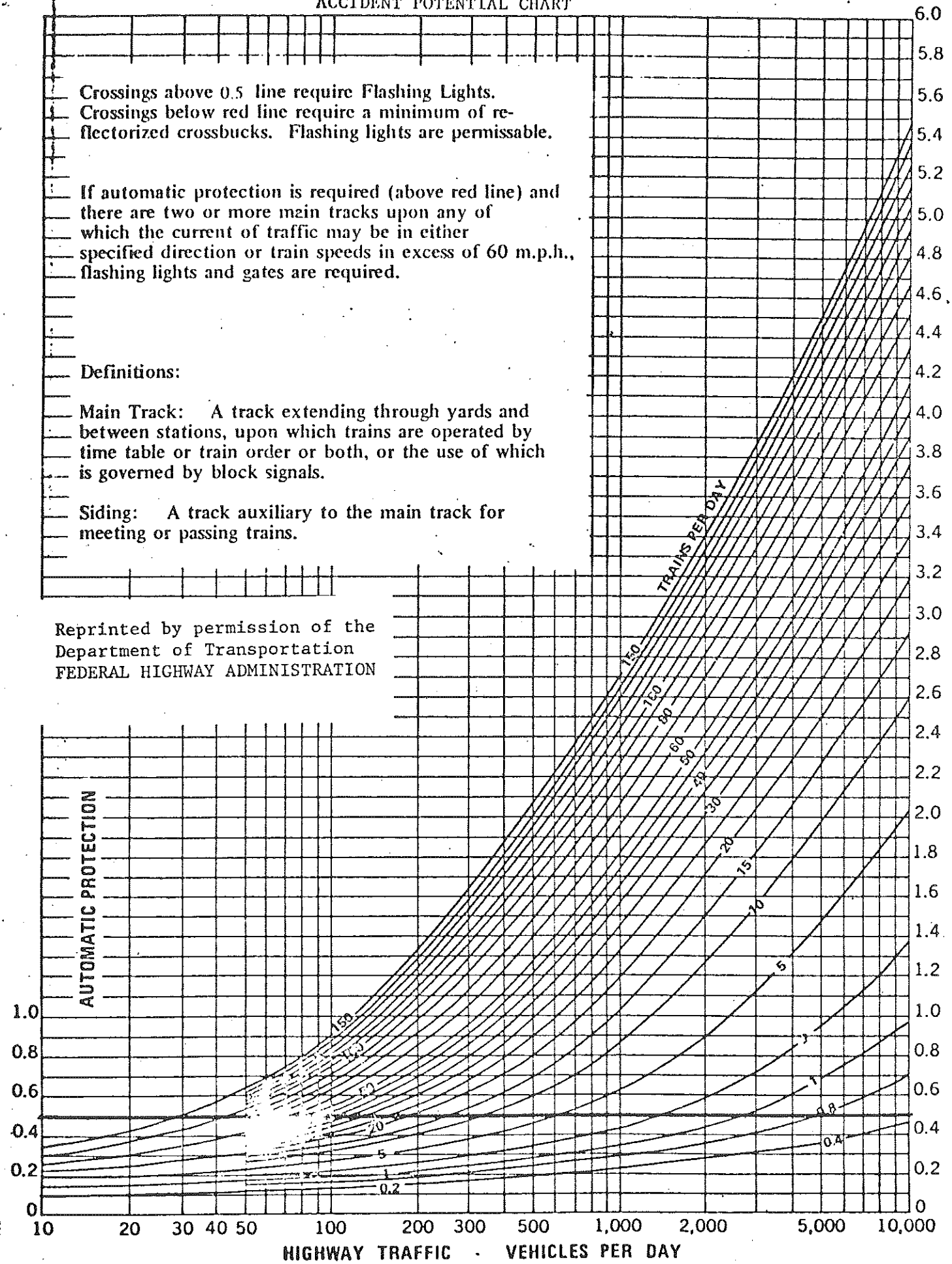
HHS
SECTIONS 203, 230
RAILROAD PRIORITY
DETERMINATION

DATE: _____

CROSSING - _____

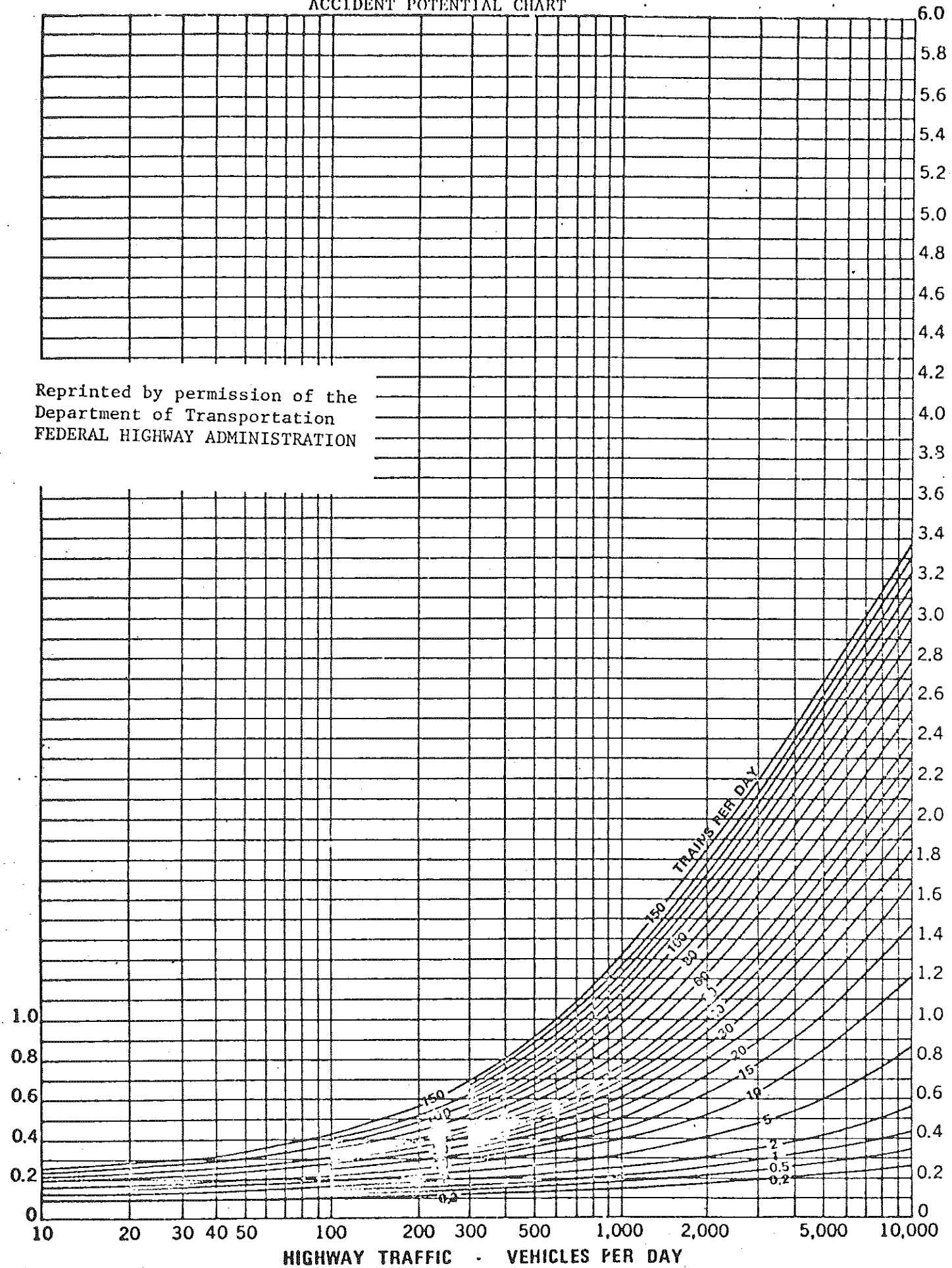
Determination of Points

CRITERIA	MAX. POINTS	RELATIVE INFORMATION	ACTUAL POINTS	REVISED POINTS
MPSC - (Priority & Order)	40			
Speed	10			
Chart - ADT, No. Trains	20			
Alignment & Sight -	10			
No. Tracks -(Max. For 2)	5			
Condition of Approaches	5			
School Busses -	5			
No. Trains -	5		_____	_____
TOTAL POINTS				
Other Criteria - Circumstances which affect priority, not included above. 10 Points.				
TOTAL POINTS			_____	_____



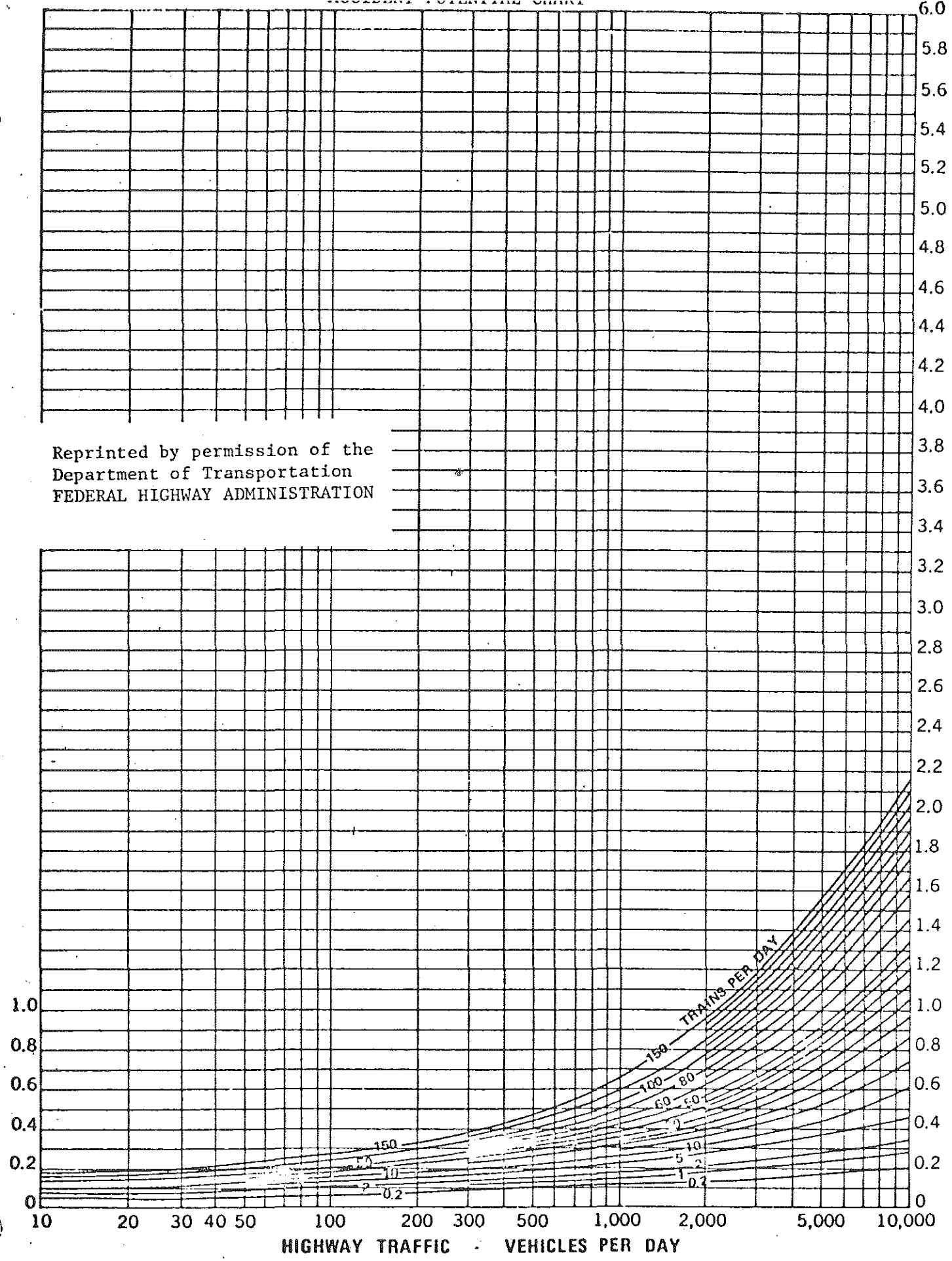
PROBABLE ANNUAL NUMBER OF VEHICLE - TRAIN ACCIDENTS

AT GRADE CROSSINGS PROTECTED BY SIGNS ONLY



PROBABLE ANNUAL NUMBER OF VEHICLE - TRAIN ACCIDENTS

AT GRADE CROSSINGS PROTECTED BY FLASHING LIGHTS



PROBABLE ANNUAL NUMBER OF VEHICLE - TRAIN ACCIDENTS

GRADE CROSSINGS PROTECTED BY AUTOMATIC GATES

MICHIGAN DEPARTMENT OF STATE POLICE
John R. Plants, Director

Motor Vehicle-Railroad Train Accidents By County In Michigan
1973

County	Total Accidents	County	Total Accidents
Alcona	2	Lake	0
Alger	0	Lapeer	5
Allegan*	8	Leelanau	0
Alpena	5	Lenawee*	10
Antrim	1	Livingston	4
Arenac	1	Luce	0
Baraga	0	Mackinac	0
Barry	1	Macomb*	13
Bay*	16	Manistee	0
Benzie	2	Marquette	5
Berrien*	20	Mason	3
Branch	4	Mecosta	0
Calhoun*	17	Menominee	6
Cass	1	Midland	4
Charlevoix	1	Missaukee	0
Cheboygan	1	Monroe*	18
Chippewa	2	Montcalm	4
Clare	2	Montmorency	0
Clinton	2	Muskegon	5
Crawford	1	Newaygo	3
Delta	4	Oakland*	28
Dickinson	4	Oceana	1
Eaton	4	Ogemaw	0
Emmet	1	Ontonagon	0
Genesee*	27	Osceola	2
Gladwin	0	Oscoda	0
Gogebic	2	Otsego	0
Grand Traverse	2	Ottawa*	20
Gratiot*	8	Presque Isle	1
Hillsdale	2	Roscommon	0
Houghton	1	Saginaw*	65
Huron	5	St. Clair	6
Ingham*	14	St. Joseph	7
Ionia	2	Sanilac	3
Iosco	3	Schoolcraft	1
Iron	1	Shiawassee*	11
Isabella	1	Tuscola	5
Jackson*	12	VanBuren*	10
Kalamazoo*	18	Washtenaw*	11
Kalkaska	0	Wayne*	159
Kent*	29	Wexford	5
Keweenaw	0		
		TOTAL	642

Prepared by Department of State Police, April 11, 1974

*These Counties represent 80% of the total.

Trunkline Railroad Accident Ranking
Top 20 Counties
1973 Data

County	No. of Crossings	Accidents/ Crossing	Rate Rank	No. of Accidents	No. Rank
Shiawassee	9	0.89	1	8	2
Midland	2	0.50	2	1	19
Alpena	4	0.50	3	2	10
Lapeer	4	0.50	4	2	11
Oakland	11	0.45	~~5~~ 7	5	3
Macomb	7	0.43	6	3	8
St. Clair	12	0.42	~~7~~ 3	5	4
Saginaw	34	0.35	~~8~~ 9	12	1
Clare	3	0.33	9	1	20
Bay	15	0.27	10	4	6
Genesee	19	0.26	11 5	5	5
Ottawa	8	0.25	12	2	12
Lenawee	18	0.22	13	4	7
Eaton	9	0.22	14	2	13
Monroe	11	0.18	15	2	14
Dickinson	11	0.18	16	2	15
Newaygo	6	0.17	17	1	21
Chippewa	6	0.17	18	1	22
Cass	6	0.17	19	1	23
Charlevoix	6	0.17	20	1	24

Non-trunkline Railroad Accident Ranking
Top 20 Counties
1973 Data

County	No. of Crossings	Accident/ Crossing	Rate Rank	No. of Accidents	No. Rank
Wayne	439	.36	1	158	1
Saginaw	277	.19	2	53	2
Alcona	12	.17	3	2	38
Genesee	143	.15	4	22	5
Ingham	96	.14	5	13	11
Calhoun	113	.13	6	15	10
Schoolcraft	8	.13	7	1	48
Oakland	200	.12	8	23	4
Iosco	25	.12	9	3	29
Macomb	87	.11	10	10	15
Ottawa	168	.11	11	18	7
Kent	243	.11	12	26	3
Berrien	169	.11	13	19	6
Benzie	18	.11	14	2	39
Washtenaw	112	.10	15	11	14
Branch	46	.09	16	4	25
Jackson	131	.09	17	12	12
Kalamazoo	209	.08	18	16	8
Crawford	12	.08	19	1	49
Midland	44	.07	20	3	30

Rail-Highway Crossings
(Section 203)

Project Location	Project Description: Warning Devices: FLS	Gates	CA	AWS	Pvt. Mkg.	Total Cost	Construction: Appr. Work	X-ing Work	C&G &/or G.R.	Realign	Clear Vision	Total Cost	Justification: Priority Points	Potential Accidents	Cost in Federal Funds: Programmed	PS&E	Project Agreement
N&W-Main St., Village of Britton	x	x			x	18,000	x	x				2,000	90	1.0	18,000		
C&O Scottville,Mason Co.	x				x	30,000	x	x				9,000	77	0.4	35,100		
PC - Bellevue,Leslie	x	x			x	30,000							75	0.8	27,000		
C&O-Barden Rd.,Midland Co.	x				x	29,000	x	x	x			1,400	81	0.7	27,360		
PC-Sprague & Jay, Coldwater		x				35,000	x	x	x			5,000	TOPICS		36,000		
Mil.-CNW-Main St.,Iron Mt.	x		x	x	x	40,000							84	0.5	36,000		
C&O-12 Mile Rd., Novi	x			x	x	35,000							94	1.6	31,500		
C&O-Divine Hwy., Portland	x			x	x	32,000							80	0.4	28,800		
C&O-Willow, Wayne Co.	x	x		x	x	30,000							90	3.0	27,000		
C&O-7 Mile Rd.,Northville	x	x				30,000							90	3.0	27,000		
PC-N. Angling, St. Joseph Co.	x				x	25,000		x	x			7,000	73	0.5	28,800		
PC-Hurd Rd., Monroe Co.	x	x		x	x	50,000							81	1.0	45,000		
PC-68th St., Dutton	x		x		x	30,000							74	0.6	27,000		
PC-Wyoming, Wayne Co.							x	x				13,800	90	3.0	12,420		
PC-Tireman, Wayne Co.							x	x				51,750	90	3.0	46,575		
PC-Warren, Wayne Co.							x	x				49,500	90	3.0	44,550		
PC-Venoy, Wayne Co.							x	x				62,100	90	3.0	55,890		
PC-Merriman, Wayne Co.							x	x				33,100	90	3.0	29,790		
PC-Pennsylvania, Wayne Co.							x	x				4,600	90	3.0	4,140		
PC-Northline Rd., Wayne Co.							x	x				15,000	90	3.0	13,500		
PC-Sibley Rd., Wayne Co.							x	x				8,100	90	3.0	7,290		
PC-King Rd., Wayne Co.							x	x				2,500	90	3.0	2,250		
PC-Van Horn, Wayne Co.							x	x				2,700	90	3.0	2,430		
N&W-Haggerty, Wayne Co.							x	x				16,800	90	3.0	15,120		
Detroit Terminal RR-Mound, Wayne Co.							x	x				62,100	90	3.0	55,890		
Detroit Terminal RR-Wyoming, Wayne Co.							x	x				124,000	90	3.0	111,600		
DTSL-Pennsylvania, Wayne Co.							x	x				2,300	90	3.0	2,170		
DTSL-Northline Rd., Wayne Co.							x	x				9,800	90	3.0	8,820		
DTSL-King Rd., Wayne Co.							x	x				2,700	90	3.0	2,430		
DTSL-Van Horn, Wayne Co.							x	x				5,300	90	3.0	4,770		

Rail-Highway Crossings
(Section 203)

Project Location	Project Description: Warning Devices						Project Description: Construction						Justification		Cost in Federal Funds		
	FLS	Gates	CA	AWS	Pvt. Mkg.	Total Cost	Appr. Work	X-ing Work	C&G &/or G.R.	Realign	Clear Vision	Total Cost	Priority Points	Potential Accidents	Programmed	PS&E	Project Agreement
C&O-Inkster Rd., Wayne Co.							x	x				16,800	90	3.0	15,120		
DT&I-Sibley, Wayne Co.							x	x				4,200	90	3.0	3,780		
C&O-Fourth St., Coleman	x	x		x	x	25,000							75	0.3	22,500		
PC-LaPlaisane, Dunbar, Nadeau, Monroe Co.	x	x				80,000							85	2.7	72,000		
DT&I-King Rd., Wayne Co.							x	x				5,400	90	3.0	4,860		
M-113- PC, Kingsley	x		x			16,047		x				8,953	75	0.2	22,500		
M-113- PC, Walton Jct.	x					15,471		x				9,529	80	0.2	22,500		
M-46 - C&O, Edmore	x		x			20,000		x				5,000	80	0.6	22,500		
M-59 - GTW - Pontiac	x					85,500							75	1.0		76,950	
M-81 - GTW - Cass City	x		x			13,607		x				11,393	75	0.3	22,500		
M-53 - DT - Detroit								x				14,495	80	0.6		13,045	
US-131 & US-12 - PC, St. Joseph Co.								x				1,780	75	1.1			1,602
M-99 - PC - Albion								x				20,000	85	0.6	18,000		
M-28 - Soo - Alger Co.	x		x			25,000			x			2,000	80	1.0	24,300		
M-25 - PH&D - Marysville	x		x			12,000							85	0.9	10,800		
Totals						706,625						590,100		83	1,075,555	89,995	1,602

Notes:

FLS = Flashing Light Signals; CA = Cantilever Arms; AWS = Advance Warning Signs; Pvt. Mkg. = Pavement Markings; Appr. Work = Approach Work; X-ing Work = Crossing Work; C & G &/or G.R. = Curb and Gutter and/or Guard Rail; Realign = Realignment.

APPENDIX

SECTION 205

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, GOVERNOR

DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

STATE HIGHWAYS BUILDING - POST OFFICE DRAWER K - LANSING, MICHIGAN 48904

JOHN P. WOODFORD, DIRECTOR

April 3, 1974

TO: ALL COUNTY ROAD COMMISSIONS

Gentlemen:

The Federal Highway Safety Act of 1973 provides funds for a Pavement Marking Demonstration Program (Section 205) on both the Federal aid and non-Federal aid highway systems. In establishing programs, priority is given to projects on two-lane highways which are located in rural areas and to projects where adequate pavement markings will probably reduce high accident rates. Federal funding is available under this program at 100 percent of project cost.

The 1973-74 Safety Work Plan prepared by the Office of Highway Safety Planning gives top priority to the re-survey and establishment of "No Passing Zones" to assure compliance with national standards. In line with this recommendation, a program is being set up to re-survey, pavement mark, and sign "No Passing Zones" on rural two-lane roads having speeds greater than 35 mph. Signs at these zones are desirable, although not mandatory.

The placing of signs can be funded from your existing Federal aid Secondary monies when on the Federal aid system, and from Federal aid Safety (Section 230) monies for off system projects.

It is anticipated that contracts will be let by the Michigan Department of State Highways and Transportation to accomplish this work. However, consideration will be given to allow a county to do all or a part of this work on a negotiated basis. If you are interested in the re-establishing of your "No Passing Zones" to conform to the latest standards, please advise this office and furnish the following information:

1. A map showing the rural hard-surfaced roads in the county that are more than 16' wide and have greater than 35 mph speed limit. All roads having an ADT of 250 or greater must be included. Color code this map to separate the Federal aid system. This information is necessary as some Federal funds are restricted to use on certain systems.

MICHIGAN
THE GREAT LAKE STATE

2. Provide a separate total of miles shown on the map for both the on Federal system and the off Federal system roads.

3. Do you anticipate doing this work under a negotiated basis?

4. Are you interested in placing "Do Not Pass" signs on all or a portion of your zones?

This program also provides for centerline marking, edge marking, narrow bridge marking, railroad crossing marking, etc. If in the review of your system you locate a high accident rate area where it is probable that adequate pavement marking will reduce the accident rate, please submit this type of program, along with justifying traffic information to this office, for possible funding.

Any pavement marking project under this program is limited to areas not previously marked, or to those areas needing change to conform to the standards set forth in the 1971 edition of the Manual on Uniform Traffic Control Devices.

Sincerely,

William J. MacCreery, P.E.
Engineer of Local Government

John V. Bergh, P.E.
Federal-Aid Engineer

JVB:eh

Pavement Marking Demonstration Program
Section 205

Project Location	Project Description	Justification	Cost in Federal Funds		
			Programmed	PS&E	Project Agreement
Statewide Non-trunkline* highways	No-passing zone survey	Conformance with Manual of Uniform Traffic Control Devices	613,500		
Statewide Non-trunkline* highways	No-passing zone, center-line and edgeline markings	Conformance with MUTCD	2,201,158		

*All State trunklines have been marked in compliance with National standards.

Form Approved
OMB 04-R1683

RCS HTO 20-CI
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PAVEMENT MARKING PROGRAM

Placement of Markings During FY _____	Miles & Cost by System								Total Miles and Cost During FY __		Total Miles and Cost To Date	
	Federal-Aid System				Off The Federal-Aid System							
	Primary		Secondary		State Jurisdiction		Local Jurisdiction					
	Miles	Cost	Miles	Cost	Miles	Cost	Miles	Cost	Miles	Cost	Miles	Cost
Both centerlines and edge lines												
Only centerlines												
Only edge lines												
Total												

Total Miles Remaining to be Marked

Placement of Markings	Miles by System				
	Federal-Aid System		Off The Federal-Aid System		
	Primary	Secondary	State	Local	Total
Both centerlines and edge lines	–	600	–	420	1020
Only centerlines	–	1890	–	1323	3213
Only edge lines	–	3060	–	840	3900
Total **	*	5550	*	2583	8133

Form FHWA 1451
(1-74)

*All state trunklines have been marked in compliance with national standards.

**No passing zone surveys will be conducted on an estimated 20,400 miles of roadway which includes 15,180 miles of federal-aid secondary and 5,220 miles of non federal-aid (local).

APPENDIX

SECTION 209

Locations Identified as
Safety Projects by
Area-wide TOPICS Plans

Agency	Location	No. Acc/Yr.	Acc. Rate(MV)
City of Battle Creek	Capital Ave. @ Bidwell	12	1.92
City of Battle Creek	Capital @ Columbia	35	2.83
City of Battle Creek	Capital @ Emmett	12	1.60
City of Ann Arbor	Huron Parkway @ Geddes	15	2.30
Macomb County	Metro Parkway @ Crocker	--	7.90
Macomb County	21 Mile Rd. @ Earl Memorial	--	7.13
Macomb County	18 Mile Rd. @ Ryan	--	7.03
Macomb County	Glenwood @ Harper	--	5.55
Macomb County	22 Mile Rd. @ Earl Memorial	--	5.56
Macomb County	12 Mile Rd. @ Dequindre	--	5.35
Macomb County	23 Mile Rd. @ Mound	--	5.12
Macomb County	9 Mile Rd. @ Greater Mack	--	5.02
Macomb County	13 Mile Rd. @ Ryan	--	4.49
City of Detroit	W. Grand Blvd. @ 3rd,2nd, Lodge Service Drive	58	----
City of Detroit	Oakman @ Chicago	--	----
City of Detroit	East 7 Mile @ Hoover	27	----
City of Detroit	E.Outer Dr.-Mt. Elliott to Sherwood	44	----
City of Detroit	Conner @ Jefferson	28	----
City of Detroit	Jefferson @ Randolph @ Woodward @ Griswold	--	----
City of Detroit	E. Outer Dr.-Whittier to Chandler Park	--	----
City of Grand Rapids	Michigan St. @ Lafayette Ave.	27	3.2
City of Grand Rapids	Pearl St. @ Front Ave.	26	4.3

Locations Identified as
Safety Projects by
Area-wide TOPICS Plans

Agency	Location	No. Acc/Yr.	Acc. Rate (MV)
City of Grand Rapids	Eastern Ave. @ Franklin St.	31	3.5
City of Grand Rapids	Eastern Ave. @ Wealthy	27	3.0
City of Grand Rapids	Fulton @ Fuller	26	2.9
City of Wyoming	Division St. @ 36th	48	7.1
City of Wyoming	Division St. @ 32nd	47	5.8
City of Walker	Alpine Ave. @ Hillside Drive	17	2.6
City of Flint	Ballenger @ Beecher	--	6.39
City of Flint	Atherton @ Van Slyke	--	4.18
City of Flint	Averill Ave. @ Lapeer Road	--	5.63
City of Flint	Clio Rd. @ Stewart Ave.	--	5.51
City of Flint	Oakley St. @ S. Saginaw St.	--	4.11
City of Flint	Fenton Rd. @ 12th St.	--	3.26
City of Flushing	Main St. @ McKinly Rd. @ Cherry @ Maple St.	--	17.1 MVM
City of Flushing	Main St., Chestnut to Chamberlain	--	9.8 MVM
City of Flushing	Elms Rd. @ Coutant	--	2.8
City of Traverse City	8th @ Railroad & Woodmere	--	2.4
City of Traverse City	City-wide Sign Modernization	--	----
Wayne County	Ecorse Road @ Inkster	--	4.2
Wayne County	Eureka @ Trenton	--	3.4
Wayne County	Merriman @ Ford	--	3.0
Wayne County	Merriman @ Ecorse	--	4.2
Wayne County	Moross @ Mack	--	2.2
Wayne County	Pelham @ Van Born	--	2.4
Wayne County	Plymouth, Newburgh, Hines	--	4.5
Wayne County	Venoy @ Michigan	--	2.3

Locations Identified as
Safety Projects by
Area-wide TOPICS Plans

Agency	Location	No. Acc/Yr.	Acc. Rate (MV)
Wayne County	Ecorse @ Middlebelt	--	2.9
Wayne County	Van Horn @ Fort	--	4.4
Wayne County	West @ Grange	--	5.7
Wayne County	Warren @ Merriman	--	3.9
Wayne County	Wyoming @ Michigan	--	2.3
Wayne County	Ecorse @ Wayne	--	2.7
Wayne County	Miller @ Dix	--	2.7
Wayne County	West @ Fort	--	3.7
Oakland County	9 Mile @ Orchard Lake	20	2.11
Oakland County	9 Mile @ Hughes	20	2.49
Oakland County	9 Mile @ Paxton	21	2.88
Oakland County	10 Mile @ Orchard Lake	27	3.37
Oakland County	South Blvd. @ Franklin	22	2.74
Oakland County	Long Lake @ Dequindre	23	4.58
Oakland County	Union Lake @ Commerce	22	3.04
Oakland County	Coolidge @ Lincoln	30	3.04
Oakland County	Avon @ Rochester	22	2.41
Oakland County	Highland @ Crescent Lake	30	2.37
Oakland County	Telegraph @ Voorheis	30	2.74
City of Bay City	Saginaw @ 7th	21	2.46
City of Bay City	Henry @ N. Union	16	2.37
City of Bay City	Center @ Lincoln	19	2.19
City of Bay City	McKinley @ Washington	25	2.08
City of Bay City	7th @ Water	14	2.07
City of Bay City	Center @ Trumbull	21	1.98
City of Bay City	McKinley @ Saginaw	14	1.62
City of Bay City	Wilder @ Bangor	--	----

