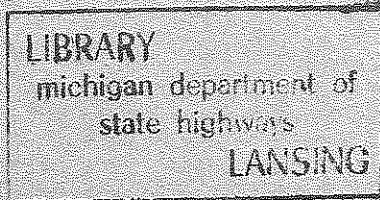


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A PROPOSED PLAN for Adjustment of the Present Truck-Weight Detection System to the Changing Highway Pattern

MICHIGAN STATE HIGHWAY DEPARTMENT
John C. Mackie, Commissioner



Prepared by
OFFICE OF PLANNING Planning Division

September 22, 1958

A PROPOSED PLAN FOR
ADJUSTMENT OF THE PRESENT
TRUCK-WEIGHT DETECTION SYSTEM
TO THE CHANGING HIGHWAY PATTERN

MICHIGAN
STATE HIGHWAY DEPARTMENT
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22 September 1958

A PROPOSED PLAN FOR ADJUSTMENT OF
THE PRESENT TRUCK-WEIGHT DETECTION SYSTEM
TO THE CHANGING HIGHWAY PATTERN

INTRODUCTION

An increasing number of commercial vehicles is utilizing Michigan's highway network. Additional limited access construction, while providing for a larger volume of commercial traffic, has resulted in a rapidly changing highway pattern. It is desirable to alter the present truck-weight detection system so as to adjust this enforcement program to the changing highway pattern.

STRUCTURE OF THE
PRESENT
WEIGHMASTER SECTION

The Weighmaster Section of the Highway Department has developed two basic methods of enforcing truck-weight regulations: 1) the permanent weighing station, and 2) the road patrol weighmaster with portable scales. The permanent stations are located so that the major flows of truck traffic are intercepted for weight checking. These permanent stations require a relatively large physical area and an initial cost of approximately \$130,000 under present economic conditions. It is impractical to construct and maintain a permanent station at every useful check point in the State Trunkline System. They have therefore been supplemented by a number of road patrol weighmasters. These mobile units are particularly effective in checking those truckers who deliberately overload and attempt to avoid permanent stations by taking alternate routes.

At the present there are 13 permanent scale sites in the state and 50 road patrol weighmasters using portable scales. The enforcement system is divided into nine districts; there are eight in the lower peninsula with the upper peninsula being considered the ninth district, although it is divided into six sub-units.

DESIGN OF WEIGH
STATIONS AND DUTIES
OF WEIGHMASTERS

There are three basic designs for present permanent weigh stations. The first of these consists of a station on one side of the highway that services two-way traffic. This system is hazardous; it creates a congested area by intermingling opposing lanes of traffic; and it generally reduces the volume of traffic flow. The second design consists of two stations on opposite sides of the highway, each serving its respective one-way traffic flow. This system avoids the hazardous situation caused by mixing opposing traffic flows. The construction and maintenance of dual facilities, however, is a more costly method of administration. The third design combines the best features of the other two. Such a station is located in the median strip separating opposing flows. Hazards and congestion are reduced by incorporating deceleration and acceleration lanes into and from the weighing facility. Costs are reduced and efficiency is increased by being able to service opposing lanes of traffic from a single station.

Weighmasters have immediate authority and control over the operation of their respective stations. They enforce the passage of trucks over scales; perform weighing operations; issue notices of violation where necessary; and write daily and weekly reports relevant to the performance of their duties.

Mobile weighmasters do not begin to handle the traffic of the permanent stations. Although they may observe many vehicles, they generally weigh only those judged by experience to be suspected of overloading. The actual number weighed is then a small percentage of the vehicles observed, and an even smaller fraction of the volume handled by the permanent stations. The mobile weighmasters are necessary in supplementing the permanent stations and enforcing regulations on less important arterial highways. They provide the flexibility needed to adjust the truck-weight check system to minor changes in the highway and traffic flow pattern.

