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MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

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Manistee Area
Transportation Study
External Survey
January, 1974
Northwest Transportation
Analysis Unit

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JOHN P. WOODFORD, DIRECTOR

January 18, 1974

Mr. Sam F. Cryderman
Deputy Director
Bureau of Transportation Planning

Dear Mr. Cryderman:

The Transportation Survey and Analysis Section of the Bureau of Transportation Planning has documented the results of the "Manistee Area Transportation Study External Survey". During the month of August, 1972, an external origin and destination survey was conducted at Manistee, Michigan. Its purpose was to determine the traffic patterns in Manistee as a sound basis for planning the efficient traffic arteries needed in the future.

This report was prepared by Thomas Pickens, Transportation Analyst. The Northwest Analysis Unit Supervisor is Norman Farnum.

Sincerely,

A handwritten signature in cursive script that reads "Keith E. Bushnell".

Keith E. Bushnell
Engineer of Transportation
Survey and Analysis Section



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Terminology and Definitions

The following terms may be mentioned in the context of this report. A brief definition of each should enable a better understanding of the processes and concepts involved in this Origin-Destination Study.

Central Business District (CBD): The zone or zones comprising the concentrated commercial and retail business center of a city.

Classification Counts: Vehicles are counted and placed in categories (passenger cars, single unit trucks, etc.).

Cordon Line: The imaginary line enclosing the area of study.

Cordon Trip, Terminal Trip: A trip with one end outside of the study area and the other end inside the study area.

Desire Line: A straight imaginary line between stations and/or zones connecting a trip origin and destination. Actual routes of travel are not considered.

Destination: Place where a trip ends.

External Station, Interview Station: A point on a route crossing the cordon line at which the drivers of vehicles are interviewed and classification counts are taken.

External Survey: One phase of the origin-destination survey. Interviews are conducted at the cordon line.

External Trip: A trip with one or both ends outside the study area.

Origin: Place where a trip begins.

Study Area: The geographical area selected for the origin and destination study. Area enclosed by the cordon line.

Through Trip: A trip through an external station having both ends of the trip outside the study area.

Trip: One-way travel between an origin and a destination.

Zone: A basic subdivision of the study area having a single or dominant land use, designated for purposes of tabulation and analysis.

FIELD PROCEDURE

Field work for the Manistee external O-D study was conducted during August of 1972. The purpose of the study was to collect data on traffic movement into, out of, and through the Manistee area.

A cordon line was drawn around Manistee and environs in order to define the study area. Where the cordon line crossed a road an external interview station was established. Eleven such stations were created for the Manistee area of which four were on state trunkline. The study area was subdivided into 29 internal zones.

Three of the original eleven external interview stations were not operated since preliminary counts indicated that traffic passing through these stations was negligible when compared to the remaining eight stations.

Interview and classification counts were taken at each of the eight operational stations. Classification counts were taken for twenty-four hours and interviewing drivers was conducted between the hours of 6 a.m. and 8 p.m. in each case.

The drivers were interviewed as to the origin, destination, and purpose of the trip they were making. The responses to these questions were recorded on Form OD-1757. Information from each vehicle was recorded on separate lines of the interview form. These interviews were made of vehicles traveling in each direction, i.e. inbound and outbound. Where traffic was heavy, periodically vehicles were allowed to pass through in order to prevent back-ups. Approximately 60 percent of the twenty-four hour volume was interviewed. A sample copy of the interview form is shown in Appendix A.

STATION LOCATIONS

<u>Station Number</u>	<u>Route</u>	<u>Location</u>
1	M-110	.6 Mi. N. of Parkdale
2	Hill Road	.6 Mi. N. of US-31
3	US-31, North	.1 Mi. NE. of Frost Road
4	M-55	1.0 Mi. SE. of Pine Creek Road
5	East Lake Road	.1 Mi. NW. of Stienberg Road
6	Link Road	.5 Mi. S. of Drive to PKG. Co.
7	US-31, South	S. of JCT, with Grant Road
8	Maple Road	.1 Mi. N. of Canfield

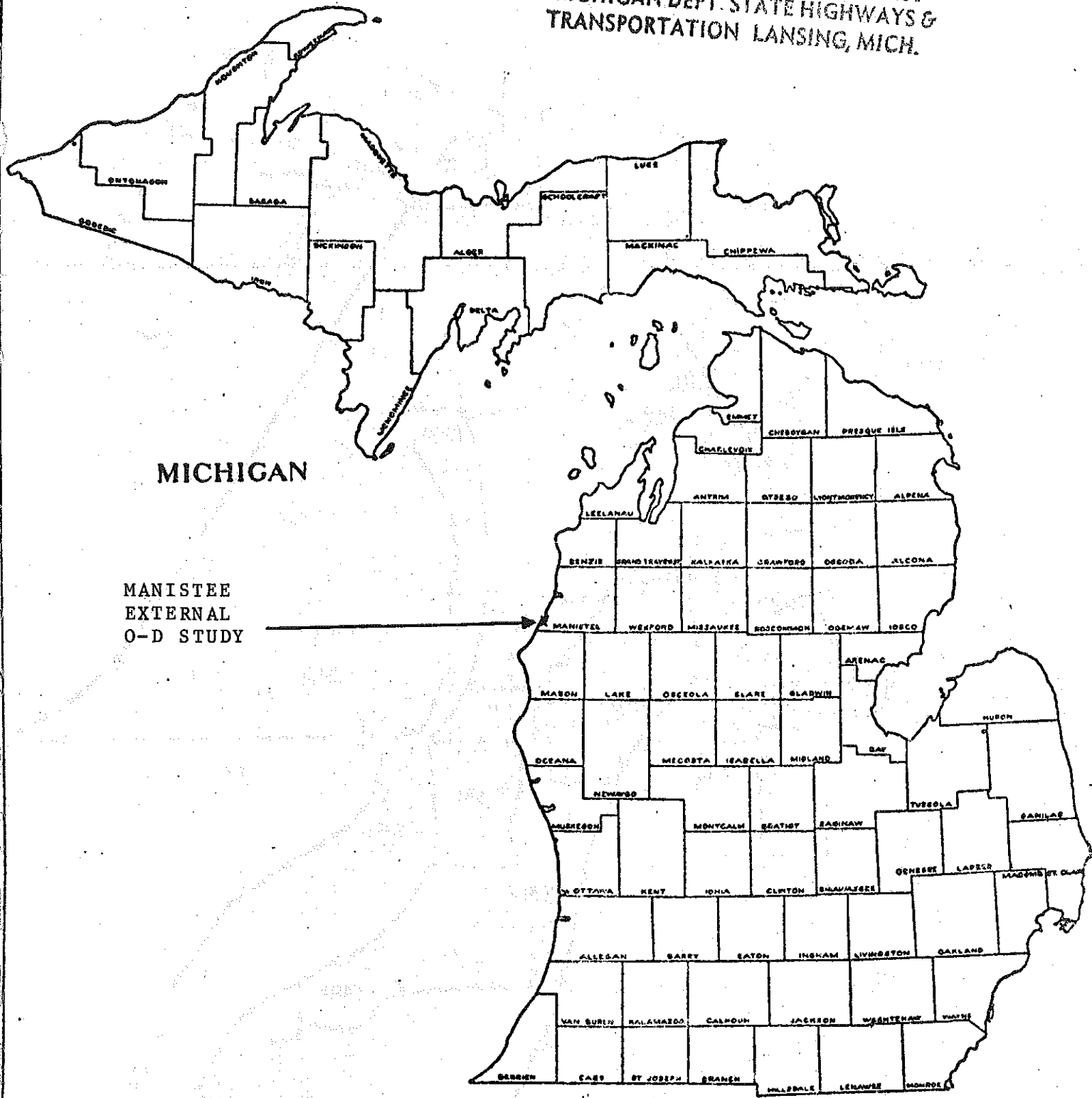
STUDY AREA ZONES

<u>Zone Number</u>	<u>Code</u>	<u>Translation</u>
40	PCOFA	Packaging Corporation of America
39	FC	Filer City
38	MDFC	Manistee Drop Forge Company
37	STWP	South Township
36	NML	Noman's Land
35	SLRC	Standard Line Refractories Corp.
34	SETWP	Southeast Township
33	HSC	Hardy Salt Company
32	CENT	Century Boats
31	MHCC	Manistee Heights Care Center
30	MGCC	Manistee Golf & Country Club
29	FSTPK	First Street Park
28	SR	South Residence
27	SER	Southeast Residence

5

<u>Zone Number</u>	<u>Code</u>	<u>Translation</u>
26	MSC	Morton Salt Company
25	ELK	East Lake
24	ETWP	East Township
23	MCC	Michigan Chemical Corporation
22	MLK	Manistee Lake
21	CBD	Central Business District
20	NWSC	Northwest Shopping Center
19	MIW	Manistee Iron Works
18	COMP	Consumers Power Company
17	FAVPK	Fifth Avenue Park
16	NR	North Residence
15	OAKCR	Oakgrove Motel & Cemetery
14	CORD	County Road Commission
13	PKDALE	Parkdale
12	NTWP	North Township

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MANISTEE
 EXTERNAL
 O-D STUDY

MICHIGAN

MANISTEE AREA

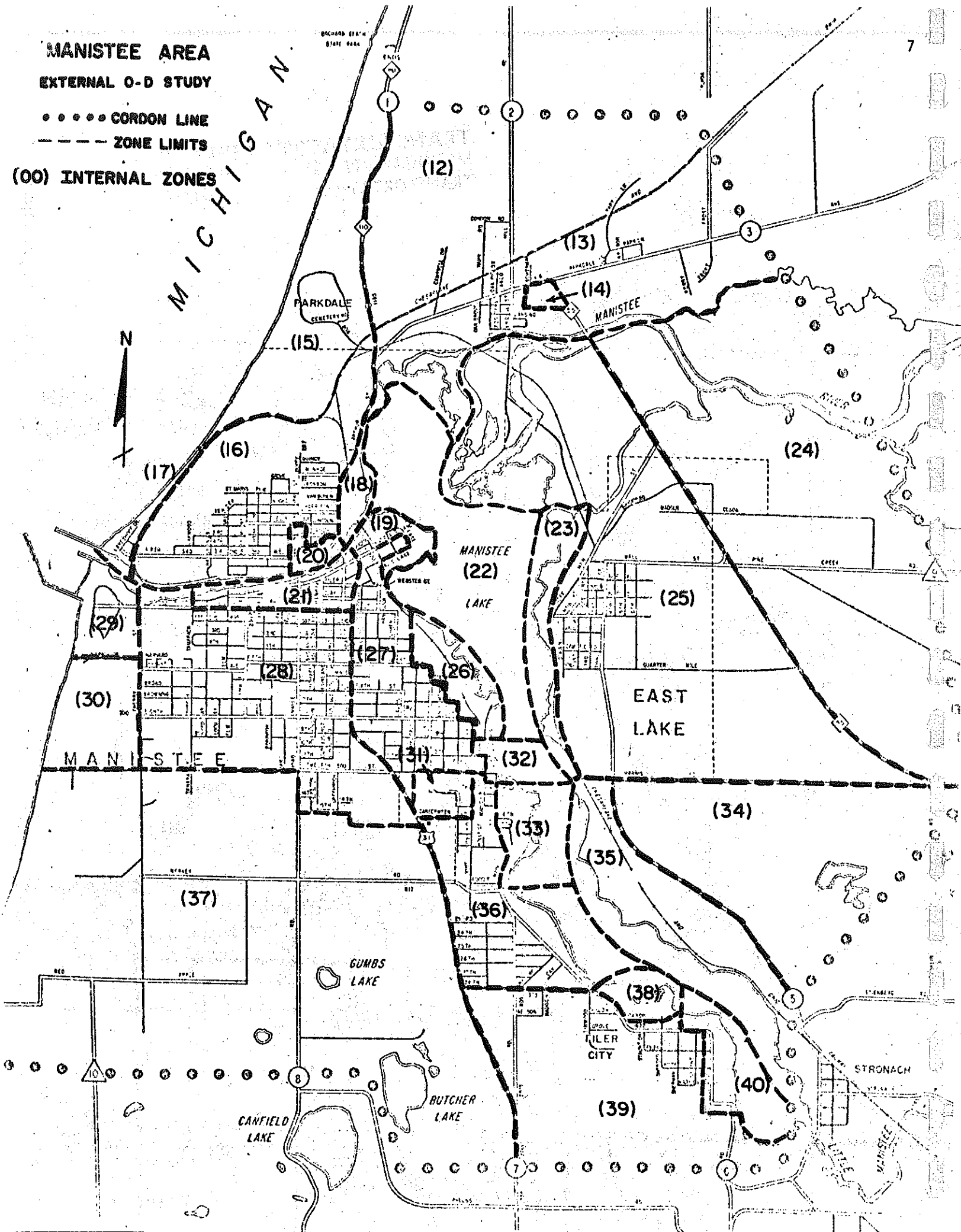
EXTERNAL O-D STUDY

..... CORDON LINE

----- ZONE LIMITS

(00) INTERNAL ZONES

MICHIGAN



All Stations

On an average August weekday in 1972, there were 21,536 vehicles which passed through the eight interview stations located on the Cordon Line around the Manistee Study Area. Of the 21,536 vehicles, 17,160 (79.7 percent) traveled on the state highways.

There were 13,191 interviews taken for 14-hours at the eight stations. This is 61.3 percent of the 21,536 vehicles counted during the 24-hour period. Station 3 (US-31, North) had 3,780 interviews taken in the 14-hour period or 47.6 percent of the 24-hour volume of 7,949 vehicles. This is the lowest percentage for any of the eight stations. The highest percentage of 14-hour interviews of 24-hour volume was 79.6 percent at Station 2 (Hill Road).

Station 3 (US-31, North) had the highest volume of 7,949 vehicles for a 24-hour period or 36.9 percent of the 21,536 counted vehicles at all stations. Station 2 (Hill Rd.) had the lowest volume of traffic for a 24-hour period-553 vehicles or 2.6 percent of the total 21,536 vehicles.

Station 6 (Link Rd.) had the highest percentage of terminal traffic-93.8 percent or 1,697 vehicles out of the 1,810 total. Station 7 (US-31, South) had the lowest percent of terminal traffic-56.1 percent or 2,809 vehicles out of the 5,010 total.

There were 15,268 terminal trips. These are trips that have one end of the trip inside the study area and the other end outside the area. Zone 21 (Central Business District) generated the largest number of terminal trips-3,263 trips or 21.4 percent

of the 15,268 total terminal trips. Four zones (16, 21, 27, and 28) accounted for 8,375 terminal trips or 54.9 percent of the total 15,268 terminal trips.

The traffic volume at each station is as follows:

Station	Traffic	% of Grand Total
1 - M-110	2,513	11.7
2 - Hill Road	553	2.6
3 - US-31, North	7,949	36.9
4 - M-55	1,688	7.8
5 - East Lake Road	743	3.4
6 - Link Road	1,810	8.4
7 - US-31, South	5,010	23.3
8 - Maple Road	<u>1,270</u>	<u>5.9</u>
Grand Total	21,536	100.0

	Traffic	% of Grand Total
Trunkline (Stations 1, 3, 4 and 7)	17,160	79.7
Non-Trunkline (Stations 2, 5, 6 and 8)	<u>4,376</u>	<u>20.3</u>
Grand Total	21,536	100.0

Station	24-Hour Total Traffic	14-Hour (6AM-8PM) Interviews Taken	% Interviewed
1	2,513	1,820	72.4
2	553	440	79.6
3	7,949	3,780	47.6
4	1,688	1,200	71.1
5	743	548	73.8
6	1,810	1,346	74.4
7	5,010	3,099	61.9
8	<u>1,270</u>	<u>958</u>	75.4
Grand Total	21,536	13,191	61.3

Station	Total Traffic	Terminal	% of Total	Through	% of Total
1	2,513	2,151	85.6	362	14.4
2	553	426	77.0	127	23.0
3	7,949	5,232	65.8	2,717	34.2
4	1,688	1,257	74.5	431	25.5
5	743	636	85.6	107	14.4
6	1,810	1,697	93.8	113	6.2
7	5,010	2,809	56.1	2,201	43.9
8	<u>1,270</u>	<u>1,060</u>	83.5	<u>210</u>	16.5
Grand Total	21,536	15,268		6,268*	
Trips	18,402	15,268	83.0	3,134	17.0

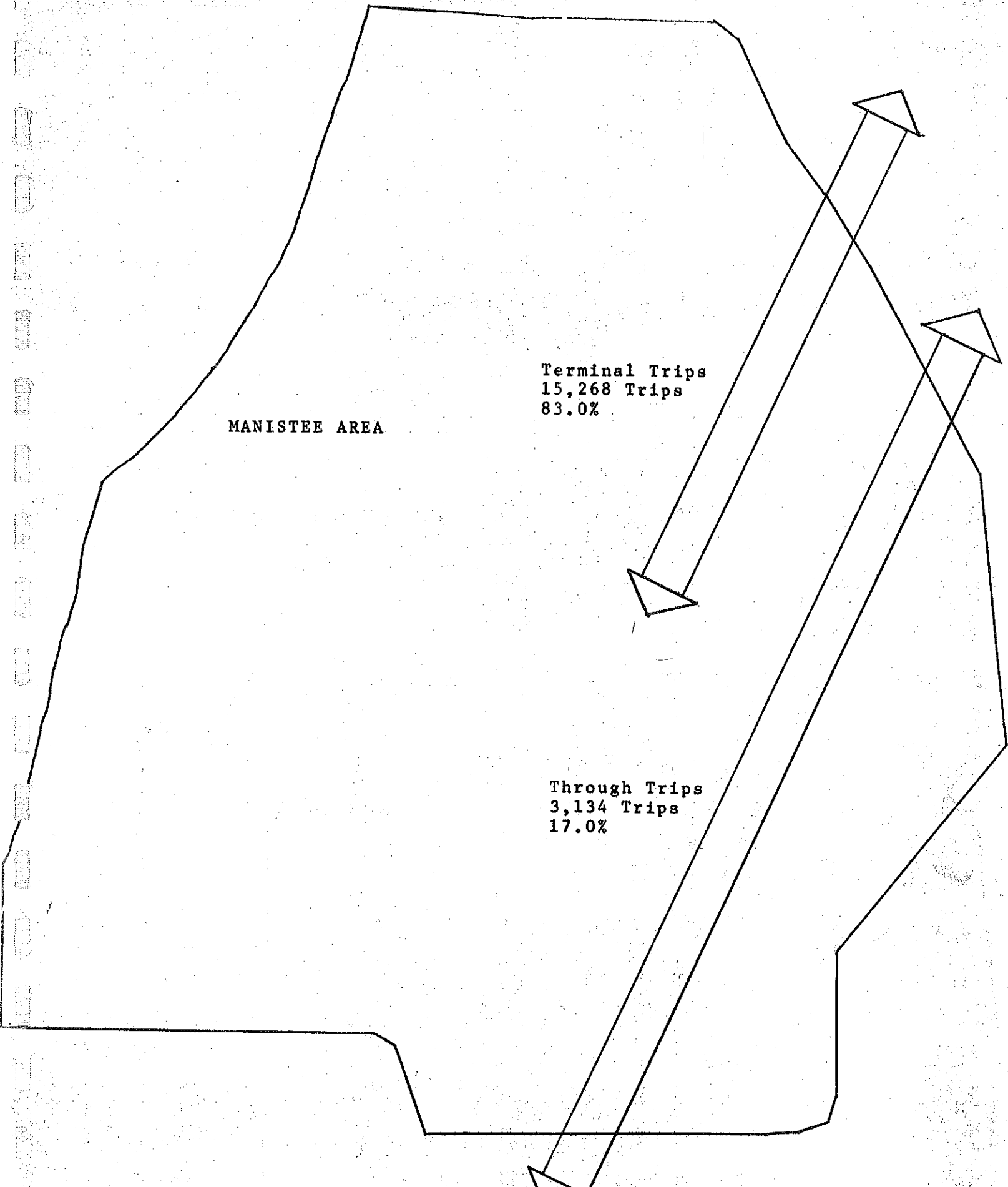
* A through vehicle is counted twice. It is counted at both its entering and departing stations.