Projects

Signal

Locations Identified as
Safety Projects by
402 Funded Studies

Agency	Location	No. Acc/Yr.	Acc. Rate/ MV
Berrien County	Pipestone Rd. @ Napier Ave.	14	2.23
Berrien County	Euclid Ave. @ Territorial	12	4.28
Berrien County	Napier Ave. @ M-139	10	1.76
Berrien County	Red Arrow Hwy. @ John Beers	10	2.27
Berrien County	Crystal @ Territorial	8	3.32
Jackson County	South St. @ Flansburg	14	6.31
Jackson County	Page Ave. @ Falahee Rd.	14	3.57
Jackson County	Page Ave. @ Dettman	9	2.22
Jackson County	Page Ave. @ Sutton Rd.	9	1.59
Jackson County	Horton Rd. @ Jackson	7	--
Jackson County	Francis St. @ Hinckley Blvd.	6	--
Calhoun County	Columbia Ave. @ 20th	29	3.53
Calhoun County	Columbia Ave. @ Riverside Dr.	19	1.74
Calhoun County	Territorial Rd. @ 20th	16	1.98
Calhoun County	Columbia @ Grand Blvd.	15	--
Calhoun County	Columbia @ Arbor Rd.	14	--
Calhoun County	Columbia @ Lavista Blvd.	12	--
Calhoun County	Columbia @ Woodrow Ave.	12	--
Calhoun County	Morgan Rd. @ North Ave.	9	2.73
Monroe County	Lewis @ Temperance	14	--
Monroe County	Smith @ Lewis	13	--
Monroe County	Sterns Rd. @ Lewis	11	--
Monroe County	Secor @ Sterns	10	--
Monroe County	Summerfield @ Secor	9	--
Monroe County	Nadeau @ Cloverdale	9	--
Monroe County	Cord 151 @ Secor	9	--
Monroe County	8 Locations	59	--

Locations Identified as
Safety Projects by
402 Funded Studies

Agency	Location	No. Acc/Yr.	Acc. Rate/ MV
Kalamazoo County	Shaver @ Center	21	---
Kalamazoo County	Portage @ Center	19	---
Kalamazoo County	Mosel @ Burdick	17	---
Kalamazoo County	Westnedge @ Center	13	---
Kalamazoo County	Main @ Humphery	10	---
Kalamazoo County	12 Locations	71	---
City of Portage	Westnedge Ave. @ Milham Rd.	35	---
City of Portage	Milham @ Oakland Dr.	10	---
City of Portage	5 Locations	30	---
City of Battle Creek	Michigan @ McCamly	37	---
City of Battle Creek	Capitol @ Columbia	33	---
City of Battle Creek	Roosevelt Ave. @ North Ave.	26	---
City of Battle Creek	W. Territorial @ Capital	25	---
City of Battle Creek	Capital @ Michigan	23	---
City of Battle Creek	Capital @ Fountain	23	---
City of Battle Creek	Michigan @ Washington	22	---
City of Battle Creek	Emmett @ North	19	---
City of Battle Creek	Washington @ Champion	16	---
City of Battle Creek	Michigan @ Kendall	16	---
City of Battle Creek	North @ McCamly	14	---
City of Battle Creek	Carlyle @ Michigan	14	---

Locations Identified as
Safety Projects by
402 Funded Studies

Agency	Location	No. Acc/Yr.	Acc. Rate/ MV
City of Battle Creek	Capital @ Bidwell	11	---
City of Battle Creek	Michigan @ Cass	9	---
City of Battle Creek	3 Locations	23	---
City of St. Joseph	12 Locations	53	---
City of Three Rivers	8 Locations	16	---
City of Niles	11 Locations	35	---
City of Dowagiac	10 Locations	19	---
City of Hancock	5 Locations	9	---
City of Ionia	Main @ Depot	12	---
City of Ionia	6 Locations	21	---
City of Escanaba	Ludington @ 11th	28	---
City of Escanaba	Ludington @ 14th	28	---
City of Escanaba	Ludington @ 10th	22	---
City of Escanaba	Ludington @ 12th	15	---
City of Escanaba	Ludington @ 13th	15	---
City of Escanaba	Stephenson @ 3rd	13	---
City of Escanaba	Ludington @ Stephenson	12	---
City of Escanaba	Ludington @ 22nd	12	---
City of Escanaba	Ludington @ 16th	11	---
City of Escanaba	South 14th @ 1st	10	---
City of Escanaba	4 Locations	26	---
City of Adrian	Broad St. @ Maumee	19	---
City of Adrian	Beecher @ Davison	13	---
City of Adrian	Beecher @ Treal	10	---
City of Adrian	Church @ Broad St.	10	---
City of Adrian	13 Locations	78	---

Locations Identified as
Safety Projects by
402 Funded Studies

Agency	Location	No. Acc/Yr.	Acc. Rate/ MV
Benzie County	10 Locations	9	--
Lapeer County	9 Locations	21	--
Lenawee County	4 Locations	19	--
Marquette County	9 Locations	23	--
Mason County	7 Locations	14	--
Montmorency County	6 Locations	7	--
Osceola County	7 Locations	8	--
Otsego County	3 Locations	8	--
St. Joseph County	12 Locations	27	--
Tuscola County	2 Locations	4	--

Locations Identified as
Skidproofing Projects
by 402 Funded Studies

Agency	Location	No. Acc.	No. Wet Acc.	Percent
Lapeer County	Washburn Road at Dodge Road	20	9	.45
City of Portage	Westnedge Ave. @ Milham Rd.	175	52	.30
City of Portage	Westnedge Ave. @ Idaho St.	42	16	.38
City of Portage	Westnedge Ave. @ Amos St.	33	12	.36
City of St. Joseph	Napier Ave. @ Langley Ave.	45	13	.29
City of St. Joseph	Broad St. @ Court St.	41	12	.29
City of St. Joseph	State St. @ Broad St.	32	10	.31
City of St. Joseph	State St. @ Pleasant St.	24	6	.25
City of St. Joseph	State St. @ Ship St.	22	6	.27
City of St. Joseph	Broad St. @ Wayne St.	19	7	.37
City of St. Joseph	Pleasant St. @ Court St.	17	9	.53
City of St. Joseph	Winchester Ave. @ State St.	10	2	.20
City of St. Joseph	State St. @ Elm St.	10	4	.40
Kalamazoo County	Mosel Ave. @ the Penn Central R.R. Crossing	15	7	.47
Kalamazoo County	Portage Road @ Milham Road	38	14	.37
Kalamazoo County	E. Main St. @ Nazareth Rd.	33	9	.27
Kalamazoo County	Sprinkle Road @ Meredith Rd.	33	13	.39
Kalamazoo County	Douglas Ave. @ Mosel Ave. & Barney Road	29	9	.31
Kalamazoo County	Douglas Ave. @ Edison St.	19	7	.37
City of Adrian	Broad St. @ Maumee St.	95	27	.28
City of Adrian	Beecher St. @ Division St.	64	25	.39
City of Adrian	Church St. @ Broad St. & State St.	50	15	.30
City of Adrian	Church St. @ Tecumseh St.	22	12	.54

Locations Identified as
Skidproofing Projects
by 402 Funded Studies

Agency	Location	No. Acc.	No. Wet Acc.	Percent
City of Marquette	Lincoln Ave. @ College Ave.	36	10	.28
City of Marquette	Seventh St. @ Magnetic St.	34	9	.27
City of Marquette	Presque Isle Ave. @ Fair Ave.	32	11	.34
City of Marquette	Third St. @ Baraga Ave.	21	8	.38
City of Marquette	Presque Isle Ave. @ Wright St.	14	6	.43
City of Three Rivers	Pealer Street Bridge	24	7	.29
Calhoun County	Columbia Ave. @ Main St.	101	36	.36
Calhoun County	Columbia Ave. @ Riverside Dr.	56	20	.36
City of Battle Creek	Michigan Ave. @ McCamly St.	148	38	.26
City of Battle Creek	Michigan Ave. @ Capitol Ave.	56	20	.36
City of Battle Creek	Michigan Ave. @ Carlyle-State Street	53	22	.42
City of Battle Creek	Michigan Ave. @ Kendall St.	64	27	.42
City of Battle Creek	Michigan Ave. @ Cass St.	37	19	.51
City of Battle Creek	Michigan Ave. @ Washington Ave.	87	35	.40
City of Battle Creek	Washington Ave. @ Champion St.	65	25	.39
City of Battle Creek	North Ave. @ Emmett St.	77	39	.51
City of Battle Creek	Cliff Street @ Main Street	31	12	.39

5 fatalities in 91 locations

Establish Program
aimed at reducing
deaths & injuries

evaluate our safety
objectives

Insurance Institute — perhaps
most important benefits
are reductions in
~~highway~~ fatalities & injuries

1973 High Accident Locations on the State Highway System*

DISTRICT 1

Route City/Twp.	Location	Accidents Fatal	Injury	Total
US-41BR Marquette	(Front St.) Washington to Baraga	0	4	41
US-41, M-28, M-35 Ishpeming	Teal Lake Ave. to Second	0	11	24
US-41, M-28, US-41BR Marquette	E. Jct.	0	4	21
M-28BR Ishpeming	Main to Second	0	3	13
US-2 Ironwood	Douglas Blvd.	0	6	12
US-41BR Marquette	Park to 7th	0	3	11

DISTRICT 2

Route City/Twp.	Location	Accidents Fatal	Injury	Total
US-2 @ M-94 Manistique	Schoolcraft Co.	0	1	13
US-2, US-41, M-35	Lincoln Street from S. of 11th Ave.	0	7	12

DISTRICT 3

Route City/Twp.	Location	Accidents Fatal	Injury	Total
US-27BR @ US-10 Clare	Fifth Street Clare County	0	7	28

*Excluding Detroit

1973 High Accident Locations
on the State Highway System*

DISTRICT 3 (CONT)

Route City/Twp.	Location	Accidents Fatal	Injury	Total
US-10, M-115 @ US-27BR Clare	Clare County	0	5	22
US-10	Pine Evart, Osceola County	0	4	17
M-72, M-37 Traverse City	Silver Lake Road	0	2	16
M-37 Baldwin	8th St., Lake County Lake St. to Ninth St.	0	0	13
US-10 @ US-31 Scottville	E. Jct. (State & Main St.) Mason County	0	4	12
US-10 @ US-131 Richmond	Osceola County	0	4	12
M-37 Pleasant Plains	Star Lake Rd., Lake County	0	0	10

DISTRICT 4

Route City/Twp.	Location	Accidents Fatal	Injury	Total
US-23 Alpena	Johnson-Long Rapids Rd.	0	10	26
US-23 Alpena	Ripley Blvd. Alpena County	0	1	20
US-23 @ M-32 Alpena	Chisholm St. Alpena County	0	2	20
US-23 Oscoda	Waterloo-Cedar Lake Rd. Iosco County	0	7	17
US-23 Alpena	4th to 5th St.	0	2	13
US-23 Cheboygan	Cheboygan River	0	2	12

*Excluding Detroit

1973 High Accident Locations
on the State Highway System* (CONT)

DISTRICT 5

Route City/Twp.	Location	Accidents Fatal	Injury	Total
US-31BR, BS-96 Muskegon	Sherman	0	15	46
M-37 Walker	3 Mile Rd.	0	9	41
M-11 Wyoming	Buchanan	0	9	39
M-21BR Wyoming	Godfrey-Freeman	0	11	38
M-11 @ I-196 Grandville	Ramps	0	10	38
US-131 Grand Rapids	Franklin	0	12	36
US-31BR Holland	10th St.	0	11	32
US-131 Grand Rapids	Burton St.	0	5	31
US-131 Grand Rapids	Pearl	0	7	30

DISTRICT 6

Route City/Twp.	Location	Accidents Fatal	Injury	Total
M-54 Grand Blanc	Hill	0	21	51
M-58 Saginaw	Hemmeter	0	8	40
M-46 Thomas	River, Village of Shields	1	10	37
M-58 Saginaw	(Davenport) @ Warwick	0	10	37

*Excluding Detroit

1973 High Accident Locations
on the State Highway System*

DISTRICT 6 (CONT)

Route City/Twp.	Location	Accidents Fatal	Injury	Total
M-46 Saginaw	(Remington) @ Sheridan	0	10	33
M-25, BL-75 Bay City	(7th) @ Saginaw	0	13	33
M-84 Saginaw	From Luther to Dale	0	4	32
M-54BR Flint	1st to Water	0	6	32
M-46 Saginaw	(Stephens) From Harrison to Hamilton	0	8	31

DISTRICT 7

Route City/Twp.	Location	Accidents Fatal	Injury	Total
M-139 Benton	Napier	0	18	71
M-43 Kalamazoo	Gull Rd.	0	21	67
M-43 Kalamazoo	(Mich.) @ Riverview	0	5	50
M-37 Battle Creek	@ Capitol	0	2	48
US-12, M-66 Sturgis	@ Monroe	0	10	34
US-12 Coldwater	@ Monroe	0	6	33
US-12, M-66 Sturgis	@ W. Jct.	0	7	32

*Excluding Detroit

1973 High Accident Locations on
the State Highway System* (CONT)

DISTRICT 8

Route City/Twp.	Location	Accidents Fatal	Injury	Total
US-12 Ypsilanti	@ Hamilton	0	12	52
BL-94 Jackson	(Washtenaw) From Blackstone to Jackson	1	13	52
BL-94 Jackson	(Washtenaw) @ Glick	0	3	46
M-43 Delta	(Saginaw) @ Elmwood	0	10	46
US-27, BL-96 Lansing	(Larch) @ Grand River	0	11	36
M-99 Lansing	(Logan) @ Mt. Hope	0	8	36
BL-94, BR-23 Ann Arbor	(Huron) @ (N. Main)	0	14	35
M-125 Monroe	From 3rd to 1st	0	12	35
M-125 Monroe	@ Dunbar	0	10	35
M-17 Ypsilanti	(Cross) @ Hamilton	0	10	34
BL-94 Jackson	(Mich.) From Gorham to Horton	0	8	34
US-27 Lansing	(Larch) From Thomas to Harris	0	7	33

*Excluding Detroit

1973 High Accident Locations on the State Highway System*

DISTRICT Metro

Route City/Twp.	Location	Accidents Fatal	Injury	Total
M-85 Cities of Southgate & Wyandotte	(Fort) from Orange to Catalpa	1	21	98
M-39 City of Lincoln Park	(Southfield) from Dix-Toledo-Riopelle	0	23	95
M-53 City of Centerline	From Edward to 10 Mile	0	30	76
M-59 Waterford Township	@ Cresent Lake Road	0	23	67
M-1 Cities of Berkley & Royal Oak	(Woodward) from 12 Mile to Beverly Boulevard	0	10	63
M-1 Cities of Huntington Woods & Royal Oak	(Woodward) from Princeton-Borgnan X-Over	0	20	62
US-25 City of Roseville	@ Frazho Road	0	29	61
M-1 City of Royal Oak	(Woodward) from Guilford to Woodslee	0	17	51
US-24 Redford Township	(Telegraph) from Davison to Schoolcraft	0	19	50
M-1 City of Birmingham	(Woodward) from 14 Mile to Buckingham	0	18	46
M-1 City of Royal Oak	(Woodward) from Millington-Wellsley	0	16	45

*Excluding Detroit

1973 High Accident Locations
on the State Highway System*

DISTRICT Metro (CONT)

Route City/Twp.	Location	Accidents Fatal	Injury	Total
M-102 City of Southfield	(8 Mile) @ John Lodge	0	21	45
M-53 From M-102 City of Warren	(8 Mile) to Rivard Street	0	15	44
I-75BL, US-10BR M-59 to (M-59 W.B) City of Pontiac	From Pike to University	0	9	44
M-59 Highland Township	From John St. C & O X-01	0	20	43
US-25 Clinton Township	From Schafer to Nunnely	0	14	41
US-24 City of Southfield	(Telegraph) from Norcrest to 9 Mile	0	18	38
M-1 City of Birmingham	(Woodward) from Normandy & Hunt to Chester	0	17	36
BL-75, M-24 Oxford Township	@ Drahner Road	0	13	36
M-1 (US-10) City of Detroit & Highland Park	From McLean to Massachusetts Avenue	0	15	35
US-24 City of Southfield	(Telegraph) @ 10 Mile	0	7	35
M-1 City of Royal Oak	(Woodward) from Amherst & Elm to Fairwood	0	11	34
M-153 City of Dearborn	From Kinmore to Highview	0	10	33

*Excluding Detroit

1973 High Accident Locations
on the State Highway System*

DISTRICT Metro (CONT)

Route City/Twp.	Location	Accidents Fatal	Injury	Total
US-25 City of Mt. Clemens	From Cass-Market Street	0	7	33
US-12, I-96BS City of Dearborn	From Lois Street-Oakman Boulevard	0	13	32
US-25 Clinton Township	From Pitko to Quinn Road	0	12	33
M-49 City of Sterling Heights	@ Mound Road	1	13	32
US-10 Waterford Township	From Ruth Street to X-Over	0	8	31
US-24 Redford Township	(Telegraph) from Fullerton to Glendale	0	6	31
US-24 Redford Township	(Telegraph) from Wadsworth to Capitol Street	0	10	30
M-53 City of Centerline	From Chapp Street to Superior	0	6	30
US-10 Waterford Township	From Gilcrest to Scott Lake Road	1	8	30

*Excluding Detroit

High Accident Intersections 1973

City of Detroit[1]

		Detroit Ranking	Accidents*
1.	Grand River (B.S. - 96) and Livernois	(#4)	38
2.	Van Dyke (M-53) and East Outer Drive	(#9)	29
3.	Van Dyke (M-53) and Harper	(#10)	29
4.	Davison (M-14) and Livernois	(#11)	28
5.	Davison (M-14) and Conant	(#12)	28
6.	Woodward (M-1) and Seven Mile	(#14)	26
7.	Van Dyke (M-53) and E. Seven Mile Rd.	(#16)	25
8.	Van Dyke (M-53) and E. McNichols	(#18)	24
9.	Davison (M-14) and Linwood	(#20)	23
10.	Woodward (M-1) and E. Jefferson	(#22)	23
11.	Woodward (M-1) and State Fair	(#26)	23
12.	Plymouth (M-14) and W. Outer Drive	(#27)	22
13.	Michigan (US-12) and Livernois	(#33)	20
14.	Michigan (US-12) and Lonyo	(#34)	20
15.	Woodward (M-1) and Larned	(#35)	20

*Accidents occurring within intersections defined by extension of right of way lines

(1) Department of Streets and Traffic

High Hazard Locations
(Section 209)

Project Location	Project Description	Justification	Cost in Federal Funds		
			Programmed	PS&E	Project Agreement
M-13 (Euclid) at BL-75 (Salzburg), City of Bay City	Provide a common left-turn lane on Salzburg Road	16 Acc. in 1970 1.9 Acc/MV 6 H.O.L.T. Acc. (37%)	47,000		
US-2,41,M-35 (Lincoln) from US-2,41 (Ludington) N'ly to 3rd Ave., City of Escanaba	Construct center left-turn lanes on all approaches	65 Acc. in 1969 15 H.O.L.T. Acc. (23%) 16 Rt. Ang. Acc. 15 Rear-end Acc. 2.7 Acc/MV	342,000		
M-11 (28th St.) @ M-37, M-44 (E. Beltline) City of Grand Rapids	8-Phase Signal	58 Acc. in 1972 4.3 Acc/MV 9 Rt. Ang. Acc 17 H.O.L.T. Acc. (29%)	27,000		
US-31 @ 32nd St. City of Holland	Construct Left-turn lane in Median of US-31	22 Acc. in 1970 2.6 Acc/MV 2 H.O.L.T. Acc. (9%)		22,770	
US-31 @ M-40 (Lincoln) City of Holland	Construct Left-turn lanes in Median of US-31	22 Acc. in 1971 3.3 Acc/MV 7 H.O.L.T. Acc. (32%)		28,474	
US-31 @ 8th City of Holland	Construct Left-turn lanes in Median of US-31	24 Acc. in 1971 3.7 Acc/MV 7 H.O.L.T. Acc. (29%)		33,900	
US-31 @ 16th City of Holland	Construct Left-turn lanes in Median of US-31	22 Acc. in 1971 4.1 Acc/MV 3 H.O.L.T. Acc. (14%)		34,300	
M-56 @ Elms Road Genesee County	Construct Center Left-turn lane on M-56	21 Acc. in 1972 4.4 Acc/MV 5 H.O.L.T. Acc. (24%)		67,700	

High Hazard Locations
(Section 209)

Project Location	Project Description	Justification	Cost in Federal Funds		
			Programmed	PS&E	Project Agreement
US-10 Off Ramp to 9 Mile Road City of Southfield	Construct free flow merge lane & modify ramp alignment to shopping center drives	14 Acc. in 1969 2.1 Acc/MV 12 Rear-end Acc. (86%)	99,000		
M-46 @ River Road Saginaw County	Widen M-46 to provide a center left-turn lane	39 Acc. in 1972 4.5 Acc/MV 20 H.O.L.T. Acc. (51%)		100,620	
M-17 (Washtenaw) at Carpenter Washtenaw County	Construct center Left-turn lane and right-turn lane	44 Acc. in 1971 2.4 Acc/MV 14 H.O.L.T. Acc. (32%)	67,500		
US-127 BR (West) at Ganson City of Jackson	Construct EB & SB Right-turn lanes and extend NB Left-turn lane	28 Acc. in 1969 3.3 Acc/MV		100,080	
M-24 (Main) at Oregon City of Lapeer	Skidproofing	34 Acc. in 1972 12 (35%) wet weather Acc. Coef. of WSF .26 & .30 NB Coef. of WSF .31 & .32 SB		25,641	
M-125 @ Dunbar & Monroe Shopping Center; US-24 @ Dunbar, Monroe County	Skidproofing	124 Acc. in 1972 at the 3 locations. 45 (36%) wet weather Acc. Coefs. of WSF from .17 to .31	123,300		
US-2 at Siemens Creek Gogebic County	Increase curve radius and superelevation	18 Ran-off-road Acc. in a 5-year period		64,980	
M-139 (Scottdale) at Napier Avenue Berrien County	8-Phase Signal	64 Acc. in 1972 5.2 Acc/MV 12 H.O.L.T. Acc. (19%) 12 Right Angle Acc.	40,500		

High Hazard Locations
(Section 209)

Project Location	Project Description	Justification	Cost in Federal Funds		
			Programmed	PS&E	Project Agreement
M-99 at Fayette City of Hillsdale	3-Phase Signal	15 Acc. in 1973 2.6 Acc/MV 10 H.O.L.T. Acc. (67%) 2 Rt. Angle Acc.	16,200		
M-56 (Corunna) at Ballenger City of Flint	Widening to provide center left-turn lanes on 4 legs	39 Acc. in 1969 6.2 Acc/MV 16 H.O.L.T. Acc (41%)	162,000		
M-43 (Grand River Ave.) at Hagadorn City of East Lansing	8-Phase Signal, Right-turn Lanes, Bus Bays, extend left-turn lane.	74 Acc. in 1972 3.8 Acc/MV 13 H.O.L.T. Acc. (18%) 5 Rt. Angle Acc.	153,000		
Napier at Colfax Berrien County	Widen all approaches to provide a center left-turn lane	14 Acc. in 1969 1.6 Acc/Mil.Veh. 6 H.O.L.T. (43%)	224,000		
Columbia at Main Calhoun County	Widen all approaches to provide a center left-turn lane	28 Acc. in 1971 2.8 Acc/Mil.Veh. 16 H.O.L.T. Acc (57%) 5 Rt. Angle Acc.	126,000		
Ballenger at Flushing City of Flint	Widen all approaches to provide a center left-turn lane	14 Acc. in 1969 1.4 Acc/Mil.Veh. 8 H.O.L.T. Acc (57%)	162,000		
Cork-Portage-Lovers Lane City of Kalamazoo	Widen approaches to two intersections to provide left-turn lane and channel-ize third intersection	54 Acc. in 1969	207,000		
Division at 44th Street Cities of Wyoming & Kentwood	Widen N,S, &E approaches to provide center left-turn lane	33 Acc in 1968 3.6 Acc/Mil.Veh. 14 H.O.L.T. Acc (42%)			172,611

High Hazard Locations
(Section 209)

Project Location	Project Description	Justification	Cost in Federal Funds		
			Programmed	PS&E	Project Agreement
Rodd Street-Baker to Collins City of Midland	Reduce curvature of reverse curves	21 Acc. in 3 years 9 Ran off Rd. Acc. 2 Side-swipe Acc.	45,000		
	Totals		1,841,700	478,465	172,611

Summary of High Hazard Locations
(Section 209)

Type of Project	No. of Projects	Total/Acc/Yr. All Projects	Avg. No. Acc/Yr/Projects	Average Acc. Rate	Avg. Cost in Federal Funds Per Project
Separate turning lanes	16	485	30.3	3.2 A/MV	$118,622
Separate turning lanes plus multiphase signal	1	74	74.0	3.8	153,000
Modify Ramp Ending	1	14	14.0	2.1	99,000
Skidproofing	2(4 Locations)	158	79.0	*	74,470
Modify curve radius	2	39	19.5	---	54,990
Multiphase signal	3	137	45.7	4.0	27,900
All Projects	25	907	36.3	3.3	99,711

* 35% Wet Surface Accidents

Township Ranking
Non-trunkline Total Accidents
Top 20 Jurisdictions

Jurisdiction	Total Acc/Mile	Rate Rank	Total No. Accidents	No. Rank
Lansing Township	8.88	1	382	25
Mt. Morris Township	6.35	2	870	5
Commerce Township	6.23	3	536	15
Redford Township	6.07	4	1,178	3
Pontiac Township	5.96	5	382	26
Harrison Township	5.61	6	449	20
Ypsilanti Township	5.59	7	811	7
Farmington Township	5.36	8	1,223	2
Carrollton Township	5.33	9	192	56
Flint Township	5.17	10	740	8
Waterford Township	5.10	11	1,224	1
Van Buren Township	5.09	12	515	17
Benton Township	4.97	13	737	9
Clinton Township	4.88	14	991	4
Battle Creek Township	4.86	15	603	12
Plymouth Township	4.64	16	358	28
Shelby Township	4.59	17	694	10
Brownstone Township	4.45	18	272	40
West Bloomfield Township	4.36	19	816	6
St. Joseph Township	4.24	20	225	49

City Ranking
Non-trunkline Total Accidents
Population Less Than 5,000
Top 20 Jurisdictions

Jurisdiction	Total Acc/Mile	Rate Rank	Total No. Accidents	No. Rank
Belleville	22.28	1	156	9
Utica	17.74	2	284	1
Keego Harbor	13.11	3	118	11
Walled Lake	12.00	4	180	5
Brighton	10.43	5	167	7
Pleasant Ridge	8.55	6	77	25
Roosevelt Park	8.33	7	100	15
Milford	8.25	8	165	8
Wood Haven	8.08	9	186	3
Rockford	8.00	10	104	14
South Lyon	7.90	11	79	24
Sylvan Lake	7.62	12	61	44
Buchanan	7.54	13	181	4
Gibralter	7.00	14	77	26
Lathrup Village	6.93	15	201	2
Coloma	6.72	16	74	29
Allegan	6.37	17	172	6
Sparta	6.23	18	81	20
Imlay City	6.11	19	55	53
Hartford	5.76	20	75	28

City Ranking
Non-trunkline Total Accidents
Population 5,000 to 10,000
Top 20 Jurisdictions

Jurisdiction	Total Acc/Mile	Rate Rank	Total No. Accidents	No. Rank
Northville	9.15	1	183	10
Grosse Pointe	8.55	2	154	17
Flat Rock	8.15	3	155	4
Ishpeming	7.11	4	256	1
Novi	6.71	5	396	1
Hillsdale	6.56	6	256	5
Coldwater	6.39	7	294	2
Ionia	6.00	8	144	18
Ludington	5.83	9	280	3
Manistee	5.72	10	246	6
Lapeer	5.50	11	165	12
Huntington Woods	5.44	12	136	21
St. Johns	5.24	13	194	9
Marshall	4.88	14	176	11
Dowagiac	4.81	15	159	14
Tecumseh	4.52	16	163	13
Sturgis	4.33	17	208	7
Hastings	3.62	18	156	15
Cadillac	3.60	19	202	8
Fenton	3.43	20	141	20

City Ranking
Non-trunkline Total Accidents
Population 10,000 to 25,000
Top 20 Jurisdictions

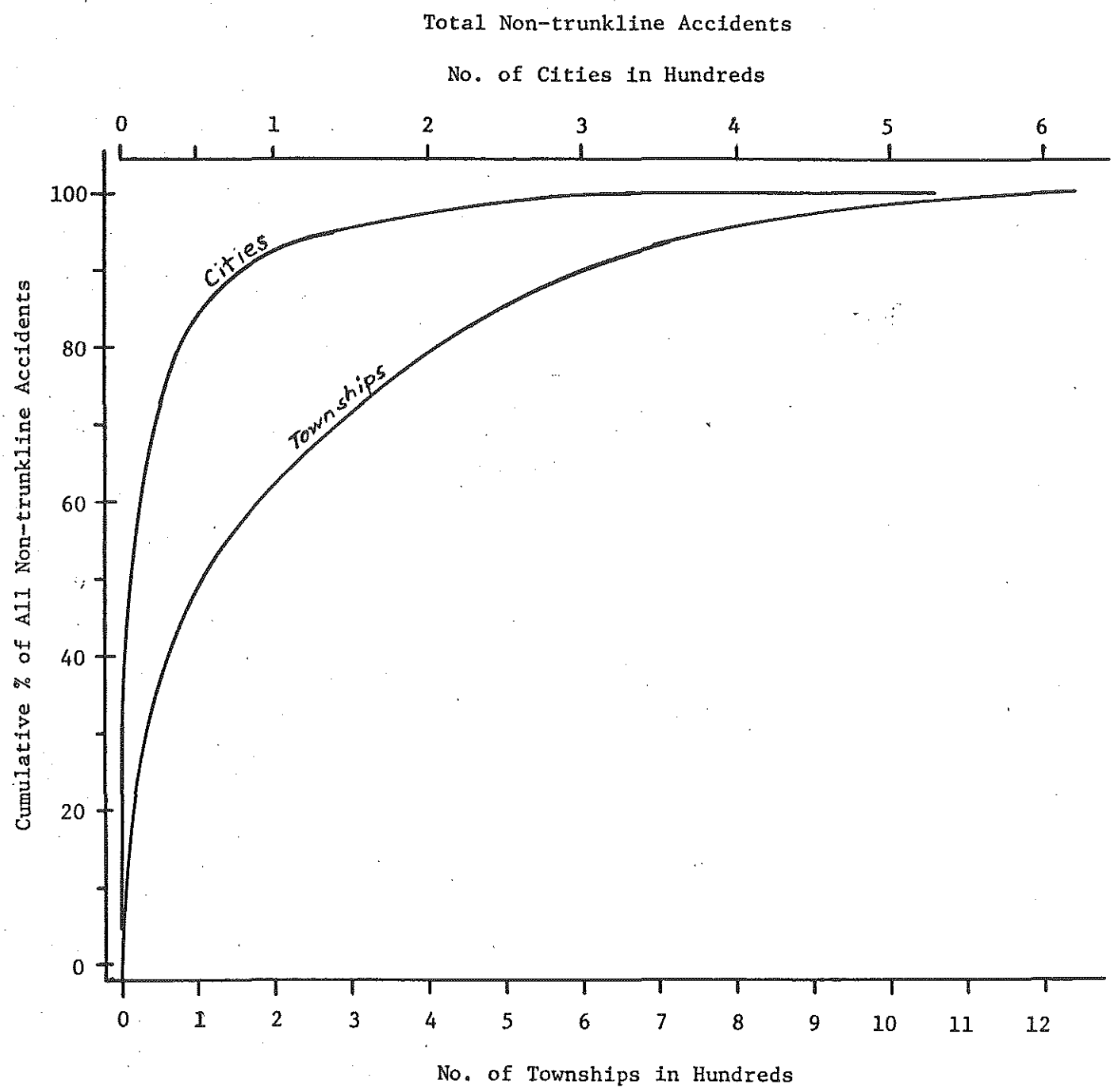
Jurisdiction	Total Acc/Mile	Rate Rank	Total No. Accidents	No. Rank
Ecorse	22.87	1	755	4
Melvindale	17.44	2	506	10
River Rouge	16.32	3	457	16
Hazel Park	15.15	4	894	2
Fraser	15.03	5	436	19
Benton Harbor	14.91	6	865	3
Romulus	12.74	7	1,249	1
Clawson	11.97	8	479	13
Adrian	9.95	9	647	7
Mt. Clemens	9.74	10	526	9
Berkley	9.73	11	506	11
Muskegon Heights	9.64	12	656	6
Marquette	9.13	13	658	5
Traverse City	8.49	14	637	8
Trenton	8.41	15	488	12
Grand Haven	8.25	16	462	15
Wayne	7.58	17	425	21
Escanaba	6.32	18	449	18
Sault Ste. Marie	5.55	19	478	14
Kentwood	5.06	20	451	17

City Ranking
Non-trunkline Total Accidents
Population 25,000 to 50,000
Top 20 Jurisdictions

Jurisdiction	Total Acc/Mile	Rate Rank	Total No. Accidents	No. Rank
Hamtramck	31.97	1	1,215	9
Highland Park	20.91	2	962	14
Madison Heights	18.46	3	1,699	2
Southgate	17.07	4	1,298	7
Wyandotte	15.40	5	1,448	6
Oak Park	12.58	6	1,057	11
East Lansing	11.08	7	820	16
Jackson	10.37	8	1,619	5
Inkster	10.20	9	969	13
Muskegon	9.93	10	1,768	1
Battle Creek	9.55	11	1,624	4
Port Huron	9.29	12	1,208	10
Allen Park	9.06	13	834	15
Troy	8.92	14	1,677	3
Birmingham	8.73	15	725	20
East Detroit	8.38	16	813	17
Garden City	8.09	17	809	18
Bay City	6.86	18	1,242	8
Portage	6.69	19	1,031	12
Midland	4.43	20	772	19

City Ranking
Non-trunkline Total Accidents
Population Over 50,000
Top 20 Jurisdictions

Jurisdiction	Total Acc/Mile	Rate Rank	Total No. Accidents	No. Rank
Detroit	25.77	1	67,820	1
Kalamazoo	15.29	2	3,823	6
Pontiac	14.33	3	3,110	8
Grand Rapids	13.69	4	7,874	3
Warren	12,89	5	5,134	3
Saginaw	12.86	6	3,627	7
Lincoln Park	11.54	7	1,316	20
Roseville	11.37	8	1,467	18
Lansing	10.37	9	4,086	5
Livonia	9.85	10	2,965	9
Dearborn Heights	9.72	11	1,790	13
Westland	9.63	12	1,734	15
Taylor	9.58	13	1,734	15
Flint	9.47	14	4,882	4
Royal Oak	8.94	15	1,888	11
Wyoming	8.14	16	1,604	16
Southfield	7.73	17	1,856	12
Ann Arbor	7.61	18	1,941	10
Sterling Heights	6.49	19	1,351	19
Dearborn	5.79	20	1,523	17


Total Non-trunkline Accidents
No. of Cities in Hundreds
0
1
2
3
4
5
6
Cumulative % of All Non-trunkline Accidents
100
80
60
40
20
0
Cities
Townships
0
1
2
3
4
5
6
7
8
9
10
11
12
No. of Townships in Hundreds

APPENDIX

SECTION 210

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, GOVERNOR

DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

STATE HIGHWAYS BUILDING - POST OFFICE DRAWER K - LANSING, MICHIGAN 48904

JOHN P. WOODFORD, DIRECTOR

April 22, 1974

TO: ALL COUNTY ROAD COMMISSIONS

Gentlemen:

Section 210 of the Federal Highway Safety Act of 1973 requires each county to make an inventory of the number of hazardous roadside obstacles along public roads under their jurisdiction (See All County Letter of 2/28/74 sent from this office). This inventory is considered to be a one-time windshield type survey on a statistically selected portion of each county's system.