ADJUSTMENTS NEEDED IN
THE PRESENT TRUCK-
WEIGHT DETECTION SYSTEM

Land use patterns are constantly changing in our dynamic society as a result of population pressures and changing economic, political, and social values. It is, therefore, important to reappraise the various aspects of our highway program from time to time and to anticipate to the best of our knowledge future needs. The State Highway Department's accelerated construction program will build many miles of both limited access and free access highways. It is imperative that the complete truck-weight enforcement program be re-evaluated in relationship to the increased mileage and new pattern of Michigan's total future network. There are several reasons for an adjustment of the present weight detection system:

1. Existing weigh stations on free access roads that are to be rebuilt or relocated as limited access highways should be replaced in accordance with the physical change and higher operational standards of the new facility.
2. The location of major enforcement gaps in the future trunkline network should be determined and consideration be given to the inclusion of new weigh stations at those points.
3. The number and distribution of mobile road patrol weighmasters should be adjusted in accordance with the new pattern of highways, traffic flow, and the location of permanent weigh stations.

The existing pattern of average daily truck volumes on the trunkline system, based on the 1957 Commercial Traffic Map, and future planned changes in the trunkline system have been carefully considered with respect to proposed changes in the truck-weight enforcement system. The possibility of the development of electronic overload detectors of sufficient capacity and accuracy to meet our standards and requirements is being investigated by the Testing and Research Division. If these devices prove satisfactory, the individual efficiency and capacity of any particular weigh station could be increased many times, since only a small percentage of the total commercial traffic would be required to submit to precise static weighing.

RECOMMENDED CHANGES
IN THE TRUCK-WEIGHT
DETECTION SYSTEM

Permanent weigh stations have been classified into three groups: 1) present sites, 2) sites to be relocated, and 3) proposed new sites. These sites are shown graphically in relation to the Five Year Construction Program in Plate 1. Table 1 gives the distribution of road patrol and scale house weighmasters in the various districts.

A recent alteration of enforcement districts has achieved a more equitable distribution of average daily truck volumes. This present system also provides for the distribution and allocation of road patrol weighmasters in keeping with the increasing volume flow and changing highway pattern.

In order to maintain an efficient enforcement of truck-weight regulations, it is necessary to adjust detection installations to the increasing and changing flow pattern. Proposed changes in permanent site locations are discussed here briefly.

It is felt that four installations in the state do not need to be relocated, these being the Lansing station and three stations in the Erie area. The design and location of these stations are such as to effectively check weight regulations in these areas. The Erie region has three weigh stations, two of which are uni-directional, occupying a permanent site on both sides of US-24A, the other being located on US-25.

Presently, two stations checking opposing traffic make up the New Buffalo Scale. A limited access highway is scheduled for construction in this area that should provide a great increase in traffic from the Chicago region. It is thought that one station located in the triangle formed by LaPorte and Wilson Roads on the east side of the interchange and south of the junction of M-60 and US-12 will best be able to serve the needs of the enforcement program at this point.

It is desirable to relocate the present Cambridge Junction Scale situated 20 miles southeast of Jackson for two reasons: 1) proposed route relocation and construction

in this area will supplant the usefulness of the present station, and 2) approximately 550 more trucks pass near Clinton on US-112 than at the present scale site. It is suggested, therefore, that the station be relocated near the community of Clinton.

A new location is needed for the present St. Ignace Scale. Trucks now have to pass two miles out of their way to cross the scale on the old ferry dock as a result of the completion of the Mackinac Bridge. A new installation near the bridge on the Mackinaw City side would serve as a check on the natural funnel of commercial traffic to and from the Upper Peninsula.

It will be necessary to move the Clio Scale as a result of the western relocation of US-23. No definite site has been selected, but the location should be in the median strip.

The Pontiac and Fowlerville Scales will also have to be relocated due to the construction of limited access highways. Relocation should be in the median strip. According to the 1957 Commercial Traffic Map, more trucks pass the Pontiac check point than any other scale in the state.

US-12 is to be extended east of Jackson as a limited access highway, necessitating the relocation of the Jackson Scale in the median strip.

The Ionia Scale at the junction of US-16 and M-66 should be relocated in the median strip in keeping with planned construction between Lansing and Grand Rapids.