TRIP MOVEMENTS
1972 August Weekday
Total 18,402 Trips

MANISTEE AREA

Terminal Trips
15,268 Trips
83.0%

Through Trips
3,134 Trips
17.0%



ALL STATIONS COMBINED

Terminal Trips to Study Zones

<u>Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
12	52	.3
13	1,019	6.7
14	217	1.4
15	30	.2
16	1,372	9.0
17	184	1.2
18	139	.9
19	291	1.9
20	275	1.8
21	3,263	21.4
22	19	.1
23	0	0.0
24	38	.3
25	494	3.2
26	212	1.4
27	1,921	12.6
28	1,819	11.9
29	271	1.8
30	75	.5
31	126	.8
32	141	.9
33	160	1.0
34	13	.1
35	344	2.3
36	1,078	7.1
37	217	1.4
38	106	.7
39	693	4.5
40	<u>699</u>	<u>4.6</u>
Total	15,268	100.0

TERMINAL TRAFFIC BETWEEN
ALL STATIONS AND INTERNAL ZONES
15,268 VEHICLE TRIPS

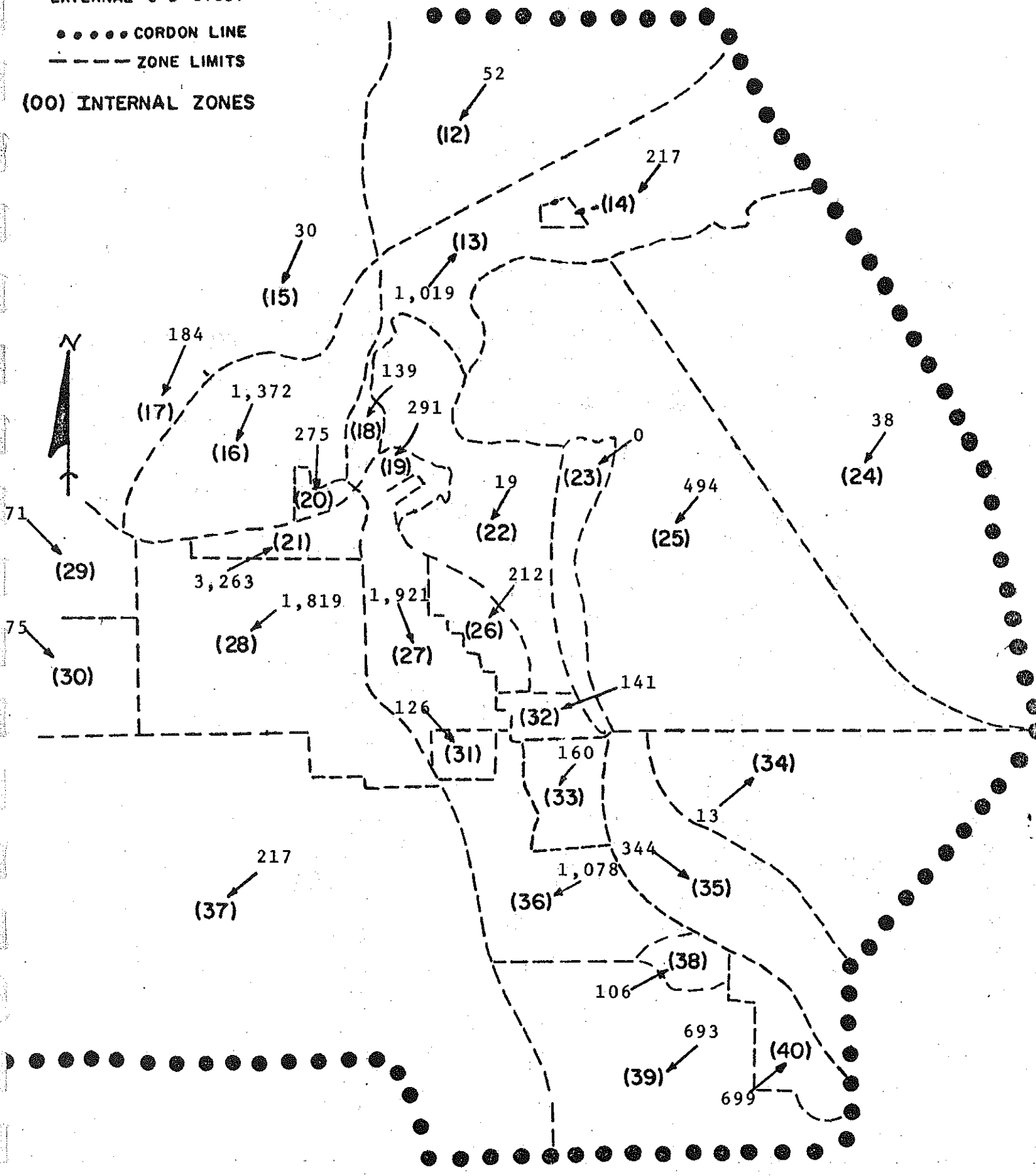
MANISTEE AREA

EXTERNAL O-D STUDY

..... CORDON LINE

----- ZONE LIMITS

(OO) INTERNAL ZONES



Station 1 (M-110)

Station 1 is located .6 miles north of Parkdale. M-110 leads to the State Park which is 2 miles north of Manistee.

A total of 2,513 vehicles passed through this station. Tabulations on the following pages give a detailed documentation of this traffic.

Approximately 8 out of every 10 vehicles had a terminal inside the study area; 8 out of every 10 vehicles were autos and 8 out of 100 vehicles were panels or pickups whether they traveled into or through the area. More than 80 percent of the passenger cars and panels or pickups had a terminal inside the study area.

The largest trip purpose was other soc. or rec. with 728 trips or 28.9 percent of the 2,513 total trips. All trip purposes except vacation had more than 80 percent terminal traffic. Nearly two-thirds of the vacation trips were through trips.

Station 7 (US-31 South) accounted for 182 trips or 50.3 percent of the 362 through trips. Stations 3, 4, and 7 accounted for 321 trips or 88.7 percent of the 362 through trips.

Zone 21 (Central Business District) accounted for 596 trips or 27.7 percent of the 2,151 terminal trips. Zones 16, 21, 27, and 28 accounted for 1,448 trips or 67.3 percent of the 2,151 terminal trips.

There were 1,932 trips or 76.9 percent of the 2,513 trips that had a trip length of 1-20 minutes. There were 2,319 trips (92.3 percent) that had a trip length of one hour or less.

The origin and destination of all the trips which passed through the station were tabulated by county, Ontario and 11 states (see 95 zone system). There are two ends for each trip; an origin and a destination. There were 2,502 trips which passed through Station 1. This total is slightly different from the other tabulations due to rounding. There were 5,004 total trip ends.

There were 4,682 trip ends (93.6 percent) in Manistee County. There were 5 trip ends (0.1 percent) in the upper peninsula. The lower peninsula accounted for 4,974 trip ends (99.4 percent). There were 25 origins and/or destinations (0.5 percent) outstate.

Station 1, M-110

<u>Vehicle Type</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Passenger Car	2,197	87.4	1,925	87.6	272	12.4
Passenger Car with Trailer	73	2.9	29	39.7	44	60.3
Panel or Pickup	208	8.3	178	85.6	30	14.4
Panel or Pickup with Trailer	18	0.7	8	44.4	10	55.6
Other Single Unit Trucks	10	0.4	8	80.0	2	20.0
Combinations and Trucks with Trailers	7	0.3	3	42.9	4	57.1
TOTAL	2,513	100.0	2,151	85.6	362	14.4

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	625	24.9	561	89.8	64	10.2
Personal Business	119	4.7	112	94.1	7	5.9
Shopping	607	24.2	597	98.4	10	1.6
Vacation	228	9.1	78	34.2	150	65.8
Other Soc. or Rec.	728	28.9	627	86.1	101	13.9
All Other	206	8.2	176	85.4	30	14.6
TOTAL	2,513	100.0	2,151	85.6	362	14.4

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Station 1, M-110

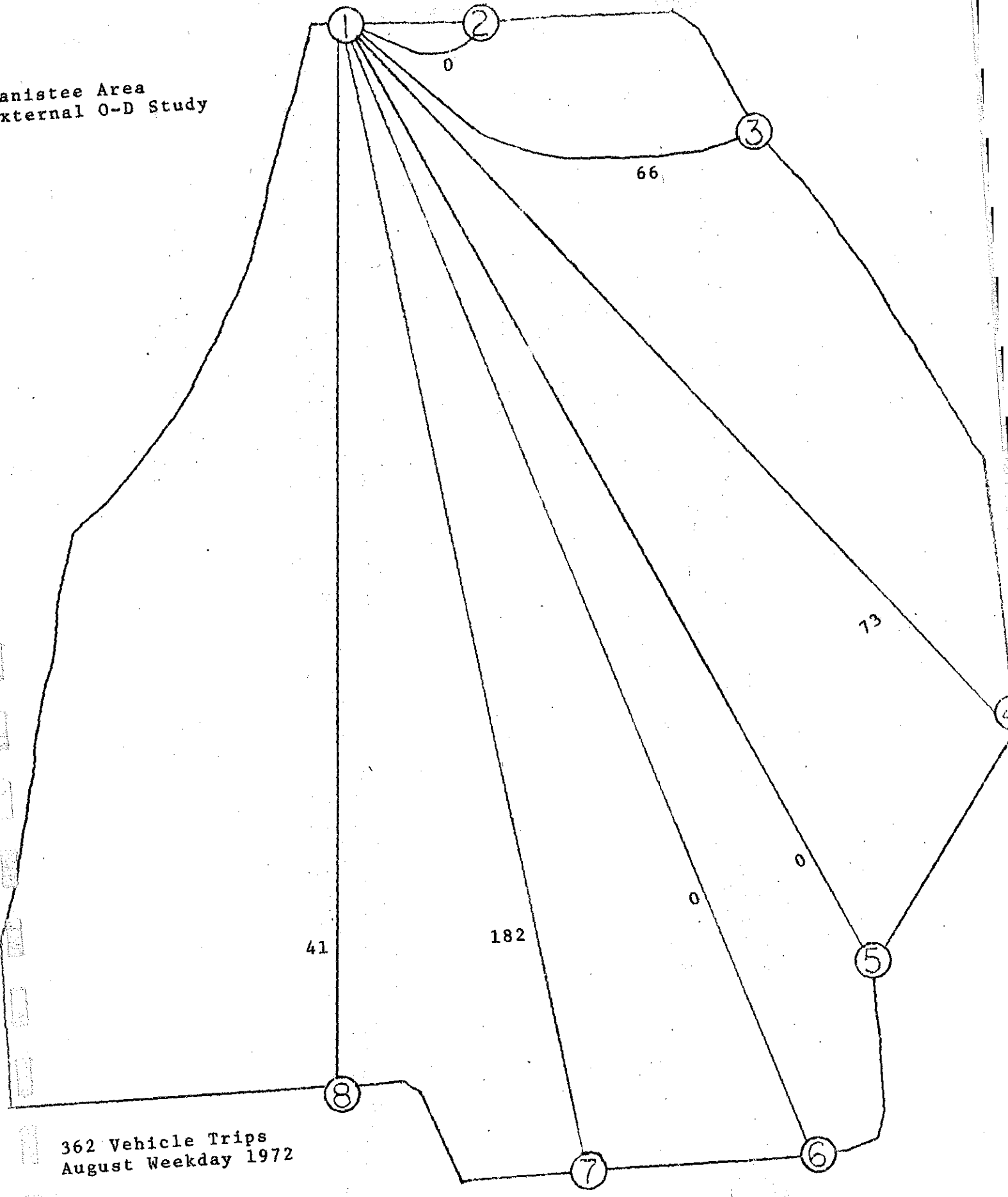
THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
2 - Hill Road	0	0.0
3 - US-31 (North)	66	18.2
4 - M-55	73	20.2
5 - East Lake Road	0	0.0
6 - Link Road	0	0.0
7 - US-31 (South)	182	50.3
8 - Maple Road	41	11.3
TOTAL	362	100.0

TRANSPORTATION LITERATURE
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TRANSPORTATION LITERATURE

THROUGH TRAFFIC INTERCHANGE
Station 1, M-110

Manistee Area
External O-D Study



362 Vehicle Trips
August Weekday 1972

TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
12	12	.6
13	135	6.3
14	3	.1
15	10	.5
16	274	12.7
17	41	1.9
18	16	.7
19	32	1.5
20	76	3.5
21	596	27.7
22	10	.5
23	0	0.0
24	1	.05
25	19	.9
26	20	.9
27	263	12.2
28	315	14.7
29	84	3.9
30	22	1.0
31	21	1.0
32	4	.2
33	15	.7
34	0	0.0
35	5	.2
36	88	4.1
37	29	1.3
38	1	.05
39	38	1.8
40	21	1.0
TOTAL	<u>2151</u>	<u>100.0</u>

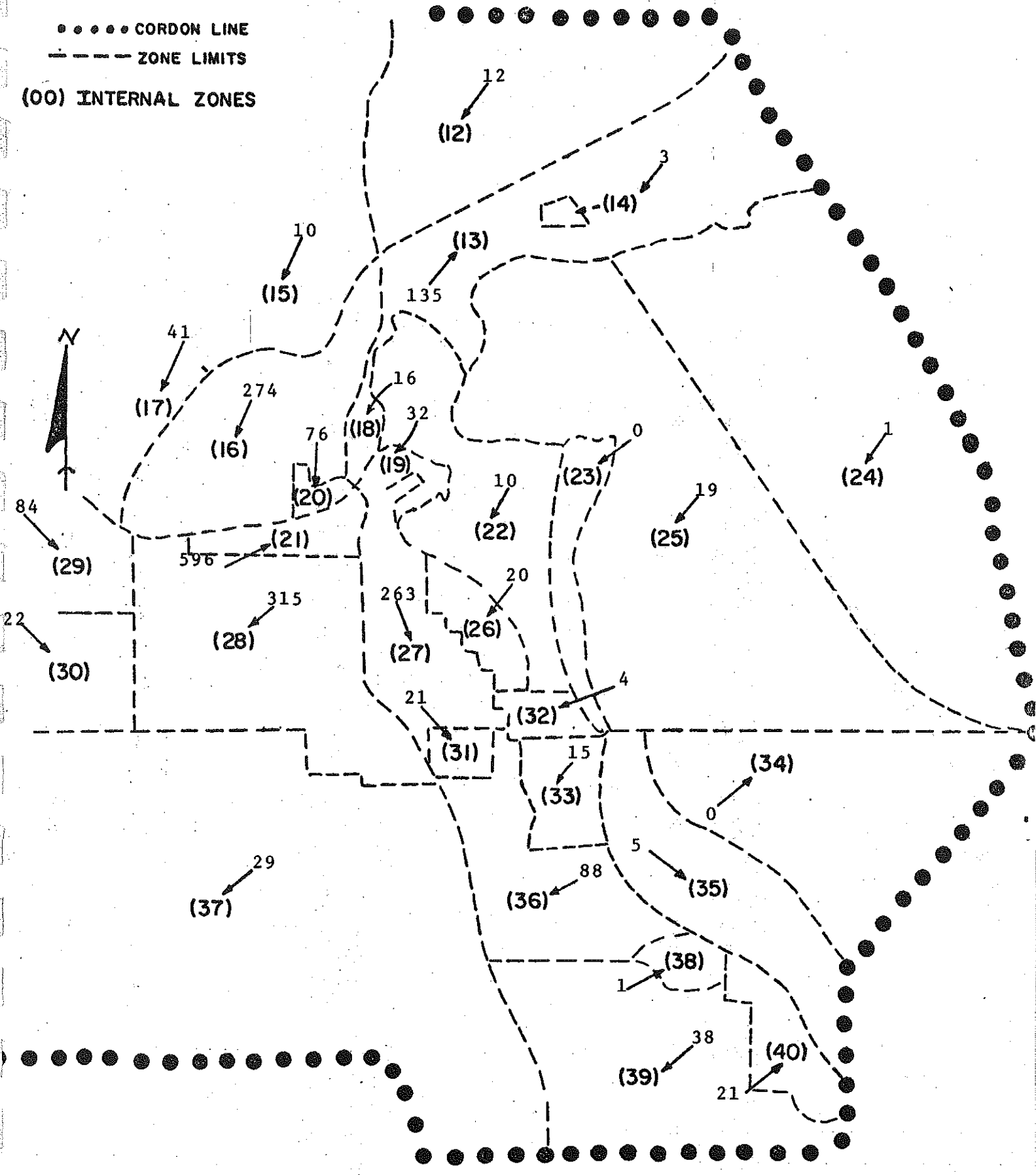
MANISTEE AREA STATION 1 (M-110) AND INTERNAL ZONES
 2,151 VEHICLE TRIPS

EXTERNAL O-D STUDY

●●●●● CORDON LINE

----- ZONE LIMITS

(OO) INTERNAL ZONES



Station 1, M-110

TRIP LENGTHS

<u>Minutes</u>	<u>No. of Trips</u>	<u>Percent of Totals</u>
1-20	1932	76.9
20-40	324	12.9
40-60	63	2.5
60-90	56	2.2
90-120	18	.7
120-180	37	1.5
180-240	26	1.0
240-300	15	.6
300-820	<u>42</u>	<u>1.7</u>
TOTAL	2513	100.0

Longest trip = 13 Hr.

Average Trip Length = 36 Min.

Station 2, (Hill Road)

Station 2 is located .6 miles north of US-31.

A total of 553 vehicles passed through this station. Tabulations on the following pages give a detailed documentation of this traffic.

Approximately 8 out of every 10 vehicles had a terminal inside the study area; 9 of every 10 vehicles were autos and 12 out of 100 vehicles were panels or pickups whether they traveled into or through the area. More than 75 percent of the passenger cars and panels or pickups had a terminal inside the study area.

The largest trip purpose was work with 206 trips or 37.2 percent of the 553 total trips. All trip purposes except vacation had more than 65 percent terminal traffic.

Station 3 (US-31 North) accounted for 77 trips or 60.6 percent of the 127 through trips. Stations 3, 4, and 7 accounted for 124 trips or 98.0 percent of the 127 through trips.

Zone 13 (Parkdale) accounted for 122 trips or 28.6 percent of the 426 terminal trips. Zones 13, 21, and 28 accounted for 246 trips or 57.7 percent of the 426 terminal trips.

There were 511 trips or 92.3 percent of the 553 trips that had a trip length of 1-20 minutes. There were 542 trips (98.0 percent) that had a trip length of one hour or less.