The State has made a random selection of roads within each county which will require an inventory of hazardous obstacles. The roads to be surveyed by you are shown on the attached map and represent a sample of approximately 10 percent of your road system. Upon receipt of your inventory, the State will expand your random sample to determine the estimated number of hazardous obstacles on your complete system. Federal aid in the amount of 90 percent of the survey cost is allowed under this program.

An agreement will be sent to you in the near future, allowing Federal aid reimbursement at a fixed price per mile for completing this survey. Work may be started, upon complete execution of this agreement, and should then be completed within 60 days. (It is estimated that a two-man survey team should complete an average county inventory in approximately one week.)

Please return completed inventory forms to this office. If you require additional instructions on completing the attached inventory forms, please contact John Michels of this office.

Sincerely,

William J. MacCreery, P.E.
Engineer of Local Government

John V. Bergh

John V. Bergh, P.E.
Federal-Aid Engineer

Attachments

MICHIGAN
THE GREAT LAKE STATE

210-1A

OBSTACLES TO BE SURVEYED

1. Bridge or culvert parapet ends without guardrail properly attached to parapet.

2. Bridge abutments or piers without proper guardrail or shielding treatment. Also narrow culverts needing extension or protection.

3. Guardrail ends which are not flared, buried, or cushioned, and without proper anchorage (on divided highways count only approach ends).

4. Inadequate guardrail; wooden posts only; existing cable guardrail; improper height and lateral placement of steel beam guardrail.

5. Non-breakaway or non-yielding light supports and/or sign supports within 30 feet of the edge of traveled way 2/, except those located in protected locations. 1/

6. Utility poles within 30 feet of the edge of traveled way except those installed in protected locations. 1/

7. Trees or stumps 4" in diameter or larger within 30' of the edge of traveled way, except those located in protected locations. 1/

8. Trees and stumps in clumps or strips within 30 feet of the edge of traveled way, except those located in protected locations. Estimated measurement will be by acres for each occurrence in the survey. (See table for conversion.) 1/

9. Buildings within 30' of the edge of traveled way except those located in protected locations. 1/

10. Ditches within 30' of the edge of traveled way whose ditch center lines are less than or equal to 15' from the edge of traveled way and also having a depth of ditch greater than 4' except those located in protected locations. Estimated measurement will be by miles for each occurrence in the survey. 1/

11. Mail boxes on non-yielding supports, non-yielding fence posts, large boulders, etc., within 30' of the edge of traveled way except those located in protected locations. 1/

1/ A protected location is considered to be a location behind a bridge rail, steel beam guardrail or other highway barrier, or up on a non-traversable backslope. An existing sign or light standard (except an overhead sign structure) behind guardrail which was placed solely to shield the sign or light standard is not considered to be in a protected location. Where the posted speed limit is 40 MPH or less, the obstacles are to be counted only if located within 10' of the edge of traveled way. If the posted speed is 40 mph or less the area behind a curb designed to inhibit or discourage vehicles from leaving the pavement is considered to be a protected area.

2/ Traveled way - The portion of the roadway for the movement of vehicles exclusive of shoulders.

SURVEY PACKAGE

1. Federal-aid survey tabulation forms
2. Non Federal-aid survey tabulation forms
3. Acre Conversion Table
4. Sample Federal-aid survey tabulation form
5. Sample Non Federal-aid survey tabulation form
6. County map indicating random selected survey segments
    a. Federal-aid indicated in red
    b. Non Federal-aid indicated in green

GENERAL NOTES

--- Thirty feet off the edge of traveled way must be used for both Federal-aid and non Federal-aid routes because this survey will be compared to all states nationwide by the Federal Highway Administration.

--- The Federal-aid routes (indicated in red) to be surveyed must be tabulated separately by segment number on their own form.

--- The non Federal-aid routes (indicated in green) should be tabulated in mass using as many non Federal-aid forms as needed. The total non Federal-aid mileage to be surveyed within the selected township consists of all county local mileage as certified in your Township and Enlarged Section Maps Booklet.

--- When inadequate guardrail is surveyed (obstacle Type #4), indicate it only once in column #4 and not in column #1, #2 or #3.

--- Make all comments or remarks on the back of the appropriate forms.

ATE ______ FAS ...UTE ______ (...MEI ______ Mark... map ...ed)

Speed Limit:	Total Laneage:	Total Length Surveyed:	Approximate Right-of-Way:	Classification Category: *

OBSTACLE TYPE **

1 Guardrail not Attached	2 Without Proper Guardrail Treatment	3 Guardrail Not Flared, Buried or Cushioned	4 Inadequate Guardrail Treatment	5 Sign Supports	6 Utility Pole	7 Trees or Stumps Alone	8 Trees or Stumps in Clumps or Strips (acres)	9 Buildings	10 Ditches (miles)	11 Others
Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:

* Classification Categories

Rural	Urban	Urbanized
1. FA Routes	3. FA Routes	5. FA Routes
a. State system	a. State system	a. State system
b. Other (local)	b. Other (local)	b. Other (local)
2. Non-FA Routes	4. Non-FA Routes	6. Non-FA Routes
a. State system	a. State system	a. State system
b. Other (local)	b. Other (local)	b. Other (local)

SIGNATURE ______________________ DATE ________

** Obstacle Types

1. Bridge or culvert parapet ends without guardrail properly attached to parapet.
2. Bridge abutments or piers without proper guardrail or shielding treatment. Also narrow culverts needing extension or protection.
3. Guardrail ends which are not flared, buried, or cushioned, and without proper anchorage (on divided highways count only approach ends).
4. Inadequate guardrail; wooden posts only; existing cable guardrail; improper height and lateral placement of steel beam guardrail.
5. Non-breakaway or non-yielding light supports and/or sign supports within 30 feet of the edge of traveled way 2/, except those located in protected locations. 1/
6. Utility poles within 30 feet of the edge of traveled way except those installed in protected locations. 1/
7. Trees or stumps 4" in diameter or larger within 30' of the edge of traveled way except those located in protected locations. 1/
8. Trees and stumps in clumps or strips within 30 feet of the edge of traveled way, except those located in protected locations. Estimated measurement will be by acres for each occurrence in the survey. (See table for conversion.) 1/
9. Buildings within 30' of the edge of traveled way except those located in protected locations. 1/
10. Ditches within 30' of the edge of traveled way whose ditch center lines are less than or equal to 15' from the edge of traveled way and also having a depth of ditch greater than 4' except those located in protected locations. Estimated measurement will be by miles for each occurrence in the survey. 1/
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2/ Traveled way — The portion of the roadway for the movement of vehicles exclusive of shoulders.

_ATE _____ NON DER AID JNT DAD Mark a ma, greet,

Total Length Surveyed:	Township:	Classification Category *:

OBSTACLE TYPE**

1 Guardrail not Attached	2 Without Proper Guardrail Treatment	3 Guardrail Not Flared, Buried or Cushioned	4 Inadequate Guardrail Treatment	5 Sign Supports	6 Utility Pole	7 Trees or Stumps Alone	8 Trees or Stumps in Clumps or Strips (acres)	9 Buildings	10 Ditches (miles)	11 Others
Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:

* Classification Categories

Rural	Urban	Urbanized
1. FA Routes	3. FA Routes	5. FA Routes
a. State system b. Other (local)	a. State system b. Other (local)	a. State system b. Other (local)
2. Non-FA Routes	4. Non-FA Routes	6. Non-FA Routes
a. State system b. Other (local)	a. State system b. Other (local)	a. State system b. Other (local)

SIGNATURE _____ DATE _____

** Obstacle Types

1. Bridge or culvert parapet ends without guardrail properly attached to parapet.
2. Bridge abutments or piers without proper guardrail or shielding treatment. Also narrow culverts needing extension or protection.
3. Guardrail ends which are not flared, buried, or cushioned, and without proper anchorage (on divided highways count only approach ends).
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2/ Traveled way — The portion of the roadway for the movement of vehicles exclusive of shoulders.

210-1E

ACRE CONVERSION TABLE

Length (Miles)

Width (Feet)	.01 (53')	.05 (264')	.10 (528')	.30 (1584')	.70 (3696')	1.0 (5280')	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
5'	.01	.03	.06	.18	.42	.61	.91	1.21	1.52	1.82	2.12	2.42	2.73	3.03
10'	.01	.06	.12	.36	.85	1.21	1.82	2.42	3.03	3.64	4.24	4.85	5.46	6.06
15'	.02	.09	.18	.55	1.27	1.82	2.73	3.64	4.55	5.46	6.36	7.27	8.18	9.09
20'	.02	.12	.24	.73	1.70	2.42	3.64	4.85	6.06	7.27	8.49	9.70	10.91	12.12
25'	.03	.15	.30	.91	2.12	3.03	4.55	6.06	7.58	9.09	10.61	12.12	13.64	15.15
30'	.04	.18	.36	1.10	2.55	3.64	5.46	7.27	9.09	10.91	12.73	14.55	16.36	18.18

43,560 sq. ft. = 1 Acre

Length greater than 5 miles = $\frac{\text{Length in Miles} \times 5{,}280 \times \text{Width in feet}}{43{,}560}$

DATE: 5-14-74 FAS ROUTE NO. 362 (SEGMENT # 3) (Marked on map in red)

Speed Limit:	Total Laneage:	Total Length Surveyed:	Approximate Right-of-Way:	Classification Category: *
55 MPH	2L	5.6 MI.	66'	16

OBSTACLE TYPE **

1 Guardrail not Attached	2 Without Proper Guardrail Treatment	3 Guardrail Not Flared, Buried or Cushioned	4 Inadequate Guardrail Treatment	5 Sign Supports	6 Utility Pole	7 Trees or Stumps Alone	8 Trees or Stumps in Clumps or Strips (acres)	9 Buildings	10 Ditches (miles)	11 Others
𝍸 11	1111	𝍸 1111	111	1	𝍸 𝍸 𝍸 𝍸 𝍸 111	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 1111	.01, .06, .18 3.64, 6.36	111	2.2, 1.4, .7	MAIL BOX SUPPO 111 CORNER FENCE 1111
Total: 7	Total: 4	Total: 9	Total: 3	Total: 1	Total: 28	Total: 49	Total: 10.25 ac	Total: 3	Total: 4.3 mi	Total: 7

SAMPLE FORM

* Classification Categories

Rural	Urban	Urbanized
1. FA Routes	3. FA Routes	5. FA Routes
a. State system	a. State system	a. State system
b. Other (local)	b. Other (local)	b. Other (local)
2. Non-FA Routes	4. Non-FA Routes	6. Non-FA Routes
a. State system	a. State system	a. State system
b. Other (local)	b. Other (local)	b. Other (local)

** Obstacle Types

1. Bridge or culvert parapet ends without guardrail properly attached to parapet.
2. Bridge abutments or piers without proper guardrail or shielding treatment. Also narrow culverts needing extension or protection.
3. Guardrail ends which are not flared, buried, or cushioned, and without proper anchorage (on divided highways count only approach ends).
4. Inadequate guardrail; wooden posts only; existing cable guardrail; improper height and lateral placement of steel beam guardrail.
5. Non-breakaway or non-yielding light supports and/or sign supports within 30 feet of the edge of traveled way 2/, except those located in protected locations. 1/
6. Utility poles within 30 feet of the edge of traveled way except those installed in protected locations. 1/
7. Trees or stumps 4" in diameter or larger within 30' of the edge of traveled way except those located in protected locations. 1/
8. Trees and stumps in clumps or strips within 30 feet of the edge of traveled way, except those located in protected locations. Estimated measurement will be by acres for each occurrence in the survey. (See table for conversion.) 1/
9. Buildings within 30' of the edge of traveled way except those located in protected locations. 1/
10. Ditches within 30' of the edge of traveled way whose ditch center lines are less than or equal to 15' from the edge of traveled way and also having a depth of ditch greater than 4' except those located in protected locations. Estimated measurement will be by miles for each occurrence in the survey. 1/
11. Mail boxes on non-yielding supports, non-yielding fence posts, large boulders, etc., within 30 feet of the edge of traveled way except those located in protected locations 1/

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2/ Traveled way — The portion of the roadway for the movement of vehicles exclusive of shoulders.

SIGNATURE John E. Smith DATE 5-14-74

210-16

DATE: 5-16-74

NON-FEDERAL-AID COUNTY ROADS (Marked on map in green)

1 of 2

Total Length Surveyed:	Township:	Classification Category *:
124.6 mi	SCOTT	26

OBSTACLE TYPE **

1 Guardrail not Attached	2 Without Proper Guardrail Treatment	3 Guardrail Not Flared, Buried or Cushioned	4 Inadequate Guardrail Treatment	5 Sign Supports	6 Utility Pole	7 Trees or Stumps Alone	8 Trees or Stumps in Clumps or Strips (acres)	9 Buildings	10 Ditches (miles)	11 Others
27	48	61	24	13	—	—	.06, 2.12, 6.06, 3.64, 1.52, 2.42, .18, 3.03, 1.27, .02, .12, 1.70, 9.09	13	3.2, 1.1, 2.6, .3, .1, .4, 2.4, 10.2, 6.3	MAIL BOX SUPPORTS 11, LARGE BOULDER 1, CONCRETE WALL AROUND CEMETERY 1, RETAINING WALL AT DRIVES 11 1
Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total: 31.23	Total:	Total: 26.6 mi	Total: 35

SAMPLE FORM

* Classification Categories

Rural	Urban	Urbanized
1. FA Routes	3. FA Routes	5. FA Routes
a. State system b. Other (local)	a. State system b. Other (local)	a. State system b. Other (local)
2. Non-FA Routes	4. Non-FA Routes	6. Non-FA Routes
a. State system b. Other (local)	a. State system b. Other (local)	a. State system b. Other (local)

SIGNATURE John E. Smith DATE 5-16-74

** Obstacle Types

1. Bridge or culvert parapet ends without guardrail properly attached to parapet.
2. Bridge abutments or piers without proper guardrail or shielding treatment. Also narrow culverts needing extension or protection.
3. Guardrail ends which are not flared, buried, or cushioned, and without proper anchorage (on divided highways count only approach ends).
4. Inadequate guardrail; wooden posts only; existing cable guardrail; improper height and lateral placement of steel beam guardrail.
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2/ Traveled way — The portion of the roadway for the movement of vehicles exclusive of shoulders.

DATE: 3/6/74

NON-FEDERAL-AID COUNTY ROADS (Marked on map in green)

Total Length Surveyed:	Township:	Classification Category *:

OBSTACLE TYPE **

1 Guardrail not Attached	2 Without Proper Guardrail Treatment	3 Guardrail Not Flared, Buried or Cushioned	4 Inadequate Guardrail Treatment	5 Sign Supports	6 Utility Pole	7 Trees or Stumps Alone	8 Trees or Stumps in Clumps or Strips (acres)	9 Buildings	10 Ditches (miles)	11 Others
					202	242				
Total:	Total:	Total:	Total:	Total:	Total: 202	Total: 242	Total:	Total:	Total:	Total:

SAMPLE FORM

* Classification Categories

Rural	Urban	Urbanized
1. FA Routes	3. FA Routes	5. FA Routes
a. State system b. Other (local)	a. State system b. Other (local)	a. State system b. Other (local)
2. Non-FA Routes	4. Non-FA Routes	6. Non-FA Routes
a. State system b. Other (local)	a. State system b. Other (local)	a. State system b. Other (local)

SIGNATURE _____ DATE _____

** Obstacle Types

1. Bridge or culvert parapet ends without guardrail properly attached to parapet.
2. Bridge abutments or piers without proper guardrail or shielding treatment. Also narrow culverts needing extension or protection.
3. Guardrail ends which are not flared, buried, or cushioned, and without proper anchorage (on divided highways count only approach ends).
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2/ Traveled way — The portion of the roadway for the movement of vehicles exclusive of shoulders.

1973 FEDERAL HIGHWAY SAFETY ACT

REQUEST FOR REIMBURSEMENT

Date _____ Request No. FINAL

Local Agency _____ Program No. ROS - SRS

Mailing Address _____ Date Completed _____

SUMMARY OF CHARGES

On Federal-Aid System (Section 210; ROS) _____ Miles Surveyed at $6.46/mile = _____ Total Project Cost

Non-Federal-Aid System (Section 230; SRS) _____ Miles Surveyed at $6.46/mile = _____ Total Project Cost

CERTIFICATION:

I certify that, to the best of my knowledge, the foregoing tabulation is correct and represents a proper claim for reimbursement for expenditures made for conducting the Roadside Obstacle Survey funded under Section 210 and Section 230 of the Federal Highway Safety Act of 1973.

_____ Signature _____ Title _____ Date

1973 Reported Accidents

Category	Fatal No.	%	Injury No.	%	Property Damage No.	%	Total No.	%	Severity Index*
TOTAL ACCIDENTS									
Trunkline	927	48	37,258	34	81,069	34	119,254	34	0.32
Non Trunkline	1,022	52	73,027	66	157,561	66	231,610	66	0.32
Rural	1,290	66	39,350	36	81,564	34	122,204	35	0.33
Urban	659	34	70,935	64	157,066	66	228,660	65	0.31
Statewide	1,949	100	110,285	100	238,630	100	350,864	100	0.32
FIXED OBJECT OFF ROADWAY ACCIDENTS									
Trunkline	187	43	4,340	28	9,339	34	13,866	32	0.32
Non Trunkline	250	57	11,048	72	18,008	66	29,306	68	0.39
Rural	303	69	9,220	60	16,799	62	26,322	61	0.36
Urban	134	31	6,168	40	10,548	38	16,850	39	0.37
Statewide	437	100	15,388	100	27,347	100	43,172	100	0.36
PERCENTAGE OF FIXED OBJECT OFF ROADWAY ACCIDENTS (FIXED OBJECT ACCIDENTS/TOTAL ACCIDENTS)									
Trunkline		20		12		12		12	
Non Trunkline		24		15		11		13	
Rural		23		23		21		22	
Urban		20		9		7		7	
Statewide		22		14		11		12	

*Severity Index - Fatal + Injury/Total

Township Ranking
Non-trunkline Fixed Object Accidents
Top 20 Jurisdictions

Jurisdiction	Fixed Object Acc/Mile	Rate Rank	No. Fixed Object Acc.	No. Rank
Commerce Township	1.29	1	111	7
Frenchtown Township	1.13	2	107	9
Harrison Township	1.12	3	90	13
Milford Township	1.04	4	64	32
Dexter Township	1.03	5	66	30
Bedford Township	1.01	6	138	3
Berlin Township	0.98	7	66	31
Waterford Township	0.96	8	231	1
Brownstown Township	0.93	9	57	41
Ypsilanti Township	0.92	10	134	4
Marshall Township	0.88	11	54	45
Van Buren Township	0.85	12	86	19
White Lake Township	0.82	13	90	14
Benton Township	0.80	14	118	6
Huron Township	0.79	15	77	24
Bridgport Township	0.79	16	89	16
West Bloomfield Township	0.79	17	147	2
Superior Township	0.77	18	51	49
Saginaw Township	0.76	19	98	11
Green Oak Township	0.75	20	62	34

City Ranking
Non-trunkline Fixed Object Accidents
Population Less Than 5,000
Top 14 Jurisdictions

Jurisdiction	Fixed Object Acc/Mile	Rate Rank	No. Fixed Object Acc.	No. Rank
Grosse Pointe Shores	1.50	1	18	8
Milford	1.45	2	29	3
Orchard Lake	1.38	3	18	9
Allegan	1.37	4	37	1
Walled Lake	1.27	5	19	6
Buchanan	1.13	6	27	4
New Baltimore	1.12	7	19	7
Bloomfield Hills	1.07	8	32	2
Wixom	1.00	9	20	5
Brighton	1.00	10	16	13
North Muskegon	0.86	11	18	10
Holly	0.83	12	15	14
Portland	0.82	13	18	11
Springfield	0.53	14	17	12

City Ranking
Non-trunkline Fixed Object Accidents
Population 5,000 - 10,000
Top 20 Jurisdictions

Jurisdiction	Fixed Object Acc/Mile	Rate Rank	No. Fixed Object Acc.	No. Rank
Novi	1.14	1	67	1
Marshall	1.11	2	40	3
Flat Rock	1.11	3	21	10
Northville	1.05	4	21	11
Coldwater	1.00	5	46	2
Grosse Pointe	0.89	6	16	18
Three Rivers	0.84	7	36	4
Fenton	0.73	8	30	6
Manistee	0.70	9	30	7
Sturgis	0.65	10	31	5
Dowagiac	0.64	11	21	12
Rochester	0.63	12	15	20
Hillsdale	0.59	13	23	9
Lapeer	0.57	14	17	16
Charlotte	0.56	15	18	15
Ishpeming	0.56	16	20	13
Tecumseh	0.56	17	20	13
Flushing	0.53	18	17	17
Cadillac	0.52	19	29	8
Greenville	0.43	20	19	14

City Ranking
Non-trunkline Fixed Object Accidents
Population 10,000 - 25,000
Top 20 Jurisdictions

Jurisdiction	Fixed Object Acc/Mile	Rate Rank	No. Fixed Object Acc.	No. Rank
Ecorse	1.63	1	54	7
Romulus	1.47	2	145	1
Benton Harbor	1.27	3	74	4
Marquette	1.23	4	89	2
Fraser	1.20	5	35	18
Melvindale	1.13	6	33	19
Hazel Park	1.06	7	63	6
Plymouth	1.06	8	32	21
Sault Ste. Marie	0.95	9	82	3
River Rouge	0.92	10	26	25
Riverview	0.90	11	28	24
Grand Haven	0.83	12	47	11
Adrian	0.83	13	54	8
Grosse Pointe Farms	0.76	14	30	22
Mt. Clemens	0.75	15	41	13
St. Joseph	0.69	16	29	23
Wayne	0.66	17	37	15
Clawson	0.65	18	26	26
Traverse City	0.64	19	48	10
Trenton	0.63	20	37	16

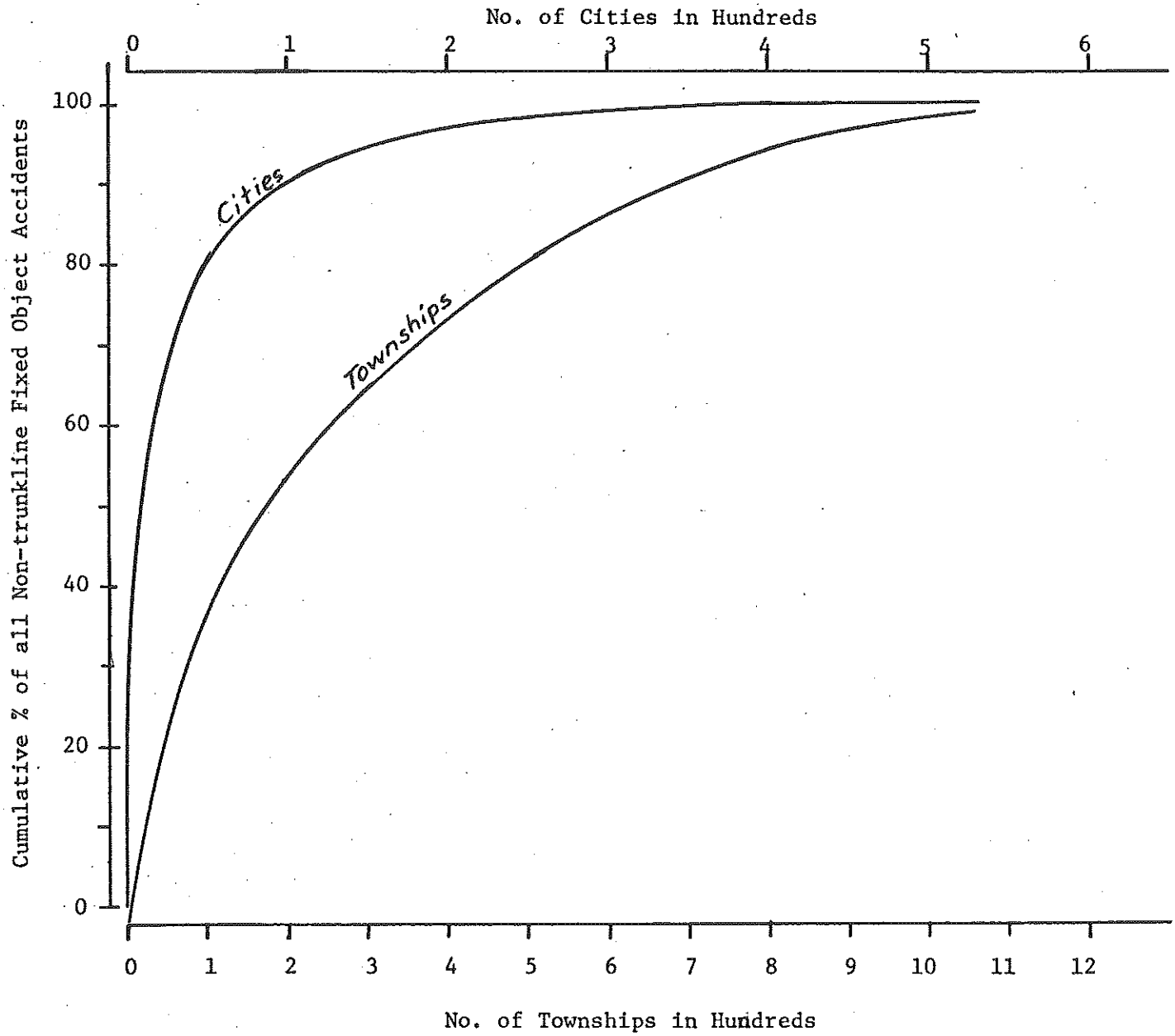
City Ranking
Non-trunkline Fixed Object Accidents
Population 25,000 - 50,000
Top 20 Jurisdictions

Jurisdiction	Fixed Object Acc/Mile	Rate Rank	No. Fixed Object Acc.	No. Rank
Highland Park	2.06	1	95	10
Hamtramck	1.55	2	59	16
Wyandotte	1.24	3	117	6
Ypsilanti	1.05	4	56	17
East Lansing	1.02	5	76	12
Jackson	0.94	6	148	1
Portage	0.92	7	142	4
Southgate	0.90	8	69	14
Battle Creek	0.85	9	145	3
Inkster	0.81	10	77	11
Troy	0.78	11	148	2
Madison Heights	0.78	12	72	13
Muskegon	0.76	13	136	5
Port Huron	0.75	14	98	9
Bay City	0.61	15	112	7
Midland	0.58	16	101	8
Oak Park	0.57	17	48	19
Holland	0.52	18	64	15
East Detroit	0.49	19	48	20
Allen Park	0.48	20	45	21

City Ranking
Non-trunkline Fixed Object Accidents
Population Over 50,000
Top 20 Jurisdictions