Seven new locations are suggested for permanent weighing installations in order to fill gaps in the present enforcement system. Nearly all proposed stations should be of the median strip design. They are necessary in order to efficiently serve the increased, high-volume flow possible on proposed limited access highways in these areas.

1. A station is proposed for the Mt. Clemens area near the junction of US-25 and M-59. Presently, 1700-1900 commercial vehicles pass

this intersection daily. This figure is expected to increase with highway facilities and increased traffic between Port Huron and Detroit. This traffic may be further influenced by development of the St. Lawrence Seaway.

2. A second station is recommended for the area south of the proposed US-23 - US-223 interchange near the state line. At the present, US-23 handles 1300 trucks daily in this area. The merger of US-23 and US-223 into a dual route here will result in an increased volume of traffic.
3. A new station is proposed for a location six miles north of the state line on a limited access highway to be constructed along the present US-27. This new facility should result in increased truck traffic entering Michigan from the Ohio-Indiana Turnpike, Fort Wayne, and other points south.
4. A station is proposed for the area near the junction of US-131 and US-112 so as to check traffic between the Detroit and Chicago regions apart from the M-60 - US-12 connection.
5. A station is proposed for the limited access highway to be constructed between the important economic centers of Grand Rapids and Kalamazoo. In the past, the southwestern part of the state has not been adequately served by the truck-weight enforcement system. It is strongly recommended that a permanent station be located between these two major urban areas in order to increase the effectiveness of the enforcement system in the southwestern region.
6. Commercial traffic has increased on US-127 between Jackson and US-112. With the construction of an east bypass (US-127) at Jackson, traffic is expected to show a further increase. It is recommended that a permanent weigh station be located in the median strip north of the M-50 - US-127 interchange and south of the city limits of Jackson.
7. A station is deemed necessary for the junction of US-2 and US-41 near Powers in the Upper Peninsula. Such a location will serve as a check on the interchange of traffic between Iron Mountain, Menominee, and Escanaba. Approximately 250-450 commercial vehicles pass through this intersection daily.