The origin and destination of all the trips which passed through the station were tabulated by county, Ontario and 11 states (see 95 zone system). There are two ends for each trip; an origin and a destination. There were 550 trips which passed through Station 2. This total is slightly different from the other tabulations due to rounding. There were 1,100 total trip ends.

There were 1,083 trip ends (98.5 percent) in Manistee County. There were no trip ends in the upper peninsula. The lower peninsula accounted for 1,100 trip ends (100.0 percent). There were no origins and/or destinations outstate.

Station 2, Hill Road

<u>Vehicle Type</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Passenger Car	481	87.0	366	76.1	115	23.9
Passenger Car with Trailer	4	.7	3	75.0	1	25.0
Panel or Pickup	66	11.9	56	84.8	10	15.6
Panel or Pickup with Trailer	2	.4	1	50.0	1	50.0
Other Single Unit Trucks	0	0	0	0	0	0
Combinations and Trucks with Trailers	<u>0</u>	<u>0</u>	<u>0</u>	0	<u>0</u>	0
TOTAL	553	100.0	426	77.0	127	23.0

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	206	37.2	163	79.2	43	20.9
Personal Business	53	9.6	35	66.0	18	34.0
Shopping	70	12.7	69	98.6	1	1.4
Vacation	2	.4	0	0	2	100.0
Other Soc. or Rec.	158	28.5	107	67.7	51	32.3
All Other	<u>64</u>	<u>11.6</u>	<u>52</u>	81.3	<u>12</u>	18.8
TOTAL	553	100.0	426	77.0	127	23.0

Station 2, Hill Road

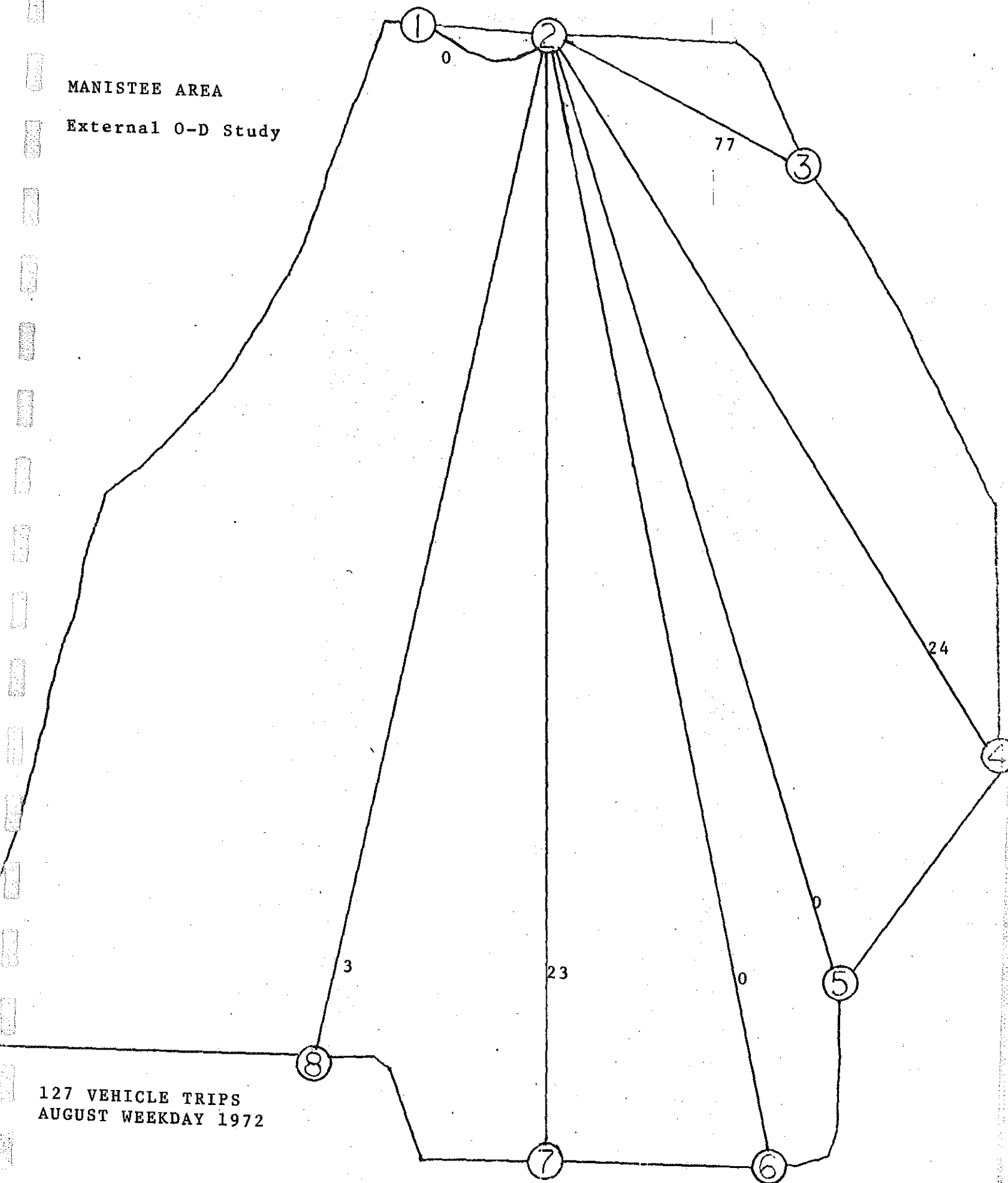
THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 = M-110	0	0.0
3 = US-31, North	77	60.6
4 = M-55	24	18.9
5 = East Lake Road	0	0.0
6 = Link Road	0	0.0
7 = US-31, South	23	18.1
8 = Maple Road	<u>3</u>	<u>2.4</u>
TOTAL	127	100.0

DATA FROM ...
THROUGH TRAFFIC INTERCHANGE
STATION 2, HILL ROAD

MANISTEE AREA

External O-D Study



127 VEHICLE TRIPS
AUGUST WEEKDAY 1972

Station 2, Hill Road
 EDWARDSVILLE CITY AND COUNTY
TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
12	7	1.6
13	122	28.6
14	5	1.3
15	0	0.0
16	23	5.4
17	3	.7
18	3	.7
19	2	.5
20	3	.7
21	80	18.8
22	0	0.0
23	0	0.0
24	0	0.0
25	40	9.4
26	6	1.4
27	38	8.9
28	44	10.3
29	1	.2
30	3	.7
31	3	.7
32	0	0.0
33	0	0.0
34	0	0.0
35	17	4.0
36	6	1.4
37	1	.2
38	8	1.9
39	9	2.1
40	<u>2</u>	<u>.5</u>
TOTAL	426	100.0

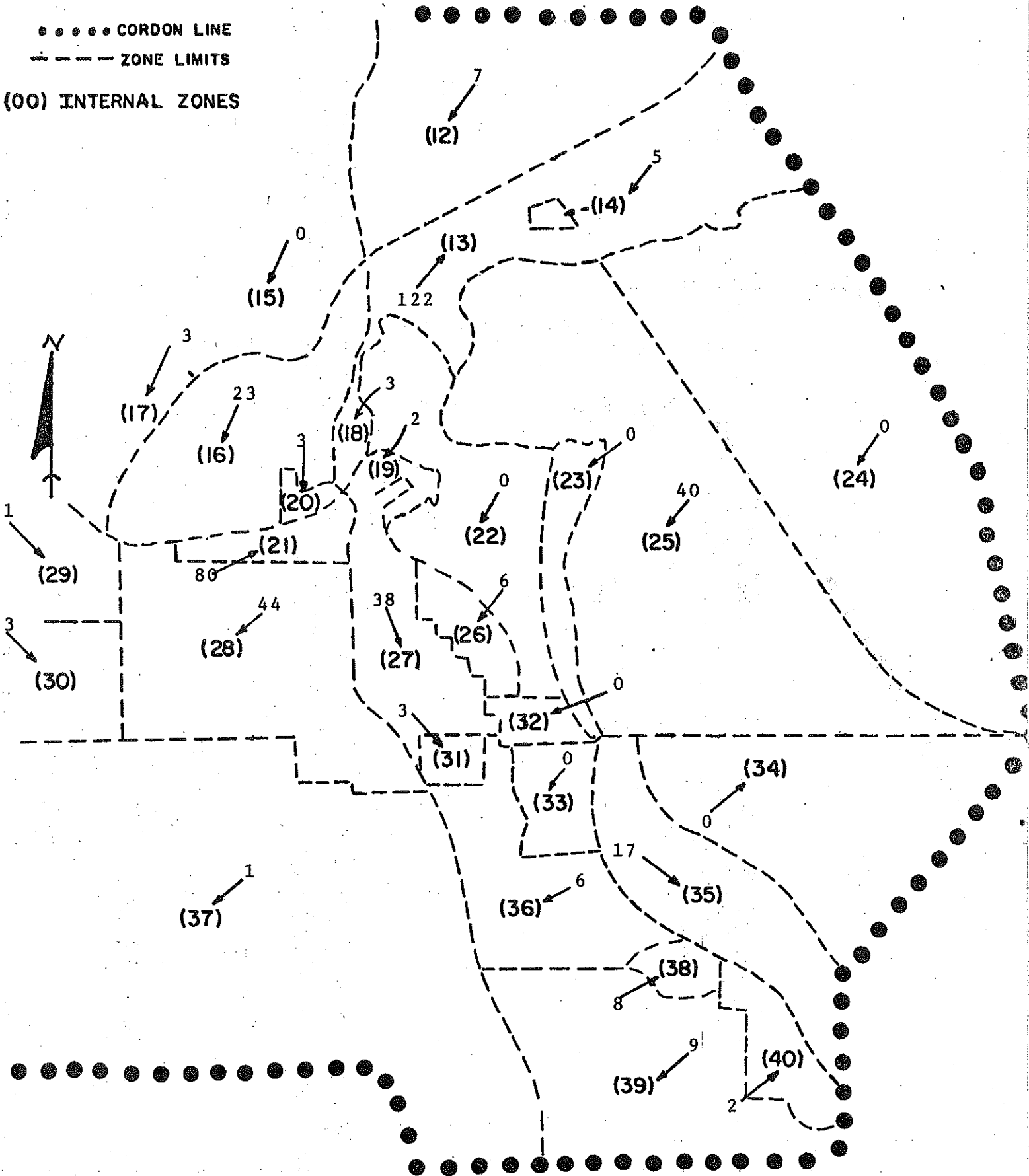
TERMINAL TRAFFIC BETWEEN MANISTEE AREA STATION 2 (HILL RD.) AND INTERNAL ZONES 426 VEHICLE TRIPS

EXTERNAL O-D STUDY

●●●●● CORDON LINE

----- ZONE LIMITS

(00) INTERNAL ZONES



Station 2, Hill Rd.

<u>TRIP LENGTHS</u>		
<u>Minutes</u>	<u>No. of Trips</u>	<u>Percent of Totals</u>
1-20	511	92.3
20-40	29	5.2
40-60	2	.4
60-90	6	1.1
90-120	1	.2
120-180	2	.4
180-240	2	.4
240-300	0	0.0
300-820	<u>0</u>	<u>0.0</u>
TOTAL	553	100.0

Longest trip = 3 Hr. 50 Min.

Average Trip Length = 23 Min.

Station 3, (US-31 North)

Station 3 is located .1 mile northeast of Frost Road.

A total of 7,949 vehicles passed through this station. Tabulations on the following pages give a detailed documentation of this traffic.

Approximately 7 out of every 10 vehicles had a terminal inside the study area; 8 of every 10 vehicles were autos and 8 out of 100 vehicles were panels or pickups whether they traveled into or through the area. More than 70 percent of the passenger cars and panels or pickups had a terminal inside the study area. Passenger cars with trailer were almost 90 percent through trips.

The largest trip purpose was work with 2,633 trips or 33.0 percent of the 7,949 total trips. All trip purposes except vacation had more than 60 percent terminal traffic. More than 80 percent of the vacation trips were through trips.

Station 7 (US-31 South) accounted for 2,149 trips or 79.1 percent of the 2,717 through trips. Stations 4 and 7 accounted for 2,442 trips or 89.9 percent of the 2,717 through trips.

Zone 21 (Central Business District) accounted for 1,311 trips or 25.1 percent of the 5,232 terminal trips. Zones 21, 27, and 28 accounted for 2,688 trips or 51.4 percent of the 5,232 terminal trips.

There were 2,784 trips or 35.0 percent of the 7,949 trips that had a trip length of 20-40 minutes. There were 5,403 trips (68.0 percent) that had a trip length of one hour or less.

The origin and destination of all the trips which passed through the station were tabulated by county, Ontario and 11 states (see 95 zone system). There are two ends for each trip; an origin and a destination. There were 7,976 trips which passed through Station 3. This total is slightly different from the other tabulations due to rounding. There were 15,952 total trip ends.

There were 11,406 trip ends (71.5 percent) in Manistee County. There were 200 trip ends (1.3 percent) in the upper peninsula. The lower peninsula accounted for 15,365 trip ends (96.3 percent). There were 387 origins and/or destinations (2.4 percent) outstate.

Station 3, US-31 (North)

<u>Vehicle Type</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Passenger Car	6,696	84.2	4,573	68.3	2,123	31.7
Passenger Car with Trailer	176	2.2	22	12.5	154	87.5
Panel or Pickup	660	8.3	494	74.9	166	25.1
Panel or Pickup with Trailer	34	0.4	10	29.4	24	70.6
Other Single Unit Trucks	267	3.4	102	38.2	165	61.8
Combinations and Trucks with Trailers	<u>116</u>	<u>1.5</u>	<u>31</u>	26.7	<u>85</u>	73.3
TOTAL	7,949	100.0	5,232	65.8	2,717	34.2

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	2,633	33.0	1,925	73.1	708	26.9
Personal Business	330	4.2	270	81.8	60	18.2
Shopping	1,462	18.4	1,406	96.2	56	3.8
Vacation	1,343	16.9	162	12.1	1,181	87.9
Other Soc. or Rec.	1,366	17.2	872	63.8	494	36.2
All Other	<u>815</u>	<u>10.3</u>	<u>597</u>	73.3	<u>218</u>	26.7
TOTAL	7,949	100.0	5,232	65.8	2,717	34.2

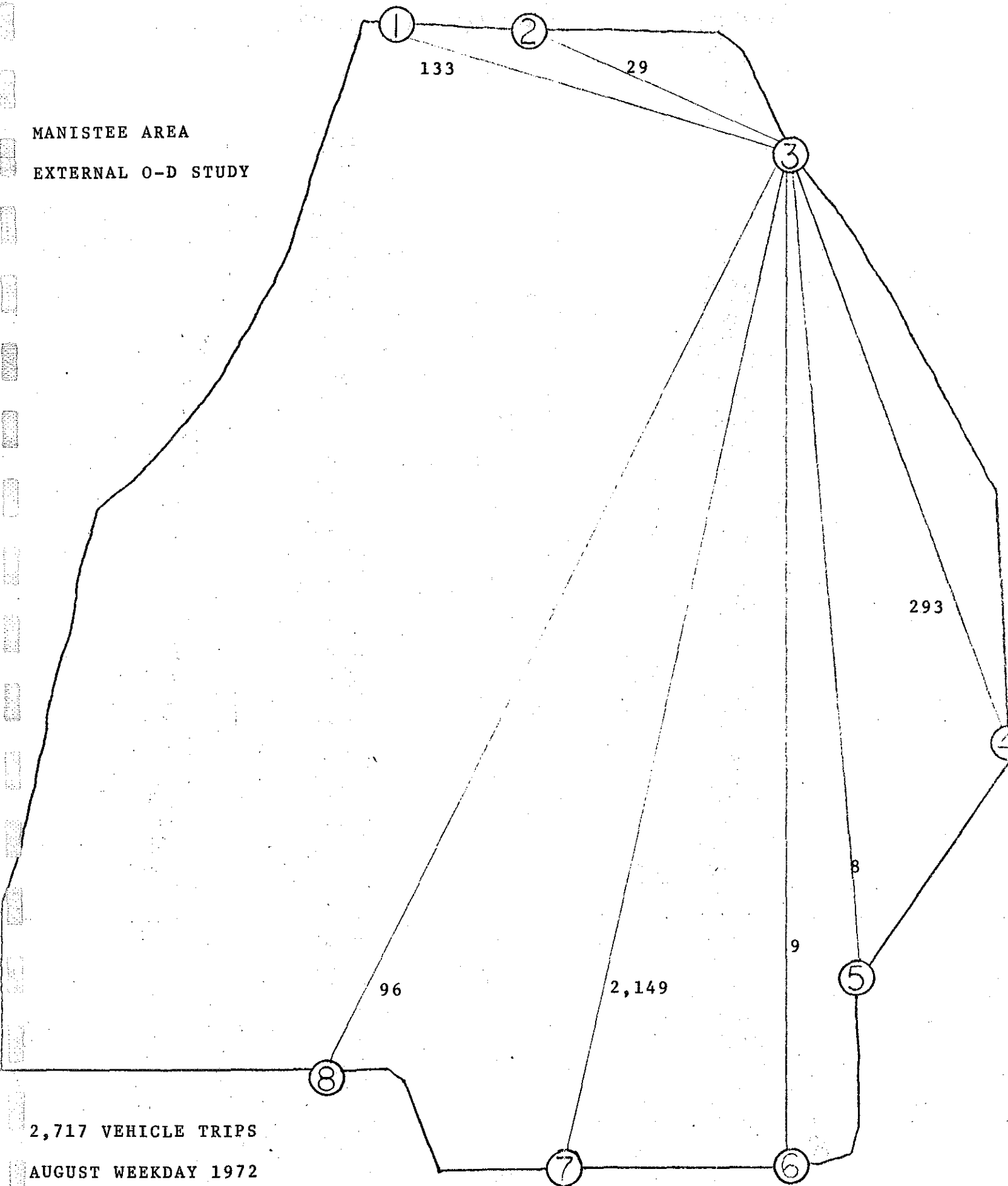
Station 3, US-31 (North)

THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 - M-110	133	4.9
2 - Hill Road	29	1.1
4 - M-55	293	10.8
5 - East Lake Road	8	.3
6 - Link Road	9	.3
7 - US-31, South	2,149	79.1
8 - Maple Road	<u>96</u>	<u>3.5</u>
TOTAL	2,717	100.0

THROUGH TRAFFIC INTERCHANGE
STATION 3, US-31 (NORTH)

MANISTEE AREA
EXTERNAL O-D STUDY



2,717 VEHICLE TRIPS
AUGUST WEEKDAY 1972

Station 3, US-31 (North)
 (MTRON) 12-20, E MOUNTAIN
TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
12	14	.3
13	435	8.3
14	93	1.8
15	2	0.0
16	554	10.6
17	53	1.0
18	70	1.3
19	120	2.3
20	123	2.4
21	1,311	25.1
22	0	0.0
23	0	0.0
24	27	.5
25	97	1.8
26	84	1.6
27	714	13.6
28	663	12.7
29	41	.8
30	33	.6
31	14	.3
32	54	1.0
33	41	.8
34	2	0.0
35	50	1.0
36	302	5.8
37	66	1.3
38	25	.5
39	143	2.7
40	<u>101</u>	<u>1.9</u>
TOTAL	5232	100.0