Jurisdiction	Fixed Object Acc/Mile	Rate Rank	No. Fixed Object Acc.	No. Rank
Kalamazoo	1.54	1	387	4
Detroit	1.50	2	3,947	1
Pontiac	1.45	3	316	7
Saginaw	1.20	4	340	6
Lansing	0.96	5	379	5
Grand Rapids	0.92	6	529	2
Flint	0.82	7	424	3
Wyoming	0.74	8	146	12
Roseville	0.68	9	89	19
Sterling Heights	0.67	10	141	13
Taylor	0.67	11	122	15
Livonia	0.65	12	197	9
Ann Arbor	0.63	13	162	10
Warren	0.63	14	251	8
Dearborn Heights	0.62	15	115	16
Royal Oak	0.61	16	129	14
Dearborn	0.60	17	160	11
St. Clair Shores	0.51	18	94	18
Westland	0.47	19	87	20
Southfield	0.44	20	107	17

Non-trunkline Fixed Object Off Roadway Accidents



Fixed Object Accident Rates by Control Section

Ranked by Rate #1	Control Section	Route	Length (Mi.)	ADT (1971)	Total Fixed Object Accidents	1972 Fixed Object Rate #1*	1972 Fixed Object Rate #2**	Ranked by Rate #2
1	41131	US-131	17.933	52,300	279	15.6	81.4	25
2	70023	M-21	5.338	18,100	83	15.5	235.4	3
3	11013	BL-94	2.351	22,200	36	15.3	189.0	5
4	52044	US-41BR	2.181	11,900	33	15.1	348.4	1
5	82192	M-39	11.113	90,900	165	14.8	44.8	40
6	50051	US-25	15.022	38,800	193	12.8	90.7	21
7	25085	M-78, M-21	2.948	19,400	32	10.9	153.3	8
8	63031	US-10	11.345	42,900	120	10.6	67.6	32
9	82061	US-12	14.478	36,200	153	10.6	80.0	26
10	81074	US-23	7.444	27,200	79	10.6	106.9	14
11	61072	US-31	4.352	21,400	45	10.3	132.4	10
12	82211	M-85	14.967	27,600	144	9.6	95.5	18
13	63051	M-1	13.031	55,700	117	9.0	44.2	41
14	61153	US-31BR	3.398	18,700	30	8.8	129.3	11
15	82053	US-24	9.922	60,000	87	8.8	40.0	42
16	41042	BR-21	5.166	10,700	45	8.7	223.0	4
17	82052	US-24	11.126	42,300	96	8.6	55.9	38
18	41062	M-11	4.165	38,700	34	8.2	57.8	36
19	38083	BL-94	6.251	20,000	50	8.0	109.6	13
20	33011	M-99	5.716	21,700	45	7.9	99.4	16
21	81032	US-12	7.847	20,200	61	7.8	105.4	15
22	11053	US-33	4.600	7,800	34	7.4	259.5	2
23	11031	M-139	5.376	11,700	38	7.1	165.5	6
24	73062	M-46	8.963	20,200	62	6.9	93.8	19
25	61151	BS-96,BR-31	6.066	23,700	42	6.9	80.0	27
26	73073	M-46	13.641	28,000	89	6.5	63.8	34
27	33032	BL-96	6.613	24,000	43	6.5	74.2	28
28	23042	M-43	6.991	21,200	45	6.4	83.1	23
29	50011	M-53	12.628	49,300	80	6.3	35.2	44
30	63112	M-24	14.992	20,500	94	6.3	83.8	22
31	25031	US-23	15.125	31,900	91	6.0	51.7	37
32	82021	M-153	20.162	46,100	121	6.0	35.7	43
33	81075	US-23	9.144	27,300	53	5.8	58.2	35
34	13061	M-37	12.539	13,900	71	5.7	111.6	12
35	39042	M-96	9.171	9,900	52	5.7	156.9	7
36	73091	M-13	7.448	16,000	42	5.6	96.6	17
37	63041	M-59	21.210	22,400	118	5.6	68.0	31
38	50031	M-97	14.221	29,300	79	5.6	51.9	39
39	70014	US-31	7.634	18,200	42	5.5	82.8	24
40	11052	US-23	23.524	10,700	126	5.4	137.1	9
41	25052	BR-54	9.662	19,700	51	5.3	73.4	30
42	25084	M-21	11.715	18,700	59	5.0	73.8	29
43	23012	M-78	16.028	14,600	80	5.0	93.7	20
44	39081	M-43	9.064	20,800	45	5.0	65.4	33

*Fixed object Acc/control section mile

**Fixed object Acc/100 Million-vehicle-miles

STATE-WIDE	POP GROUP RL	-U	+U	DR	POP GROUP RL	-U	+U	TOT ACC	DI	CONTROL SECTION	POB	POE	FAT	INJ	PD	WET	HWY-AREA-TYPE 1	2	3	4	TOTAL D	I	ACCIDENTS RL	-U	+U
1				1				23	5	41131	13.300	13.480		11	12	15	15		8			13			23
1				1				23	5	41131	13.560	13.760		6	17	14	15		8			9			23
2				1				22	8	33045	00.030	00.230		7	15	8	22					9			22
3				1				19	6	25032	02.870	03.070		12	7	3			19			14	19		
3				1				19	9	82191	11.830	12.010		5	14	6		1	18			16		1	18
4				2				18	5	41131	13.090	13.290		10	8	7	15		3			18			18
5				2				17	6	73112	00.400	00.530		6	11	5	1		16			6	6	11	
5				2				17	8	33045	02.240	02.400		9	8	6	17					9			17
5				2				17	9	63174	10.020	10.200		9	8	3	17					11			17
6				3				16	9	50111	11.520	11.690		7	9	5	15		1			10	16		
6				3				16	9	63174	04.300	04.500		7	9	2	16					7			16
6				3				16	9	82022	11.440	11.620		10	6	6	16					11			16
6				3				16	9	82104	00.240	00.440		8	8	6	5	1	10			12			16
6				3				16	9	82191	02.010	02.160		5	11	5	14		2			7	15	1	

1973 Fixed Objects Hit Off Roadway

Object Hit	Townships # of Occurrences	Townships Percent	Cities # of Occurrences	Cities Percent	Trunkline # of Occurences	Trunkline Percent	Total # of Occurrences	Total Percent
Guardrail	1,033	5	1,114	7	3,761	23	5,656	11
Highway Sign	1,368	7	1,803	11	2,388	15	5,359	11
Utility Pole	1,978	10	5,269	33	2,218	14	9,294	19
Culvert	326	2	65	1	234	2	618	1
Ditch	5,530	28	1,115	7	2,840	18	9,355	19
Bridge Pier	174	1	223	1	246	2	632	1
Bridge Rail	208	1	107	1	228	1	531	1
Tree	4,804	25	2,311	14	1,164	8	8,223	16
Railroad Signal	43	1	117	1	89	1	237	1
Building	205	1	1,178	7	239	2	1,593	3
Mail Box	2,036	10	488	3	728	5	3,205	6
Fence	1,191	6	1,244	8	578	4	2,973	6
Other off Roadway	651	3	1,010	6	730	5	2,325	5
Totals	19,547	100	16,044	100	15,443	100	50,001	100

Elimination of Roadside Obstacles
(Section 210)

Project Location	Project Description	Justification	Cost in Federal Funds		
			Programmed	PS&E	Project Agreement
Statewide	Roadside Obstacle Survey of Randomly Selected Segments	Required by Section 210 of the 1973 Highway Safety Act			24,750
US-131 South Kent County Line to M-11 (28th Street) Kent County	Guard rail & culvert headwall corrections, guard rail end treatments & anchorage @ structures, breakaway sign supports	15.6 Fixed object Acc/Mi. 81.4 Fixed object Acc/ 100 Mil. Veh. Mi.	233,100		
Wayne County	Impact attenuators at center piers at 12 locations	Accident potential	99,000		
Davison Expressway US-10 to Oakland Wayne County	GM Median Barrier	109 Acc. in 1971 30 Acc. involving Median Guardrail	187,200		

APPENDIX

SECTION 230

Summary Federal-Aid Safer Roads Demonstration Program

Section 230

Type of Project	No. Locations	Average Cost in Federal Funds
Preliminary Engineering	2 (Statewide)	$57,240
Signing	2 (City-wide)	94,500
Impact Attenuator	1	8,000
Railroad Crossing Improvements	18	27,275
All Projects	23	$34,888

Federal Aid Safer Roads Demonstration Program
Section 230

Project Location	Project Description	Justification	Cost in Federal Funds		
			Programmed	PS&E	Project Agreement
Statewide	Obstacle Survey	Required by 1973 Highway Safety Act			60,480
Statewide	Preliminary Engineering for Railroad Crossings			54,000	
City-wide City of Saginaw	Warning & Regulatory Sign Upgrading	Conformance with MUTCD	180,000		
Miller North of Michigan Wayne County	Impact attenuator	Accident Potential	8,000		
City-wide City of Wolverine Lake	Sign Upgrading	Conformance with MUTCD	9,000		
	Totals		197,000	54,000	60,480

Federal-aid Safer Roads Demonstration Program
(Section 230)
Rail-Highway Crossings

Project Location	Project Description: Warning Devices						Project Description: Construction						Justification		Cost in Federal Funds		
	FLS	Gates	CA	AWS	Pvt. Mkg.	Total Cost	Appr. Work	X-ing Work	C&G &/or G.R.	Realign	Clear Vision	Total Cost	Priority Points	Potential Accidents	Programmed	PS&E	Project Agreement
GTW-Hess Rd.,Cass Co.	x	x			x	20,000							88	0.5	18,000		
PC-Strobel Rd.,Saginaw Co.	x					40,000	x					2,000	110	1.0	37,800		
Soo Line-3rd St.,Marquette	x				x	15,000	x	x				5,000	86	2.0	18,000		
Soo Line-5th St., Marquette	x				x	15,000							88	2.0	13,500		
Soo Line-Spring St.,Marquette	x				x	20,000							83	2.0	18,000		
C&O-Cumberland,Saginaw	x				x	25,000							85	2.2	22,500		
N&W-Lyons Hwy.,Sand Creek	x				x	20,000	x	x	x			10,000	83	0.6	27,000		
PC-Reech Rd.,Southfield	x			x	x	30,000	x	x	x			15,000	81	2.0	28,350		
PC-Racho Rd.,Taylor	x			x	x	50,000	x	x				6,000	88	NA	50,400		
PC-Reynolds Rd.,Jackson Co.	x				x	30,000	x	x	x			3,000	76	0.6	29,700		
PC-Maple St.,Saginaw	x	x		x	x	30,000							70	1.3	27,000		
C&O-Barrett Ave.,Grandville	x	x		x	x	25,000	x	x	x			5,000	90	1.9	27,000		
GTW-Morris Rd.,Lapeer Co.	x			x	x	25,000							77	0.7	22,500		
N&W-Hannon Rd., Wayne Co.		x			x	5,000	x	x	x			5,400	90	3.0	9,360		
PC-Howe Rd., Wayne Co.							x	x	x			4,600	90	3.0	4,140		
PC,DTSL,DTI-Payne St.,Riverview	x	x		x	x	40,000	x	x	x	x		35,000	108	1.0	67,500		
C&O-Hulett & Wallace,Ingham Co.											x	40,000	67	0.3	36,000		
PC-Hermansau Rd.,Saginaw Co.	x	x			x	38,000							105	1.5	34,200		
Totals						428,000						131,000		25.6	490,950		

Notes:

FLS = Flashing Light Signals; CA = Cantilever Arms; AWS = Advance Warning Signs; Pvt. Mkg. = Pavement Markings; Appr. Work = Approach Work; X-ing Work = Crossing Work; C & G &/or G.R. = Curb and Gutter and/or Guard Rail; Realign = Realignment.

Federal Aid Safer Roads Demonstration Program
Section 230
Functional Classification of Roadway

Project Location	Project Description	Road Classification
Statewide	Obstacle Survey	Collector, Local
Statewide	Prelimianry Engineering for Railroad Crossings	Collector, Local
City-wide,City of Saginaw	Warning & Regulatory Sign Upgrading	Collector, Local
Miller North of Michigan, Wayne County	Impact Attenuator	Collector
City-wide, City of Wolverine Lake	Sign Upgrading	Collector, Local
GTW-Hess Rd., Cass Co.	Railroad Crossing Improvement	Local
PC-Strobel Rd., Saginaw Co.	Railroad Crossing Improvement	Local
Soo Line-3rd St., Marquette	Railroad Crossing Improvement	Collector
Soo Line-5th St., Marquette	Railroad Crossing Improvement	Local
Soo Line-Spring St., Marquette	Railroad Crossing Improvement	Local
C&O-Cumberland, Saginaw	Railroad Crossing Improvement	Local
N&W-Lyons Hwy., Sand Creek	Railroad Crossing Improvement	Local
PC-Reech Rd., Southfield	Railroad Crossing Improvement	Collector
PC-Racho Rd., Taylor	Railroad Crossing Improvement	Local
PC-Reynolds Rd., Jackson Co.	Railroad Crossing Improvement	Local
PC-Maple St., Saginaw	Railroad Crossing Improvement	Local
C&O-Barrett Ave., Grandville	Railroad Crossing Improvement	Local
GTW-Morris Rd., Lapeer Co.	Railroad Crossing Improvement	Local
N&W-Hannon Rd., Wayne Co.	Railroad Crossing Improvement	Collector
PC-Howe Rd., Wayne Co.	Railroad Crossing Improvement	Collector
PC-DTSL,DTI-Payne St., Riverview	Railroad Crossing Improvement	Collector
C&O-Hulett & Wallace, Ingham Co.	Railroad Crossing Improvement	Local
PC-Hermansau Rd.,Saginaw Co.	Railroad Crossing Improvement	Local

SECTION 2

REPORT

of the

MICHIGAN SAFETY (Ms) PROGRAM

FISCAL YEAR

1972-73

LIST OF CONTENTS

INTRODUCTION

The Michigan Department of State Highways early recognized the need for initiating "spot improvements" at locations exhibiting unusually severe accident or operational problems. Beginning in 1955, an annual sum of $500,000 was earmarked for the Michigan Operational Betterment (MOB) Program. Numerous minor geometric improvements of limited scope were completed under this program over a ten-year period.

Beginning in late 1965, greater emphasis was given to spot improvements for increased safety and capacity, this emphasis taking the form of creation of the Michigan Safety (Ms) Program with an annual budget of $5.0 million. The increased budget allowed for serious consideration of both a larger number of individual projects and projects of increased scope. Projects typical of the Safety (Ms) Program include intersectional widenings to provide for additional through capacity and for turning movements, improved roadside control, increased curb radii, protective guardrail and barrier median, and skidproofing of roadways exhibiting a disproportionate number of wet surface accidents. The Safety (Ms) Program has also financed limited trunkline improvements in the vicinity of new traffic generators such as shopping centers, factories, sports facilities, and educational institutions.

In additon to the types of improvements already discussed, the Safety (Ms) Program has funded trial installations of promising new products or techniques. Thermoplastic pavement markings, cold rolled plastic lane line inserts and pavement grooving to reduce hydroplaning are examples. A portion of the budget has also been earmarked for installation of impact attenuating devices.

II
ACCIDENT LOCATION SYSTEM

The Michigan Department of State Highways and Transportation has for a number of years utilized an accident location system based on the control section and mileage point for the trunkline system. For most accidents the location can be accurately determined within a distance of 0.01 mile.

Under present state laws, as an owner or driver, one must file an accident report with the appropriate police jurisdiction if one or more of the following is true:

A. There is more than $200 damage to his own vehicle, other vehicles, or any property belonging to another.

B. Someone has been injured.

C. Someone has been killed.

All accidents reported are transmitted to the Michigan State Police who administratively control collection, location indexing and distribution of all highway traffic accidents.

The Department of State Highways and Transportation maintains state trunkline accident files and analyzes the data through electronic data processing.

Several programs have been written to analyze accidents. Those of specific use in procedures for identifying accident locations are:

A) Q24020 General Accident Program

A data selection program with twelve printout options and seven parameter selection fields. Data can be selected for the entire trunkline system or for one

to 144 control sections or 48 specific locations within a control section. This program generates the following reports which are reviewed:

1. Fixed object - Ran off roadway (Program Q24035)
2. Wrong-way accidents
3. Railroad crossing accidents
4. Yearly total accident printout
5. Selected accident type printout (Program Q 24033)

B) Q24028 Critical Accident Locations

This program searches the accident master file (Program Q24035) for two-tenths-mile segments which meet a predetermined threshold minimum accident warrant based on geographic location. A minimum of 10 accidents in Districts 1 through 4 and a minimum of 30 accidents in Districts 5 through 9(Metro) satisfy this warrant. Upon receipt of this program each segment is identified by trunkline number, major cross-street within the segment, and municipality. This requires manual cross referencing between the control section mileage log and program printout which generates between 800 and 900 segments per year.

C) Q24050 Detroit Accident Listing

The sole purpose of this program was to list the City of Detroit accident data which the State Police did not process because Detroit used an accident report form which did not conform to the State Police standard prior to 1974. Beginning in 1974, Detroit's data is now being converted to the Highway control section and mileage point format which makes this data more accessible.

D) Q24034 General Accident Report

This program provides the same data as the yearly total accident printout provides under Program Q 24020 with one variation. This program uses the Michigan State Police accident type rather than the Highway accident type. This variation allows quarterly statewide accident printouts of the current year with approximately a one month delay.

E) Q24009 Automated Collision Data

A multi-phase program which utilizes an accident record data base on magnetic tape and control cards prepared by the user which define the accident records desired and described required elements necessary for the plotting of geometric background. See attached example.

It should be noted that the above-mentioned electronic data programs were used in justifying projects for the 1972-73 Safety (Ms) Program and does not reflect the numerous changes that have since been initiated. A complete review of all electronic data programs that the Michigan Department of Highways and Transportation utilizes regarding accident data retrieval is listed in Report No. TSD-RD-212-72 (Revised in 1974) entitled "A GUIDE TO THOSE COMPUTER PROGRAMS USED FOR ANALYSIS OF THE STATE HIGHWAY TRAFFIC ACCIDENT PROBLEM".

III

SELECTION OF PROJECTS

Project selection is both the most important and most difficult phase of the program. Emphasis is, of course, placed on attempting to assure the highest possible return for the money expended. There is, however, a recognition that a problem's magnitude is related to the geographical area in which it occurs. Congestion and delay, which is accepted as the norm in highly urbanized portions of the state, would be considered intolerable in outstate areas. The cost of completing similar improvements varies widely depending on the need to acquire new right-of-way or on problems related to drainage and soil considerations and maintaining traffic flow during construction. Certain locations which are recognized as being deficient, with regard to capacity and safety, sometimes defy attempts to develop practical and economical plans for improvement.

Factors taken into account in the screening process for spot improvements, not necessarily in order of importance, are as follows:

1. Number of accidents (total) and severity of accidents.
2. Presence of "correctable patterns" and reoccurring patterns.
3. Practicality - Potential for improvement, size of project, consideration of potential right-of-way and/or drainage problems and necessity of securing participation from municipalities.
4. Operational considerations such as increased capacity, providing for left and right turns, roadside control and removal of obvious "bottlenecks".
5. Area factor - Potential growth, traffic generators, and uniformity of treatment within a route.

6. In selecting appropriate treatment and project limits, careful consideration is given to expanding an intersection to its "ultimate cross-section".

7. Some locations may involve the possibility of operational changes such as signs, signals or pavement markings rather than reconstruction.

Locations for consideration as Safety projects come from basically three sources, which are:

1. Listing of high accident locations by 0.2 mile increments from accident data printout.

2. District Traffic and Safety Engineer suggestions/public complaints reflecting everyday field observations.

3. Surveillance team field observations

Upon receipt of suggestions regarding the need for improvements at a location, a preliminary office review is initiated. This starts with a comparison of suggested locations against other Department improvement programs to determine if any of the locations will be improved by major trunkline projects within the near future. Those locations contained within the limits of such a project are further checked to determine if the proposed improvements have potential to reduce accidents. If information received indicates that a spot location will be satisfactorily improved within a reasonable length of time, then the location is dropped from further consideration.

Location files for those locations not eliminated due to inclusion in other programs, are reviewed for recent and pertinent data on volumes, turning movements, previous improvements, accident diagrams. If such data is missing, then studies are ordered, or steps are taken to renew the data.

Locations within a District having adequate background data are accumulated and preliminary review is held with the District Traffic and Safety Engineer to determine which locations have potential for accident reduction and other problems associated with the location, such as: parking removal, traffic control, right-of-way, character of immediate and adjacent areas (business development, downtown areas, adjacent signal operation and progression, etc.)

Those locations determined to have a potential for corrective action are scheduled for an on-site multidisplinary review by Traffic and Safety Engineers specializing in Signing, Signals, Geometrics, Surveillance, in company with the District Traffic and Safety Engineer. Each location is reviewed independently and a consensus developed as to the corrective measures needed.

As a result of this on-site investigation, correspondence is initiated stating the corrective treatment required to lessen the difficulties as observed for approval to include the location in a fiscal Safety (Ms) Program.

At those locations in need of geometrics revision, a functional scheme and cost estimate is prepared. Priorities are then established from which design and letting schedules are set. The majority of projects are placed under contract in about one year after programming, however those involving right-of-way or presenting engineering difficulties may take longer.

IV

EVALUATION OF SAFETY ACTIVITIES

Over the years, evaluations have been made of improved locations, or numbers of locations with like improvements, to determine the effect which the operational change, or reconstruction has had on accident experience. Factors affecting the choice of locations for study includes:

1. Number of improvements made or new developments. A number of changes or unusual growth at an improved location can introduce variables that negate the ability to pinpoint reasons for changes in accident experience. An ideal location for study would hold all variables constant with only the improvement constituting a change. Traffic volumes and turning movements should remain about the same in the before and after period.

2. Statistical significance of changes in accident experience. The numbers of accidents must be of a sufficient total so that an increase or reduction in accident experience can be of such magnitude that a change will have meaning that can be ascribed to an improvement made at the location in question. Many locations experience a fluctuating number of accidents year to year and a change in numbers in an after period must be of sufficient magnitude to indicate that the change was caused by an improvement and not by a naturally occuring fluctuation.

Many locations that are the subject of improvements experience so many changes in variables, such as signal installation, traffic growth due to new industry, shopping centers or attraction to the new facility that a study to determine the effect of an improvement will not yield meaningful results.

Evaluations prepared by the Michigan Department of Highways and Transportation give results of safety activities; either operational measures or reconstruction. These reports assist greatly in determining corrective measures at locations currently under study. The following is a list of evaluation reports that have been completed.

SAFETY (Ms) PROJECT EVALUATIONS

- US-127 (Cedar St.-now BL-96) at Holmes Road
  City of Lansing. May, 1967

  Subject: Skidproofing

- US-23 at Beaver and Kawkawlin Roads
  Bay County. Maych, 1968

  Subj: Median left turn lanes (Rural)

- I-94 @ M-239 (LaPorte Rd.)
  Berrien County. June, 1968

  Subj: Several traffic control devices were changed at the freeway ending.

- BL-96 (Cedar St.) @ Jolly Road
  City of Lansing. June, 1968

  Subj: Widening from four to five lanes to provide a center lane for left turns.

- M-153 (Ford Rd.) in Garden City
  (3.25 miles). November, 1968

  Subj: Removal of curb parking and changing four lane roadway to five lanes.

- M-17 (Ecorse Rd.) at Pelham Road
  City of Allen Park. December, 1968

  Subj: Widening from four to five lanes to provide a center lane for left turns.

- US-12 (Michigan and Norris-one way streets) at six intersections in the City of Wayne.
  April, 1969. TSD-SS-112-69

  Subj: Evaluation of overhead traffic lane-use-control signs.

- I-75 NB at M-85
  Wayne County. May, 1969 TSD-SS-113-69

  Subj: Installation of dual roadside "symbol" signs and illumination of existing overhead signs.

- US-10 (Woodward Ave.) at Opdyke Road
  Oakland County. June, 1969. TSD-SS-116-69

  Subj: Replacement of a median bi-directional crossover with a pair of directional crossovers.

- I-75 in Monroe and Wayne Counties
  October, 1969. TSD-SS-123-69

  Subj: Evaluation of three installations of "blocked-out" median guardrail with glare screen.

- M-11 (28th St.) Cities of Grand Rapids and Wyoming
  5 intersections. December, 1969

  Subj: Adding a separate left-turn phase to traffic control signals with supplement for 2nd "after" year.

- 1965-66 Skidproofing Projects
  February, 1970. TSD-SS-126-70

  Subj: Evaluation of skidproofing overlays at 73 locations.

- M-37 at M-46 (South Junction) near Casnovia
  Muskegon County. March, 1970. TSD-SS-128-70

  Subj: Evaluation of changing the assignment of vehicle right-of-way at a rural trunkline intersection.

- 1966-67 Skidproofing projects
  April, 1970. TSD-SS-129-70

  Subj: Evaluation of skidproofing overlays at 22 locations

- M-53 (Freeway Ending) at Earle Memorial Highway
  Macomb County. August, 1970. TSD-SS-129-70

  Subj: Evaluation of Electrical and Reflective Devices for signal control and advance warning.

- 1967-68 Skidproofing projects
  November, 1970. TSD-SS-146-70

  Subj: Evaluation of skidproofing overlays at 9 locations

- M-85 at Oak-Phelps
  Cities of Wyandotte and Southgate
  February, 1971. TSD-SS-152-71

  Subj: Reconstruction of median crossovers and removal of median parking.

- 1965-66 and 1966-67 Tree Removal Program
  June, 1971. TSD-SS-149-70

- M-43, US-27 and US-131. Evaluation of four safety projects in Ingham and Kent Counties. June, 1972. TSD-G-207-72

  Subj: Widening 6.6 miles of four lane highways to five lanes.

- Evaluation of an operational change at 17 locations.
  April, 1972. TSD-G-208-72

  Subj: Addition of an All Red Clearance Interval to the Traffic Signal Timing Sequence.

- US-27 near Ithaca and US-127 near Jackson
  July, 1973. TSD-224-73

  Subj: Curve superelevation and drainage correction to reduce hydroplaning.

- An Evaluation of the installation of oversized lenses and low level type signals. November, 1973. TSD-229-73

  Subj: Additions to traffic signals at 14 locations on M-53 (Van Dyke Avenue) in Oakland County

V

SAFETY PROJECTS LET TO CONTRACT DURING FISCAL YEAR 1972-73

The program for the 1972-73 fiscal year totaled $5,520,000.

There were 68 projects completed under formal contract procedures and, in addition, numerous minor improvements were completed by work forces. Monies expended for formal projects totaled $5,192,049 and monies expended by work forces totaled $327,951.

The following listing provides an indication of the wide variety of improvements common to Michigan's annual spot improvement Safety (Ms) Program. In this list the costs for each include 15% for engineering and contingencies added to contract prices which are chargeable to the program. The list is not inclusive although the costs represent the major share of expenditures.

1. Classification Code 21. Widening for center left turn lanes, usually from four to five lanes but two projects widened an existing two lanes to five lanes and two projects widened an existing four lanes to seven lanes. 15 projects at $1,990,210.
2. Classification Code 21. Passing flares. Providing a means for through vehicles to pass left turning vehicles at an intersection, often in a rural area. Projects usually involve widening of two lanes to three, although two projects widened two lanes to four lanes. 9 projects at $491,440.

3. Classification Code 99. Directional crossovers in the median of divided highways. These facilities allow for left turns to be rerouted and take place via a U-turn maneuver away from the crossroad.
   3 projects at $162,300.
4. Classification Code 10. Providing right or left turn lanes or tapers to accommodate increased volumes.
   8 projects at $159,010.
5. Classification Code 25. Longitudinal grooving to reduce hydroplaning on curves.
   1 project at $60,820.
6. Classification Code 26. Skidproofing overlays to increase the coefficients of wet friction and decrease the percent of wet surface accidents.
   7 projects at $175,040.
7. Classification Code 19. Reconstruction of Wye intersections to a tee configuration.
   3 projects at $151,090.
8. Classification Code 64. Thermoplastic markings replacing normal painted lines.
   1 project involving four sections of highways at $93,450.
9. Classification Code 19. Radii improvements. Increase of intersection radii to improve turning characteristics
   6 projects at $41,700.
10. Classification Code 63. Median guardrail or concrete barrier installations to prevent errant crossings of a divided highway.
    2 projects at $181,800.

11. Classification Code 41. Grade lift to increase intersection sight distance.

    1 project at $19,780.

12. Classification Code 20. Transition tapers lengthened to improve lane reductions

    1 project at $18,400.

13. Classification Code 52. Removal of abandoned RR tracks to eliminate crossing.

    1 project at $14,340.

14. Classification Code 60. Upgrading of traffic signs by field forces.

    Work Authorizations $199,150.

15. Classification Code 68. Installation of impact attenuators.

    3 projects at $82,150.

16. Classification Code 99. Installation of automatic gates supplementing signal devices on approaches to river bridge.

    1 project at $46,220.

17. Classification Code 99. Construction of interchange "B" loop off ramp.

    1 project at $173,890.

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS
Traffic Division

CONTROL SECTION MILEAGE LOG

Form 1553

CONTROL 39041 COUNTY Kalamazoo

Revised 2-16-72 ROUTE(S) I-94 BL, US-131 BR, M-43

ROADWAY	SIGNAL	MILEAGE	CITY CODE	Area Type	
		03.375	85	8	Left Turn Channel from N. E. Bd. Michigan Avenue @ N. E. Bd. Stadium
2 @ 36'		03.386	85	8	S. W. Bd. Michigan @ S. W. Bd. Stadium Road (TL follows Michigan Avenue)
		03.469	85	8	Eddies Lane @ Michigan Avenue
	01	03.517	85	8	Lovell Street @ Michigan Avenue
	01	03.607	85	8	Oakland Drive and South Street @ Michigan Avenue
		03.703	85	8	Academy
75'	01	03.826	85	8	Jct. M-43, Main Street @ Michigan, Michikal and Elm Street Cross-over - Route Turns E.
					Begin E. Bd. Portion of One-way Pair
		03.867	85	8	Allen Blvd. @ Michigan
	01	04.008	85	8	US-131 BR Westnedge Avenue @ Michigan
					Michikal W. Bd. Portion of One-way Pair
36'		83.826	85	8	Jct. M-43, Main and Michigan @ Michikal
		83.896	85	8	Elm Street Cross-over @ Michikal
		84.118	85	8	Westnedge Avenue @ Michikal
		84.142	85	8	Kalamazoo @ Michikal
					Miscellaneous
		03.900			Holly's Restaurant
		03.990			Sunoco Gas Station
		03.990			St. "A" Church

Area blocked out above is being considered for possible safety improvements.