SUMMARY

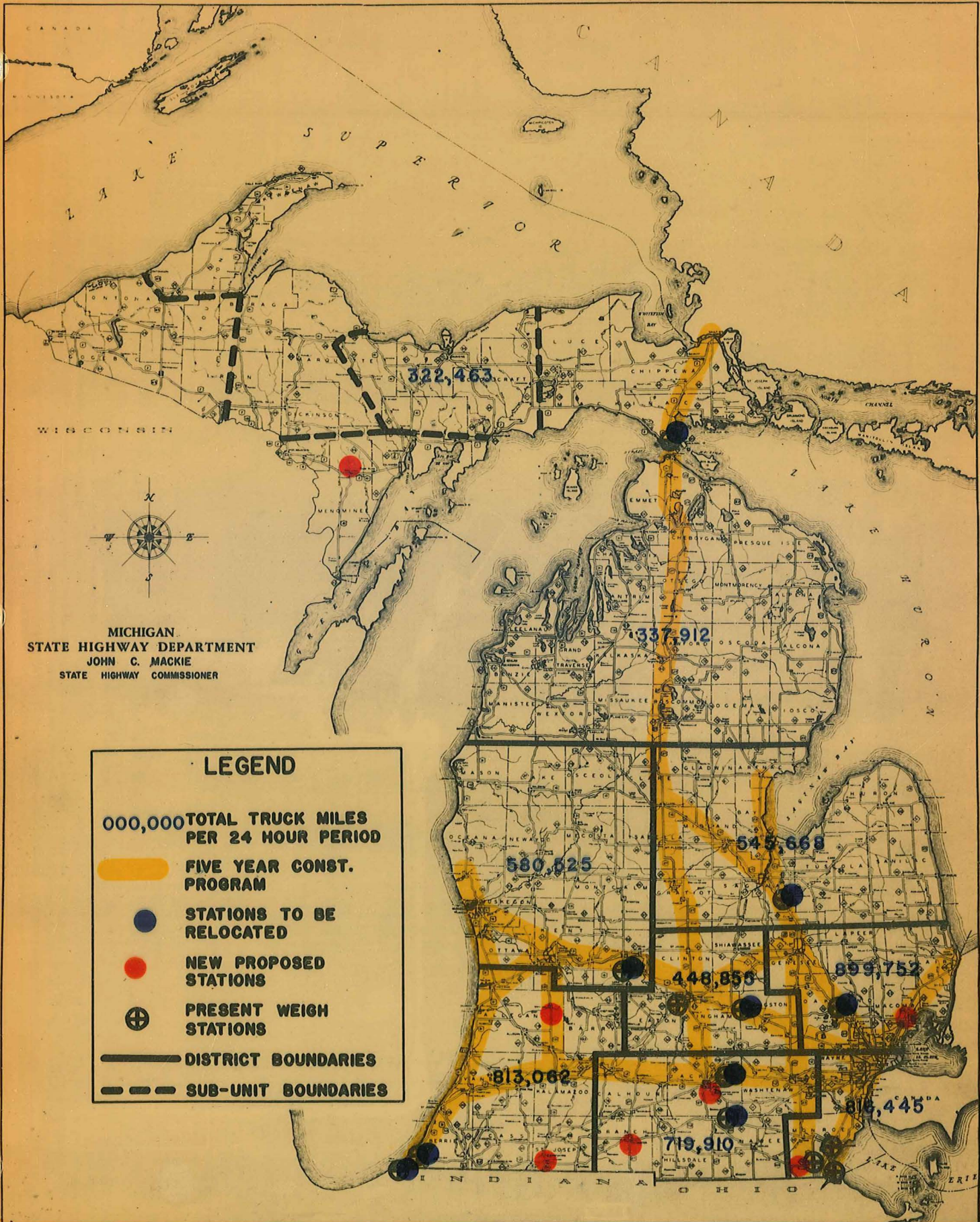
These proposed adjustments in the truck-weight detection system are needed in order to increase the effectiveness of the system and to align it with the new, total highway pattern and commercial traffic flow. A highly effective enforcement program will reduce roadway failure and sustain maximum traffic flow to the benefit of all concerned.

A D D E N D A

TABLE I
DISTRIBUTION OF ROAD PATROL
AND
SCALE HOUSE WEIGHMASTERS

<u>DISTRICT NO.</u>	<u>ROAD PATROL WEIGHMASTERS</u>	<u>SCALE HOUSE WEIGHMASTERS</u>
1. (Wayne-Monroe)	6	14
2. (Jackson-Cambridge)	8	8
3. (New Buffalo)	5	8
4. (Ionia)	6	4
5. (Lansing-Fowlerville)	5	9
6. (Pontiac)	6	4
7. (Clio)	4	4
8. (Mackinaw City)	4	0
9. (Upper Peninsula)	<u>6</u>	<u>4</u>
	50	55