TERMINAL TRAFFIC BETWEEN
STATION 3 (US-31, NORTH) AND INTERNAL ZONES
5,232 VEHICLE TRIPS

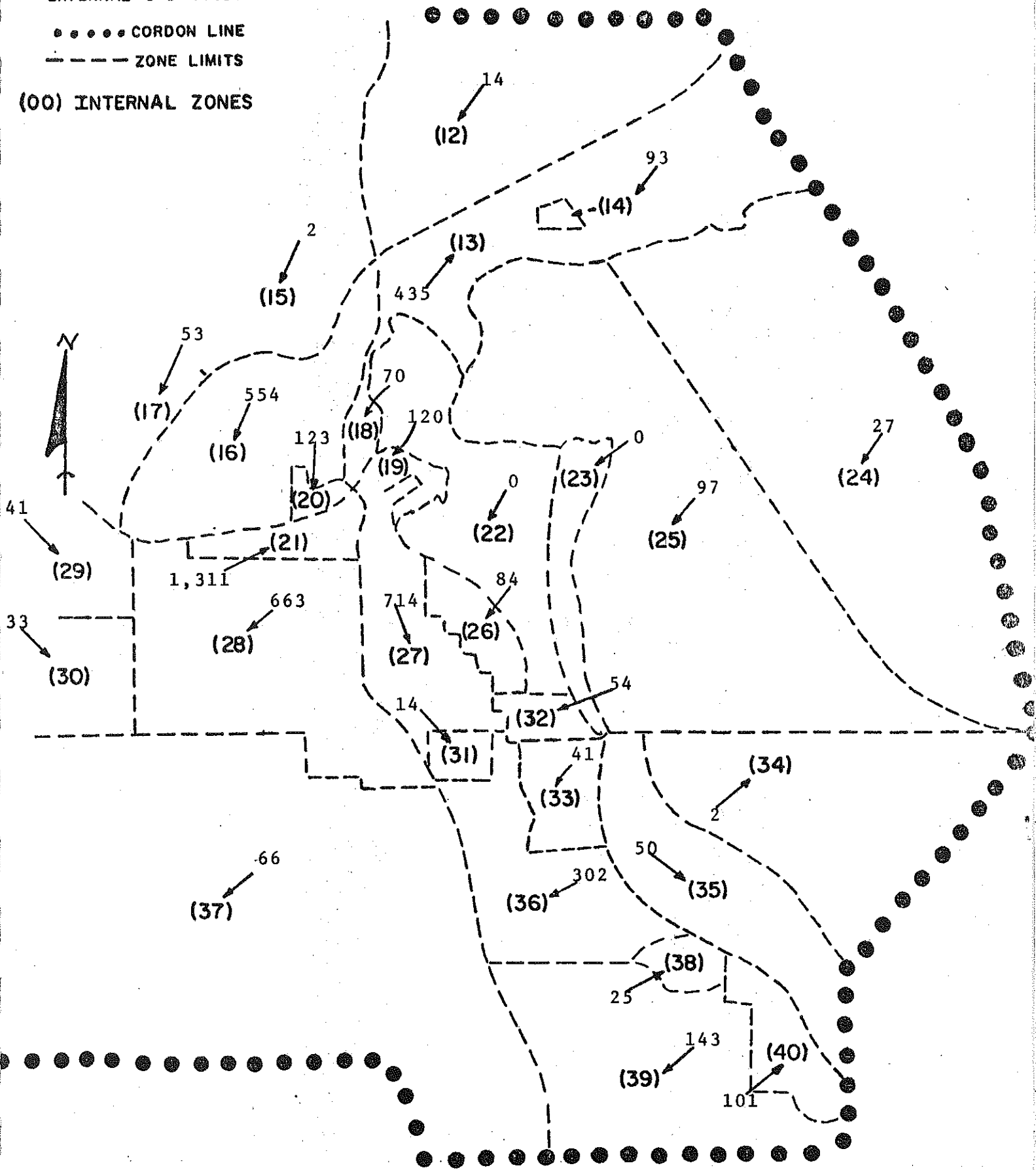
MANISTEE AREA

EXTERNAL O-D STUDY

..... CORDON LINE

----- ZONE LIMITS

(OO) INTERNAL ZONES



Station 3, US-31 (North)

<u>Minutes</u>	<u>TRIP LENGTHS</u>	
	<u>No. of Trips</u>	<u>Percent of Totals</u>
1-20	2193	27.5
20-40	2784	35.0
40-60	426	5.4
60-90	654	8.2
90-120	133	1.7
120-180	497	6.3
180-240	403	5.1
240-300	252	3.2
300-820	601	7.5
820-1130	<u>6</u>	<u>.1</u>
TOTAL	7949	100.0

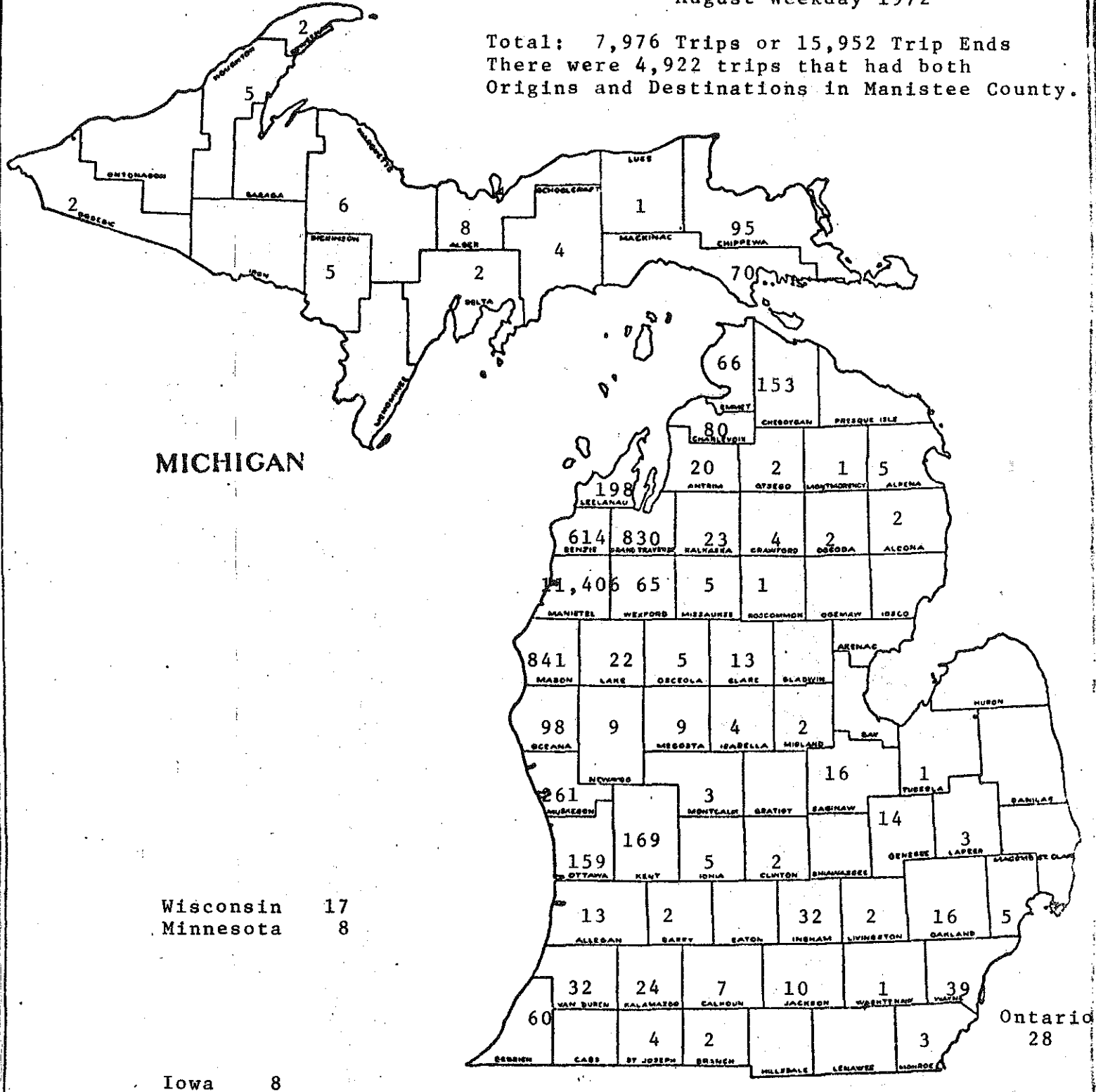
Longest trip = 18 Hr. 50 Min.

Average Trip Length = 90 Min.

Origins and/or Destinations
of Traffic Through
Station 3 on US-31 (North),
Northeast of Frost Road . 41

MANISTEE AREA EXTERNAL O-D STUDY
August Weekday 1972

Total: 7,976 Trips or 15,952 Trip Ends
There were 4,922 trips that had both
Origins and Destinations in Manistee County.



Illinois	204	Indiana	76	Ohio	26	Pennsylvania	2
Missouri	11	Kentucky	5	New York	2		

Station 4, (M-55)

Station 4 is located one mile southeast of Pine Creek Road.

A total of 1,688 vehicles passed through this station. Tabulations on the following pages give a detailed documentation of this traffic.

Approximately 7 out of every 10 vehicles had a terminal inside the study area; 8 of every 10 vehicles were autos and 11 out of 100 vehicles were panels or pickups whether they traveled into or through the area. More than 70 percent of the passenger cars and panels or pickups had a terminal inside the study area. Passenger cars with trailer were nearly equally divided into terminal and through trips.

The largest trip purpose was work with 557 trips or 33.0 percent of the 1,688 total trips. All trip purposes except vacation had more than 70 percent terminal traffic. More than half of the vacation trips were through trips.

Station 3 (US-31, North) accounted for 231 trips or 53.6 percent of the 431 through trips. Stations 3 and 7 accounted for 358 trips or 83.1 percent of the 431 through trips.

Zone 21 (Central Business District) accounted for 304 trips or 24.2 percent of the 1,257 terminal trips. Zones 16, 21, and 28 accounted for 599 trips or 47.7 percent of the 1,257 terminal trips.

There were 449 trips or 26.5 percent of the 1,688 trips that had a trip length of 20-40 minutes. There were 953 trips (56.5 percent) that had a trip length of one hour or less.

The origin and destination of all the trips which passed through the station were tabulated by county, Ontario and 11 states (see 95 zone system). There are two ends for each trip; an origin and a destination. There were 1,672 trips which passed through Station 4. This total is slightly different from the other tabulations due to rounding. There were 3,344 total trip ends.

There were 2,360 trip ends (70.6 percent) in Manistee County. There were 21 trip ends (0.6 percent) in the upper peninsula. The lower peninsula accounted for 3,299 trip ends (98.7 percent). There were 24 origins and/or destinations (0.7 percent) outstate.

Station 4, M-55

<u>Vehicle Type</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Passenger Car	1,269	75.1	919	72.4	350	27.6
Passenger Car with Trailer	44	2.6	23	52.3	21	47.7
Panel or Pickup	180	10.7	141	78.3	39	21.7
Panel or Pickup with Trailer	3	0.2	2	66.7	1	33.3
Other Single Unit Trucks	133	7.9	125	94.0	8	6.0
Combinations and Trucks with Trailers	<u>59</u>	<u>3.5</u>	<u>47</u>	<u>79.7</u>	<u>12</u>	<u>20.3</u>
TOTAL	1,688	100.0	1,257	74.5	431	25.5

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	557	33.0	431	77.4	126	22.6
Personal Business	110	6.5	90	81.8	20	18.2
Shopping	247	14.6	228	92.3	19	7.7
Vacation	235	13.9	112	47.7	123	52.3
Other Soc. or Rec.	413	24.5	297	71.9	116	28.1
All Other	<u>126</u>	<u>7.5</u>	<u>99</u>	<u>78.6</u>	<u>27</u>	<u>21.4</u>
TOTAL	1,688	100.0	1,257	74.5	431	25.5

**TRANSPORTATION LIBRARY
MICHIGAN DEPT. STATE HIGHWAYS &
TRANSPORTATION LANSING, MICH.**

Station 4, M-55

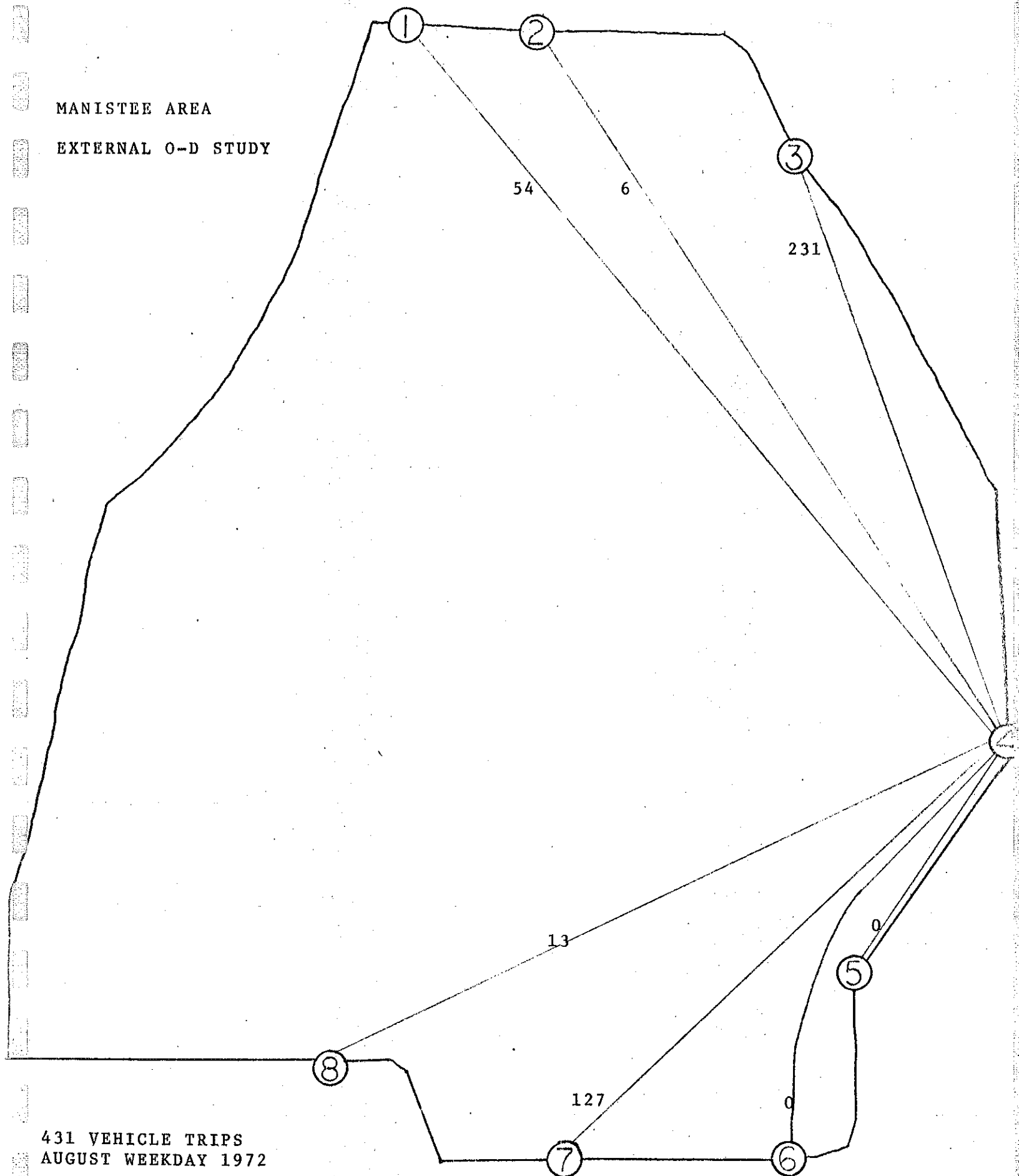
THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 - M-110	54	12.5
2 - Hill Road	6	1.4
3 - US-31, North	231	53.6
5 - East Lake Road	0	0.0
6 - Link Road	0	0.0
7 - US-31, South	127	29.5
8 - Maple Road	<u>13</u>	<u>3.0</u>
TOTAL	431	100.0

ILLINOIS DEPARTMENT OF TRANSPORTATION
 STATE HIGHWAY ENGINEERING DIVISION
 CHICAGO, ILLINOIS

THROUGH TRAFFIC INTERCHANGE
STATION 4, M-55

MANISTEE AREA
EXTERNAL O-D STUDY



431 VEHICLE TRIPS
AUGUST WEEKDAY 1972

HOWARD Station 4, M-55 DIVISION
 CE-M & HOYTATE
TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
12	5	.4
13	91	7.2
14	99	7.9
15	4	.3
16	145	11.5
17	30	2.4
18	14	1.1
19	45	3.6
20	13	1.0
21	304	24.2
22	5	.4
23	0	0.0
24	6	.5
25	47	3.7
26	25	2.0
27	116	9.2
28	151	12.0
29	32	2.5
30	5	.4
31	32	2.6
32	5	.4
33	3	.3
34	9	.7
35	4	.3
36	39	3.1
37	7	.6
38	4	.3
39	14	1.1
40	<u>3</u>	<u>.3</u>
TOTAL	1,257	100.0

TERMINAL TRAFFIC BETWEEN
STATION 4 (M-55) AND INTERNAL ZONES
1,257 VEHICLE TRIPS

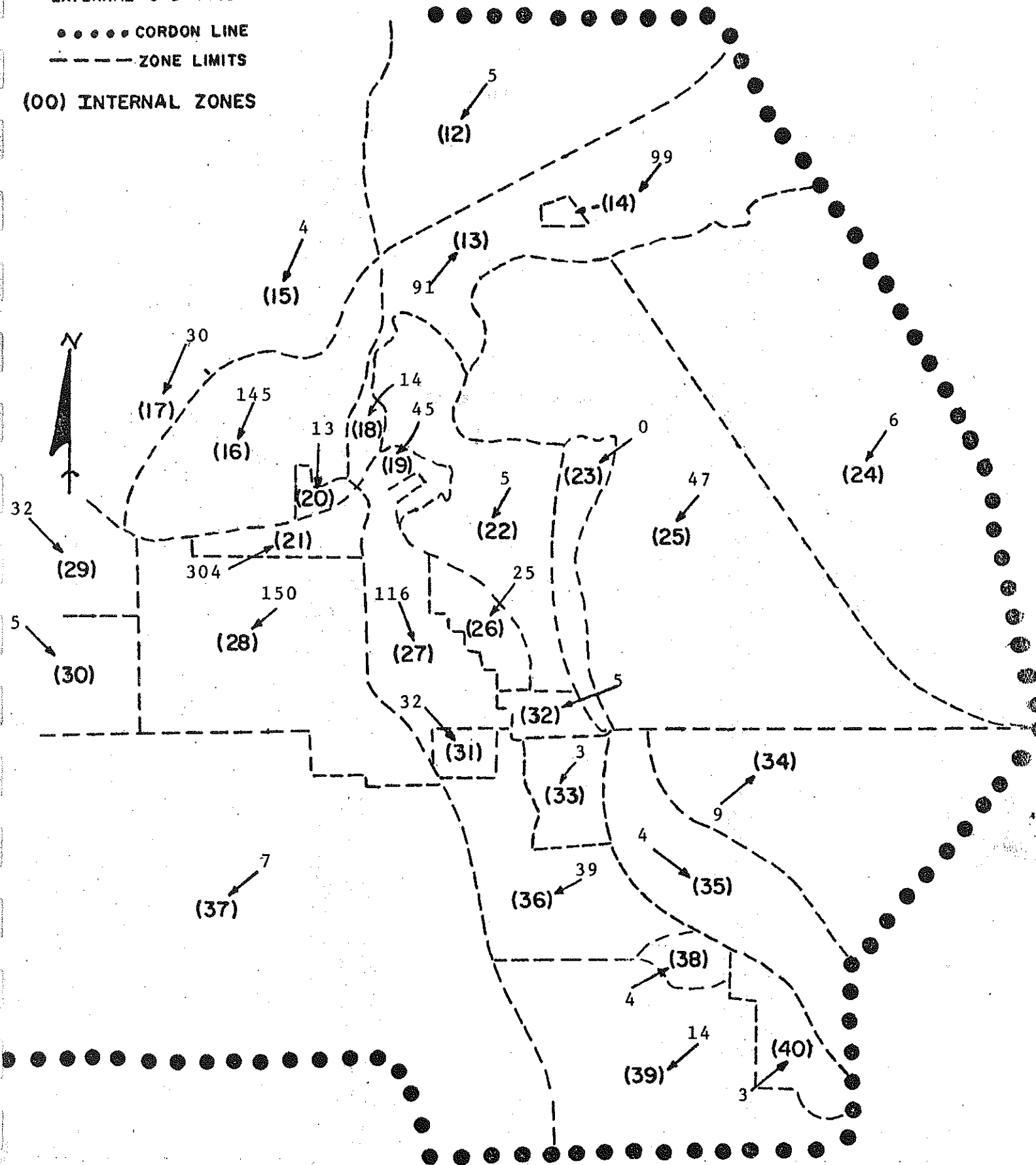
MANISTEE AREA

EXTERNAL O-D STUDY

..... CORDON LINE

----- ZONE LIMITS

(OO) INTERNAL ZONES



Station 4, M-55

<u>Minutes</u>	<u>TRIP LENGTHS</u>	
	<u>No. of Trips</u>	<u>Percent of Totals</u>
1-20	364	21.6
20-40	449	26.5
40-60	140	8.3
60-90	231	13.7
90-120	67	4.0
120-180	155	9.2
180-240	110	6.5
240-300	109	6.5
300-820	<u>63</u>	<u>3.7</u>
TOTAL	1688	100.0

Longest trip = 12 Hr. 20 Min.