Exhibit A

C10173-123173 CONTROL-39041

DIST	CONTROL SECTION	MILEAGE	AREA LOC	DIRECTN V1	V2	DRIVER INTENT C1	C2	MSP ACC TYPE	ZVEH ACC TYPE	IMPACT PRIME	SECND	CIRCM STNCE	WEATH	SURF COND	ALIGN	DATE	HOUR OF OCCURENCE	ACC REPORT NUMBER	SEVERITY PD	KLD	INJC
C7	39041	C3.340	2 00	SE	SW	C5	C1	M-VEH	ANGLE	FRNT-L	FRONT	OTHER	CLEAR	DRY	STR	01 01 73	C1AM-02AM	009466			2
C7	39041	C3.340	2 00	SE	SW	C1	C1	M-VEH	ANGLE	FRNT-R	SIDE-R	D-EQP	CLEAR	WET	STR	01 10 73	C3PM-04PM	009467	X		
C7	39041	C3.340	2 99	SW		C1		FXOBJ		FRONT		LTG-D	CLEAR	WET	STR	02 02 73	02AM-03AM	C31357	X		
C7	39041	C3.360	2 99	E	E	C3	18	M-VEH	SS-SW	SIDE-R	SIDE-L	OTHER	CLEAR	WET	STR	12 22 73	C1PM-02PM	271344	X		
C7	39041	C3.370	2 00	NE	NE	C2	C1	M-VEH	SS-SW	SIDE-L	FRNT-R	OTHER	CLEAR	DRY	CURVE	01 14 73	07PM-08PM	C12198	X		
C7	39041	C3.370	2 00	SE	SE	C1	12	M-VEH	R-END	FRONT	REAR	OTHER	RAIN	WET	STR	04 18 73	10PM-11PM	C85622	X		
C7	39041	C3.370	2 00	E	NE	C5	12	M-VEH	OTHER	FRNT-R	REAR-L	OTHER	CLEAR	DRY	STR	02 01 73	07AM-08AM	C31358	X		
C7	39041	C3.370	2 00	NE	NE	C1	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	11 08 73	07AM-08AM	241591	X		
C7	39041	C3.370	2 00	E	E	C1	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	05 31 73	10PM-11PM	112306	X		
C7	39041	C3.370	2 00	NE	NE	C8	C1	M-VEH	SS-SW	FRNT-R	SIDE-L	OTHER	CLEAR	DRY	TRANS	11 11 73	06PM-07PM	245858	X		
C7	39041	C3.370	2 99	W		C1		BIKE	OTHER	FRNT-L		NONE	CLEAR	DRY	STR	08 28 73	03PM-04PM	187421			1
C7	39041	C3.370	2 99	NE	NE	07	C1	M-VEH	R-END	FRNT-L	SIDE-R	OTHER	CLEAR	ICE	CURVE	12 14 73	09AM-10AM	276239	X		
C7	39041	C3.370	2 00	E	SW	C1	01	M-VEH	ANGLE	REAR-L	FRNT-L	OTHER	CLEAR	DRY	CURVE	09 28 73	11PM-MDNT	206713	X		
C7	39041	C3.380	2 99	NE	NE	C1	01	M-VEH	SS-SW	FRNT-R	REAR-L	OTHER	CLEAR	DRY	STR	11 05 73	06PM-07PM	241588	X		
C7	39041	C3.380	2 00	SW	SW	C3	01	M-VEH	L-TRN	REAR-R	FRNT-L	OTHER	CLEAR	DRY	CURVE	05 07 73	01PM-02PM	097253	X		
C7	39041	C3.380	2 00	SW	SW	C3	C1	M-VEH	SS-SW	FRNT-R	REAR-L	OTHER	CLEAR	DRY	CURVE	11 28 73	08PM-09PM	254733	X		
C7	39041	C3.380	2 00	S	S	03	01	M-VEH	SS-SW	FRNT-R	SIDE-L	OTHER	SNOW	WET	STR	02 22 73	03PM-04PM	C49409	X		
C7	39041	C3.380	2 00	SW		01		FXOBJ		FRNT-L		OTHER	CLEAR	DRY	STR	08 20 73	11PM-MDNT	174599	X		
C7	39041	C3.390	2 99	NE	NE	C1	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	01 27 73	02PM-03PM	C26053			1
C7	39041	C3.390	2 99	NE	NE	18	01	M-VEH	R-END	FRNT-R	FRNT-L	SKID	CLEAR	ICE	STR	12 14 73	07AM-08AM	275109	X		
C7	39041	C3.410	3 99	SW		01		FXOBJ		FRONT		D-EQP	CLEAR	WET	STR	03 11 73	01AM-02AM	C53306	X		
C7	39041	C3.470	2 57	SW	SW	C1	05	M-VEH	R-END	FRONT	REAR	SKID	CLEAR	WET	STR	12 20 73	NOON-01PM	276141	X		
C7	39041	C3.480	2 99	S	S	12	18	M-VEH	R-END	REAR	FRONT	OTHER	CLEAR	DRY	STR	05 11 73	07AM-08AM	102601	X		
C7	39041	C3.490	2 57	N	N	04	18	M-VEH	PRKNG	SIDE-L	SIDE-R	OTHER	CLEAR	DRY	STR	05 26 73	09PM-10PM	114017	X		
C7	39041	C3.490	2 99	SW	SW	C1	C7	M-VEH	R-END	SIDE-L	REAR	SKID	RAIN	WET	STR	11 21 73	01AM-02AM	245260	X		
C7	39041	C3.490	2 71	SW	SW	03	12	M-VEH	R-END	FRNT-L	REAR	OTHER	RAIN	WET	STR	11 28 73	10AM-11AM	254730			1
C7	39041	C3.490	2 99	N	N	18	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	08 30 73	06AM-07AM	187572	X		
C7	39041	C3.500	2 99	E	E	C1	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	07 13 73	09AM-10AM	147888	X		
C7	39041	C3.500	2 99	NE	NE	C8	12	M-VEH	R-END	FRONT	REAR	ILL	CLEAR	DRY	STR	10 18 73	09PM-10PM	226947	X		
C7	39041	C3.500	2 99	W	W	C5	05	M-VEH	L-TRN	REAR-L	FRNT-R	OTHER	CLEAR	DRY	STR	06 07 73	01PM-02PM	121617	X		
C7	39041	C3.500	2 99	SW	SW	C5	C1	M-VEH	OTHER	REAR-R	FRNT-L	OTHER	CLEAR	WET	STR	09 22 73	10AM-11AM	201170	X		
C7	39041	C3.500	2 99	W	W	05	C5	M-VEH	SS-SW	SIDE-R	SIDE-L	OTHER	RAIN	WET	STR	10 12 73	03PM-04PM	214113	X		
	39041	C3.500	2 99	SW	NE	11	12	M-VEH	OTHER	REAR	FRONT	OTHER	SNOW	WET	STR	03 16 73	09PM-10PM	C58398	X		
	39041	C3.500	2 99	SW	SW	18	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	WET	STR	11 28 73	08AM-09AM	254732			2
	39041	C3.500	2 99	N	N	18	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	08 24 73	02PM-03PM	187568	X		
	39041	C3.500	2 99	E	E	05	C5	M-VEH	SS-SW	SIDE-R	FRNT-L	OTHER	CLEAR	WET	STR	11 02 73	05PM-06PM	244419	X		
	39041	C3.510	2 00	NE	NE	C6	C1	M-VEH	R-TRN	FRNT-L	FRNT-R	OTHER	CLEAR	WET	STR	01 17 73	10AM-11AM	C12197	X		
	39041	C3.510	2 00	W	W	05	05	M-VEH	SS-SW	FRNT-R	SIDE-L	OTHER	RAIN	WET	STR	10 29 73	04PM-05PM	224691	X		
	39041	C3.510	2 00	W	W	C1	C5	M-VEH	L-TRN	FRNT-R	SIDE-L	OTHER	RAIN	WET	STR	10 31 73	03PM-04PM	224627	X		
	39041	C3.510	2 00	NW	NW	05	05	M-VEH	L-TRN	FRNT-R	SIDE-L	OTHER	RAIN	WET	STR	07 28 73	02AM-03AM	156651	X		
	39041	C3.510	2 00	N	N	C1	C1	M-VEH	ANGLE	FRONT	SIDE-L	OTHER	CLEAR	WET	STR	11 21 73	01AM-02AM	245261	X		
	39041	C3.510	2 00	NW	NW	C1	C5	M-VEH	R-TRN	SIDE-R	REAR-L	OTHER	CLEAR	DRY	STR	06 25 73	03PM-04PM	139829	X		
	39041	C3.510	2 00	E	N	01	C5	M-VEH	ANGLE	FRNT-R	REAR-L	OTHER	CLEAR	WET	STR	01 24 73	08AM-09AM	C15738	X		
	39041	C3.510	2 00	E	W	05	05	M-VEH	L-TRN	SIDE-L	SIDE-R	NONE	CLEAR	DRY	STR	06 12 73	NOON-01PM	121614	X		
	39041	C3.510	2 00	W	W	01	C5	M-VEH	L-TRN	FRNT-R	FRNT-L	OTHER	CLEAR	DRY	STR	06 08 73	07PM-08PM	121615	X		
	39041	C3.510	2 00	E	W	C1	01	M-VEH	HD-ON	FRONT	FRNT-L	OTHER	CLEAR	DRY	STR	05 02 73	09PM-10PM	096569			1
	39041	C3.510	2 00	W	W	01	C5	M-VEH	L-TRN	REAR-R	FRNT-L	ILL	CLEAR	DRY	STR	05 11 73	01PM-02PM	102602	X		

Exhibit B-1

DIST	CONTROL SECTION	MILEAGE	AREA LOC	DIRECTN V1	DIRECTN V2	DRIVER INTENT C1	DRIVER INTENT C2	MSP ACC TYPE	2VEH ACC TYPE	IMPACT PRIMP	IMPACT SECND	CIRCM STNCE	WEATH	SURF COND	ALIGN	DATE	HOUR OF OCCURENCE	ACC REPORT NUMBER	SEVERITY PD	SEVERITY MLC	SEVERITY INJC
07	39041	03.510	2 00	N	N	01	05	M-VEH	L-TRN	FRNT-R	SIDE-L	OTHER	CLEAR	WET	STR	01 25 73	10AM-11AM	026819	X		
07	39041	03.510	2 00	N	SW	01	04	M-VEH	ANGLE	FRNT-R	REAR-L	OTHER	CLEAR	DRY	STR	03 22 73	04PM-05PM	058395	X		
07	39041	03.510	2 00	N		01		BIKE	OTHER	FRONT		NONE	CLEAR	DRY	CURVE	08 05 73	07PM-08PM	173281			1
07	39041	03.510	2 00	N	N	01	05	M-VEH	L-TRN	FRNT-R	FRNT-L	ILL	RAIN	WET	STR	05 22 73	01AM-02AM	110507	X		
07	39041	03.510	2 01	N	N	01	12	M-VEH	R-END	FRONT	REAR	OTHER	RAIN	WET	STR	04 09 73	11AM-NOON	078977	X		
07	39041	03.510	2 00	S	N	01	19	M-VEH	ANGLE	SIDE-L	FRNT-R	OTHER	CLEAR	DRY	STR	12 08 73	09PM-10PM	264121	X		
07	39041	03.510	2 00	N	N	19	01	M-VEH	ANGLE	FRNT-R	REAR-R	SKID	CLEAR	DRY	STR	11 11 73	02AM-03AM	254727	X		
07	39041	03.510	2 00	NE	N	01	01	M-VEH	ANGLE	FRNT-R	FRNT-R	OTHER	CLEAR	DRY	STR	11 03 73	09PM-10PM	244417			1
07	39041	03.510	2 00	SW	SW	01	05	M-VEH	L-TRN	SIDE-R	FRNT-L	OTHER	CLEAR	ICE	STR	01 09 73	05PM-06PM	009468	X		
07	39041	03.510	2 00	N	N	01	05	M-VEH	L-TRN	FRNT-R	SIDE-L	LIG-D	CLEAR	DRY	STR	09 29 73	NOON-01AM	206714	X		
07	39041	03.520	2 99	N	N	01	12	M-VEH	R-END	FRONT	REAR	OTHER	RAIN	WET	STR	11 15 73	10AM-11AM	245254	X		
07	39041	03.520	2 57	E	N	11	01	M-VEH	BCKNG	REAR	FRONT	OTHER	CLEAR	DRY	STR	06 25 73	02PM-03PM	139830	X		
07	39041	03.520	2 99	NE	NE	01	07	M-VEH	SS-SM	FRONT	REAR	RECKL	RAIN	WET	STR	10 12 73	02PM-03PM	214114			1
07	39041	03.520	2 99	SW	SW	18	12	M-VEH	R-END	FRONT	REAR	SKID	CLEAR	DRY	STR	09 30 73	05PM-06PM	206712			1
07	39041	03.530	2 99	SW	SW	01	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	11 20 73	06PM-07PM	245259	X		
07	39041	03.530	2 99	N		01		FXOBJ		FRONT		OTHER	CLEAR	WET	STR	01 26 73	02AM-03AM	026820			2
07	39041	03.530	2 99	N	N	12	01	M-VEH	R-END	REAR	FRONT	NONE	CLEAR	DRY	STR	08 24 73	07PM-08PM	187569	X		
07	39041	03.590	2 99	NE	NE	13	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	05 02 73	08PM-09PM	096574	X		
07	39041	03.590	2 99	NE	NE	01	12	M-VEH	R-END	FRONT	REAR	ILL	CLEAR	DRY	STR	10 10 73	04PM-05PM	214115	X		
07	39041	03.590	2 99	E	E	01	12	M-VEH	R-END	FRONT	REAR	OTHER	RAIN	WET	STR	10 31 73	11PM-MONT	229782	X		
07	39041	03.600	2 00	NE	E	08	01	M-VEH	ANGLE	FRNT-L	SIDE-R	OTHER	CLEAR	DRY	STR	04 17 73	06AM-07AM	082518	X		
07	39041	03.600	2 00	NE	NE	04	01	M-VEH	R-TRN	FRNT-R	REAR-L	OTHER	CLEAR	WET	STR	02 02 73	09AM-10AM	031356	X		
07	39041	03.600	2 00	SW	NE	01	19	M-VEH	ANGLE	SIDE-R	FRNT-R	OTHER	CLEAR	DRY	STR	10 11 73	03PM-04PM	214116	X		
07	39041	03.600	2 00	NE	N	01	05	M-VEH	ANGLE	FRNT-R	REAR-L	OTHER	CLEAR	DRY	STR	08 01 73	09AM-10AM	173282	X		
07	39041	03.600	2 00	N	NE	01	05	M-VEH	ANGLE	SIDE-L	REAR-R	OTHER	RAIN	WET	STR	08 08 73	07PM-08PM	173278	X		
07	39041	03.600	2 00	SE	SE	03	01	M-VEH	SS-SM	FRNT-R	SIDE-L	OTHER	CLEAR	DRY	STR	11 12 73	09AM-10AM	245860	X		
07	39041	03.600	2 00	E	E	01	01	M-VEH	SS-SM	FRNT-R	SIDE-L	OTHER	CLEAR	DRY	STR	08 23 73	03PM-04PM	187570	X		
07	39041	03.600	2 02	E	E	01	03	M-VEH	R-END	SIDE-R	FRNT-L	OTHER	CLEAR	DRY	STR	11 06 73	11PM-MONT	230405	X		
07	39041	03.600	2 00	E	E	01	05	M-VEH	L-TRN	REAR-R	FRNT-L	OTHER	CLEAR	DRY	STR	10 01 73	09AM-10AM	211342	X		
07	39041	03.600	2 00	SE	NE	01	01	M-VEH	ANGLE	FRNT-R	FRNT-L	OTHER	CLEAR	DRY	STR	09 24 73	02PM-03PM	206716	X		
07	39041	03.610	2 99	S	S	07	12	M-VEH	R-END	FRONT	REAR	OTHER	RAIN	WET	STR	05 08 73	04PM-05PM	097252	X		
07	39041	03.620	2 99	NE		01		FXOBJ		FRNT-R		OTHER	RAIN	WET	STR	04 30 73	MONT-01AM	094706			2
	39041	03.660	2 99	SW	SW	03	01	M-VEH	R-END	REAR-L	FRONT	OTHER	RAIN	WET	TRANS	09 17 73	06PM-07PM	195566			1
	39041	03.660	2 99	E	E	01	12	M-VEH	R-END	FRONT	REAR-L	OTHER	RAIN	WET	STR	08 23 73	11AM-NOON	182165			1
	39041	03.660	2 56	SE	SW	08	01	M-VEH	PRKNG	FRNT-L	SIDE-R	OTHER	CLEAR	DRY	STR	09 12 73	07AM-08AM	194150	X		
	39041	03.660	2 99	NE	NE	18	03	M-VEH	R-END	FRONT	REAR	SKID	CLEAR	DRY	STR	10 01 73	02PM-03PM	211343			1
	39041	03.700	2 00	W	E	12	01	M-VEH	ANGLE	SIDE-L	FRONT	NONE	CLEAR	DRY	STR	07 16 73	10AM-11AM	147885			2
	39041	03.700	2 00	W	S	01	01	M-VEH	ANGLE	FRONT	REAR-L	OTHER	CLEAR	DRY	STR	01 02 73	01PM-02PM	026697	X		
	39041	03.700	2 00	NE	NE	18	05	M-VEH	R-END	FRONT	REAR-L	SKID	SNOW	ICE	STR	12 10 73	04PM-05PM	269197	X		
	39041	03.700	2 00	E	NE	01	08	M-VEH	ANGLE	REAR-R	FRONT	OTHER	CLEAR	DRY	STR	04 04 73	11AM-NOON	073973	X		
	39041	03.700	2 00	SW	SE	01	01	M-VEH	ANGLE	SIDE-R	FRNT-L	OTHER	RAIN	WET	STR	11 15 73	02PM-03PM	245255	X		
	39041	03.700	2 00	E		04		BIKE	OTHER	FRNT-R		NONE	CLEAR	DRY	STR	11 17 73	NOON-01PM	245256			1
	39041	03.700	2 00	NE	NE	01	01	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	06 26 73	03PM-04PM	139827	X		
	39041	03.700	2 00	NE	NE	18	12	M-VEH	R-END	FRONT	REAR	SKID	RAIN	WET	STR	05 07 73	03PM-04PM	096571	X		
	39041	03.700	2 02	N	N	18	10	M-VEH	R-END	FRNT-R	REAR-L	SKID	CLEAR	WET	STR	10 12 73	07PM-08PM	214119	X		
	39041	03.700	2 02	E	E	11	05	M-VEH	PRKNG	REAR-L	SIDE-L	OTHER	CLEAR	DRY	STR	10 16 73	01PM-02PM	214117	X		
	39041	03.700	2 00	NE	NE	01	12	M-VEH	R-END	FRONT	REAR	OTHER	RAIN	WET	STR	04 30 73	NOON-01PM	094699			1

DIST	CONTROL SECTION	MILEAGE	AREA LOC	DIRECTN V1	DIRECTN V2	DRIVER INTENT C1	DRIVER INTENT C2	MSP ACC TYPE	2VEH ACC TYPE	IMPACT PRIMF	IMPACT SECND	CIRCM STNCE	WEATH	SURF COND	ALIGN	DATE	HOUR OF OCCURENCE	ACC REPORT NUMBER	SEVERITY PD	SEVERITY KLD	SEVERITY INJD
07	39041	03.700	2	00	E	N	01	01	M-VEH	ANGLE	SIDE-R	FRNT-L	OTHER	CLEAR	WET	STR	12 06 73	02PM-03PM	263120	X		
07	39041	03.700	2	00	S	N	05	01	M-VEH	L-TRN	FRNT-R	FRNT-L	OTHER	CLEAR	UNK	STR	12 12 73	03PM-04PM	263124	X		
07	39041	03.700	2	00	E	N	01	01	M-VEH	ANGLE	REAR-R	FRNT-L	OTHER	RAIN	WET	STR	12 25 73	02PM-03PM	271345	X		
07	39041	03.700	2	51	N		11		PKD-V		REAR-L		SKID	SNOW	ICE	STR	12 20 73	02AM-03AM	271342	X		
07	39041	03.710	2	99	N	NE	04	01	M-VEH	ANGLE	FRONT	REAR	OTHER	RAIN	WET	STR	09 21 73	04PM-05PM	201172	X		
07	39041	03.720	2	99	S	S	01	01	M-VEH	SS-SM	FRNT-L	FRNT-R	OTHER	CLEAR	DRY	STR	10 12 73	02AM-03AM	224643	X		
07	39041	03.730	3	56	SW	SW	04	01	M-VEH	PRKNG	REAR	FRONT	OTHER	CLEAR	WET	STR	12 28 73	03PM-04PM	28616Z	X		
07	39041	03.800	2	56	E	SW	11	04	M-VEH	PRKNG	REAR-L	SIDE-R	OBS-V	RAIN	WET	STR	03 29 73	03PM-04PM	068027	X		
07	39041	03.800	2	57	N	SW	11	04	M-VEH	PRKNG	FRNT-L	FRNT-R	OTHER	RAIN	WET	STR	09 25 73	02PM-03PM	201169	X		
07	39041	03.810	2	99	NE	NE	03	01	M-VEH	SS-SM	FRNT-L	FRNT-R	OTHER	CLEAR	DRY	CURVE	07 08 73	08PM-09PM	147890	X		
07	39041	03.810	2	57	SW	NW	01	12	M-VEH	PRKNG	FRNT-R	REAR-L	OTHER	CLEAR	DRY	CURVE	04 02 73	01PM-02PM	073972	X		
07	39041	03.810	2	99	NE	NE	01	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	02 16 73	05PM-06PM	038920	X		
07	39041	03.810	2	99	NE	NE	08	12	M-VEH	R-END	FRONT	REAR	OTHER	RAIN	WET	STR	01 18 73	08PM-09PM	012864	X		
07	39041	03.810	2	99	NE	NE	08	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	03 21 73	03PM-04PM	056396	X		
07	39041	03.810	2	99	NE	NE	01	12	M-VEH	R-END	FRONT	REAR-R	OTHER	RAIN	WET	STR	04 04 73	09PM-10PM	078979		1	
07	39041	03.810	2	99	NE	NE	01	07	M-VEH	R-END	FRONT	REAR	ILL	CLEAR	WET	STR	10 02 73	02PM-03PM	211344	X		
07	39041	03.810	2	99	N	N	01	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	WET	STR	01 05 73	01PM-02PM	009470	X		
07	39041	03.820	2	00	S	NE	05	04	M-VEH	L-TRN	REAR-R	FRNT-R	OTHER	CLEAR	WET	STR	09 22 73	08PM-09PM	201173	X		
07	39041	03.820	2	00	S	E	01	01	M-VEH	ANGLE	FRNT-R	FRNT-L	OTHER	CLEAR	DRY	STR	09 23 73	MONT-01AM	201254	X		
07	39041	03.820	2	00	NE	NE	01	01	M-VEH	SS-SM	SIDE-L	FRNT-R	OTHER	CLEAR	DRY	CURVE	11 06 73	09PM-10PM	241569	X		
07	39041	03.820	2	00	S	N	05	01	M-VEH	L-TRN	FRNT-R	FRNT-L	OTHER	CLEAR	DRY	STR	12 16 73	02PM-03PM	278234	X		
07	39041	03.830	2	99	E	E	03	01	M-VEH	SS-SM	SIDE-R	FRNT-L	OTHER	CLEAR	WET	CURVE	12 20 73	03PM-04PM	281241	X		
07	39041	03.840	2	56	N	E	05	01	M-VEH	PRKNG	REAR-L	FRNT-R	OTHER	CLEAR	DRY	STR	08 15 73	08AM-09AM	174597	X		
07	39041	03.850	2	99	E	E	03	01	M-VEH	SS-SM	FRNT-R	REAR-L	OTHER	CLEAR	DRY	STR	05 16 73	02PM-03PM	110481	X		
07	39041	03.860	2	00	E	E	05	01	M-VEH	L-TRN	SIDE-L	FRONT	OTHER	RAIN	WET	STR	04 04 73	04PM-05PM	073977	X		
07	39041	03.860	2	01	E		11		PKD-V		FRNT-R		OTHER	CLEAR	DRY	STR	10 11 73	11PM-MONT	224642	X		
07	39041	03.860	2	00	E	E	05	01	M-VEH	L-TRN	FRNT-L	SIDE-R	OTHER	CLEAR	DRY	STR	02 09 73	04PM-05PM	031360	X		
07	39041	03.860	2	00	E	E	03	01	M-VEH	SS-SM	FRNT-R	SIDE-L	LIG-D	RAIN	WET	STR	11 18 73	MONT-01AM	245855	X		
07	39041	03.860	2	00	E	E	18	07	M-VEH	R-END	FRONT	REAR	D-EQP	CLEAR	DRY	STR	01 03 73	03PM-04PM	009460		1	
07	39041	03.880	2	99	E		01		FXOBJ		FRNT-L		SKID	RAIN	WET	STR	04 19 73	01AM-02AM	094710	X		
07	39041	03.920	3	56	E	E	01	04	M-VEH	PRKNG	FRNT-R	REAR-L	OTHER	CLEAR	WET	STR	09 29 73	NOON-01PM	208830	X		
07	39041	03.940	3	56	E	E	03	02	M-VEH	R-END	FRNT-R	REAR-L	OTHER	CLEAR	DRY	STR	05 09 73	04PM-05PM	096027	X		
	39041	03.940	3	56	E	E	01	04	M-VEH	OTHER	SIDE-R	REAR-L	OTHER	RAIN	WET	STR	03 09 73	06PM-07PM	053913	X		
	39041	03.940	3	99	E		01		FXOBJ		SIDE-L		RFCKL	CLEAR	WET	STR	03 28 73	09PM-10PM	066908	X		
	39041	03.950	3	99	E	E	03	18	M-VEH	R-END	FRNT-R	REAR	OTHER	CLEAR	WET	STR	12 20 73	03PM-04PM	281242	X		
	39041	03.960	3	57	E	E	04	01	M-VEH	PRKNG	SIDE-R	FRNT-L	OTHER	CLEAR	DRY	STR	12 17 73	08AM-09AM	278233	X		
	39041	03.980	2	99	E	E	03	01	M-VEH	SS-SM	FRNT-L	FRNT-R	OTHER	CLEAR	DRY	STR	11 12 73	02PM-03PM	245854	X		
	39041	03.980	2	99	E	E	03	01	M-VEH	R-END	FRNT-L	REAR-R	OTHER	CLEAR	DRY	STR	06 24 73	08PM-09PM	139826	X		
	39041	03.980	2	99	E	E	03	01	M-VEH	R-END	FRNT-R	FRNT-L	OTHER	RAIN	WET	STR	09 28 73	09AM-10AM	206711	X		
	39041	03.980	2	99	E	E	03	01	M-VEH	SS-SM	FRNT-L	FRNT-R	OTHER	CLEAR	DRY	STR	09 02 73	04PM-05PM	194152		1	
	39041	03.990	2	99	E	E	18	12	M-VEH	R-END	FRNT-R	REAR-L	LIG-D	CLEAR	DRY	STR	04 14 73	10PM-11PM	082570	X		
	39041	03.990	2	99	E	E	08	08	M-VEH	SS-SM	FRNT-R	SIDE-L	OTHER	CLEAR	DRY	STR	10 18 73	11AM-NOON	226934	X		
	39041	03.990	2	99	E	E	07	12	M-VEH	R-END	FRONT	REAR	OTHER	CLEAR	DRY	STR	09 19 73	09PM-10PM	198468	X		
	39041	03.990	2	99	E	E	18	12	M-VEH	R-END	FRONT	REAR	D-EQP	CLEAR	DRY	STR	10 03 73	04PM-05PM	210408	X		
	39041	03.990	2	99	E	E	01	04	M-VEH	R-TRN	REAR-L	FRNT-R	NONE	CLEAR	DRY	STR	05 04 73	02PM-03PM	102965	X		
	39041	03.990	2	56	E	E	03	01	M-VEH	SS-SM	SIDE-L	FRNT-R	OTHER	CLEAR	DRY	STR	12 08 73	09AM-10AM	263125	X		
	39041	08.100	3	99	N		01		CTLRN		OTHER		D-EQP	CLEAR	DRY	STR	08 27 73	06PM-07PM	185710	X		

Exhibit B-3

STATE -WIDE	POP GROUP RL	POP GROUP -U	POP GROUP +U	DR	TOT ACC	DI	CONTROL SECTION	POB	POE	ACCIDENTS FAT	ACCIDENTS INJ	ACCIDENTS PD	ACCIDENTS WET	HWY-AREA-TYPE 1	HWY-AREA-TYPE 2	HWY-AREA-TYPE 3	HWY-AREA-TYPE 4	TOTAL D	TOTAL I	ACCIDENTS RL	ACCIDENTS -U	ACCIDENTS +U
34				29	63	9	63051	08.360	08.560		19	44	13		51	12			31		41	22
34				29	63	9	82081	11.890	12.050		25	38	22		57	6			47			63
34				29	63	9	82192	01.960	02.160		17	46	16		56	7			27			63
35				7	62	5	41131	13.600	13.780		12	50	35	48		14			17			62
35				8	62	8	81032	04.770	04.970		16	46	21		56	6			25	14		48
35				30	62	9	50011	09.940	10.120		12	50	18	7	51	4			25			62
35				30	62	9	63051	09.500	09.680		20	42	10		56	6			46		29	33
35				30	62	9	82211	08.890	09.080	1	16	45	8		57	5		1	24			62
36				8	61	5	41051	00.900	01.060	1	15	45	20		43	18		1	27			61
36				31	61	9	77032	03.890	04.090		9	52	12		50	11			12			61
36				31	61	9	77032	04.100	04.300		7	54	7		48	13			10			61
36				31	61	9	82053	01.780	01.960		31	30	19	2	43	16			49			61
37				9	60	5	41063	00.000	00.200		13	47	19		40	20			16			60
This location currently under investigation for possible safety improvements.																						
37				8	60	7	39041	03.490	03.690		12	48	26		60				15			60