PLATE I
THE PERMANENT WEIGH STATION SYSTEM



MICHIGAN
STATE HIGHWAY DEPARTMENT
JOHN C. MACKIE
STATE HIGHWAY COMMISSIONER

LEGEND

000,000 TOTAL TRUCK MILES PER 24 HOUR PERIOD

FIVE YEAR CONST. PROGRAM

STATIONS TO BE RELOCATED

NEW PROPOSED STATIONS

+ PRESENT WEIGH STATIONS

— DISTRICT BOUNDARIES

- - - SUB-UNIT BOUNDARIES

322,463

337,912

580,525

545,668

448,855

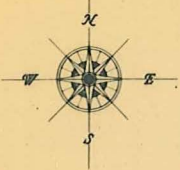
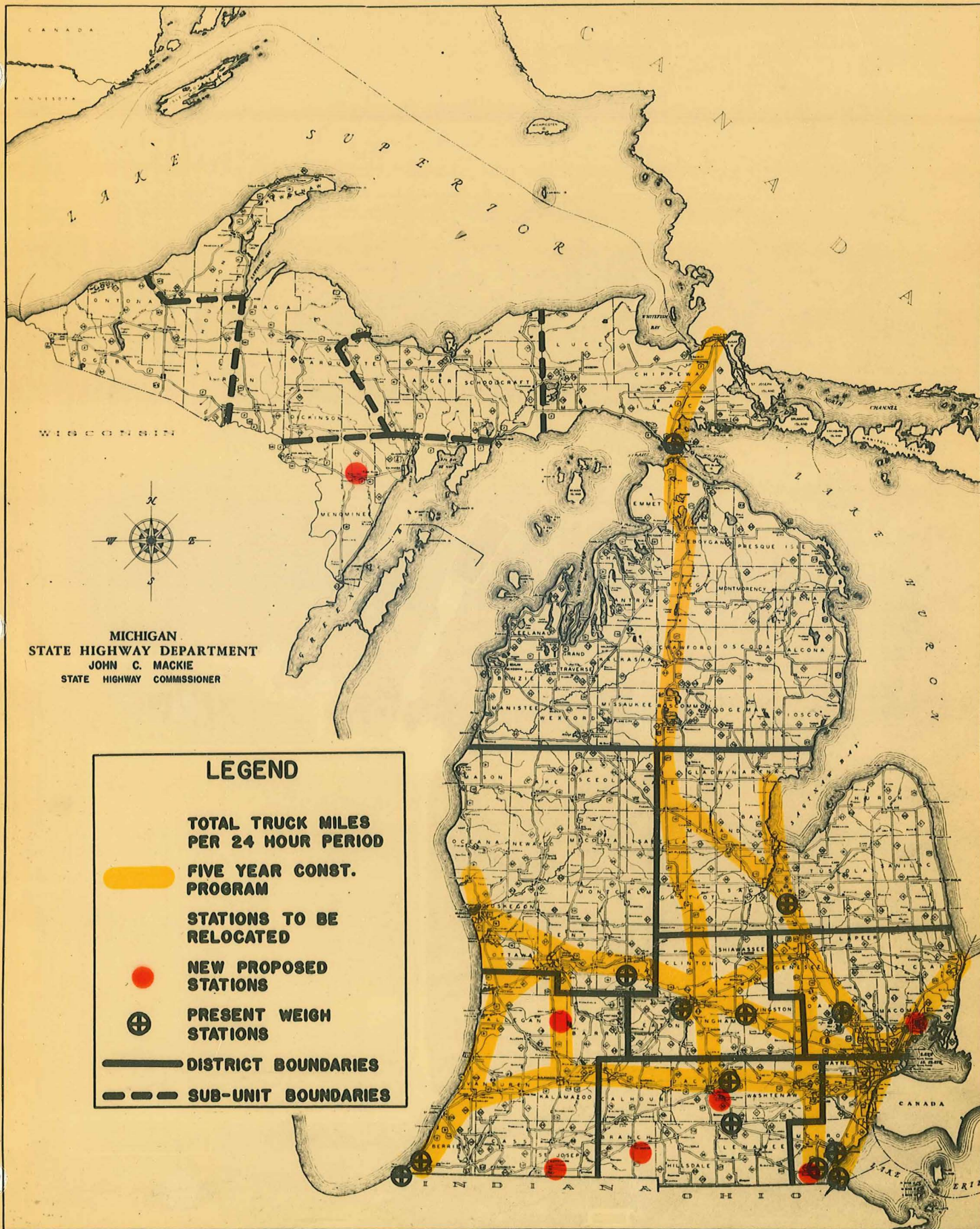
899,752