Average Trip Length = 92 Min.

Station 5, East Lake Road

Station 5 is located .1 mile northwest of Stienberg Road.

A total of 743 vehicles passed through this station. Tabulations on the following pages give a detailed documentation of this traffic.

Approximately 9 out of every 10 vehicles had a terminal inside the study area; 8 of every 10 vehicles were autos and 1 out of 10 vehicles were panels or pickups whether they traveled into or through the area. More than 80 percent of the passenger cars and panels or pickups had a terminal inside the study area.

The largest trip purpose was work with 468 trips or 63.0 percent of the 743 total trips. All trip purposes had more than 80 percent terminal traffic.

Station 3 (US-31, North) accounted for 80 trips or 74.8 percent of the 107 through trips. Stations 1, 3, and 4 accounted for 106 trips or 99.1 percent of the 107 through trips.

Zone 25 (East Lake) accounted for 256 trips or 40.2 percent of the 636 terminal trips. Zones 13, 25, and 35 accounted for 569 trips or 89.5 percent of the 636 terminal trips.

There were 588 trips or 79.2 percent of the 743 trips that had a trip length of 1-20 minutes. There were 717 trips (96.5 percent) that had a trip length of one hour or less.

The origin and destination of all the trips which passed through the station were tabulated by county, Ontario and 11 states (see 95 zone system). There are two ends for each trip; an origin and a destination. There were 742 trips which passed through Station 5. This total is slightly different from the other tabulations due to rounding. There were 1,484 total trip ends.

There were 1,369 trip ends (92.3 percent) in Manistee County. There were no trip ends in the upper peninsula. The lower peninsula accounted for 1,484 trip ends (100 percent). There were no origins and/or destinations outstate.

Station 5, East Lake Road

<u>Vehicle Type</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Passenger Car	570	76.7	494	86.7	76	13.3
Passenger Car with Trailer	0	0	0	0	0	0
Panel or Pickup	135	18.2	107	79.3	28	20.7
Panel or Pickup with Trailer	1	0.1	1	100.0	0	0
Other Single Unit Trucks	21	2.8	18	85.7	3	14.3
Combinations and Trucks with Trailers	<u>16</u>	<u>2.2</u>	<u>16</u>	100.0	<u>0</u>	0
TOTAL	743	100.0	636	85.6	107	14.4

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	468	63.0	408	87.2	60	12.8
Personal Business	33	4.4	27	81.8	6	18.2
Shopping	54	7.3	47	87.0	7	13.0
Vacation	5	0.7	4	80.0	1	20.0
Other Soc. or Rec.	135	18.1	110	81.5	25	18.5
All Other	<u>48</u>	<u>6.5</u>	<u>40</u>	83.3	<u>8</u>	16.7
TOTAL	743	100.0	636	85.6	107	14.4

Station 5, East Lake Road

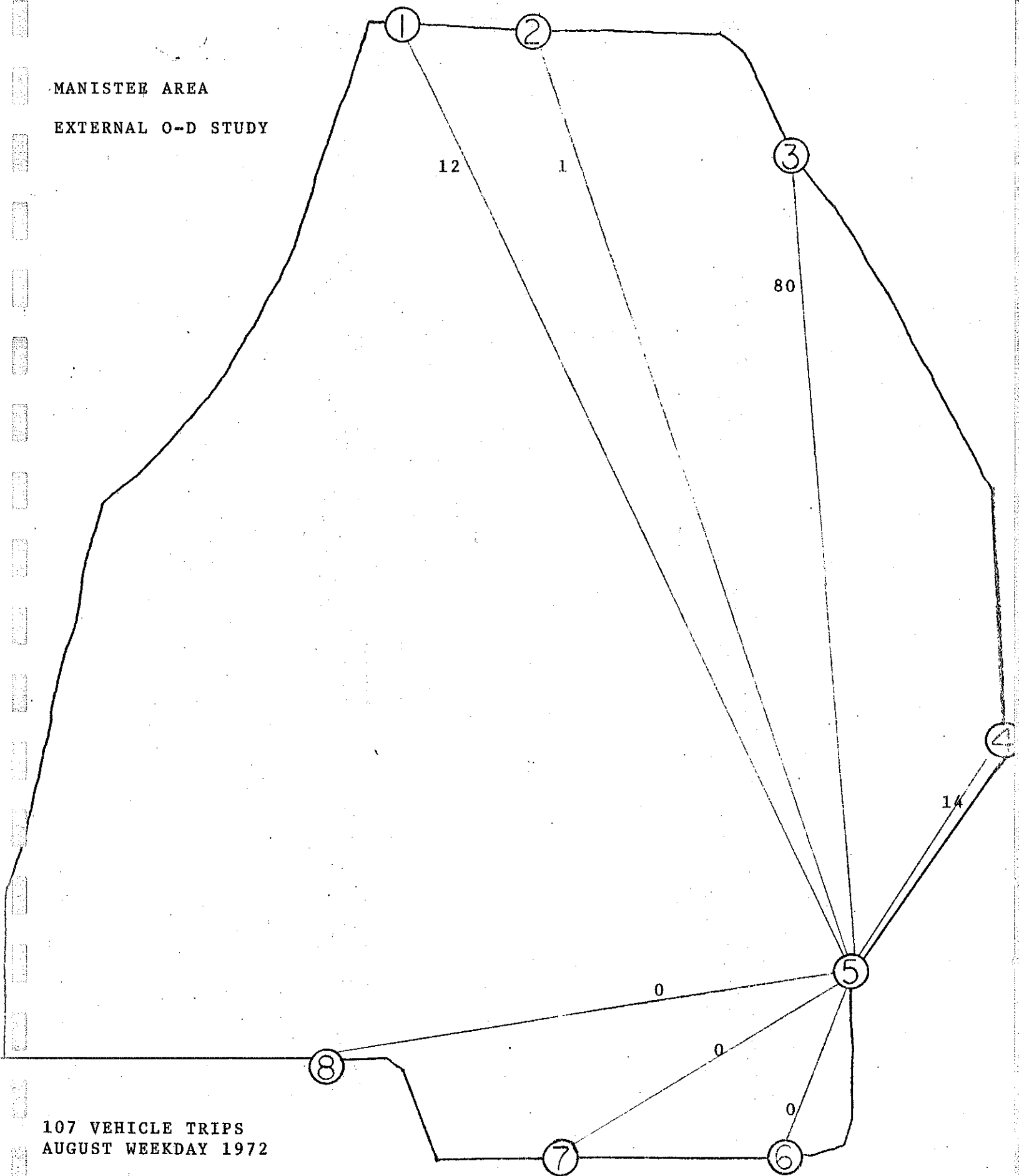
THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 - M-110	12	11.2
2 - Hill Road	1	.9
3 - US-31, North	80	74.8
4 - M-55	14	13.1
6 - Link Road	0	0.0
7 - US-31, South	0	0.0
8 - Maple Road	<u>0</u>	<u>0.0</u>
TOTAL	107	100.0

THROUGH TRAFFIC INTERCHANGE
STATION 5, EAST LAKE ROAD

MANISTEE AREA

EXTERNAL O-D STUDY



107 VEHICLE TRIPS
AUGUST WEEKDAY 1972

Station 5, East Lake Road
 TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
12	1	.2
13	62	9.7
14	5	.8
15	1	.2
16	13	2.0
17	0	0.0
18	4	.6
19	0	0.0
20	1	.2
21	17	2.6
22	0	0.0
23	0	0.0
24	1	.2
25	256	40.2
26	0	0.0
27	12	1.9
28	4	.6
29	2	.3
30	0	0.0
31	3	.5
32	2	.3
33	0	0.0
34	0	0.0
35	251	39.5
36	1	.2
37	0	0.0
38	0	0.0
39	0	0.0
40	<u>0</u>	<u>0.0</u>
TOTAL	636	100.0

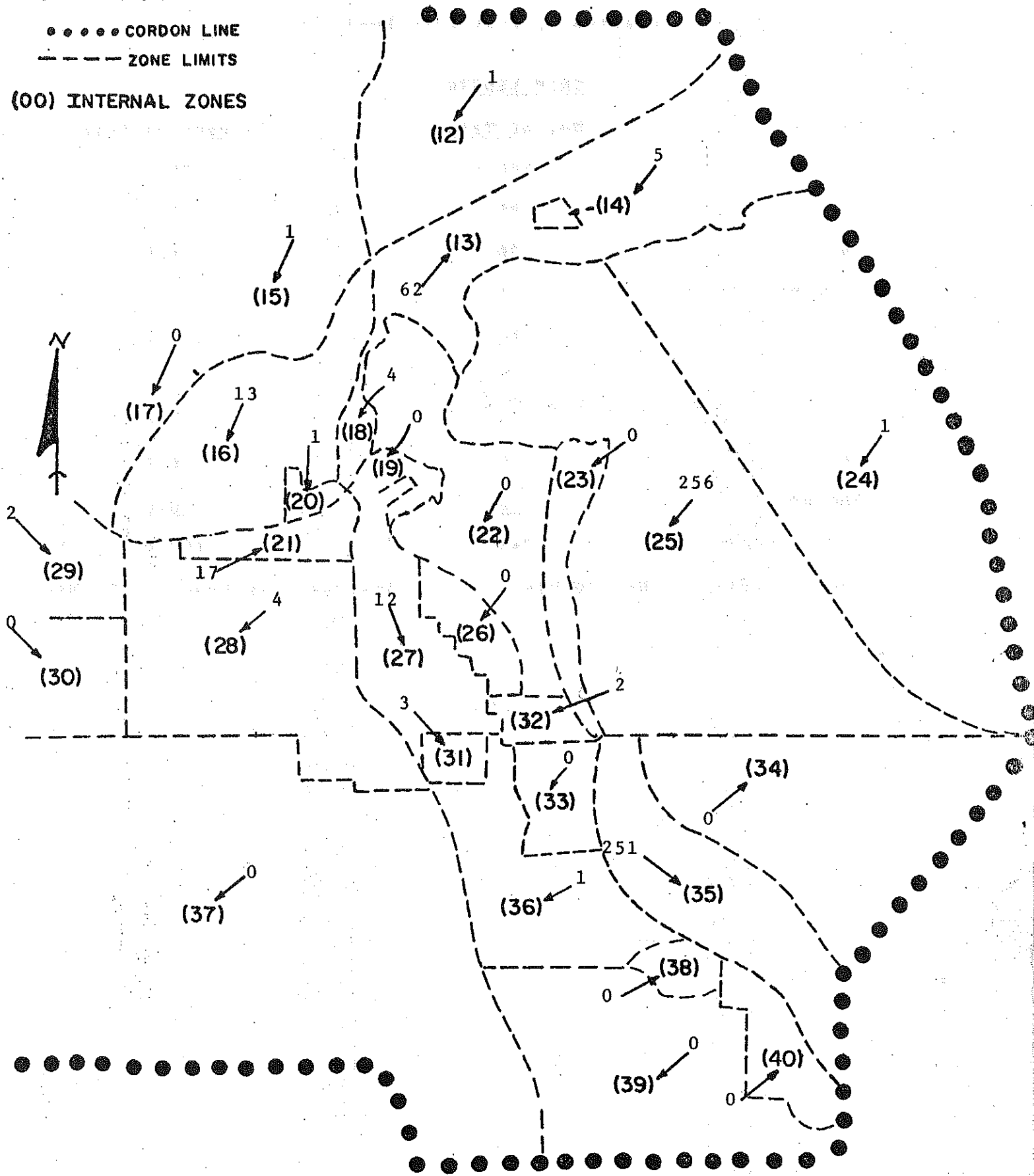
MANISTEE AREA STATION 5 (EAST LAKE RD.) AND INTERNAL ZONES 636 VEHICLE TRIPS

EXTERNAL O-D STUDY

●●●●● CORDON LINE

----- ZONE LIMITS

(OO) INTERNAL ZONES



Station 5, East Lake Road

<u>Minutes</u>	<u>TRIP LENGTHS</u>	
	<u>No. of Trips</u>	<u>Percent of Totals</u>
1-20	588	79.2
20-40	99	13.3
40-60	30	4.0
60-90	5	.7
90-120	10	1.3
120-180	8	1.1
180-240	3	.4
240-300	0	0.0
300-820	<u>0</u>	<u>0.0</u>
TOTAL	743	100.0

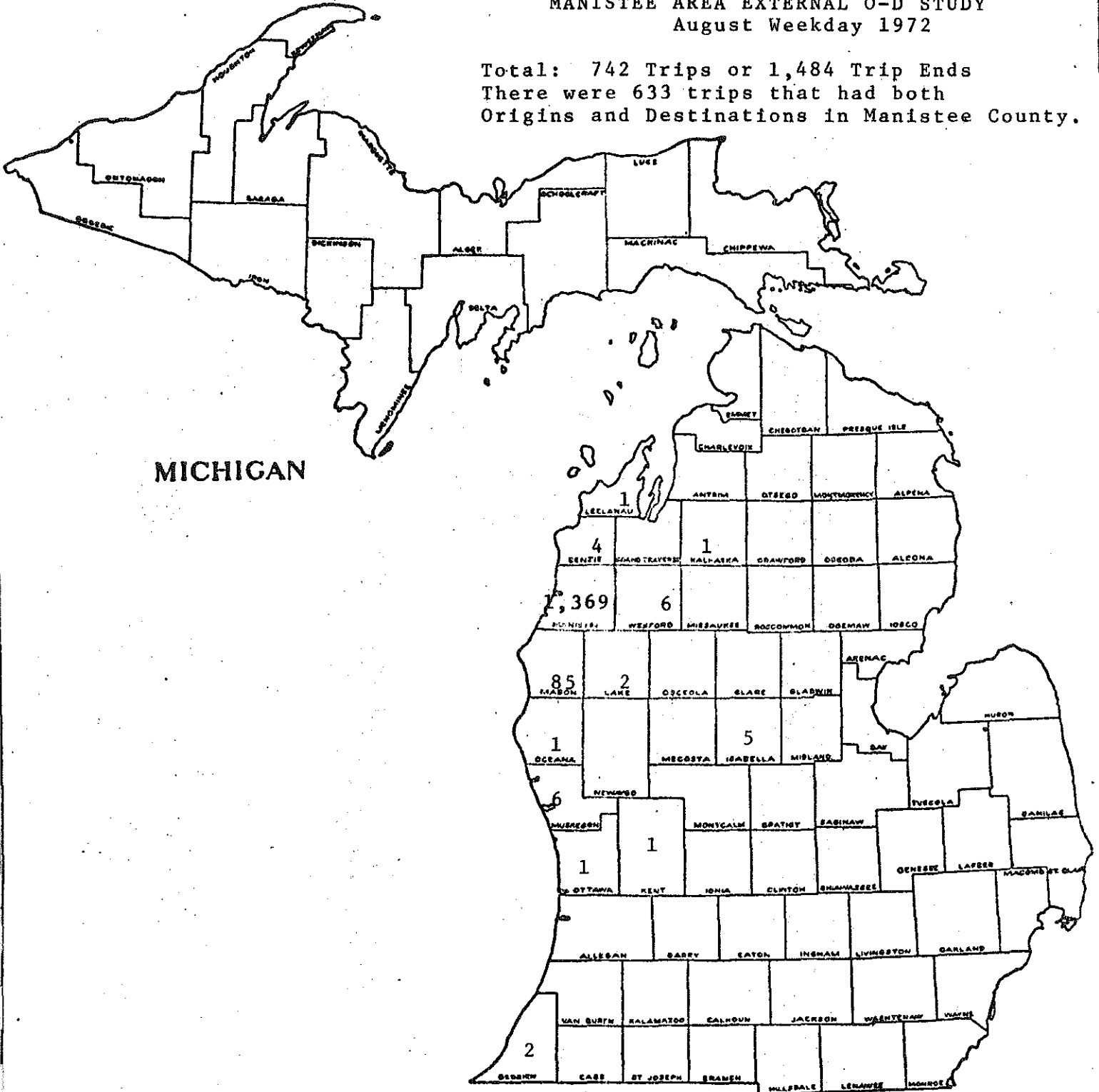
Longest trip = 3 Hr. 50 Min.

Average Trip Length = 26 Min.

Origins and/or Destinations
of Traffic Through
Station 5 on East Lake Road,
Northwest of Stienberg Road

MANISTEE AREA EXTERNAL O-D STUDY
August Weekday 1972

Total: 742 Trips or 1,484 Trip Ends
There were 633 trips that had both
Origins and Destinations in Manistee County.



Station 6, Link Road

Station 6 is located .5 miles south of drive to Packaging Corporation of America.

A total of 1,810 vehicles passed through this station. Tabulations on the following pages give a detailed documentation of this traffic.

Approximately 9 out of every 10 vehicles had a terminal inside the study area; 7 of every 10 vehicles were autos and 14 out of 100 vehicles were panels or pickups whether they traveled into or through the area. More than 90 percent of the passenger cars and panels or pickups had a terminal inside the study area.

The largest trip purpose was work with 970 trips or 53.5 percent of the 1,810 total trips. All trip purposes except vacation had more than 90 percent terminal traffic.