Exhibit C

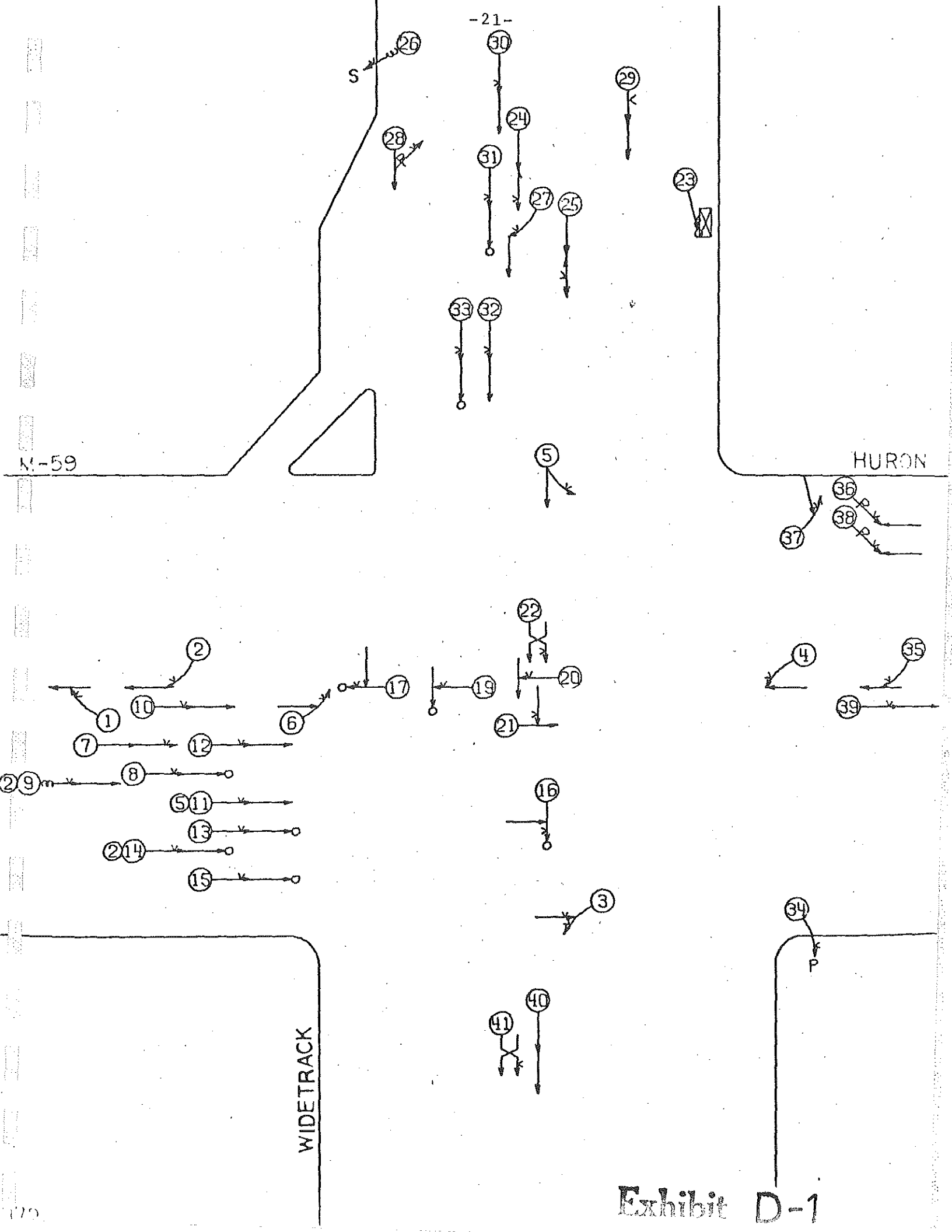


Exhibit D-1

PLAN NO. 50119 SUPPLEMENT TO COLLISION DIAGRAM DATE 8JUL74

CONTROL SECTION 63041 MP 20.800 - 20.840

CONTROL SECTION 63201 MP 1.603 - 1.650

ACC. NO.	CONT. SEC.	MILE. PT.	ACCID. RPT.NO.	DATE	DAY	TIME	SEVERITY K	SEVERITY I	SEVERITY PD	LIGHT COND.	PAVMT. COND.	HAZ. ACT.	TOT. VEH.	OBJ. HIT
1	63041	20.810	298276	2-15-72	TUE	NOON-01PM	0	0	X	DAY	UNK	N-YLD	2	
2	63041	20.810	260879	1-10-72	MON	05PM-06PM	0	0	X	DSL	WET	N-YLD	2	
3	63041	20.830	180351	11-22-72	WED	08AM-09AM	0	0	X	DAY	WET	I-TRN	2	
4	63041	20.830	161575	10-26-72	THU	03PM-04PM	0	0	X	DAY	DRY	I-TRN	2	
5	63041	20.830	24084	4-20-72	THU	06PM-07PM	0	0	X	DAY	DRY	I-TRN	2	
6	63041	20.830	33740	5- 5-72	FRI	10AM-11AM	0	0	X	DAY	DRY	I-TRN	2	
7	63041	20.810	220097	12-24-72	SUN	MDNT-01AM	0	0	X	DSL	WET	L-CTR	2	
8	63041	20.810	321293	3-10-72	FRI	08AM-09AM	0	1	X	DAY	WET	CLOSE	3	
9	63041	20.820	112277	8-27-72	SUN	03PM-04PM	0	0	X	DAY	WET	CLOSE	2	
9	63041	20.810	204951	12-13-72	WED	NOON-01PM	0	0	X	DAY	WET	FAST	2	
10	63041	20.820	260868	1- 6-72	THU	06AM-07AM	0	0	X	DSL	DRY	FAST	2	
11	63041	20.820	154524	10-21-72	SAT	09PM-10PM	0	0	X	DSL	WET	CLOSE	2	
11	63041	20.820	130578	9-21-72	THU	10PM-11PM	0	0	X	DSL	DRY	FAST	2	
11	63041	20.820	33742	5- 1-72	MON	05PM-06PM	0	0	X	DAY	WET	FAST	2	
11	63041	20.830	104690	8-18-72	FRI	02PM-03PM	0	0	X	DAY	DRY	CLOSE	2	
11	63041	20.820	80352	7- 5-72	WED	06PM-07PM	0	0	X	DAY	DRY	FAST	2	

Exhibit D-2

PLAN NO. 50119 SUPPLEMENT TO COLLISION DIAGRAM DATE 4JUL74

CONTROL SECTION 63041 MP 20.800 - 20.840

CONTROL SECTION 63201 MP 1.603 - 1.650

ACC. NO.	CONT. SEC.	MILE. PT.	ACCID. RPT.NO.	DATE	DAY	TIME	SEVERITY K	SEVERITY I	SEVERITY PD	LIGHT COND.	PAVMT. COND.	HAZ. ACT.	TOT. VEH.	OBJ. HIT
12	63041	20.820	79503	7-15-72	SAT	02PM-03PM	0	0	X	DAY	DRY	I-BCK	2	
13	63041	20.820	289684	1-28-72	FRI	05PM-06PM	0	1	X	DAY	WET	CLOSE	2	
14	63041	20.820	315484	3- 6-72	MON	11PM-MONT	0	1	X	DSL	WET	FAST	2	
14	63041	20.820	20075	4- 8-72	SAT	05PM-06PM	0	1	X	DAY	DRY	CLOSE	2	
15	63041	20.820	20051	4- 5-72	WED	07AM-08AM	0	1	X	DAY	WET	FAST	2	
16	63041	20.830	180348	11-24-72	FRI	05PM-06PM	0	1	X	DSL	DRY	N-YLD	2	
17	63041	20.830	176275	11-18-72	SAT	04PM-05PM	0	3	X	DAY	DRY	N-YLD	2	
18	63041	20.830	154523	10-14-72	SAT	06AM-07AM	0	2	X	DUS	DRY	SLOW	2	
19	63041	20.830	206218	12- 9-72	SAT	03PM-04PM	0	1	X	DAY	WET	N-YLD	2	
20	63041	20.830	321225	3-17-72	FRI	01PM-02PM	0	0	X	DAY	WET	N-YLD	2	
21	63041	20.830	119414	9- 8-72	FRI	07AM-08AM	0	0	X	DAY	WET	N-YLD	3	
22	63041	20.830	260870	1-13-72	THU	10PM-11PM	0	0	X	DSL	ICE	L-CTR	2	
23	63201	1.620	293010	2- 4-72	FRI	NOON-01PM	0	1	X	DAY	WET	L-CTR	1	2
24	63201	1.630	154586	10-16-72	MON	09AM-10AM	0	0	X	DAY	DRY	I-BCK	2	
25	63201	1.640	68657	6-29-72	THU	NOON-01PM	0	0	X	DAY	DRY	I-BCK	2	
26	63201	1.620	286646	1-23-72	SUN	03PM-04PM	0	0	X	DAY	WET	FAST	1	S

Exhibit D-3

PLAN NO. 50119 SUPPLEMENT TO COLLISION DIAGRAM DATE 4JUL74

CONTROL SECTION 63041 MP 20.800 - 20.840

CONTROL SECTION 63201 MP 1.603 - 1.650

ACC. NO.	CONT. SEC.	MILE. PT.	ACCID. RPT.NO.	DATE	DAY	TIME	SEVERITY K	I	PD	LIGHT COND.	PAVMT. COND.	HAZ. ACT.	TOT. VEH.	OBJ. HIT
27	63201	21.680	279785	7-18-72	TUE	06PM-07PM	0	0	X	DAY	DRY	FAST	2	
28	63201	21.630	176199	11-11-72	SAT	03PM-04PM	0	0	X	DAY	DRY	1-BCK	2	
29	63201	21.620	120017	14-11-72	TUE	NOON-01PM	0	0	X	DAY	DRY	CLOSE	2	
30	63201	21.620	149520	10- 6-72	FRI	09AM-10AM	0	0	X	DAY	DRY	FAST	2	
31	63201	21.620	130582	9-21-72	THU	09AM-10AM	0	1	X	DAY	DRY	FAST	2	
32	63201	21.640	161585	10-23-72	MON	06AM-07AM	0	0	X	DUS	WET	FAST	2	
33	63201	21.640	298191	18- 1-72	TUE	10AM-11AM	0	2	X	DAY	DRY	CLOSE	2	
34	63041	20.840	161581	10-29-72	SUN	09PM-10PM	0	0	X	DSL	DRY	FAST	1	P
35	63041	20.840	170024	11- 3-72	FRI	NOON-01PM	0	0	X	DAY	DRY	N-YLD	2	
36	63041	20.840	183855	11-29-72	WED	10AM-11AM	0	0	X	DAY	DRY	N-YLD	2	
37	63041	20.840	315476	3- 7-72	TUE	08PM-09PM	0	0	X	DNL	DRY	L-CTR	2	
38	63041	20.840	130751	9-14-72	THU	NOON-01PM	0	0	X	DAY	DRY	N-YLD	2	
39	63041	20.840	130579	9-21-72	THU	10AM-11AM	0	0	X	DAY	DRY	FAST	2	
40	63201	1.660	291346	2- 8-72	TUE	05PM-06PM	0	0	X	DAY	DRY	NONE	2	
41	63201	1.660	324187	3-22-72	WED	11AM-NOON	0	0	X	DAY	DRY	L-CTR	2	

SUMMARY

SEVERITY -	TOTAL	46	FTL.	0(0)	INJ.	11 (14)	PD.	35		
PVMT.COND. -	DRY	27	WET	17	ICE	1	UNKN.	1		
LIGHT COND. -	DAY	35	DUSKY	1	DK-SL	9	DK-NL	1	UNKN.	0

Exhibit D-4

APPENDIX

FISCAL YEAR 1972-73 PROJECTS

HIGHWAY SAFET. IMPRO. MEN ROJ S
(FINANCED WITH STATE FUNDS ONLY)

FROM July 1 TO Sept. 30, 72

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
780	M-150 FAP	At Wattles Road City of Troy, Oakland County C.S. 63131	Widening from 2 to 4 lanes	Continued increases in approach volumes and a persistent right angle accident pattern (18 of 50 accidents, 1968 through 1970) required additional approach lanes for signal control	126,998
807 808 787	US-23 FAP	At Bare Point Rd. At Diamond Point Drive At Werth Road Alpena Co. C.S.04031	NB Passing Flare NB Passing Flare Teeing of Wye intersection	Heavy turn demand by motorist wishing to go to the western portion of the City of Alpena	93,379
811	US-12 FAS	At M-66(CentrevilleRd) City of Sturgis St. Joseph County C.S. 78022	Widening from 4 to 5 lanes	Considerable delay to motorists trapped behind left turning vehicles and 11 head on left turn accidents of 32 total accidents	77,364
885	US-27BR FAP	At M-46 Pine River Twp. Gratiot County C.S. 29031	Widening from 4 to 5 lanes and transition from 2 to 5 lanes for signal control.	Heavy left turn demand and high severity rate. Eight year history 1963 through 1970, shows 102 total accidents with 4 fatal accidents resulting in 7 fatalities and 52 injury accidents resulting in 106 injuries.	187,888
899	NB M-39 FAP	At NB US-10 City of Southfield Oakland Co. C.S. 63081	Skidproofing	Four and one half year accident history shows 66% wet surface accidents. Wet sliding friction values range from a low of 0.27 to a high of 0.32	21,858
919	US-25BR FAP	At Black River Bascule Structure City of Port Huron St. Clair Co. C.S. 77032	Traffic gates	Alert traffic of a bridge opening	46,217

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(FINANCED WITH STATE FUNDS ONLY)

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
962	BL-94 FAP	From 10th St. to Colfax St. City of Benton Harbor Berrien County C.S. 11013	Skidproofing	Average WSF values of .27 and 36% wet surface accidents	20,858
963	US-33 FAP	At Park St. City of St. Joseph Berrien Co. C.S. 11053	Skidproofing	Average WSF values of .31 and 62% wet surface accidents	15,364
967	SB US-24 FAP	At 10 Mile Road City of Southfield Oakland Co. C.S. 63031	Skidproofing	During 1970 & 71 16 of 31 (51.6%) of SB accidents occurred on wet surface. Average WSF value of .35	42,780
986	NB US-10 FAP	At Northland Exit gore City of Southfield Oakland Co. C.S. 82104	Impact attenuator	Errant vehicle protection	16,158
	Davison Freeway WB	At Oakland St. Exit gore City of Detroit Wayne Co. C.S. 82104	Impact Attenuator	Errant vehicle protection	20,390
1011	M-36 FAP	Center to Sycamore St. City of Mason Ingham Co. C.S. 33021	Widen from 2 to 4 lanes	To provide additional capacity through a commercially developed area	82,588
1013	M-115 FFH	At E & W Jcts. of M-37 Village of Mesick Wexford Co. C.S. 83012	Passing flare and curbing	Turning traffic	11,292

STATE OF MICHIGAN
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HIGHWAY SAFETY IMPROVEMENT PROJECTS
(FINANCED WITH STATE FUNDS ONLY)

PERIOD FROM July 1 TO Sept30'72

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1018	I-94 FAI	From Wiard Rd. Westerly 1 mile Washtenaw Co. C.S. 81041	Median Guardrail	Narrow median (36 ft.) and cross median accident potential	42,434
1030	M-54 FAP	S. of Davison Rd. City of Flint Genesee Co. C.S. 25072 LWA 0-716-2	Remove median islands	Improve traffic operations	4,000
1030	M-21 FAP	At Black River Ottawa County C.S. 70023 LWA 0-718-2	Median Guardrail installation	Errant vehicle protection	4,500
1030	US-2 FAP	At Jackson St. Gogebic Co. C.S. 27021 DWA 1-702-2	Increase radius NW quad	Improve traffic operation	322
1030	US-2 FAP	At Co. Rd. 1.3 miles west of M-149 Schoolcraft County C.S. 49025 DWA 2-703-2	Install guard posts	Roadside control	400
1030	I-75 FAI	At Graham St. City of St. Ignace Mackinac County C.S. 49025 DWA 2-704-2	Install guard posts	Roadside control	120
1030	M-201 FAP	At 6th Street City of Northport Leelanau Co. C.S. 45091 DWA	Grading of clear vision area	Sight restriction	305

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PERIOD
FROM July 1 TO Sept 30 '72

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030	US-131 FAP	At Evergreen St. Kalkaska Co. C.S. 40012 DWA 3-702-2	Place of precast curb	Roadside control	150
1030	M-22 FAS	At Portage Point Rd. Manistee Co. C.S. 51031 DWA 3-703-2	Install guardposts	Roadside control	270
1030	M-22 FAS	At Lake Leelanau Leelanau Co. C.S. 45013 DWA 3-704-2	Replace cable guardrail	Repair of cable guardrail was required so it was replaced with current standard beam guardrail	814
1030	M-20 FAS	At 3rd Street City of Big Rapids Mecosta County C.S. 54022 DWA 5-701-2	Increase radius	Improve traffic operation	980
1030	US-131 RAP	At Pere Marquette St. City of Big Rapids Mecosta County C.S. 54012 DWA 5-702-2	Increase radius and remove driveway	Improve traffic operation	777
1030	M-46 FAP	At Getty St. City of Muskegon Muskegon County C.S. 61022 DWA 5-703/4-2	Drill holes and erect pedestrian chain barrier	Restriction of pedestrian movements	810
1030	M-13 FAP	At Coggins Road Bay County C.S. 09033 DWA 6-705-2	Erect guardrail	Errant vehicle protection	950

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(FINANCED WITH STATE FUNDS ONLY)

PERIOD FROM July 1 TO Sept. 30'72

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030	M-46 FAP	0.5 miles east of Townline Road Saginaw County C.S. 73063 DWA 6-706-2	Passing flare	Increased traffic demands for eastbound to northbound left turn	2,000
1030	I-94 FAI	At 40th Street Kalamazoo County C.S. 39025 DWA 7-723-2	Shorten guardrail and place end treatment	Removal of fixed object	200
1030	M-60 FAP	At White Temple Rd. Cass County C.S. 14062 DWA 7-724-2	Fencing	Roadside control at clear vision area.	210
1030	M-37 FAP	At MidVilla Barry County C.S. 08032 DWA 7-725-2	Erect guardposts	Roadside control to prohibit parking on right-of-way	160
1030	M-43 FAS	At Orchard Lake Rd. Barry County C.S. 08011 DWA 7-726-2	Pave roadside island	Eliminate ponding of water in island	125
1030	M-51 FAP	At Wheeler St. Village of Decatur Van Buren County C.S. 80071 DWA 7-727-2	Erect guardposts	Roadside control to prohibit angle parking on right-of-way.	150
1030	M-140 FAP	At 32nd Avenue Van Buren County C.S. 80031 DWA 7-728-2	Erect guardposts and fencing.	Roadside control of clear vision area.	425
1030	M-40, 89 FAP	At Monroe Road Allegan County C.S. 03072 DWA 7-729-2	Place precast curbing	Close illegal driveway	200

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(FINANCED WITH STATE FUNDS ONLY)

PERIOD
FROM July 1 TO Sept. 30'72

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030	I-94 FAI	At Lovers Lane City of Portage Kalamazoo County C.S. 39022 DWA 7-730-2	Extend R.O.W. fence	Prohibit illegal entry onto the freeway	100
1030	US-12 FAP	At Blakeslee St. Village of Galien Berrien County C.S. 11021 DWA 7-731-2	Erect guardpost	Roadside control of driveway	250
1030	I-196 US-31 FAI	South of M-140 approx. 1 mile Van Buren County C.S. 80012 DWA 7-733-2	Remove crossover	Not required for maintenance or emergency purposes	125
1030	US-12 FAP	At Garfield Road Branch County C.S. 12021 DWA 7-734-2	Erect guardposts	Roadside control	300
1030	M-89 FAP	At 6th St. and 103rd Avenue Allegan County C.S. 03024 DWA 7-735-2	Passing flares	Increased turning demand on two-lane two-way trunkline	2,450
1030	M-89 FAP	At Lake Doster Road and 1st Street Allegan County C.S. 03024 DWA 7-736-2	Passing flares and a right turn lane	Increased turning demand on two-lane two-way trunkline	1,950
1030	US-223 FAP	At Monroe St. City of Blissfield Lenawee County C.S. 46062 DWA 8-707-2	Increase radius and approach width.	Improve traffic operation	3,247

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PERIOD: FROM July 1 TO Sept. 30'72

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030	I-75 FAI	SB Service Drive at Dallas City of Royal Oak Oakland County C.S. 63174 DWA 9-704-2	Guardrail erection	Errant vehicle protection	4,360
1030	US-10BR FAP	Wide Track Drive @ BL-75 (Perry St.) City of Pontiac Oakland County C.S. 63201 DWA 9-705-2	Pedestrian barrier chain	Prohibit hazardous pedestrian movement	655
1030	M-53 FAP	At Gates Street Village of Romeo Macomb County C.S. 50012 DWA 9-706-2	Erect guardrail		393

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PERIOD: FROM October 1 TO Dec. 31'72

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
929	M-46 FAP	At Miller Road Saginaw County C.S. 73062	Widening from 4 to 5 lanes	During 1969 & 1970 twenty-four total accidents occurred of which eleven (46%) west left turn related	95,181
865	M-37 FAP	From Coventry St. to 4 Mile Road City of Walker Kent County C.S. 41033	Widening from 4 to 5 lanes	Commercial development and the need for signalization at 4 Mile Road	197,539
1024	M-15 FAP	At Goodrich Hospital Genesee County C.S. 25091	Passing flare	Heavy left turn demand on a two-lane two-way trunkline	3,000
914	M-28 FAP	At Hulbert Road Chippewa County C.S. 17061	Right turn taper and intersection curbing	Moderate right turn demand and delineation of intersection and increased radii	6,483
1019	M-134 FAS	At Hill Island Road Mackinac County C.S. 49041	Grade lift	Improve sight distance	19,780
1020	US-2 FAP	At Danforth Road City of Escanaba and from C&NWRR N'ly 0.8 miles, Wells Twp. Delta County C.S. 21022	Intersection flaring with curbing	Delineate intersection and provide two-lane approach	38,964
			Pave median area	Provide continuous center lane for left turns	
1021	US-41 FAP	At Co. Rd. 563 Menominee County C.S. 55022	Intersection flaring with curbing	Delineate intersection and provide adequate radii	1,623
1022	US-2 FAP	At Hermansville Road and at Vega Road Menominee County C.S. 55021	Intersection flaring with curbing	Delineate intersection and provide adequate radii	3,235

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PERIO
FROM October 1 TO Dec.31'72

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
955	US-2, 41 FAP	At Bay De Noc Comm. College, City of Escanaba Delta County C.S. 21022	Median left turn lane	Heavy left turn demand at the main entrance to the college could disrupt through traffic	6,292
997	M-53 FAP	At 18 Mile Road City of Sterling Heights Macomb County C.S. 50011	Directional crossover	Prohibition of EB to NB and SB to EB left turn movements at the intersection. A total of 72 accidents in 1969 and 1970	70,175
566	US-12 FAP	At M-50 (Cambridge Jct.) Lenawee County C.S. 46081	Widening from 2 to 5 lanes	Development of a large traffic generator required 5 lanes on all approaches to accommodate left turning demand	392,348
1028	M-35 FAP	At 5th Street City of Escanaba Delta County C.S. 21031	Intersection realignment	North and south legs of 5th St. were offset 134. South leg was realigned to form a common intersection with the north leg 16 accidents in 1969 & 1970 resulting in 17 injuries and 2 fatalities	2,540
1030	US-127 FAP	0.5 miles S. of I-96 Delhi Twp. Ingham County C.S. 33035 LWA 0-719-2	Modernize and extend guardrail with drum end-treatment	Errant vehicle protection	2,500
1030	US-10 FAP	At Jebavy Road City of Ludington Mason County C.S. 53021 LWA 0-720-2	Right turn lane	Right turning traffic was causing delays to through traffic	5,500
1030	M-35 FAS	300 ft. south of County Road 456 Village of Little Lk. Marquette County DWA 1-703-2	Extend Guardrail	Errant vehicle protection	156

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PERIOD 10
FROM October 1 TO Dec. 31'72

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030	US-41 FAP	4 miles N. of Baraga Baraga County C.S. 07013 DWA 1-704-2	Erect guardrail	Errant vehicle protection from shoreline erosion	643
1030	M-22 FAS	At Co. Rd. 598 Village of Onekama Manistee County C.S. 51031 DWA 3-705-2	Right turn flaring with curbing	Roadside control to delineate intersection	1,500
1030	US-31 M-68 FAP	At McDonald's Drive City of Petoskey Emmet County C.S. 24011 DWA 4-701-2	Curb construction	Roadside control	750
1030	US-31 FAP	N. of Rothbury St. Village of Grant Oceana County C.S. 64011 DWA 5-705-2	Erect guardrail	Roadside control	600
1030	M-21 FAP	E. of 120th Ave. City of Holland Ottawa County C.S. 70023 DWA 5-706-2	Widen median crossover	Accommodate turning radius of commercial vehicles	1,184
1030	M-37 FFH	400 ft. N. of M-82 City of Newaygo Newaygo County C.S. 62031 DWA 5-707-2	Erect guardrail	Roadside control of driveway	600
1030	M-13 FAP	At 2 Mile Road Monitor Twp. Bay County C.S. 09033 DWA 6-707-2	Erect guardrail	Roadside control of driveway	625

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PERIOD FROM October 1 TO Dec. 31

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030	M-46 FAP	Between Warren and Holland Sts. City of Saginaw Saginaw County C.S. 73063 DWA 6-708-2	Thermoplastic pavement markings	More durable markings	317
1030	M-54 FAP	At Coldwater Road (Relocated) Genesee Co. C.S. 25072 DWA 6-709-2	Passing flare (concrete)	NB to WB left turn demand	9,963
1030	US-12 FAP	From Smith to Barker Sts. City of New Buffalo Berrien County C.S. 11011 DWA 7-739-2	Precast curb	Roadside control of parking	340
1030	M-40 FAP	At 1st Avenue Pine Grove Twp. Van Buren County C.S. 80072 DWA 7-740-2	Remove culvert head wall and install sloped end section	Improve radii for school bus traffic	350
1030	M-89 FAP	At 37th Street Ross Twp. Kalamazoo Co. C.S. 39102 DWA 7-741-2	Increase radius	Improve traffic operation	175
1030	M-43 FAP	At Co. Rd. 665 Waverly Twp., Van Buren Co. C.S. 80042 DWA 7-742-2	Erect guardposts	Roadside control of driveway	410

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PERIO 12
FROM October 1 TO Dec. 31'7

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030	M-43 FAP	At Brynford Ave. City of Lansing Ingham County C.S. 33061 DWA 7-744-2	Insert plastic inserts in fence to a height of 3 feet	Protect pedestrians from roadway debris (water, stones, etc.)	150
1030	US-31, 33 FAP	At Hinchman Road Oronoko Twp. Berrien Co. C.S. 11052 DWA 7-745-2	Passing flare	Heavy NB to WB left turn demand on a two-lane two-way trunkline	1,200
1030	I-96, M-78 FAI	E. of Creyts Rd. Windsor Twp., Eaton County C.S. 23151 DWA 7-746-2	Relocate crossover 2200 feet easterly	Existing crossover was located at the easterly limit of a curve and was constituting a hazard by its location and illegal usage (7 accidents).	750
1030	US-131 FAP	At Washington St. Village of Constantine St. Joseph County C.S. 78012 DWA 7-748-2	Relocate guardrail	Guardrail was located to close to through traffic lane and was off-set an additional three feet.	300
1030	US-131 FAP	Between Garden and Spring Streets, Village of Constantine St. Joseph Co. C.S. 78012 DWA 7-749-2	Erect guardposts	Roadside control of driveway	125
1030	US-12 FAP	0.3 mi. W. of Union Rd Mason Twp. Cass County C.S. 14042 DWA 7-750-2	Erect guardposts	Roadside control of driveways	300

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HIGHWAY SAFETY IMPROVEMENT PROJECTS
(FINANCED WITH STATE FUNDS ONLY)

PERIOD FROM October 1 TO Dec. 31'72

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030	BL-94	Between Columbia and Dickman Roads Battle Creek Twp. Calhoun County C.S. 13121 DWA 7-751-2	Erect fencing	Closure of illegal access to limited access trunkline	215
1030	I-94 FAI	E. of Wilson Road New Buffalo Twp. Berrien County C.S. 11014 DWA 7-752-2	Relocate crossover 900 feet westerly	Existing crossover location and minimal sight distance for use by authorized vehicles	250
1030	I-94 FAI	Near Park Road Coloma Twp. Berrien County C.S. 11017 DWA 7-753-2	Relocate crossover 3500 feet westerly	Existing crossover location had minimal sight distance for use by authorized vehicles	250
1030	M-89 FAP	At 46th Street Ross Twp. Kalamazoo County C.S. 39102 DWA 7-755-2	Right turn lane	Right turning vehicles causing through traffic disruption	800
1030	M-52 FAP	Winter at M-52 (Main) City of Adrian Lenawee County C.S. 46072 DWA 8-708-2	Channelizing island	Improve traffic operation	435
1030	BL-96 FAP	At Baker St., Hazel St. and I-496, City of Lansing Ingham County C.S. 33032/33 DWA 8-709-2	Artificial median green surfacing (Ceramascape)	Eliminate maintenance problem and possible sight restriction	991

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030	M-143 FAP	At Clippert St. City of Lansing Ingham County C.S. 33062 DWA 8-711-2	Artificial surfacing of traffic control island with Ceramascape	Eliminate maintenance problem and possible sight restriction	311
1030	US-27 FAP	N. of Douglas Street City of Lansing Ingham County C.S. 33032 4 DWA 8-710-2	Artificial surfacing of traffic control island Ceramascape	Eliminate maintenance problem and possible sight restriction	206
1030	US-24 FAP	At Glendale St. Redford Twp. Wayne County C.S. 82053 DWA 9-707-2	Temporary closure of crossover	Awaiting installation of traffic signal at Glendale	524
1030	I-75 FAI	At off ramp to University Dr. Pontiac Twp. Oakland County C.S. 63172 DWA 9-708-2	Install Traf-Flex A Post traffic island	Improve traffic operation	600
1030	M-85 FAP	S. of Sibley Road City of Trenton Wayne County C.S. 82211 DWA 9-709-2	Install guardrail	Errant vehicle protect from a large quarry which parallels the roadway for approx. 1800+ feet.	24,250
1030	US-25 FAP	At Lakeport State Pk. Burtchville Twp. St. Clair County C.S. 77033 DWA 9-710-2	Erect guardposts	Roadside control and delineation of park entrance	1,183
1030	M-1 FAP	At 12 Mi. & Lincoln City of Royal Oak Oakland County C.S. 63051 DWA 9-711-2	Erect pedestrian chain	Delineation of pedestrian cross-walk through median areas	1,514

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FROM Jan.1, 1973 TO Mar.31, '7

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
964P	BL-94EB FAP	Mich. Ave. at Westnedge City of Kalamazoo Kalamazoo County C.S. 39041	Skidproofing	Low WSF value 0.34 Aug. (1971) 1971 total accidents 31 wet surface 15/48%	36,275
965P	BL-94WB FAP	Kalamazoo Ave. from Church to Pitcher City of Kalamazoo Kalamazoo County C.S. 39042	Skidproofing	Low WSF value 0.36 Aug. 1971 1971 total accidents 96 wet surface 39/44%	
1002R	BS-96WB FAP	Grand River Ave. @ Middlebelt Rd. Farmington Twp. Oakland County C.S. 63022	Directional Crossover for WB to SB and SB to EB left turns	Heavy left turn movements through median crossover (1700+) have caused one half mile back ups on N. leg of Middlebelt Road based on a 1971 Peak Period count. 29 intersectional accidents in 1970	32,124
999R	BL-75 FAP	Perry from Arlene to Cameron, City of Pontiac, Oakland County, C.S. 63091	Center lane for Left Turns (4 to 5 lane)	Extensive commercial development has created left turn demands that cannot be handled by median crossovers (median 16 ft. wide). It therefore became necessary to provide a continuous center lane for left turns. 114 total accidents 28 left turn 1970&71	79,675
1000R	BL-75 FAP	Perry at Howard City of Pontiac Oakland County C.S. 63091			
1003R	US-24 FAP	Telegraph @ Pennsylvania, City of Taylor and Brownstown Township, Wayne County C.S. 82052	Center Lane for Left Turns (4 to 5 lanes	In 1971 twenty one accidents occurred at this intersection with 19 accidents being of the head-on left turn type	73,303

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FROM Jan. 1, 1973 TO Mar. 31'73

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
930R	US-2,41 FAP	From County Road 426 to the Escanaba River C.S. 21022	Median barrier and directional crossovers at County Road 426	Cross-median accidents on wet pav't surface (Avg. WSF value .48 Accident data from Jan. 1, 1970 to July 1, 1972,23 accidents in narrow median area with 9 cross-median accidents resulting in three deaths. 16 at the intersection.	199,360
922R	M-66 FAP	At B Drive North (Beckley Rd.), Battle Creek Twp., Calhoun County C.S.13031	Realignment of two-lane two-way to four-lane divided transition.	Confusion of a definite stopping point on the crossroad and a high percentage of right angle type accidents. Realignment allowed for a center left-turn lane. 1969&70-14 accidents-8 angles 1 killed-13 injured	84,484
854R	M-11 FAP	28th St. from Highgate to Buchanan, City of Wyoming, Kent County C.S. 41062	Skidproofing	Low WSF value. Average of all lanes through the area is .36 1969-71 426 accidents with 119 wet surface (27.9%).	43,479
932R	US-131 FAP	At BL-94, US-131 BR Stadium Drive, City of Kalamazoo, Kalamazoo County C.S. 39014	Teeing of NB US-131 Exit Ramp to BL-94, US-131 BR and flaring W. leg of the 12th St. intersection adjacent to the ramp.	Removal of exit ramp merge to allow for signal installation. 1969-70 eighteen of thirty-two would be correctable by a signal	61,680
891R	BL-94 FAP	At Elm, City of Battle Creek, Calhoun County C.S. 13061	Right turn lane in the NE Quad.	Present operation allows for right turn on red but thru traffic blocks the right turns because of two lane operation. 1969 & 70 - eight of fifteen accidents on E. leg were right turn associated	17,224