813,062

719,910

816,445

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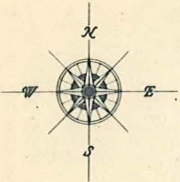
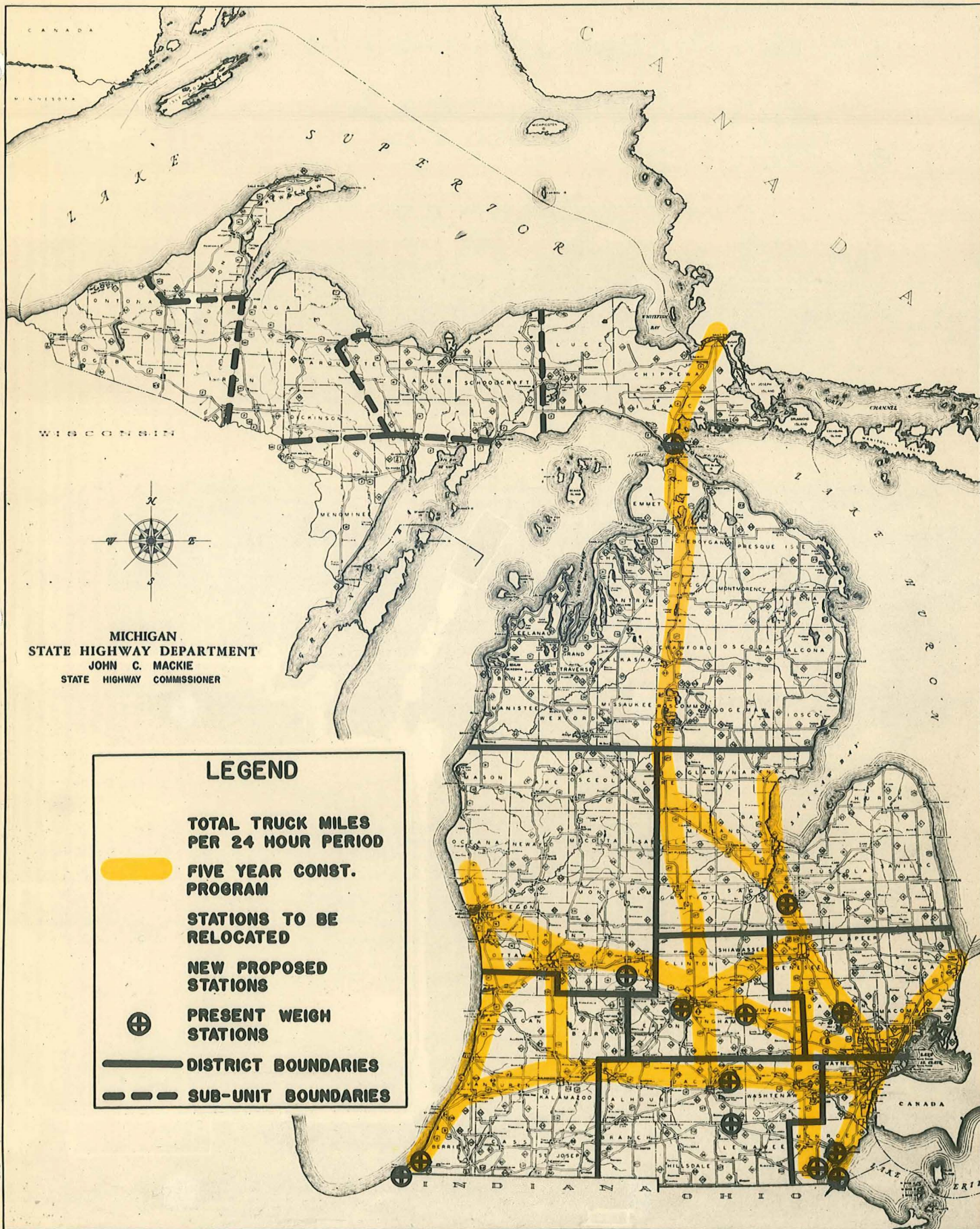


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STATE HIGHWAY COMMISSIONER

LEGEND








- TOTAL TRUCK MILES PER 24 HOUR PERIOD
- FIVE YEAR CONST. PROGRAM
- STATIONS TO BE RELOCATED
- NEW PROPOSED STATIONS
- + PRESENT WEIGH STATIONS
- DISTRICT BOUNDARIES
- SUB-UNIT BOUNDARIES