Station 7 (US-31, South) accounted for 71 trips or 62.8 percent of the 113 through trips. Stations 5 and 7 accounted for 95 trips or 84.0 percent of the 113 through trips.

Zone 40 (Packaging Corporation of America) accounted for 468 trips or 27.5 percent of the 1,697 terminal trips. Zones 36, 39 and 40 accounted for 994 trips or 58.6 percent of the 1,697 terminal trips.

There were 1,342 trips or 74.1 percent of the 1,810 trips that had a trip length of 1-20 minutes. There were 1,604 trips (88.6 percent) that had a trip length of one hour or less.

The origin and destination of all the trips which passed through the station were tabulated by county, Ontario and 11 states (see 95 zone system). There are two ends for each trip; an origin and a destination. There were 1,799 trips which passed through Station 6. This total is slightly different from the other tabulations due to rounding. There were 3,598 total trip ends.

There were 3,276 trip ends (91.1 percent) in Manistee County. There were no trip ends in the upper peninsula. The lower peninsula accounted for 3,595 trip ends (99.9 percent). There were 3 origins and/or destinations (0.1 percent) outstate.

Station 6, Link Road

<u>Vehicle Type</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Passenger Car	1,249	69.0	1,168	93.5	81	6.5
Passenger Car with Trailer	11	0.6	11	100.0	0	0
Panel or Pickup	250	13.8	234	93.6	16	6.4
Panel or Pickup with Trailer	7	0.4	7	100.0	0	0
Other Single Unit Trucks	149	8.2	143	96.0	6	4.0
Combinations and Trucks with Trailers	<u>144</u>	<u>8.0</u>	<u>134</u>	<u>93.1</u>	<u>10</u>	<u>6.9</u>
TOTAL	1,810	100.0	1,697	93.8	113	6.2

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	970	53.5	922	95.1	48	4.9
Personal Business	41	2.3	41	100.0	0	0
Shopping	273	15.1	265	97.1	8	2.9
Vacation	21	1.2	11	52.4	10	47.6
Other Soc. or Rec.	383	21.2	344	89.8	39	10.2
All Other	<u>122</u>	<u>6.7</u>	<u>114</u>	<u>93.4</u>	<u>8</u>	<u>6.6</u>
TOTAL	1,810	100.0	1,697	93.8	113	6.2

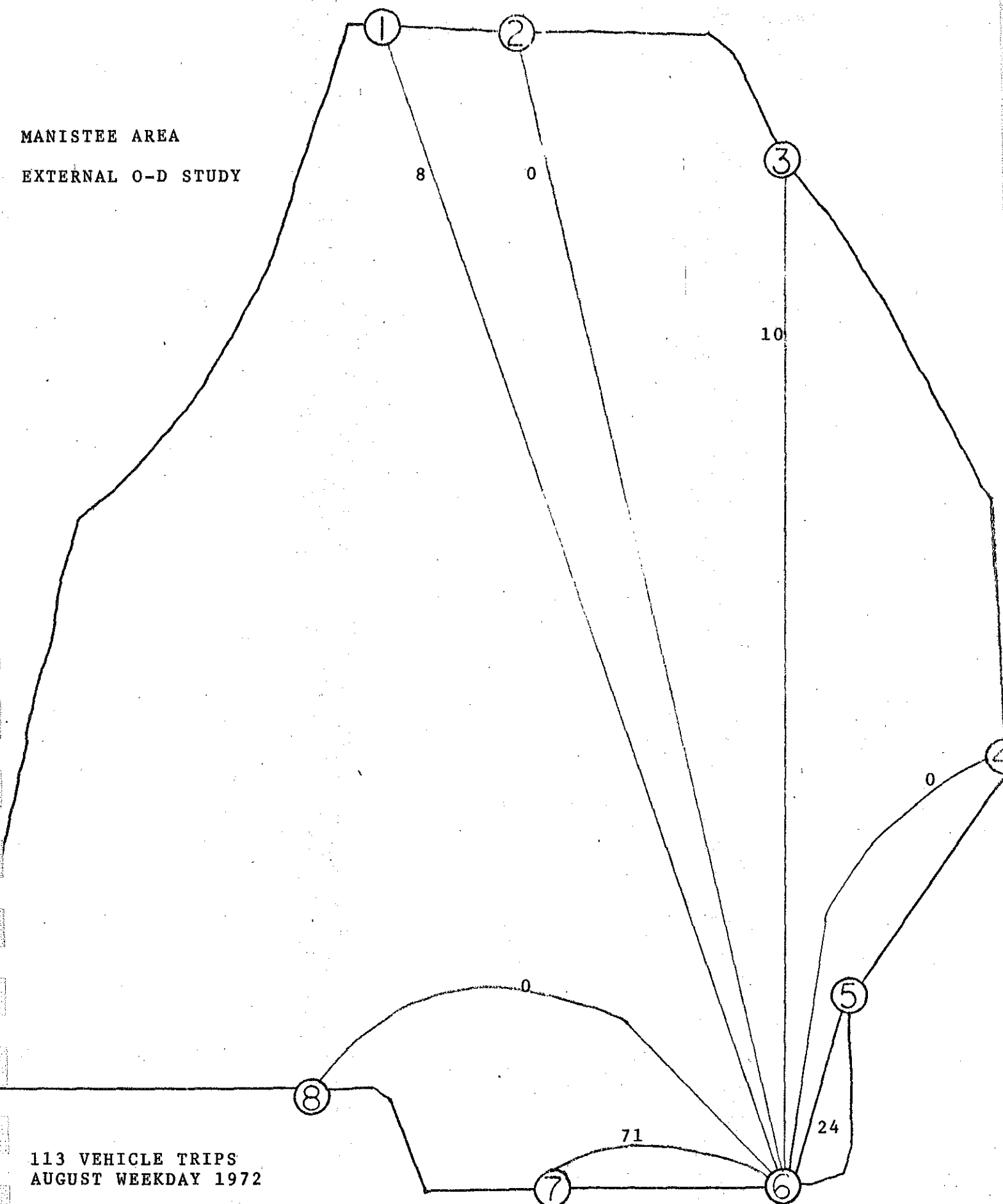
Station 6, Link Road

THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 - M-110	8	7.1
2 - Hill Road	0	0.0
3 - US-31, North	10	8.9
4 - M-55	0	0.0
5 - East Lake Road	24	21.2
7 - US-31, South	71	62.8
8 - Maple Road	<u>0</u>	<u>0.0</u>
TOTAL	113	100.0

THROUGH TRAFFIC INTERCHANGE
STATION 6, LINK ROAD

MANISTEE AREA
EXTERNAL O-D STUDY



113 VEHICLE TRIPS
AUGUST WEEKDAY 1972

Station 6, Link Road
TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
12	1	.1
13	9	.5
14	4	.2
15	2	.1
16	38	2.2
17	9	.5
18	3	.2
19	5	.3
20	11	.6
21	154	9.1
22	0	0.0
23	0	0.0
24	0	0.0
25	0	0.0
26	11	.6
27	164	9.7
28	147	8.7
29	30	1.8
30	2	.1
31	1	.1
32	13	.8
33	42	2.5
34	0	0.0
35	1	.1
36	230	13.6
37	16	.9
38	40	2.4
39	296	17.4
40	<u>468</u>	<u>27.5</u>
TOTAL	1,697	100.0

MANISTEE AREA

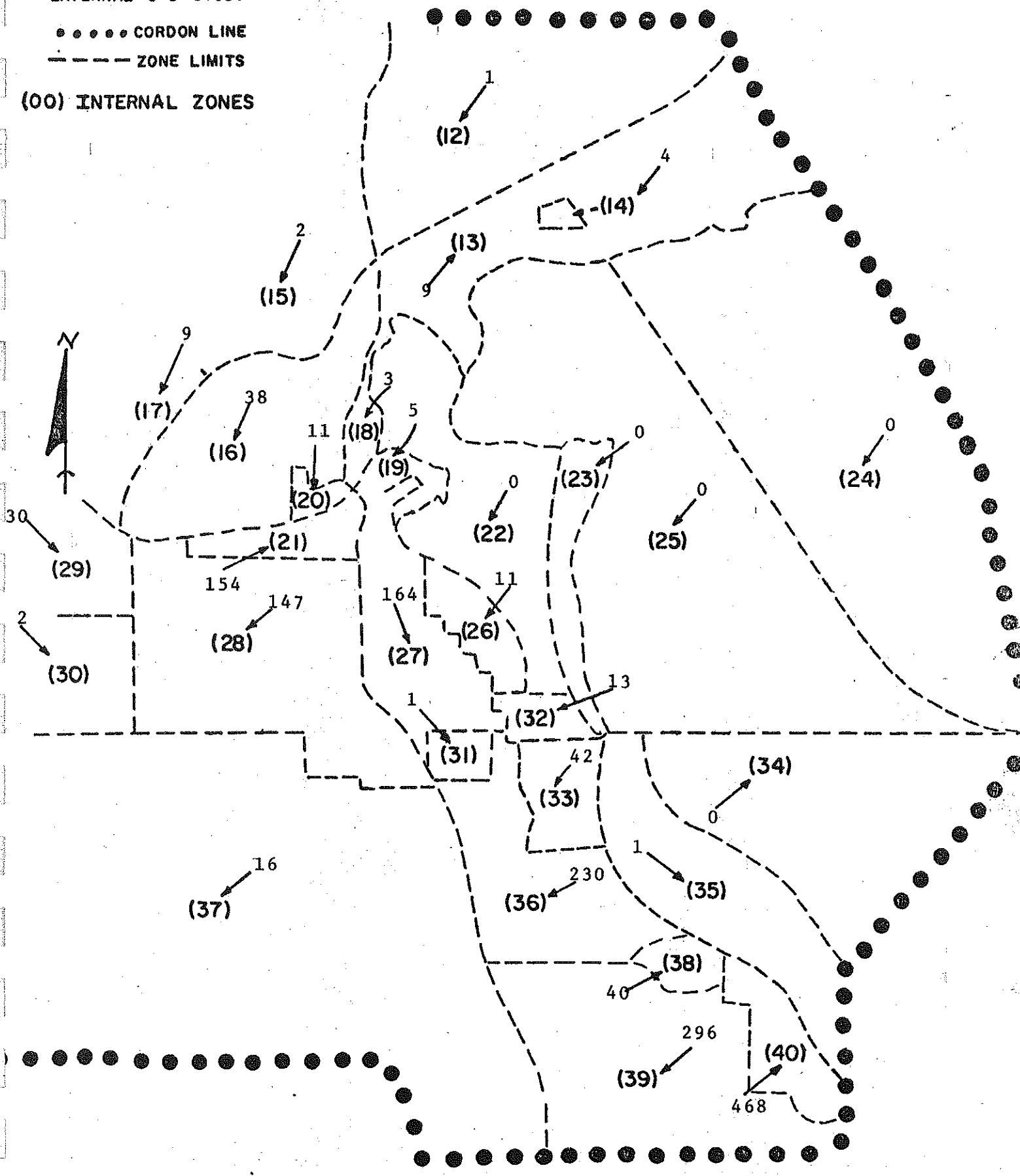
TERMINAL TRAFFIC BETWEEN
STATION 6 (LINK RD.) AND INTERNAL ZONES
1,697 VEHICLE TRIPS

EXTERNAL O-D STUDY

●●●●● CORDON LINE

----- ZONE LIMITS

(00) INTERNAL ZONES



Station 6, Link Road

TRIP LENGTHS

<u>Minutes</u>	<u>No. of Trips</u>	<u>Percent of Totals</u>
1-20	1342	74.1
20-40	195	10.8
40-60	67	3.7
60-90	115	6.4
90-120	31	1.7
120-180	33	1.8
180-240	16	.9
240-300	8	.4
300-820	<u>3</u>	<u>.2</u>
TOTAL	1810	100.0

Longest trip = 9 Hr. 50 Min.

Average Trip Length = 34 Min.

Station 7, US-31 (South)

Station 7 is located south of the junction with Grant Road.

A total of 5,010 vehicles passed through this station. Tabulations on the following pages give a detailed documentation of this traffic.

Approximately 6 out of every 10 vehicles had a terminal inside the study area; 8 of every 10 vehicles were autos and 9 out of 100 vehicles were panels or pickups whether they traveled into or through the area. More than 50 percent of the passenger cars and panels or pickups had a terminal inside the study area.

The largest trip purpose was work with 1,715 trips or 34.1 percent of the 5,010 total trips. All trip purposes except vacation had more than 50 percent terminal traffic. More than 80 percent of the vacation trips were through trips.

Station 3 (US-31, North) accounted for 1,921 trips or 87.3 percent of the 2,201 through trips. Stations 3 and 4 accounted for 2,063 trips or 93.7 percent of the 2,201 through trips.

Zone 21 (Central Business District) accounted for 549 trips or 19.6 percent of the 2,809 terminal trips. Zones 21, 27, and 36 accounted for 1,371 trips or 48.8 percent of the 2,809 terminal trips.

There were 1,134 trips or 22.6 percent of the 5,010 trips that had a trip length of 20-40 minutes. There were 2,432 trips (48.5 percent) that had a trip length of one hour or less.

TRANSPORTATION LIBRARY^Y
MICHIGAN DEPT. STATE HIGHWAYS &
TRANSPORTATION LANSING, MICH.

The origin and destination of all the trips which passed through the station were tabulated by county, Ontario and 11 states (see 95 zone system). There are two ends for each trip; an origin and a destination. There were 4,974 trips which passed through Station 7. This total is slightly different from the other tabulations due to rounding. There were 9,948 total trip ends.

There were 4,321 trip ends (43.4 percent) in Manistee County. There were 164 trip ends (1.6 percent) in the upper peninsula. The lower peninsula accounted for 9,383 trip ends (94.3 percent). There were 401 origins and/or destinations (4.0 percent) outstate.

TRANSPORTATION LIBRARY
MICHIGAN STATE UNIVERSITY
EAST LANSING, MICHIGAN

Station 7, US-31 (South)

<u>Vehicle Type</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Passenger Car	3,877	77.5	2,161	55.7	1,716	44.3
Passenger Car with Trailer	162	3.2	17	10.5	145	89.5
Panel or Pickup	473	9.4	358	75.7	115	24.3
Panel or Pickup with Trailer	31	0.6	8	25.8	23	74.2
Other Single Unit Trucks	261	5.2	129	49.4	132	50.6
Combinations and Trucks with Trailers	<u>206</u>	<u>4.1</u>	<u>136</u>	66.0	<u>70</u>	34.0
TOTAL	5,010	100.0	2,809	56.1	2,201	43.9

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	1,715	34.1	1,173	68.4	542	31.6
Personal Business	249	5.0	175	70.3	74	29.7
Shopping	674	13.5	614	91.1	60	8.9
Vacation	1,230	24.6	179	14.6	1,051	85.4
Other Soc. or Rec.	895	17.9	494	55.2	401	44.8
All Other	<u>247</u>	<u>4.9</u>	<u>174</u>	70.4	<u>73</u>	29.6
TOTAL	5,010	100.0	2,809	56.1	2,201	43.9

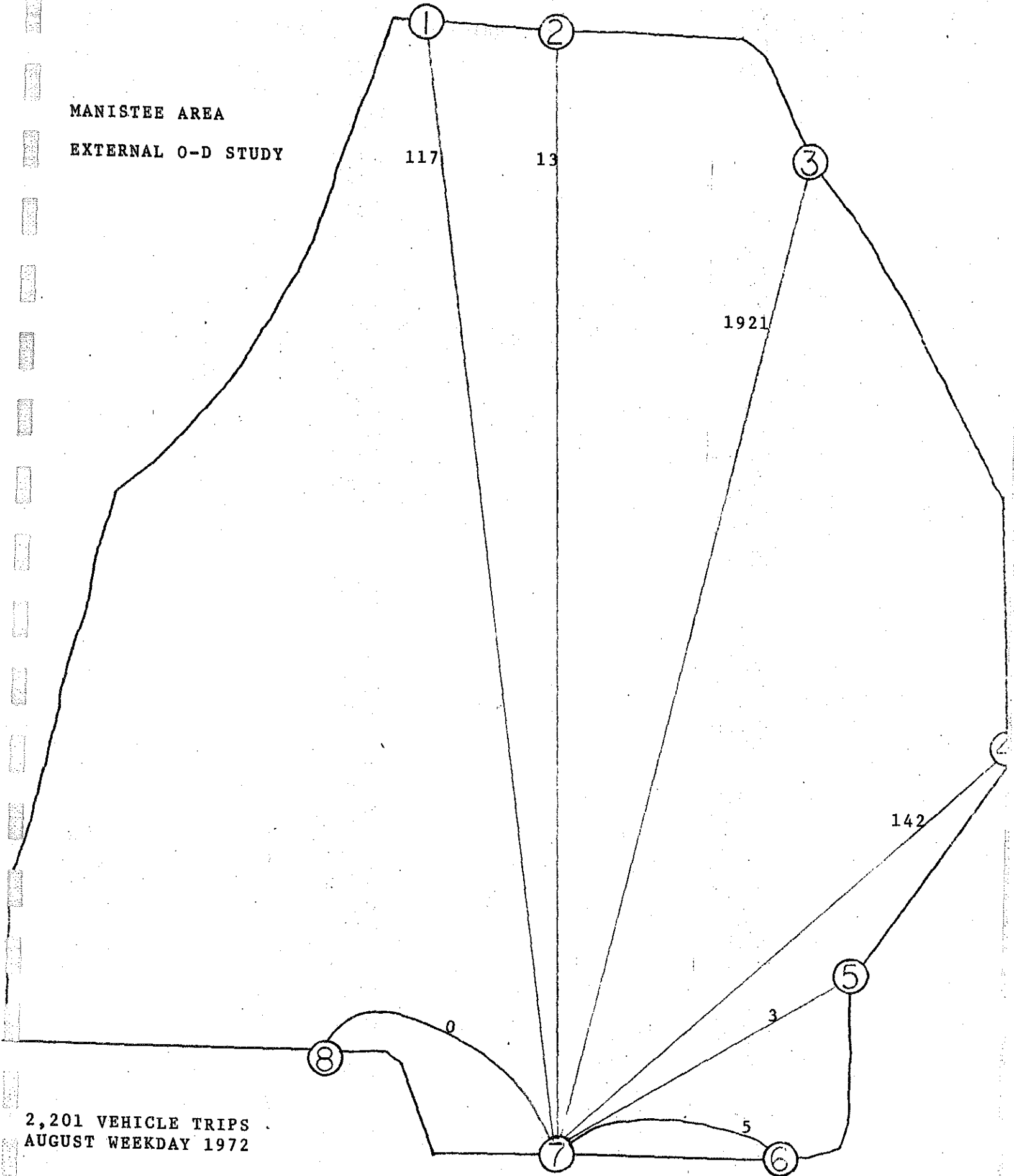
Station 7, US-31 (South)

THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 - M-110	117	5.3
2 - Hill Rd.	13	.6
3 - US-31, North	1921	87.3
4 - M-55	142	6.5
5 - East Lake Rd.	3	.1
6 - Link Rd.	5	.2
8 - Maple Rd.	<u>0</u>	<u>0.0</u>
TOTAL	2,201	100.0

THROUGH TRAFFIC INTERCHANGE
STATION 7, US-31 (South)