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PERIOD
FROM Jan. 1, 1973 TO Mar.31,'7[illegible]

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
386L	US-10	At southbound entrance to Northland Shopping Center, City of Southfield, Oakland County C.S. 63081	Impact Attenuator	Protect from impact on gore concrete wall end.	28,759 Feb.'73
943T	US-12	At BL-69 (Division-Marshall) City of Coldwater Branch County C.S. 12022	Widening from 4 to 5 lanes to provide a center lane for left turns. Ms charges on TOPICS project	1969-reported 29 accidents with 13 left turn accidents. 1970-reported 54 accidents with 18 left turn accidents. With the parking removal on W. Chicago the widening could be accomplished to provide for a center lane for left turns.	33,873
924R	M-47 FAP	At M-58 (State Rd.) C.S. 73032	Widening of all four legs (3 trunkline) to allow for future signalization, if required.	Backups on the east leg of the intersection caused by left turning vehicles forced motorists to by-pass the intersection and make U-turns to the north. This allowed them to proceed through the intersection without stopping thus reducing gaps available for westbound motorists at the intersection. During 1969 & 70, 20 intersectional crashes occurred with 13 being of the right angle type.	54,900

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PERIOD: 18
FROM Jan. 1, 1973 TO Mar. 31, '73

TEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
998R	M-19	At 32 Mile Road City of Richmond Macomb County C.S. 50091	Radius improvement in the N.W. Quad of intersection	10 Accidents were reported in 1970 with 3 rear-end accidents. In 1971, 20 accidents were reported with 8 rear-end accidents. A large share of these were false starts involving vehicles trying to turn right from M-19 onto 32 Mile Road which has an inadequate radius	13,283
827R	M-37	At 20th Street City of Battle Creek Calhoun County C.S. 13061	Right turn lane for eastbound to southbound	1969-24 accidents with 16 rear-end accidents. Of these 16, 11 were vehicles attempting to turn right onto 20th Avenue	35,407
870S	BL-94	At Raymond Road Emmett Twp., Calhoun County C.S. 13061	Laneage tapers on both east and west legs on the intersections along with roadside control of signalized intersection.	1970-4 accidents 1971-8 accidents The proposed operation would eliminate the tendency for through traffic to line up two abreast at the signal and then attempt to outmaneuver one another beyond the intersection at the lane reduction.	51,511
936R	US-10 M-115	From A.A.R.R. to Maple Street City of Clare Clare County C.S. 18022	Realignment of the eastbound lane drop and installation of curb control @ 4th Street	1967 - 5 accidents 1968 - 2 accidents 1969 - 5 accidents Of these 12 accidents, 7 were eastbound out-of-control accidents. The presence of discontinuity in the curve is to be improved by construction of taper.	18,402

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PERIOD 19
FROM Jan. 1, 1973 TO Mar. 31, '73

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1015S	US-131	1) At Calhoun St. Village of Mancelona Antrim County 2) At 4th Street Village of Kalkaska, Kalkaska Co. 3) At Old US-131 Kalkaska Twp. Kalkaska County	1)Right turn flare 2)Roadside control 3)Turning-in of Old US-131	Submitted by the District as Roadside Improvement - Ms additions to Mb work within the area.	22,797
920 R	M-37 M-44	At M-11 (28th St.) City of Kentwood Kent County C.S. 41061	Removal of an existing cross-corner connection in the NW quad. and the installation of a southbound right turn lane along M-37, M-44 to route right turns through the signals.	The right turn channel in the NW quad was under "yield" control in 1969. Accident data from 3-18-69 to 3-17-70 show 9 accidents here with 5 false start rear end accidents. Under "STOP" control in 1970, accidents from 3-18-70 to 3-17-71 show 10 accidents with 8 false start rearend accidents	30,827
945T	M-11	At Apple Blossom Trailer Park, City of Walker, Kent County C.S. 41061	Addition of a northbound passing flare on the east side of M-11 opposite the Trailer Park Drive.	Roadside Improvement consisting of a southbound right turn lane was constructed by the trailer park developer. Northbound passing flare added to Mb project proposed by District Traffic to prevent northbound left turn accidents	18,985
838T	US-31	At Garfield Avenue City of Traverse Grand Traverse Co. C.S. 28013	Widen the intersection of Front Street and Garfield Avenue to provide 5 lane cross-section on Front and a 4 lane cross-section on Garfield. Ms charges on TOPICS project	There were 17 accidents in 1967, 25 in 1968 and 27 in 1969. These three years produced a total of 22 accidents involving left turn vehicles on Front St. (6 in 1967, 8 in 1968 and 8 in 1969). During the same three year period there were also26 rear-end and 14 right-angle type accidents on Front St.	46,794

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PERIOD FROM Jan. 1, 1973 TO Mar. 31 '73

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1036D	US-31	Crossing of the C&O Railroad with US-31 West of Union St. City of Traverse City, Grand Traverse County C.S. 28013	Removal of the crossing and pavement replacement.	Unused tracks were causing congestion due to trucks and buses having to stop at the crossing. Added to TOPICS project in Traverse City.	14,342
1049L		STATEWIDE	Thermoplastic Pavement Markings	Yearly safety allotment to replace painted markings for greater durability on selected routes.	107,465
925R	M-43	At Evergreen St. City of East Lansing Ingham County C.S. 33082	Closing of the cross-over opposite Evergreen St.	Closing of the cross-over was recommended by the City. A study showed 22 accidents reported here in 1970. 12 of these accidents could have been eliminated by the closing of this cross-over. Eastbound left turns also block traffic causing congestion to the west.	4,324
799T	M-143	At Harrison Road City of East Lansing Ingham County C.S. 33062	Realignment of the south leg of Harrison Road. Widen the west leg of Michigan Ave. and construct a directional cross-over on Michigan Avenue west of Harrison Road. Ms charges on TOPICS project.	34 accidents were reported in 1968 and 51 accidents in 1969. 27 of these 85 accidents can be attributed to the offset intersection geometrics. The accident rates for 1968 and 1969 were 2.29 acc./vehicle and 3.43 acc./million vehicles respectively.	172,919

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ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
904R	US-131	At M-43 Oshtemo Twp. Kalamazoo Co. C.S. 39014	Construction of a northbound US-131 to westbound M-43 "B" loop off-ramp.	Volumes on the existing northbound US-131 off ramp are increasing as well as volumes on M-43, which increases the volumes of vehicles wishing to turn left onto westbound M-43 with few or no gaps available. Signalization expected without alternate route for northbound to westbound left turns. Undesirable location to signal	173,893
1029S	US-24	At Champaign St. City of Taylor Wayne County C.S. 82052	Removal of a median crossover.	Roadside control. Contract letting due to county work forces being unable to do work. Item bid by minority contractors.	7,321
S05D	US-41	At US-41 BR (West Junction) and at Marquette Mall, Marquette County C.S. 52044	Turning-in of US-41BR @ US-41 along with construction of directional cross-over both sides of entrances to the Marquette Mall. Some cost to be bonne by Mall developers.	1968 - 20 accidents 1969 - 26 accidents 1970 - 36 accidents Along with the construction a signal is to be installed @ WB-41 and EB-US-41BR. to help control the traffic. Westbound merge presently a problem and expected to increase with Mall opening.	74,677
1073S	M-59	At Hickory Ridge Road Highland Township Oakland County C.S. 63041	Flaring of the intersection and roadside control. Addition to county project.	The County is upgrading Hickory Ridge Rd. and felt this would be an opportune time to upgrade the intersection with roadside control as well as flaring.	14,111

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1055D	M-55	At M-66 (North Jct.) City of Lake City Missaukee Co. C.S. 57012	Radius reconstruction in the southeast quadrant along with a right turn lane on the east leg of M-55.	1969 - 1 accident 1970 - 2 accidents 1971 - 3 accidents This was felt to be an operational problem caused by the free flow northbound to eastbound channelization in the southeast quad.	26,883
1016S	US-223	At US-127 Woodstock Twp. Lenawee County C.S. 46061	Reconstruction of existing island; widening on US-127, combined with driveway control within this area. Ms addition to resurfacing project.	The westside of the existing island is to be relocated to within 2 ft. of centerline of US-27 to deter northbound US-127 traffic from entering the southbound connector. This movement is a frequent one and offers serious potential for head on accidents. The westside of the connector will be widened to a minimum of 16 ft.	71,163

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PERIOD FROM Jan. 1, 1973 TO Mar. 31, 1973

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030L	M-28	Near Tunnel Outlet City of Wakefield Gogebic County C.S. 27041 W.A.#1-701-3	Pavement Widening and Intersection Tapers	Minor improvements by State or Contract Agency Work Forces. Engineering judgement of District Traffic Engineer Facilitate turning maneuvers	3,959.82
1030L	US-45	South of Depot Crossing Village of Watersmeet Gogebic Co. C.S. 27051 W.A.#1-702-3	Guard Post Erection	Roadside control	142.53
1030L	US-31	Sta. 31+75 to 32+25 City of Manistee Manistee County C.S. 51011 W.A.#3-700-3	Erect additional 150 ft. plate guardrail	Errant vehicle protection	1,000.00
1030L	US-131	North of M-46 (N.Jct.) Intersection of the Midway Inn Reynolds Twp. Montcalm County C.S. 59011 W.A.#5-701-3	Guardrail Installation	Same As Above	750.00
1030L	M-44	At M-91 (W. Jct.) Otisco Twp. Ionia County C.S. 34081 W.A.#5-702-3	Grading and Guard Posts	Roadside control	1,500.00
1030L	M-13	M-13 (Wash. Ave.) at N.E. Corner of Potter City of Saginaw Saginaw County C.S. 73091 W.A.# 6-701-3	Construct Concrete Curb	Radius improvement	450.00

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PERIOD
FROM Jan. 1, 1973 TO Mar.31,'73

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030L	M-89	At 1st Street and Daster Rd. Allegan County C.S. 03024 W.A.#7-737-2	Pave bit. passing flare at each location	Minor improvements by State or Contract Agency Work Forces Engineering judgement of District Traffic Engineer. Left turn accident potential	2,450.00
1030L	M-89	@ 46th Street Ross Twp. Kalamazoo County C.S. 39102 W.A.#7-755-2	Pave Right Turn Lane	Right-turn rear-end accident potential	800.00
1030L	US-33	Cass St. @ Ferry St. City of Berrien Springs Berrien County C.S. 11052 W.A.#7-703-3	Remove island and close cross-walks	Improve traffic operation	275.00
1030L	M-43	Bixby Road to Colgrove Avenue Kalamazoo Township Kalamazoo County C.S. 39082 W.A.#7-704-3	Pave bit. passing flare	Left-turn rear end accident potential	3,900.00
1030L	US-23BR M-14	@ Barton Road ramp City of Ann Arbor Washtenaw County C.S. 81075 W.A.#8-701-3	Guardrail installation	Errant vehicle protection	1,779.48
1030L	US-24 US-10	(Telegraph Rd.) North of Maple Bloomfield Twp. Oakland County C.S. 63031 W.A.#9-701-3	Erect Cedar Guard Posts	Roadside control	720.00

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PERIOD FROM Jan. 1, 1973 TO Mar. 31, '73

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030L	US-25	North of Ten Mile Rd. City of Roseville Macomb Co. C.S. 50051 W.A.#9-702-3	Removal of trees in median at specified locations.	Removal of fixed objects	200.00
1030L	M-21	St. Clair Co. C.S. 77021,22 & 23 W.A.#9-703-3	Remove trees	Removal of fixed objects	5,000.00
1030L	EB M-59	@ Wide Track Dr. City of Pontiac Oakland Co. C.S. 63043 W.A. #9-704-3	Remove bituminous curbing.	Improve traffic operation	4,180.00

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(FINANCED WITH STATE FUNDS ONLY)

PERIOD FROM April 1, 1973 TO June 30, '73

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
524R 525R	M-153	@ Beech Daly Road @ Gulley Road City of Dearborn Hgts. Wayne County C.S. 82081 82061	Center lane for left turns. Earlier Ms project widening to 5 lanes delayed to widen to 7 lanes with major project.	Rear-end and head-on left turn accidents are occurring within this section. Beech-Daly had 57 accidents reported in 1966 and 36 reported in 1967. Of these 93 accidents, 54 were either rear-end or left-turn type. In 1968, 23 accidents were reported at Gulley Road with 13 either rear-end or left-turn type.	356,000
830R	US-12BR	From Ypsi Ct. to Ford Blvd., Ypsilanti Township, Washtenaw County C.S. 81032	Widening from 4 to 5 lanes at Harris Rd. intersection and approaches. Ms addition to Mb (resurfacing) project.	A large number of left-turn related accidents. 1969 - 16 total-4 left-turn related accidents. 1970 - 18 total - 10 left-turn related accidents. 1972 - 21 total 10 left-turn related accidents. We are providing left-turn lanes here to accommodate the increasing demands for turns.	193,448
956R	US-33	@ Whirlpool Ramp SB City of Benton Harbor Berrien Co. C.S. 11053	Widen the entrance ramp from Upton Dr. to SB US-33 to provide 2 full lanes. Traffic signal control will also be provided at ramp entrance upon completion of widening necessitating a stop on SB US-33.	An accident pattern developed at the ramp entrance over a period of years, along with increased congestion here at peak hours. 68 accidents were reported here during 1968 thru 1970 with a high percentage of rear-end accidents. A large number of these rear-end accidents were false starts attempting to enter US-33	18,179
952R	BL-94	@ Wildwood Avenue Blackman Township Jackson County C.S. 38082	Widening on the south side of BL-94(Mich.) on both east and west legs of intersection.	Widening to provide "headed-up" left turn lanes. 1970 Accident Data showed 13 accidents with 6 of them angle accidents	46,527

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HIGHWAY BUDGET PROGRAM PROJECTS
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PERIOD FROM April 1, 1973 TO June 30, '73

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1027T	I-696	@ Orchard Lake Rd. Farmington Township Oakland County C.S. 63101	Realign and widening on the westbound I-696 off-ramp. Integral part of adjacent TOPICS project at intersection of Orchard Lake Rd. with 12 Mile Road	Approx 400' south of Orchard Lake and 12 Mile Road intersection is the exit ramp from I-696 which contributes a heavy volume to the NB volume, with 50% of these wanting to turn left @ 12 Mile Road. This condition causes a merge problem in an extremely short distance and a congestion and accident problem at 12 Mile Road.	60,091
895T	US-10	At Lasher Road City of Southfield Oakland County C.S. 63081	Widening of the structure Ms charges on TOPICS project.	In an attempt to accommodate the heavy turning movements, Lasher Road is to be widened to 7 lanes which calls for the widening of the structure.	291,199
947R	US-27BR	At Broomfield Road City of Mt. Pleasant Isabella County C.S. 37011	Widening on the east and west side of US-27BR from Broomfield Road some 1400' southerly. Widening to develop 5 lanes with center lane for left turns	Development south of Broomfield Rd. along with increased volumes. Broomfield recently widened to 5 lanes on west leg. Intersection widened to attract turns for high accident intersections to the north where inadequate right-of-way exists. Construction of football stadium and sports building increases potential.	163,501
1012S	M-52	At Grand River Road Bennington Township Shiawassee County C.S. 76011	Type IV northbound passing flare. Ms addition to Mb (resurfacing) project.	To improve the sight distance and additional laneage for approaching northbound traffic because of vehicles waiting to make turns on Grand River Blvd. 4 accidents were reported in 1971 and the first eight months of 1972. Two of these were right-angle accidents, one resulting in a fatality.	3,561

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HIGHWAY BUDGET APPROPRIATIONS PROJECTS
(FINANCED WITH STATE FUNDS ONLY)

PERIOD FROM April 1, 1973 TO June 30, '74

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030L	US-2	Approx. 1.2 miles east of east limits of Ironwood Gogebic Co. C.S. 27021 W.A.#1-703-3	Guardrail Extension	Errant vehicle protection	605.99
1030L	US-41	Approx. 1 mi. north of Baraga-Houghton County Line Chassell Township Houghton County C.S. 31051 W.A.#1-904-3	Guard Post Erection	Roadside control	54.21
1030L	M-69	At the Point River Bridge on M-69 City of Crystal Falls Iron County C.S. 36023 W.A.#1-705-3	Guardrail Erection	Errant vehicle protection	1,219.28
1030L	US-31	@ Taylor & 5th Ave. City of Manistee Manistee County C.S. 51011 W.A.#3-702-3	Roadside Control Traffic Island	Removal of S-40 barricade island and construction of permanent island.	1,384.18
1030L	M-22	@ County Road 604 Village of Arcadia Manistee County C.S. 51011 W.A.#3-703-3	Concrete Curb & Gutter	Delineation of intersection	1,500.00
1030L	US-31 BR	250' West of E. City Limits of Whitehall City of Whitehall Muskegon County C.S. 61073 W.A.#5-703-3	Removing concrete driveways to Oakhurst Cemetery. Extending guardrail	Driveway closure to improve traffic operation	1,500.00

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PERIOD FROM April 1, 1973 TO June30,'73

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030L	M-58	M-58 (State St.) @ M-47, West end of State Street Saginaw Township Saginaw Co. C.S. 73073 W.A.# 6-702-3	Reconstruct island	Improve traffic operation	1,200.00
1030L	I-196 US-31	North of N. Shore Dr. Casco Township Allegan County C.S. 03033 W.A.# 7-705-3	Remove existing cross-over near station 1580	Illegal cross-over usage	300.00
1030L	M-50	At Grand River Bridge South of Jackson Summitt Township Jackson County C.S. 38071 W.A.# 8-702-3	Guardrail Installation	Errant vehicle protection	5,732.35
1030L	M-36	At Huron River Community of Lakeland Livingston County C.S. 47041 W.A.#8-704-3	Guardrail Installation	Same as above	4,800.00
1030L	US-223	At Wolf Creek City of Adrian Lenawee County C.S. 46061 W.A.#8-705-3	Guardrail Installation	Same as above	8,200.00
1030L	M-96	At Armstrong Road Calhoun County C.S. 13131 W.A.#7-706-3	Erect 18 wood guard posts	Roadside control	200.00

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FROM April 1 ,1973 TO June30,'73

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE OF IMPROVEMENT	REASON FOR IMPROVEMENT	COST
1030L	M-86	At B01 of 78062 and Culvert over Mill Race Village of Colon St. Joseph County C.S. 78062 W.A.#7-707-3	Remove fence and erect chain link fence	Pedestrian protection	600.00
1030L	US-12	At Bemis Road City of Saline Washtenaw County C.S. 81031 W.A.# 8-707-3	Steel Beam Guardrail Installation	Errant vehicle protection	1,156.04
1030L	I-496	At Trowbridge Road City of East Lansing Ingham County C.S. 33045 W.A.#8-708-3	Adjustment of Fitch Barrel Installation	Improve errant vehicle protection from structure end post	600.00
1030L	NB US-24	North of Swanson City of Southfield Oakland County C.S. 63131 W.A. #9-706-3	Remove Guardrail Install Guardrail	Update to current standards	2,425.00
1030L	M-97	At Parkway Bar North of Fifteen Mile Road, Clinton Twp. Macomb County C.S. 50031 W.A.#9-710-3	Place cedar posts	Roadside control	283.27
1030L	US-25	At Welts Street City of Mt. Clemens Macomb County C.S. 50051 W.A.#9-711-3	Install guardrail	Errant vehicle protection	138.86

ITEM NO.	ROUTE NO. SYSTEM	GENERAL LOCATION	TYPE O	ON FOR IMPROVEMENT	COST
1030L	US-10	SB US-10 Service Drive @ On-ramp north of Northland and US-10 NB off-ramp City of Southfield Oakland County C.S. 63081 W.A.#9-713-3	Paint No Cover of Devices	of impact attenuator	360.00
1030L	BL-94	Jackson Ave.(BL-94) E. of Maple Road City of Ann Arbor Washtenaw County C.S. 81101 W.A.# 8-709-3	Remove traffic island and replace with bituminous concrete	Improve traffic operation	2,000.00
1030L	US-10	At Pontiac Mall Waterford Township Oakland County C.S. 63052 W.A.#9-708-3	Construct larger traffic island to better define desired traffic movement	Turning roadway delineation	1,100.00

Section 3

Safety-Related Construction Programs

Introduction

There are a number of safety-related projects included in the State's various Construction and Maintenance Programs that are not categorized under a specific safety program. Projects which fall into this category are funded with Federal-Aid Interstate, TOPICS, Secondary, and Urban funds, as well as with Michigan funds, and are included in the Interstate Safety "Yellow Book"; Minor Construction; Urban Systems C and D; and the Federal-Aid Secondary Programs. Examples of the types of safety-related projects include railroad crossing protection projects; median barrier and lighting projects; intersection widening and resurfacing projects; roadside control projects; narrow bridges; shoulder widening; guardrail; culverts; tree removal; grading and slope flattening.

Interstate Program
Fiscal Year 1973-74

The purpose of the Interstate Safety and "Yellow Book" Programs in Michigan is to implement corrective measures at locations on the Interstate Highway system where roadway elements have been identified as hazardous or potentially hazardous.

Interstate Safety (Is) Program - Projects accomplished under the Interstate Safety (Is) Program are, in general, large in scope and the construction is contracted through the competitive bid letting process. The "Yellow Book" Program differs from this program in that projects are much smaller in size and are usually accomplished by State or county forces on a force account basis.

In fiscal year 1973-74, Michigan awarded 19 Interstate Safety (Is) projects at a total cost of $9,572,700. Of the 19 projects, 4 involved the construction of concrete median barrier; 4 involved the installation of Hi-Dro Cushion impact attenuator devices and 5 involved the installation of chain link fence on

structures. A listing of the Interstate projects let to contract in fiscal year 1973-74 is included in Appendix AA.

"Yellow Book" Program - The Michigan Department of State Highways and Transportation is currently engaged in a program of implementing minor safety improvements to reduce roadside hazards on the Federal Interstate system in accordance with the AASHO "Yellow Book". Most of these projects have been implemented by maintenance forces; however, due to increased work load of maintenance forces, an increasing number of "Yellow Book" projects are being contracted through the State's regular construction bid letting process.

"Yellow Book" projects are programmed in one of four general improvement classifications. The first classification includes guardrail improvements such as: removal of unnecessary guardrail; extension of guardrail and closing gaps; upgrading of guardrail to new safety standards; and correcting guardrail ending sections. The second classification includes culvert modifications such as: extension of culverts to eliminate cross ditches; removal of protruding headwalls and installation of tapered sections of culvert; and provision of steel gratings for larger culverts which have tapered end sections. The third classification includes grading to flatten ditches and other slopes and to provide minor fills in gore areas to enhance the passage of vehicles leaving the roadway. The fourth classification includes modifications such as: removal of all unnecessary signs, trees and other obstructions; installation of breakaway sign and light posts; elimination of high bridge curbs; and changeover of tubular aluminum bridge rails.

The status of the "Yellow Book" projects is indicated in Appendix BB. The last number (1-4) in the second column of Appendix BB entitled "County and Work Type Code" indicates the following general classifications of safety improvements as previously discussed: (1) guardrail, (2) culvert, (3) grading, and (4) miscellaneous.

The sixth column of the printout, entitled "Amount Authorized for Construction" indicates the total funding currently authorized for maintenance force account work by the Department. The total amount currently authorized for "Yellow Book" work by maintenance forces is approximately $5,280,000. The total amount expended to date is approximately $1 million.

Federal-Aid Urban Program
Fiscal Year 1973-74

There was a total of seven safety-related projects funded with Urban C and Urban D funds. The two projects funded with Urban C funds consisted of installing median barrier and lighting on nearly eight miles of freeway. The total estimated cost of these two projects amounted to $4,113,300.

Five safety improvement projects were funded with Urban D funds at a total estimated cost of $3,638,000. Two of these five projects are on the State Trunkline system, one of which involves railroad crossing protection. Two of these projects were former TOPICS projects which were programmed for Urban D funds prior to the 1973 Highway Safety Act. Projects being funded with Urban C and D funds are listed in Appendix CC.

Federal-Aid Secondary Program
Fiscal Year 1973-74

The Federal-Aid Secondary Construction Program included six projects, three bridge replacement projects, and three railroad crossing protection projects in fiscal year 1973-74 (see Appendix CC). The bridges being replaced are narrow and are at locations with restricted sight distance. One of the bridges (Six Mile Road in Chippewa County) is reported to have had several fatalities as a result of traffic accidents.

TOPICS Program
Fiscal Year 1973-74

The Federal-Aid TOPICS Program included seven projects designed to increase safety in fiscal year 1973-74 (See Appendix CC). Three of these projects involved the construction of a continuous center left-turn lane through a commercial area with the other four projects involving the addition of opposing left-turn lanes on the approaches to the intersection.

The total estimated cost of the safety projects included in the TOPICS Program which were placed under contract in fiscal year 1973-74 is approximately $2,236,400.

Michigan Funded Projects
Fiscal Year 1973-74

The Maintenance Division of the Michigan Department of State Highways and Transportation administers,on a continuing basis, a Minor Construction Program which involves the implementation of projects by maintenance forces during the winter months. This program is similar to the "Yellow Book" Program but is performed on the State Trunkline system utilizing State Highway Capital Outlay funds. The major types of work which qualify for this program are outlined in Appendix DD, entitled "Minor Construction Categories Defined". The work programmed for a given year may or may not be performed depending on weather conditions and the availability of maintenance forces.

The total estimated cost of the safety-related work, scheduled as part of the Minor Construction Program in fiscal year 1973-74, was approximately $976,300 (see Appendix DD). In addition to the Minor Construction Program, there were nine projects in fiscal year 1973-74 which were undertaken with hundred percent Michigan funds (see Appendix CC). Eight of these projects, at a total estimated cost of $89,410, involved railroad grade crossing improvements which were not included in Section 203 of the

1973 Highway Safety Act. These projects were not funded under the 1973 Highway Safety Act because they were initiated prior to the Act. In addition, some relatively small or urgent projects simply do not warrant the additional time and effort required to process a Federal-aid project.

APPENDIX AA

Interstate Safety (Is) Projects
Let to Contract Fiscal Year 1973-74

Location	Type of Work	Estimated Cost
Is 82023-06259A EB I-94 Exit Ramp @ NB & SB Turning Roadways to I-96, Wayne Co.	Installation of Hi-Dro Cushion Impact Attenuator Device	11,938
Is 82023-06257A EB I-94 at "Off" Ramp to I-96, Wayne Co.	Installation of Hi-Dro Cushion Impact Attenuator Device	14,241
Is 82024-0643A Frontenal Ave.,Gratiot Ave. & French Rd. over I-94, Wayne Co.	Chain Link Fence & Framing on 3 Bridge Structures	25,599
Is 82023-05166A Livernois Ave,. Junction St. & Thirtieth St. over I-94	120" Chain Link Fence and Framing on 3 Bridge Structures	23,691
Is 82023-06260A SB I-96 (Jeffries Fwy) at "Off" Ramp to I-94 (Ford Fwy) Wayne Co.	Installation of a Hi-Dro Cushion Impact Attenuator Device	14,099
Is 82024-05167A Chene St., E. Grand Blvd. @ Mt. Elliott over I-94, Wayne Co.	120" Chain Link Fence and Framing on 3 Bridge Structures	20,954
Is 82023-06242A NB West Grand Blvd., & 24th St. over I-94, Wayne Co.	Chain Link Fence & Framing on Structures	39,982
Is 82252-05168A Holbrook Ave. & Seven Mile Rd. over I-75, Wayne Co.	Chain Link Fence & Framing on Structures	20,724
Is 73111-06237A I-75, US-10 & US-23 from 3065' of Dixie Hwy to 830' N of Wadsworth Rd.,Saginaw Co.	Concrete Median Barrier	2,220,362
IS 73171-05997A I-75 from 2,694' N. of Birch Run Rd. ti 3,065' N. of Dixie Hwy, Saginaw Co.	Dual 12' Concrete Pavement Widening	1,555,500
Is 38101-05994A Is 81104-05995A Is 81062-05996A I-94 from Calhoun-Jackson Co. Line to Platt Rd., Jackson, Washtenaw Counties	Highway Sign Upgrading & Exit Numbering	319,705
	Total	$9,572,735

Interstate Safety (Is) Projects
Let to Contract Fiscal Year 1973-74

Location	Type of Work	Estimated Cost
Is 82022-05469A, 06939A I-94 from US-24 to US-25, Wayne County	Concrete Median Barrier, Freeway Lighting, Thermoplastic Pavement Marking, Highway Signing and guardrail	$3,085,996
Is 82023-06258A EB I-94 @ "Off" Ramp to Grand River, Wayne Co.	Installation of Hi-Dro Cushion Impact Attenuator Device	17,950
Is 38101-06787A I-94 from Michigan Ave. to 3,600' of Airport Rd., Jackson Co.	Concrete Median Barrier	219,299
Is 38102-06788A I-94 from 1,100' W. of M-99 to 225''of Michigan Ave.	Bituminous Shoulder Reconstruction	99,537
Is 41025-03705A Is 41025-03706A Is 41029-05500A I-96 from M-44 (Beltline Rd) NW'ly to I-696 in Grand Rapids, on I-96 at Plainfield Ave. in Grand Rapids and from I-296 & US-131 W'ly to M-37 (Alpine Ave.) in Walker, on I-196 at M-45 (Lake Michigan Drive) in Grand Rapids, and on US-131 at M-11 (38th St.) in Wyoming, Kent County	Freeway Lighting	450,765
Is 09034-06606A I-75 from I-675 to M-13, Saginaw Co.	Concrete Median Barrier	847,162
Is 23151-06184A I-96 on the Bridge over the Grand River, Eaton Co.	Superelevation Correction	149,926
Is 41025-05992A Is 34043-05991A I-96 from US-31 in Muskegon Co. to Cedar St. in Ingahm Co. Muskegon, Ottawa, Kent, Ionia, Clinton, Eaton & Ingham Cos.	Highway Traffic Sign Upgrading & Exit Numbering	435,305

APPENDIX BB

PREPARED 08/22/74 MONTH OF BUSINESS = JUNE 1900

FEDERAL ITEM CODE	COUNTY & WORK TYPE CODE	ACCOUNT CODE	ACT. CODE	JOB NUMBER	AMOUNT AUTH. ~~CURRENT MONTH~~ FOR CONSTRUCTION	COST TO DATE	TOTAL BY WORK TYPE	TOTAL BY COUNTY
N1239	82001	8780	553	06472		8,954.99		
N1239	82001	9114	553	06926		.00	8,954.99	
N1239	82002	8780	553	06473		.00	.00	
N1239	82003	8780	553	06474		.00	.00	
N1239	82004	8780	553	06475	29,000.00	.00	.00	8,954.99
FEDERAL ITEM TOTAL						8,954.99		
N1240	63001	8780	553	06456		.00	.00	
N1240	63002	8780	553	06457		.00	.00	
N1240	63003	8780	553	06458	-0-	.00	.00	.00
FEDERAL ITEM TOTAL						.00		
N1241	09003	8780	553	05089	8,030.00	7,940.35	7,940.35	7,940.35
N1241	25001	8780	553	05493		.00	.00	
N1241	25002	8780	553	05494		.00	.00	
N1241	25003	8780	553	05495	-0-	.00	.00	.00
N1241	73001	8780	553	03592		29,466.02	29,466.02	
N1241	73002	8780	553	03593		15,362.90	15,362.90	
N1241	73003	8780	553	03594		1,595.84	1,595.84	
N1241	73004	8780	553	03595	204,300.00 *	4,870.75	4,870.75	51,295.51
FEDERAL ITEM TOTAL						59,235.86		
N1242	16001	8780	553	06550		.00	.00	