PLATE I
THE PERMANENT WEIGH STATION SYSTEM

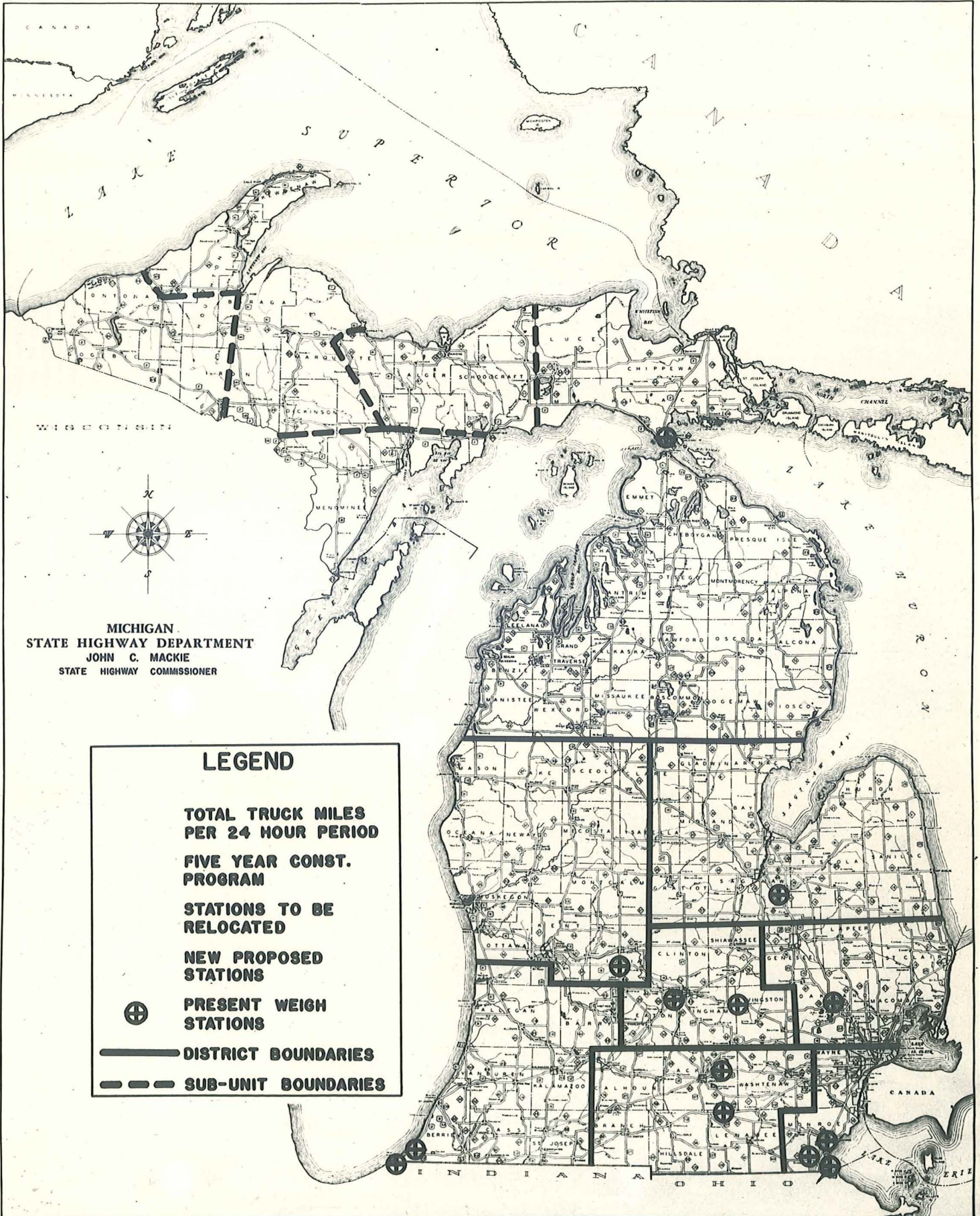


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LEGEND

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**PLATE I
THE PERMANENT WEIGH STATION SYSTEM**



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