MANISTEE AREA
EXTERNAL O-D STUDY



2,201 VEHICLE TRIPS
AUGUST WEEKDAY 1972

TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
12	8	.3
13	116	4.1
14	8	.3
15	7	.2
16	213	7.6
17	33	1.2
18	21	.7
19	66	2.3
20	27	1.0
21	549	19.6
22	4	.1
23	0	0.0
24	2	.1
25	25	.9
26	60	2.1
27	474	16.9
28	270	9.6
29	57	2.0
30	2	.1
31	45	1.6
32	56	2.0
33	55	2.0
34	2	.1
35	14	.5
36	348	12.4
37	46	1.6
38	25	.9
39	180	6.4
40	<u>96</u>	<u>3.4</u>
TOTAL	2,809	100.0

VEHICLE TRIPS BETWEEN
STATION 7 (US-31, SOUTH) AND INTERNAL ZONES
2,809 VEHICLE TRIPS

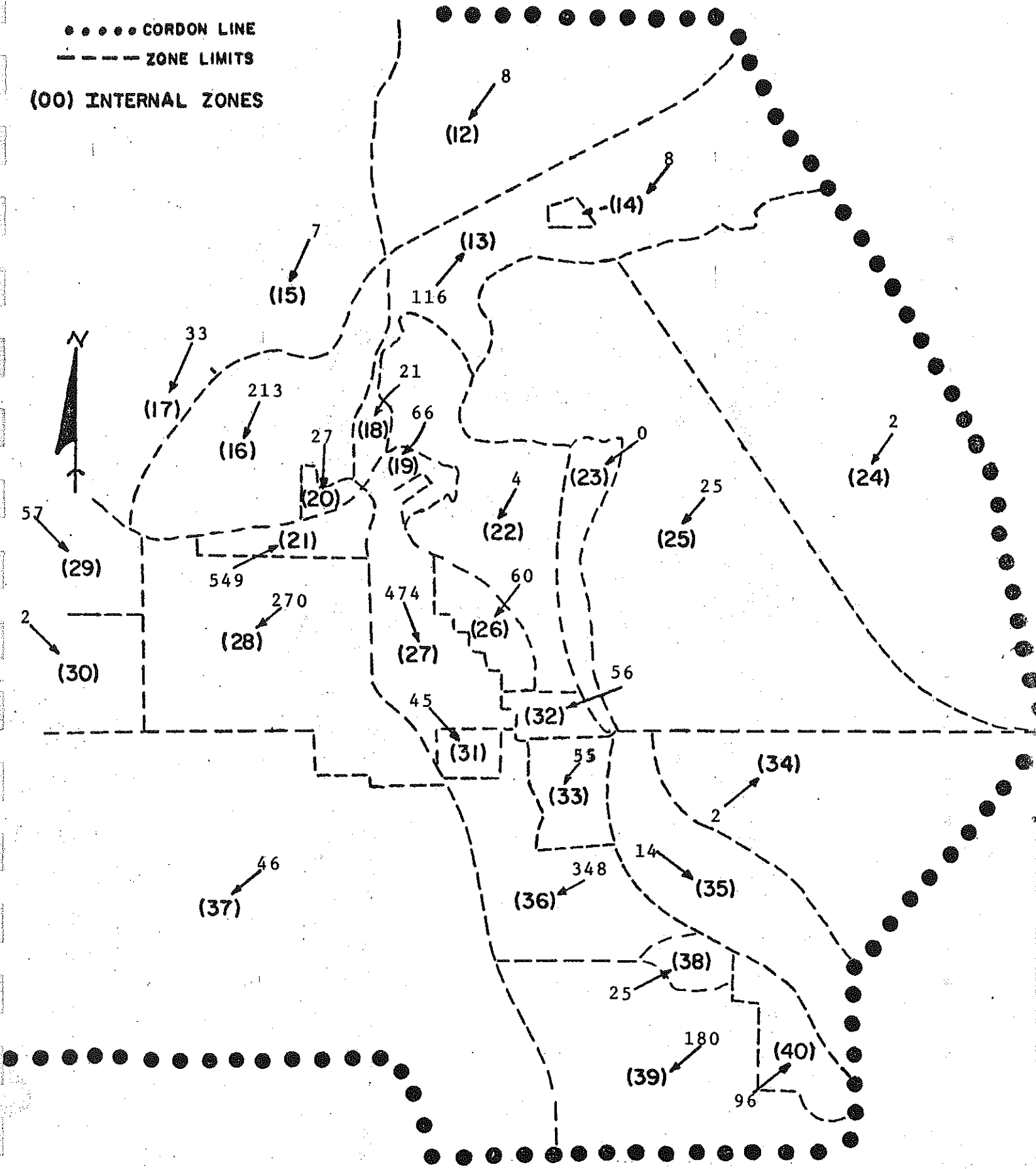
MANISTEE AREA

EXTERNAL O-D STUDY

●●●●● CORDON LINE

----- ZONE LIMITS

(00) INTERNAL ZONES



Station 7, US-31 (South)

<u>TRIP LENGTHS</u>		
<u>Minutes</u>	<u>No. of Trips</u>	<u>Percent of Totals</u>
1-20	770	15.4
20-40	1134	22.6
40-60	528	10.5
60-90	328	6.5
90-120	299	6.0
120-180	619	12.4
180-240	498	9.9
240-300	238	4.8
300-820	593	11.8
820-1130	<u>3</u>	<u>.1</u>
TOTAL	5,010	100.0

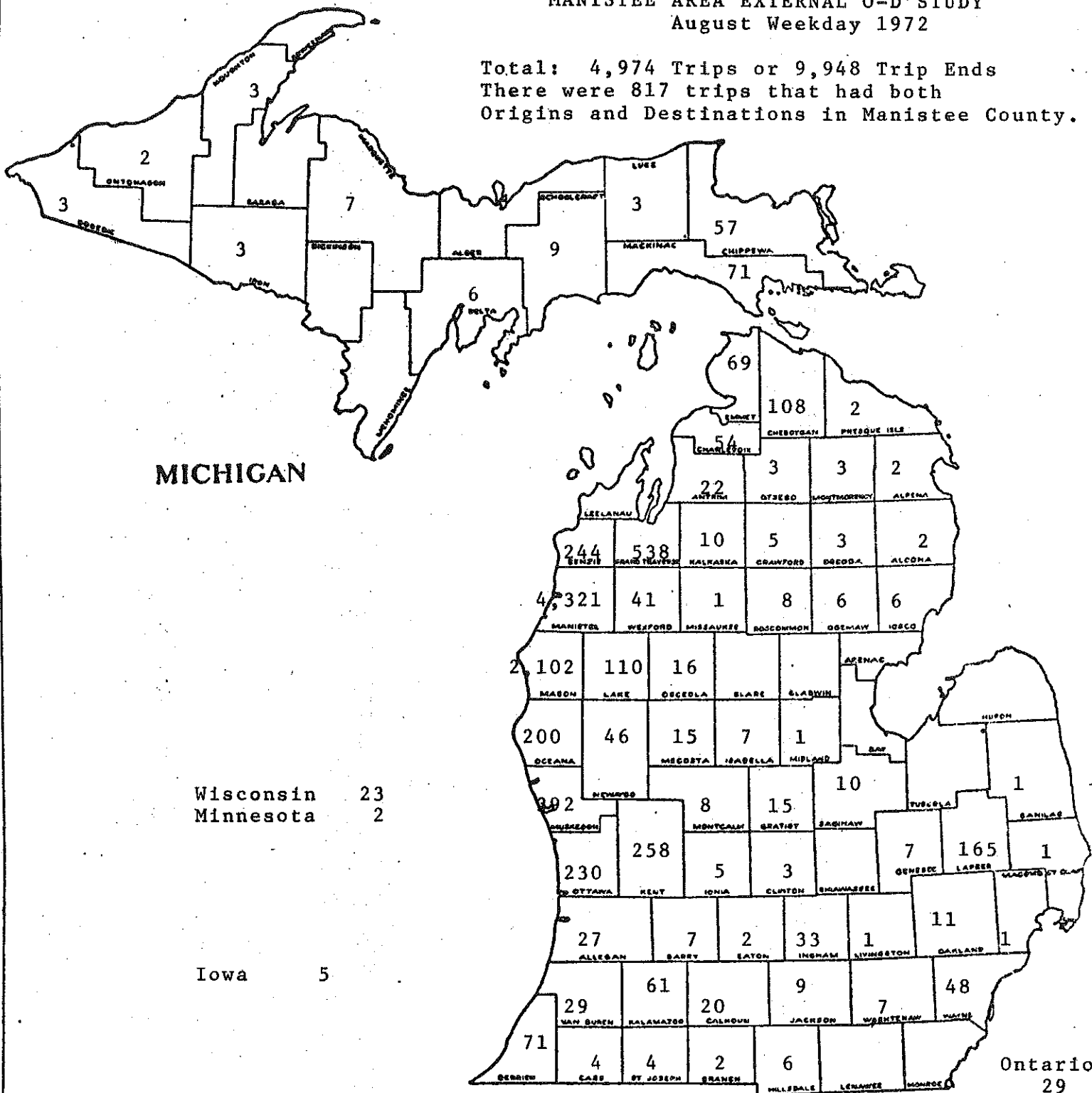
Longest trip = 14 Hr. 0 Min.

Average Trip Length = 130 Min.

Origins and/or Destinations
of Traffic Through
Station 7 on US-31 (South),
South of Grant Road

MANISTEE AREA EXTERNAL O-D STUDY
August Weekday 1972

Total: 4,974 Trips or 9,948 Trip Ends
There were 817 trips that had both
Origins and Destinations in Manistee County.



MICHIGAN

Wisconsin 23
Minnesota 2

Iowa 5

Illinois 192 Indiana 111 Ohio 25
Missouri 7 Kentucky 7

Ontario 29

Station 8, Maple Road

Station 8 is located .1 mile north of Canfield.

A total of 1,270 vehicles passed through this station. Tabulations on the following pages give a detailed documentation of this traffic.

Approximately 8 out of every 10 vehicles had a terminal inside the study area; 9 of every 10 vehicles were autos and 1 out of 10 vehicles were panels or pickups whether they traveled into or through the area. More than 80 percent of the passenger cars and panels or pickups had a terminal inside the study area.

The largest trip purpose was work with 399 trips or 31.4 percent of the 1,270 total trips. All trip purposes except vacation had more than 75 percent terminal traffic.

Station 3 (US-31, North) accounted for 156 trips or 74.3 percent of the 210 through trips. Stations 1 and 3 accounted for 190 trips or 90.5 percent of the 210 through trips.

Zone 21 (Central Business District) accounted for 252 trips or 23.7 percent of the 1,060 terminal trips. Zones 21, 27, and 28 accounted for 617 trips or 58.2 percent of the 1,060 terminal trips.

There were 442 trips or 34.8 percent of the 1,270 trips that had a trip length of 1-20 minutes. There were 1,120 trips (88.2 percent) that had a trip length of one hour or less.

The origin and destination of all the trips which passed through the station were tabulated by county, Ontario and 11 states (see 95 zone system). There are two ends for each trip; an origin and a destination. There were 1,263 trips which passed through Station 8. This total is slightly different from the other tabulations due to rounding. There were 2,526 total trip ends.

There were 1,666 trip ends (66.0 percent) in Manistee County. There were 5 trip ends (0.2 percent) in the upper peninsula. The lower peninsula accounted for 2,513 trip ends (99.5 percent). There were 8 origins and/or destinations (0.3 percent) outstate.

Station 8, Maple Road

<u>Vehicle Type</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Passenger Car	1,112	87.6	937	84.3	175	15.7
Passenger Car with Trailer	17	1.3	16	94.1	1	5.9
Panel or Pickup	126	9.9	95	75.4	31	24.6
Panel or Pickup with Trailer	7	0.6	6	85.7	1	14.3
Other Single Unit Trucks	4	0.3	4	100.0	0	0
Combinations and Trucks with Trailers	<u>4</u>	<u>0.3</u>	<u>2</u>	50.0	<u>2</u>	50.0
TOTAL	1,270	100.0	1,060	83.5	210	16.5

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	399	31.4	314	78.7	85	21.3
Personal Business	56	4.4	44	78.6	12	21.4
Shopping	287	22.6	275	95.8	12	4.2
Vacation	52	4.1	30	57.7	22	42.3
Other Soc. or Rec.	378	29.8	316	83.6	62	16.4
All Other	<u>98</u>	<u>7.7</u>	<u>81</u>	82.7	<u>17</u>	17.3
TOTAL	1,270	100.0	1,060	83.5	210	16.5

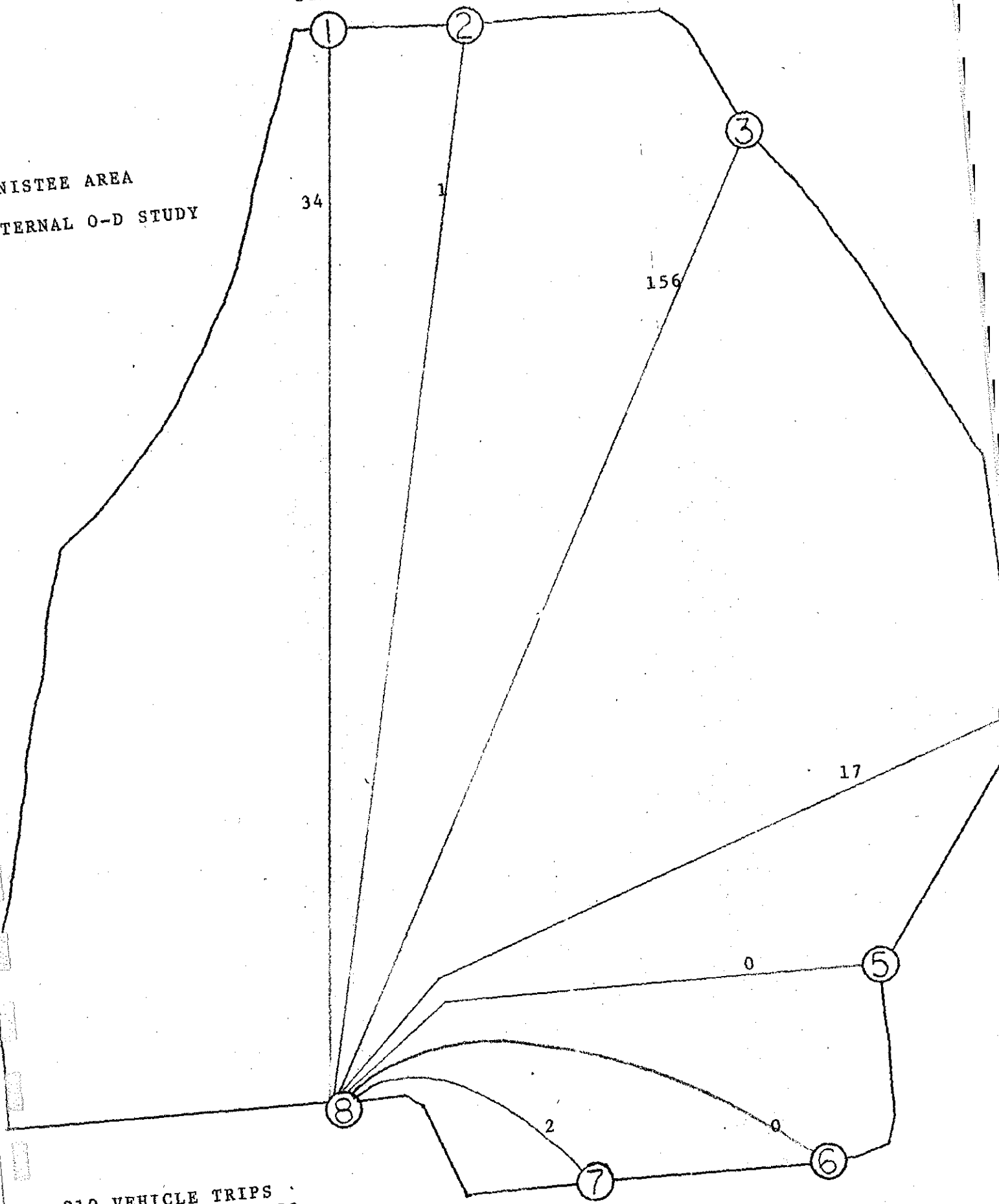
Station 8, Maple Road

THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 - M-110	34	16.2
2 - Hill Rd.	1	.4
3 - US-31, North	156	74.3
4 - M-55	17	8.1
5 - East Lake Rd.	0	0.0
6 - Link Rd.	0	0.0
7 - US-31, South	<u>2</u>	<u>1.0</u>
TOTAL	210	100.0

THROUGH TRAFFIC INTERCHANGE
STATION 8, MAPLE ROAD

MANISTEE AREA
EXTERNAL O-D STUDY



210 VEHICLE TRIPS
AUGUST WEEKDAY 1972

TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
12	4	.4
13	49	4.6
14	0	0.0
15	4	.4
16	112	10.6
17	15	1.4
18	8	.8
19	21	2.0
20	21	2.0
21	252	23.7
22	0	0.0
23	0	0.0
24	1	.1
25	10	.9
26	6	.6
27	140	13.1
28	225	21.1
29	24	2.3
30	8	.8
31	7	.7
32	7	.7
33	4	.4
34	0	0.0
35	2	.2
36	64	6.0
37	52	4.9
38	3	.3
39	13	1.2
40	<u>8</u>	<u>.8</u>
TOTAL	1,060	100.0