* Changed to Contract Letting -

BB-1

PREPARED 08/22/74 MONTH OF BUSINESS - JUNE 1900

FEDERAL ITEM CODE	COUNTY & WORK TYPE CODE	ACCOUNT CODE	ACT. CODE	JOB NUMBER	AMOUNT AUTH. ~~CURRENT MONTH~~ FOR CONSTRUCTION	AMOUNT COST TO DATE	TOTAL BY WORK TYPE	TOTAL BY COUNTY
N1242	16002	8780	553	06551		.00	.00	
N1242	16003	8780	553	06552	117,800.00	.00	.00	.00
N1242	20001	8780	553	06556		.00	.00	
N1242	20002	8780	553	06557		.00	.00	
N1242	20003	8780	553	06558		.00	.00	
N1242	20004	8780	553	06559	189,400.00	.00	.00	.00
N1242	69001	8780	553	06453		.00	.00	
N1242	69002	8780	553	06454		.00	.00	
N1242	69003	8780	553	06455	179,400.00	.00	.00	.00
FEDERAL ITEM TOTAL						.00		
N1243	16001	8780	553	06553		.00	.00	
N1243	16002	8780	553	06554		.00	.00	
N1243	16003	8780	553	06555	207,200.00 **	.00	.00	.00
N1243	24001	8780	553	06560		.00	.00	
N1243	24002	8780	553	06561		.00	.00	
N1243	24003	8780	553	06562	40,400.00 *	.00	.00	.00
FEDERAL ITEM TOTAL						.00		
N1244	17001	8780	553	06440		.00	.00	
N1244	17002	8780	553	06441		.00	.00	
N1244	17003	8780	553	06442		.00	.00	

** #49,000 will be changed to contract letting

* Will be changed to contract letting

YELLOW BOOK PROJECTS

PREPARED 08/22/74 MONTH OF BUSINESS = JUNE 1900

FEDERAL ITEM CODE	COUNTY & WORK TYPE CODE	ACCOUNT CODE	ACT. CODE	JOB NUMBER	AMOUNT AUTH. ~~CURRENT MONTH~~ FOR CONSTRUCTION	AMOUNT COST TO DATE	TOTAL BY WORK TYPE	TOTAL BY COUNTY
N1244	17004	8780	553	06443	— 0 —	.00	.00	.00
N1244	49001	8780	553	03685		41,449.53	41,449.53	
N1244	49002	8780	553	03686		.00	.00	
N1244	49003	8780	553	03687	129,000.00	.00	.00	41,449.53
FEDERAL ITEM TOTAL						41,449.53		
N1245	11001	8780	553	04151		951.33	951.33	
N1245	11002	8780	553	04152		28,716.99	28,716.99	
N1245	11003	8780	553	04153	388,300.00	943.79	943.79	30,612.11
FEDERAL ITEM TOTAL						30,612.11		
N1246	11001	8780	553	04154		.00	.00	
N1246	11002	8780	553	04155		14,739.64	14,739.64	
N1246	11003	8780	553	04156		10.49	10.49	14,750.13
N1246	39001	8780	553	03614		28,835.00	28,835.00	
N1246	39002	8780	553	03616		13,633.77	13,633.77	
N1246	39003	8780	553	03618		9,754.95	9,754.95	
N1246	39004	8780	553	04037		591.85	591.85	52,815.57
N1246	80001	8780	553	04157		3,994.04	3,994.04	
N1246	80002	8780	553	04158		44,307.70	44,307.70	
N1246	80003	8780	553	04159	576,400.00	27,772.81	27,772.81	76,074.55
FEDERAL ITEM TOTAL						143,640.25		

PREPARED 08/22/74 MONTH OF BUSINESS = JUNE 1900

	FEDERAL ITEM CODE	COUNTY & WORK TYPE CODE	ACCOUNT CODE	ACT. CODE	JOB NUMBER	AMOUNT AUTH. ~~CURRENT MONTH~~ FOR CONSTRUCTION	AMOUNT COST TO DATE	TOTAL BY WORK TYPE	TOTAL BY COUNTY
	N1247	13001	8780	553	03183		47,484.13	47,484.13	
	N1247	13002	8780	553	03568		38,799.72	38,799.72	
* FHWA authorized $100,000 to date	N1247	13003	8780	553	03569		13,313.46	13,313.46	
	N1247	13004	8780	553	03664		7,616.87	7,616.87	107,214.18
						210,000.00 *			
	N1247	39001	8780	553	03615		1,083.42	1,083.42	
	N1247	39002	8780	553	03617		20,668.10	20,668.10	
	N1247	39003	8780	553	03619		76.40	76.40	
	N1247	39004	8780	553	04077		1,297.73	1,297.73	23,125.65
						103,000.00			
FEDERAL ITEM TOTAL							130,339.83		
	N1254	61001	8780	553	06563		.00	.00	
	N1254	61002	8780	553	06564		.00	.00	
	N1254	61003	8780	553	06565		.00	.00	.00
						155,000.00			
	N1254	70001	8780	553	06566		.00	.00	
	N1254	70002	8780	553	06567		.00	.00	
	N1254	70003	8780	553	06568		.00	.00	
	N1254	70004	8780	553	06569		.00	.00	.00
						336,100.00			
FEDERAL ITEM TOTAL							.00		
	N1255	19001	8780	553	03654		.00	.00	
	N1255	19002	8780	553	03655		22,908.39	22,908.39	
	N1255	19003	8780	553	03656		6,023.30	6,023.30	28,931.69
						45,000.00			
FEDERAL ITEM TOTAL							28,931.69		

PREPARED 08/22/74 MONTH OF BUSINESS = JUNE 1900

FEDERAL ITEM CODE	COUNTY & WORK TYPE CODE	ACCOUNT CODE	ACT. CODE	JOB NUMBER	AMOUNT AUTH. ~~CURRENT MONTH~~ FOR CONSTRUCTION	AMOUNT COST TO DATE	TOTAL BY WORK TYPE	TOTAL BY COUNTY
N1256	23001	8780	553	03657		.00	.00	
N1256	23002	8780	553	03658		1,071.53	1,071.53	1,071.53
N1256	33001	8780	553	03659		.00		
N1256	33001	8780	553	05048		.00	.00	
N1256	33002	8780	553	03660		1,765.88		
N1256	33002	8780	553	05049		.00	1,765.88	
N1256	33003	8780	553	05050		.00	.00	1,765.88
N1256	47001	8780	553	05051		1,375.19	1,375.19	
N1256	47002	8780	553	04040		1,929.32		
N1256	47002	8780	553	05052		.00	1,929.32	
N1256	47003	8780	553	05053	652,800.00 *	.00	.00	3,304.51
FEDERAL ITEM TOTAL						6,141.92		
N1257	47001	8780	553	05054		.00	.00	
N1257	47002	8780	553	05055		.00	.00	
N1257	47003	8780	553	05056	108,500.00 *	.00	.00	.00
FEDERAL ITEM TOTAL						.00		
N1258	63001	8780	553	05619		.00	.00	
N1258	63002	8780	553	05620		.00	.00	
N1258	63003	8780	553	05621		.00	.00	
N1258	63004	8780	553	05622		.00		
N1258	63004	8780	653-?	05622	-0-	.00	.00	.00
FEDERAL ITEM TOTAL						.00		

* Will be changed to contract letting

* Will be changed to contract letting

PREPARED 08/22/74 MONTH OF BUSINESS = JUNE 1900

FEDERAL ITEM CODE	COUNTY & WORK TYPE CODE	ACCOUNT CODE	ACT. CODE	JOB NUMBER	AMOUNT AUTH. ~~CURRENT MONTH~~ FOR CONSTRUCTION	COST TO DATE	TOTAL BY WORK TYPE	TOTAL BY COUNTY
N1260	03001	8780	553	04678		4,785.66		
N1260	03001	8780	553	04681		1,968.59		
N1260	03001	8780	653-?	04678		.00		
N1260	03001	8780	653-?	04681		.00	6,754.25	
N1260	03002	8780	553	04679		.00		
N1260	03002	8780	553	04682		.00		
N1260	03002	8780	653-?	04679		.00		
N1260	03002	8780	653-?	04682		.00	.00	
N1260	03003	8780	553	04680		.00		
N1260	03003	8780	553	04683		.00		
N1260	03003	8780	653-?	04680		.00		
N1260	03003	8780	653-?	04683		.00	.00	6,754.25
N1260	11001	8780	553	04672		.00		
N1260	11001	8780	653-?	04672		.00	.00	
N1260	11002	8780	553	04673		.00		
N1260	11002	8780	653-?	04673		.00	.00	
N1260	11003	8780	553	04674		.00		
N1260	11003	8780	653-?	04674		.00	.00	.00
N1260	80001	8780	553	04675		353.09		
N1260	80001	8780	653-?	04675		.00	353.09	
N1260	80002	8780	553	04676		1,302.41		
N1260	80002	8780	653-?	04676		.00	1,302.41	
N1260	80003	8780	553	04677		4,052.53		
N1260	80003	8780	653-?	04677	287,900.00	.00	4,052.53	5,708.03
FEDERAL ITEM TOTAL						12,462.28		
N1261	41001	8780	553	04541		207,575.25		
N1261	41001	8780	653-?	04541		9,008.35	216,583.60	
N1261	41002	8780	553	04542		267.75		
N1261	41002	8780	653-?	04542		2.42	270.17	
N1261	41003	8780	553	04543		31,452.52		

PREPARED 08/22/74 MONTH OF BUSINESS = JUNE 1900

FEDERAL ITEM CODE	COUNTY & WORK TYPE CODE	ACCOUNT CODE	ACT. CODE	JOB NUMBER	AMOUNT AUTH. ~~CURRENT MONTH~~ FOR CONSTRUCTION	AMOUNT COST TO DATE	TOTAL BY WORK TYPE	TOTAL BY COUNTY
N1261	41003	8780	653-7	04543		4.67	31,457.19	
N1261	41004	8780	553	04544	553,400.00	52,907.89	52,907.89	301,218.85
FEDERAL ITEM TOTAL						301,218.85		
N1262	41001	8780	553	05222		61,202.87		
N1262	41001	8780	653-7	05222		3,672.16	64,875.03	
N1262	41002	8780	553	05223		11,017.47		
N1262	41002	8780	653-7	05223		661.05	11,678.52	
N1262	41003	8780	553	05224		24,320.15		
N1262	41003	8780	653-7	05224		1,459.22	25,779.37	
N1262	41004	8780	553	05225	617,000.00	16,855.04	16,855.04	119,187.96
FEDERAL ITEM TOTAL						119,187.96		
N1264	33001	8780	553	04601		112,192.92	112,192.92	
N1264	33002	8780	553	04602		1,782.51	1,782.51	
N1264	33003	8780	553	04603	142,200.00	4,865.57	4,865.57	118,841.00
FEDERAL ITEM TOTAL						118,841.00		
N1265	63001	8780	553	05612		.00	.00	
N1265	63002	8780	553	05613		.00	.00	
N1265	63003	8780	553	05614		.00	.00	
N1265	63004	8780	553	05615	-0-	.00	.00	.00
FEDERAL ITEM TOTAL						.00		
				TOTAL	$5,280,130.00			

APPENDIX CC

SAFETY-RELATED CONSTRUCTION PROJECTS

Location	Length Mi.	Character of Work	Estimated Project Cost Total	Federal	State	Other
		Urban C Funds				
US-10 - M-102 to I-96	4.2	Median Barrier & Lighting	2,400,000	1,743,300	656,700	
US-131 - M-11 to I-696	3.84	Median Barrier & Lighting	1,713,000	1,244,300	468,700	
		Urban D Funds				
M-14 - Sheldon to I-275	2.03	Widen & Surface	2,000,000	1,961,200	738,800	
E. Outer Dr. @ M-53	0.2	Widen & Surface	550,000	399,500		150,500
Orchard Lk Rd.-Green to Pontiac	0.7	Widen & Surface	750,000	544,800		205,200
E. Outer Dr. @ 7 Mile Road	0.2	Widen & Surface	293,000	212,800		80,200
M-14 @ Penn Central RR		Crossing Protection	45,000	45,000		
		Federal-Aid Secondary Funds				
Six Mile Rd.F.A.S. 231, 1 Mi. W. of I-75, Chippewa Co.		Replacement of Existing Narrow Bridge	65,000	35,100		29,900
Bard Rd.,FAS 108, 7.5 Mi. NW of Beaverton, Gladwin Co.		Replacement of Existing Narrow Bridge	56,000	30,300		25,700
Grout Rd.,FAS 1837, 6 Mi. NW of Beaverton, Gladwin Co.		Replacement of Existing Narrow Bridge	64,000	34,600		29,400
PCTC Railroad (CSG X1 of 38-7-23), Portage Road, Jackson County		Flashing Light Signals & a Half-roadway Gate	44,000	44,000		
C&O Railroad (CSG X1 of 43-11-23) Foreman Rd., Lake County		Flashing Light Signals & Extend Crossing	23,470	23,470		
PH &D Railroad (G02 of 77052) M-29 (Bree Rd), St. Clair Co.		Flashing Light Signals & Cantilever Arms. Reconst. & Extend Temp. Flashing Light Signals	40,000	40,000		

SAFETY-RELATED CONSTRUCTION PROJECTS

Location	Length Mi.	Character of Work	Estimated Project Cost Total	Federal	State	Other
		TOPICS Funds				
T 4004(17) M-58 (State) @ Hemmeter, Saginaw Co.		Construct center left-turn lane at intersection	136,748	74,364		62,384
T 4057(44) Van Born Rd. Beech-Daly to Telegraph Wayne County		Construct continuous center left-turn lane	989,652	538,173		451,479
T 4004(22) M-46 @ the C&O RR Grade Separation, City of Saginaw, Saginaw Co.		Construct continuous center left-turn lane	22,608	12,294	10,314	
T 4004(13) M-84 (Bay)-Weiss to Shattuck, City of Saginaw Saginaw County		Construct continuous center left-turn lane	539,336	293,291	225,335	21,034
T 4058(14) 9 Mile Rd. @ Hoover Rd.,City of Warren, Macomb Co.		Construct center left-turn lane on all legs	295,961	160,944		135,017
T 4059(38) Crooks Road from Lexington to Normandy, City of Royal Oak, Oakland Co.		Construct center left-turn lane	160,342	87,194		73,148
T 4002(21) M-54 (Saginaw) @ Hill Genesee County		Construct Center Left-turn lane at intersection	91,725	49,880	41,845	

SAFETY-RELATED CONSTRUCTION PROJECTS

Michigan Funds

Location	Length Mi.	Character of Work	Estimated Project Cost Total	Federal	State	Other
M-46 - C&O Railroad E'ly to Neff Rd	0.7	Widen, Surface & RR Signal	40,000		40,000	
US-10 - Lahser Rd.SE'ly to M-102	4.0	Median Barrier & Lights	1,450,000		1,321,000	129,000
C&O Railroad (G02 of 59045) M-46, Montcalm Co.		Relocate Existing Flashing Light Signal	6,040		6,040	
C&O Railroad (G03 of 59032) M-91 Montcalm County		Improve Circuitry	10,000		5,000	5,000
C&O Railroad (G04 of 59032) M-91 Montcalm County		Improve Circuitry	10,000		5,000	5,000
C&O Railroad (G03 of 25052) Mt. Morris, Genesee County		Relocate existing flashing light signal & cantilever arms (Betterment) (Remove side track not part of agreement)	6,000		6,000	
GTW Railroad (G01 of 50012)M-53 Macomb County		Relocate existing flashing light signal. Reconstruct, raise, & extend crossing	12,000		12,000	
C&O Railroad (G01 of 79051) M-24 Tuscola County		Relocate existing flashing light signal. Raise crossing	5,000		5,000	
C&O Railroad (G01 of 61076) M-120 Muskegon County		Special effect roundels	370		370	

APPENDIX DD

MINOR CONSTRUCTION
CATEGORIES DEFINED

GRADING

A. Flattening slopes for the purpose of eliminating guardrail at given locations.

B. Flattening slopes or bank for the purpose of providing adequate snow storage areas or eliminating drifting problems over roadways.

C. Grading of slopes, bank, knolls, etc. for the purpose of providing clear vision at intersections or curves for the safety of the traveling public.

GUARDRAIL

A. Upgrading obsolete cable guardrail to current safety specification steel beam types.

B. Placing or extending guardrail for safety to motoring public.

C. Placing buried end sections for safety.

CULVERTS

A. Removing headwalls, extending culverts, and placing flared end sections for upgrading to current safety specifications.

B. Repair or replacement of culverts for safety or erosion prevention around culverts.

MISCELLANEOUS

TREE REMOVAL

A. Cutting of trees on curves for safety or clear vision.

B. Cutting of trees to eliminate icing conditions caused by trees shading trunk lines.

C. Removal of trees too near to trunk lines for safety.

DRAINAGE CORRECTION — Projects to facilitate drainage or reduce maintenance costs; such as: catch basins, sewers, culverts, constructing new ditches, etc.

EROSION PROTECTION — Seeding, mulching, sodding, riprap placement, etc. to prevent erosion to our slopes.

RIGHT OF WAY FENCE REPLACEMENT — Replace right of way fence along trunk line for safety or due to total deterioration of fence.

Cost Summary

Minor Construction Program
(Safety-Related Work)

Fiscal Year 1973-74

	Grading	Guardrail	Culverts	Miscellaneous	Total
State Contract Counties	$196,058	$339,039	$ 47,759	$ 82,300	$665,156
State Direct Forces	81,583	108,569	86,499	34,495	311,146
Total	$277,641	$447,608	$134,258	$116,795	$976,302

1973-74

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FOR CONTRACT COUNTIES

(SAFETY-RELATED WORK)

DISTRICT 1

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	DICKINSON							
1-1	Flatten slopes and eliminate guardrail	2500 cyds	M-95	$ 3,000				
1-3	Rock removal to eliminate traffic hazard	80 cyds	M-95				$ 1,800	
	GOGEBIC							
1-5	Flatten slopes and eliminate guardrail	5825 cyds	US-2 US-45	$ 8,025				

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FOR CONTRACT COUNTIES

(SAFETY-RELATED WORK)

DISTRICT 2

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	ALGER							
2-1	Flatten slopes/safety	cu. yds.	M-94	$ 753				
	SCHOOLCRAFT							
2-6	Flatten slopes and eliminate guardrail	10,000 cyds	US-2	$ 15,000				
2-7	Grading for clear vision	10,000 cyds	M-77	$ 10,000				

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MINOR CONSTRUCTION PROGRAM
FOR CONTRACT COUNTIES
(SAFETY-RELATED WORK)

DISTRICT 3

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	ANTRIM							
3-1	Flatten slopes	6500 cu.yds	M-88	$ 10,600				
	BENZIE							
3-3	Flatten slopes	2500 cu.yds	M-115 US-31	$ 5,300				
3-4	Replace cable guard-rail	2700 lft.	M-115					
	CHARLEVOIX							
3-5	Replace cable guard-rail	400 lft.	US-131		$ 2,332			
3-6	Flatten slopes	3500 cu yds	US-31	$ 6,360				
	CLARE							
3-7	Flatten slopes	4500 cu yds	US-10 BU-27	$ 7,420				

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FOR CONTRACT COUNTIES
(SAFETY-RELATED WORK)

DISTRICT 3

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	GRAND TRAVERSE							
3-9	Flatten slopes	1350 cu.yds	M-37	$ 3,180				
3-10	Replace cable guard-rail	2800 lft.	US-31		$ 16,324			
	LAKE							
3-11	Replace cable guard-rail	3000 lft.	US-10		$ 4,770			
3-12	Flatten slopes and eliminate guardrail	3000 cu.yds	US-10 M-37	$ 5,830				
	LEELANAU							
3-13	Flatten slopes	6000 cu.yds	M-72	$ 10,600				

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MINOR CONSTRUCTION PROGRAM
FOR CONTRACT COUNTIES
(SAFETY-RELATED WORK)

DISTRICT 3

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	MANISTEE							
3-15	Flatten slopes	4500 cyds.	US-31	$ 7,950				
3-16	Replace cable guard-rail	1800 lft.	US-31		$ 10,494			
	MASON							
3-17	Grading	6500 cyds.	M-116 US-131	$ 10,600				
	MISSAUKEE							
3-18	Grading	8000 cyds.	M-42	$ 9,540				
3-19	Replace cable guard-rail	970 lft.	M-55		$ 4,558			
	WEXFORD							
3-20	Grading	7000 cyds.	M-42 US-131	$ 15,900				

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MINOR CONSTRUCTION PROGRAM
FOR CONTRACT COUNTIES
(SAFETY-RELATED WORK)

DIST.

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	ALCONA							
4-2	Flatten slopes to eliminate guardrail	2500 cyds.	US-23 M-65	$ 6,000				
4-3	Replace cable guard-rail	400 lft.	US-23 M-65		$ 4,000			
	ALPENA							
4-4	Extend culverts		M-32 US-23			$ 5,900		
4-6	Place buried - end sections	10 end sections	M-32 US-23		$ 2,500			
	CRAWFORD							
4-8	Replace cable guard-rail	1850 lft.	M-72		$ 7,600			

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(SAFETY-RELATED WORK)

DISTRICT 4

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	OGEMAW							
4-10	Replace cable guard-rail	3860 lft.	M-33 M-30		$ 13,896			
	OTSEGO							
4-12	Grading	1500 cyds.	M-32	$ 3,350				

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MINOR CONSTRUCTION PROGRAM
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(SAFETY-RELATED WORK)

DISTRICT 4

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	PRESQUE ISLE							
4-14	Grading	2000 Cu.Yds	US-23	$ 2,300				
4-15	Remove headwalls and extend culverts	8 headwalls	US-23			$ 1,300		
4-16	Replace cable guard-rail	4000 Ln.Ft.	US-23		$ 10,800			
	ROSCOMMON							
4-18	Culverts		US-27 M-18			$ 12,159		

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MINOR CONSTRUCTION PROGRAM
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(SAFETY-RELATED WORK)

DISTRICT 5

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	IONIA							
5-1	Grading for clear vision	.25 acre	M-66	$ 850				
5-4	Replace cable guard-rail with steel beam	6490 lft.	M-21 M-50		$ 45,430			
	KENT							
5-6	Replace cable guard-rail with steel beam	3020 lft.	M-44 M-50		$ 31,940			

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FOR CONTRACT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	MECOSTA							
5-8	Replace cable guard-rail with steel beam		US-131		$ 5,250			
5-9	Grading /clear visior		M-66	$ 6,000				
5-10	Grading /clear visior		M-66	$ 10,000				
	NEWAYGO							
5-13	Grading to eliminate guardrail	30,000 cyds	M-37 M-82	$ 30,000				

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DISTRICT 6

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	ARENAC							
6-1	Remove headwalls & extend culverts	30 loc.	US-23 M-61			$ 8,000		
	GLADWIN							
6-6	Replace cable guard-rail	2,200 lft.	M-61		$ 11,000			

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DISTRICT 6

MINOR CONSTRUCTION PROGRAM
FOR CONTRACT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	HURON							
6-7	Replace cable guard-rail	1500 L.Ft.	M-53 M-25		$ 7,500			
	MIDLAND							
6-8	Remove headwalls & extend culverts	300 L.Ft.	US-10			$ 6,000		
	SANILAC							
6-9	Replace cable guard-rail	2000 L.Ft.	US-25 M-53		$ 10,000			
	SHIAWASSEE							
6-12	Flatten slopes and eliminate guardrail	1000 Cu.Yds.	M-52	$ 4,000				

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DISTRICT 6

FOR CONTRACT COUNTIES

(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	TUSCOLA							
6-14	Extend culverts	17 loca.	M-81			$ 3,400		
6-15	Replace cable guard-rail	3500 lft.	M-24 M-46		$ 21,000			

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MINOR CONSTRUCTION PROGRAM
FOR CONTRACT COUNTIES
(SAFETY-RELATED WORK)

DISTRICT

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	JACKSON							
8-1	Replace guardrail				$ 575			
8-3	Replace guardrail				$ 1,150			
8-5	Flatten slopes and eliminate guardrail	3200 cyds.	M-99	$ 3,500				
	MONROE							
8-7	Extend culvert	Box culvert	M-50			$ 11,000		
8-8	Replace glare screen	6200 lft.	I-75				$ 20,000	

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MINOR CONSTRUCTION PROGRAM
FOR CONTRACT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	OAKLAND							
M-8	Remove and replace guardrail	7500 L.Ft.	I-96 (Future BL-96)		$ 30,000			

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MINOR CONSTRUCTION PROGRAM
FOR CONTRACT COUNTIES
(SAFETY-RELATED WORK)

METRO DISTRICT

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
	ST. CLAIR							
M-20	Replace cable guard-rail		US-25 M-136 M-19		$ 84,960			
	WAYNE							
M-16	Place guardrail for safety	216 lft.	I-75		$ 12,960			
M-17	Shoulder widening	1800 lft.	M-39				$ 25,500	

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MINOR CONSTRUCTION PROGRAM
FOR CONTRACT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc)	TOTAL DOLLARS
M-19	Bridge rail replacement	2 Struct.	M-102				$ 35,000	
	SUBTOTAL CONTRACT	COUNTIES		$196,058	$339,039	$47,759	$ 82,300	$665,156

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MINOR CONSTRUCTION PROGRAM
FOR DIRECT COUNTIES
(SAFETY-RELATED WORK)

DISTRICT 1

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc.)	TOTAL DOLLARS
	BARAGA							
1-1	Tree Removal	5 acres	US-41				$ 10,100	
1-2	Flatten Slopes to eliminate guardrail	1500 cu.yds.	M-28	$ 1,450				

MINOR CONSTRUCTION PROGRAM
FOR DIRECT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc.)	TOTAL DOLLARS
	MACKINAC							
2-1	Grading to provide clear vision	1300 cu.yds	US-2 M-134	$ 4,292				
2-2	Tree Removal	5 acres	US-2 M-134				$ 5,275	
2-4	Replace Cable guardrail	500 L. Ft.	M-134		$ 4,175			

MINOR CONSTRUCTION PROGRAM
FOR DIRECT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc.)	TOTAL DOLLARS
	KALKASKA							
3-1	Grading for clear vision	1200 cu.yds	US-131	$ 4,984				
3-2	Tree Removal	2 acres	US-131				$ 3,024	
3-3	Remove headwalls and extend culverts	12 headwalls 96 L. Ft.	US-131			$ 3,442		
	OSCEOLA							
3-4	Replace Cable Guardrail	300 L. Ft.	M-115		$ 1,343			
3-5	Grading for safety	5415 cu.yds	M-115 M-66 US-10 US-131	$ 17,145				
3-6	Tree Removal	4 acres	M-115 US-131				$ 6,083	

MINOR CONSTRUCTION PROGRAM
FOR DIRECT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc.)	TOTAL DOLLARS
	MONTMORENCY							
4-1	Tree Removal	4 acres	M-33				$ 5,330	
4-2	Grading		M-33	$ 812				
	OSCODA							
4-3	Tree Removal	3 acres	M-72 M-144				$ 4,683	
4-5	Remove headwalls and extend culverts		M-33 M-72			$ 4,764		

MINOR CONSTRUCTION PROGRAM
FOR DIRECT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc.)	TOTAL DOLLARS
	SAGINAW							
6-1	Replace Cable Guardrail	5862 L. Ft.	Various		$ 35,087			
6-2	Flatten Slopes for clear vision	875 cu.yds	I-75 ramp	$ 1,567				
6-3	Remove headwalls and extend culverts	40 L. Ft.	M-46			$ 1,066		

DISTRICT 7
Area 2

MINOR CONSTRUCTION PROGRAM
FOR DIRECT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc.)	TOTAL DOLLARS
	BARRY							
7-1	Replace Cable Guard-rail with Steel Beam	1050 L. Ft.	M-43		$ 7,800			
7-2	Grading	1200 Cu.yds	M-43	$ 4,900				
	BRANCH							
7-3	Remove headwalls and extend culverts	310 L. Ft. 190 end-sect	US-12 M-60			$ 27,165		
	CALHOUN							
7-5	Grading	1000 cu.yds	M-66	$ 4,000				

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MINOR CONSTRUCTION PROGRAM
FOR DIRECT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc.)	TOTAL DOLLARS
	ALLEGAN							
7-7	Remove headwalls extend culverts and place end sections	50 L. Ft. 50 end sect	M-40 M-81			$ 12,500		
7-8	Remove headwalls extend culverts and place end sections	40 L. Ft. 47 end sect	M-89 US-131			$ 14,000		

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MINOR CONSTRUCTION PROGRAM
FOR DIRECT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc.)	TOTAL DOLLARS
	CASS							
7-10	Replace cable guardrail	1670 L. Ft.	M-51		$ 11,641			
7-11	Flatten Slopes and eliminate guardrail	6983 cu.yds	M-60 M-40	$ 13,966				
7-12	Replace cable guardrail	2380 L. Ft.	M-60		$ 12,020			
7-13	Flatten slopes	400 cu.yds	M-62 M-152	$ 4,717				
	ST. JOSEPH							
7-14	Replace cable guardrail	500 L. Ft.	M-60		$ 2,345			
7-15	Extend culverts and flatten slopes	10 end-sect	M-216			$ 7,212		
7-16	Remove headwalls and place end sections	76 end-sect	M-60			$ 7,600		

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MINOR CONSTRUCTION PROGRAM
FOR DIRECT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc.)	TOTAL DOLLARS
	EATON							
8-1	Replace cable guardrail	1700 L. Ft.	US-27		$ 12,000			
8-2	Flatten banks	3000 cu.yds	M-99	$ 10,500				

MINOR CONSTRUCTION PROGRAM
FOR DIRECT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc.)	TOTAL DOLLARS
	INGHAM							
8-3	Flatten slopes	3000 cu.yds	M-78 M-36 M-106	$ 8,000				
	LIVINGSTON							
8-5	Remove headwalls and extend culverts	35 Loc.	US-23 I-96 BI-96			$ 8,750		
8-6	Flatten slopes for safety	12 Loc.	US-23	$ 700				
8-7	Replace cable guardrail	7640 L. Ft.	M-59		$ 20,642			

MINOR CONSTRUCTION PROGRAM
FOR DIRECT COUNTIES
(SAFETY-RELATED WORK)

DIST.-AUTH. NO.	COUNTY (Type of Work)	AMOUNT OF WORK	ROUTE NO.	ESTIMATED COST (Grading)	(Guardrail)	(Culverts)	(Misc.)	TOTAL DOLLARS
	LENAWEE							
8-9	Replace cable guardrail	252 Ft.	US-223		$ 701			
8-10	Flatten slopes	2610 cu.yds	US-223	$ 4,550				
8-12	Replace cable guardrail	300 L. Ft.	US-223		$ 815			
	SUBTOTAL DIRECT COUNTIES			$ 81,583	$ 108,569	$ 86,499	$ 34,495	$ 311,146
	GRAND TOTAL			$ 227,641	$ 447,608	$134,258	$116,795	$ 976,302.