TERMINAL TRAFFIC BETWEEN
STATION 8 (MAPLE RD.) AND INTERNAL ZONES
1,060 VEHICLE TRIPS

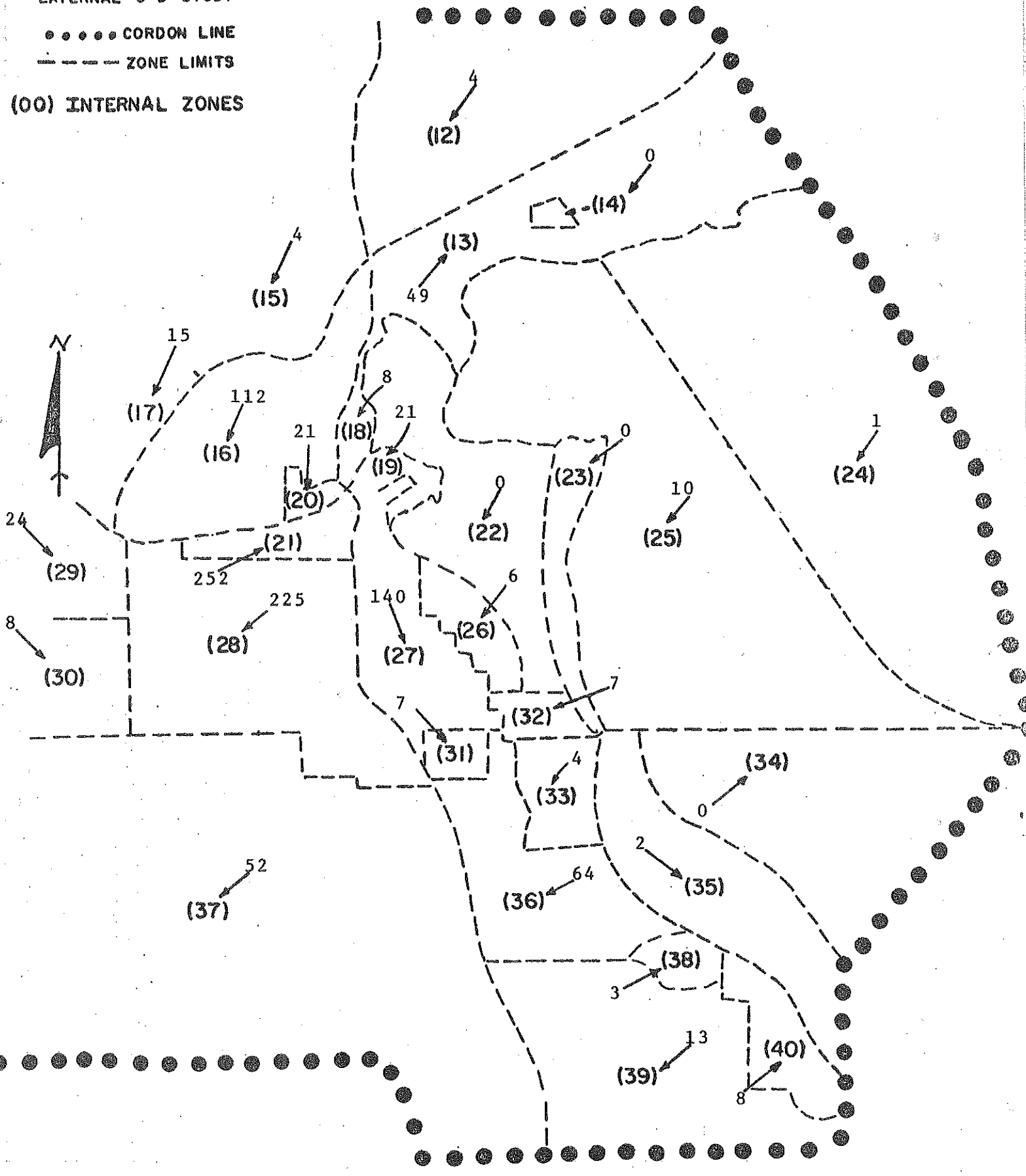
MANISTEE AREA

EXTERNAL O-D STUDY

●●●●● CORDON LINE

----- ZONE LIMITS

(OO) INTERNAL ZONES



STATION 8, MAPLE ROAD

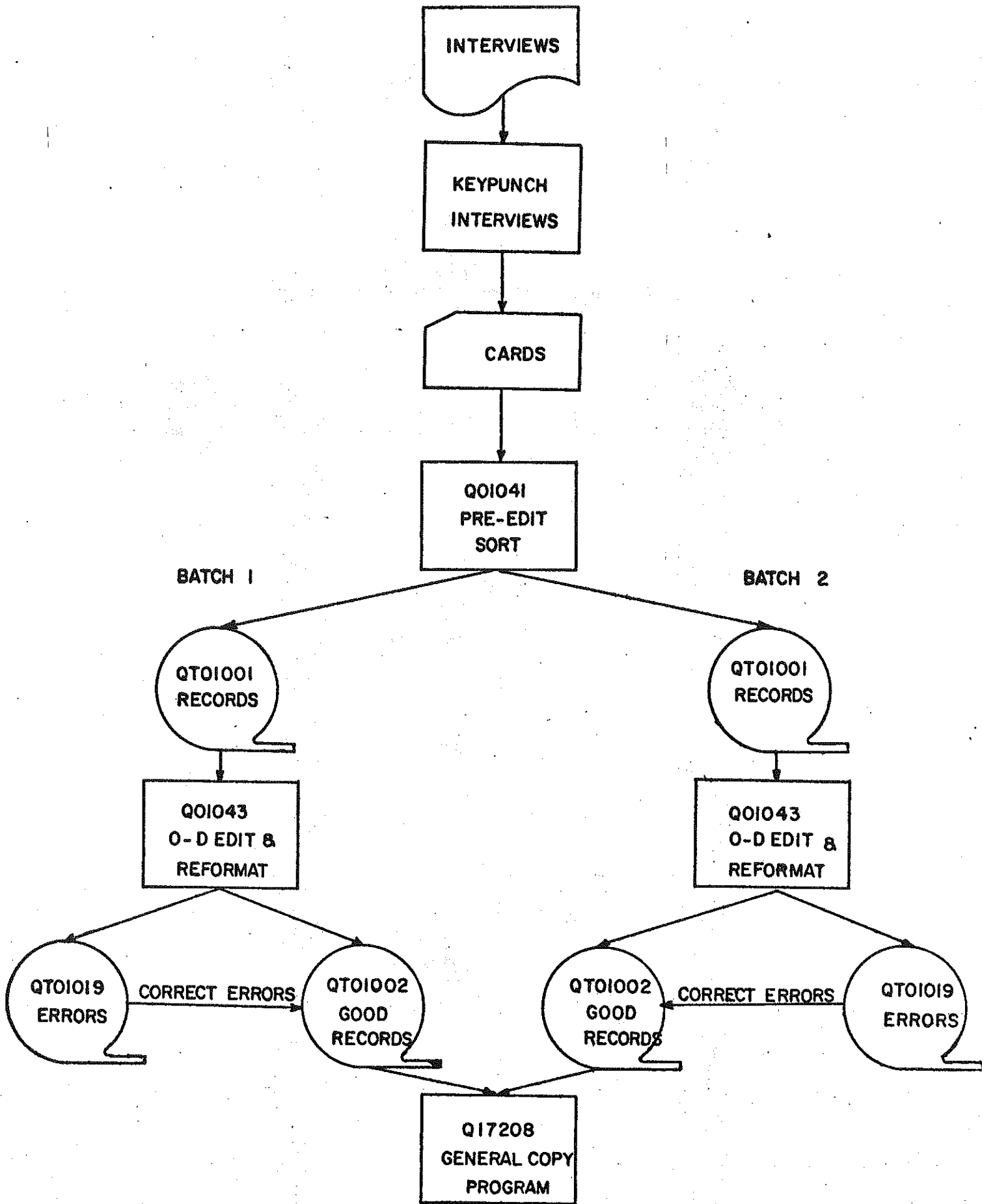
TRIP LENGTHS

<u>Minutes</u>	<u>No. of Trips</u>	<u>Percent of Totals</u>
1-20	442	34.8
20-40	284	22.4
40-60	394	31.0
60-90	78	6.1
90-120	38	3.0
120-180	17	1.3
180-240	2	.2
240-300	4	.3
300-820	<u>11</u>	<u>.9</u>
TOTAL	1270	100.0

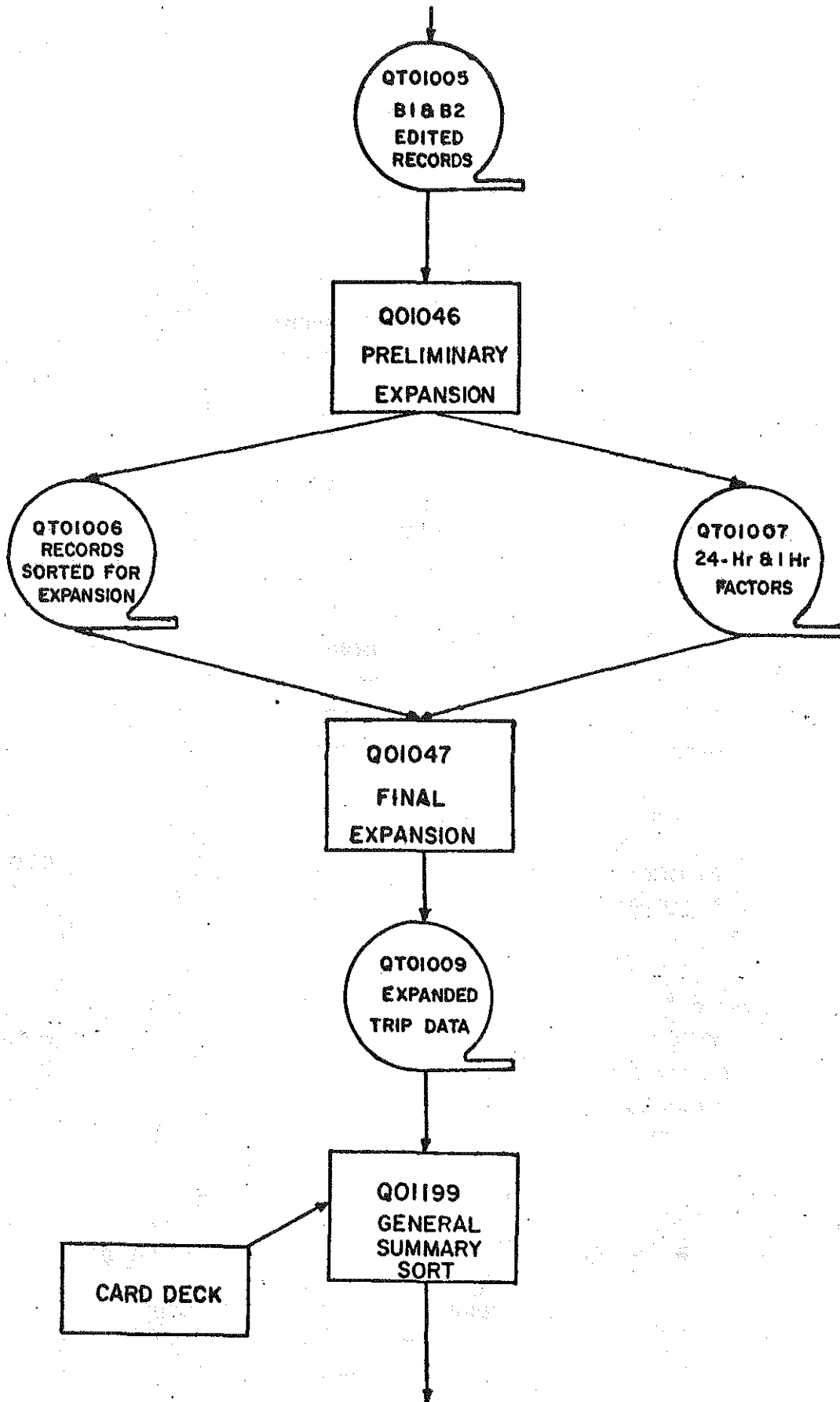
Longest trip = 13 Hr. 40 Min.

Average Trip Length = 45 Min.

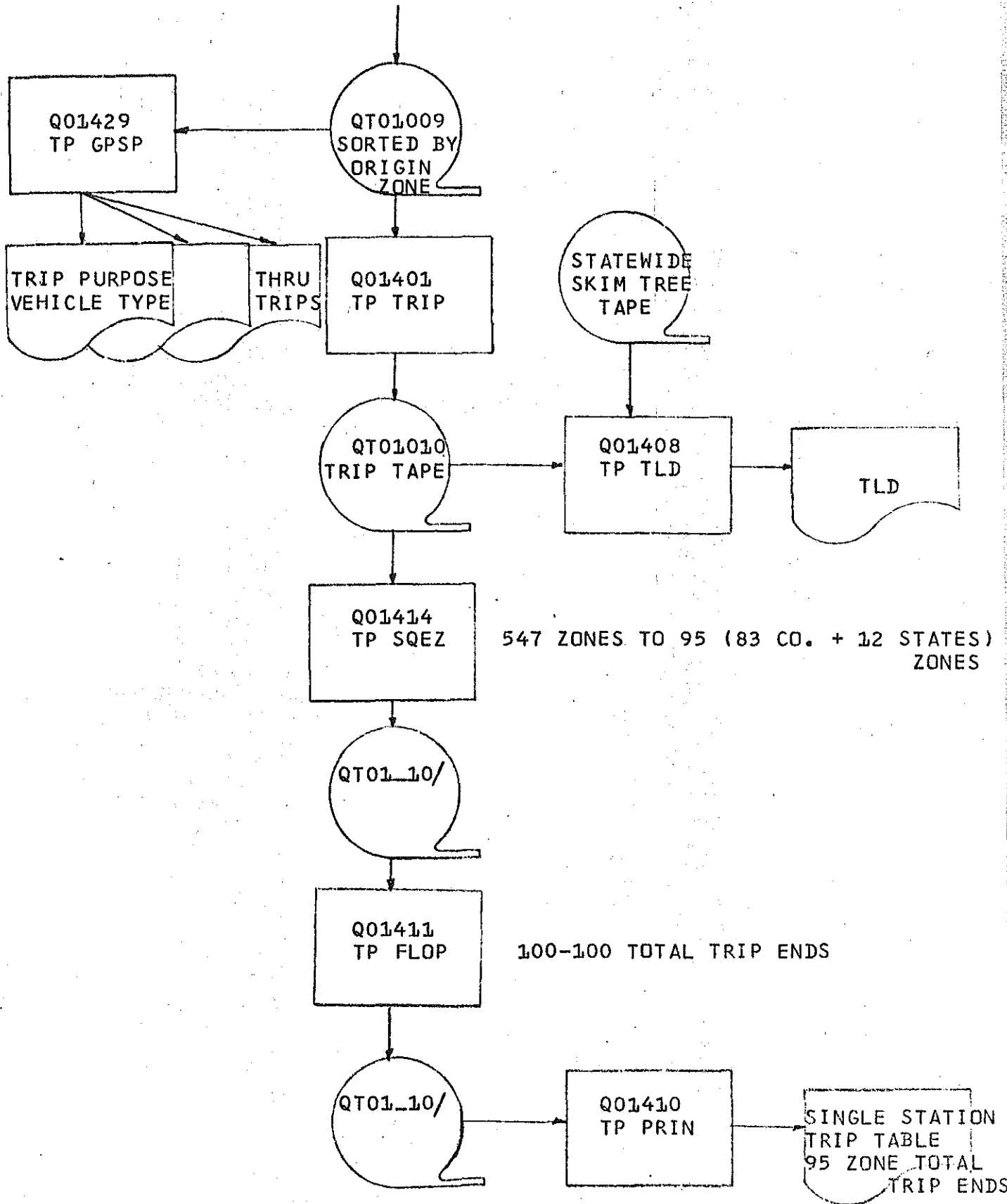
APPENDIX A



TRANS SINGLE STATION PROCESS FLOW CHART



SINGLE STATION PROCESS FLOW CHART



95 ZONE SYSTEM

INSTATE ZONES

ZONE	COUNTY	ZONE	COUNTY
1	ALCONA	43	LAKE
2	ALGER	44	LAPEER
3	ALLEGAN	45	LELANAU
4	ALPENA	46	LENAWEE
5	ANTRIM	47	LIVINGSTON
6	ARENAC	48	LUCE
7	BARAGA	49	MACKINAC
8	BARRY	50	MACOMB
9	BAY	51	MANISTEE
10	BENZIE	52	MARQUETTE
11	BERRIEN	53	MASON
12	BRANCH	54	MECOSTA
13	CALHOUN	55	MENOMINEE
14	CASS	56	MIDLAND
15	CHARLEVOIX	57	MISSAUKEE
16	CHEBOYGAN	58	MONROE
17	CHIPPEWA	59	MONTCALM
18	CLARE	60	MONTMORENCY
19	CLINTON	61	MUSKEGON
20	CRAWFORD	62	NEWAYGO
21	DELTA	63	OAKLAND
22	DICKINSON	64	OCEANA
23	EATON	65	OGEMAW
24	EMMET	66	ONTONAGON
25	GENESEE	67	OSCEOLA
26	GLADWIN	68	OSCODA
27	GOGEBIC	69	OTSEGO
28	GRAND TRAVERSE	70	OTTAWA
29	GRATIOT	71	PRESQUE ISLE
30	HILLSDALE	72	ROSCOMMON
31	HOUGHTON	73	SAGINAW
32	HURON	74	SANILAC
33	INGHAM	75	SCHOOLCRAFT
34	IONIA	76	SHIAWASSEE
35	IOSCO	77	ST. CLAIR
36	IRON	78	ST. JOSEPH
37	ISABELLA	79	TUSCOLA
38	JACKSON	80	VAN BUREN
39	KALAMAZOO	81	WASHTENAW
40	KALKASKA	82	WAYNE
41	KENT	83	WEXFORD
42	KEWEENAW		

OUTSTATE ZONES

84	ONTARIO	90	KENTUCKY
85	WISCONSIN	91	MISSOURI
86	ILLINOIS	92	IOWA
87	INDIANA	93	MINNESOTA
88	OHIO	94	PENNSYLVANIA
89	WEST VIRGINIA	95	NEW YORK

ORIGIN-DESTINATION OR
MANUAL VEHICLE CLASSIFICATION

ROUTE _____ LOCATION DESCRIPTION _____ CITY _____

FORM	COUNTY				STATEWIDE STA. NO.				O-D STA. NO.		YEAR		MONTH		DATE		DAY	O-D CITY TYPE		SEQ.	
9																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	

RECORDER _____

DO NOT ACCUMULATE

IN OUT	DIRECT OF TRAVEL	TIME ENDING		PASSENGER CAR				PANEL & PICK-UP (2 AXLE, 4 TIRE)				ALL OTHER SINGLE UNIT TRUCKS			ALL TRUCK COMB. AND SINGLE UNIT			(7) ALL BUSES		(8) MOTOR CYCLE		TOTAL														
		HOUR	MIN.	WITHOUT (1) TRAILER		WITH (2) TRAILER		WITHOUT (3) TRAILER		WITH (4) TRAILER		WITHOUT TRAILER (5)			TRUCK WITH TRAILER (6)																					
22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54				
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DAY OF WEEK: Col. 17

Sunday	1	Thursday	5
Monday	2	Friday	6
Tuesday	3	Saturday	7
Wednesday	4		

STATION TYPE: Col. 20

Cordon Line Station	2
Screen Line Station	1
Single Station	3
S. W. Winter Class.	4

TRUCK IDENTIFICATIONPanel and Pickup (2 axle, 4 tire)

Light 2-axle, 4-tire trucks of less than one ton rated capacity, including:

- Panel and pickups standard type, including mini-vans (Ford Econoline, Volkswagon, etc.)
- Pickup trucks carrying a cab high (sleeper style) camper.

All Other Single Unit Trucks

Heavy 2-axes or more (dual tires or super singles) equal to or greater than one ton rated capacity, including:

- All multistop or standup delivery trucks (primarily designed for moving rural and urban goods.)
- All large 4-tire trucks with flatbed, dump or other heavy cargo bodies.
- Pickups and panels, having heavy truck type hubs or axles, or are noticeably larger and longer than the standard type.
- Heavy 2-axle trucks with a higher than cab camper body.
- Truck tractor without trailer.

Truck Combinations

Truck and/or truck tractor (power unit) pulling semi-trailer or full trailer combinations.

DIRECTION OF TRAVEL: Cols. 23 - 24

Northbound	01	Westbound	07
Northeastbound	02	Northwestbound	08
Eastbound	03	North-South (2-Way)	09
Southeastbound	04	East-West (2-Way)	10
Southbound	05	Northeast-Southwest (2-Way)	11
Southwestbound	06	Northwest-Southeast (2-Way)	12

TIME ENDING: Cols. 25 - 28

TIME	HOUR	MIN.
	Cols. 25 - 26	Cols. 27 - 28
1:05 AM	01	05
2:13 AM	02	13
etc.		
12:00 Noon	12	00
etc.		
3:15 PM	15	15
etc.		
11:45 PM	23	45
etc.		