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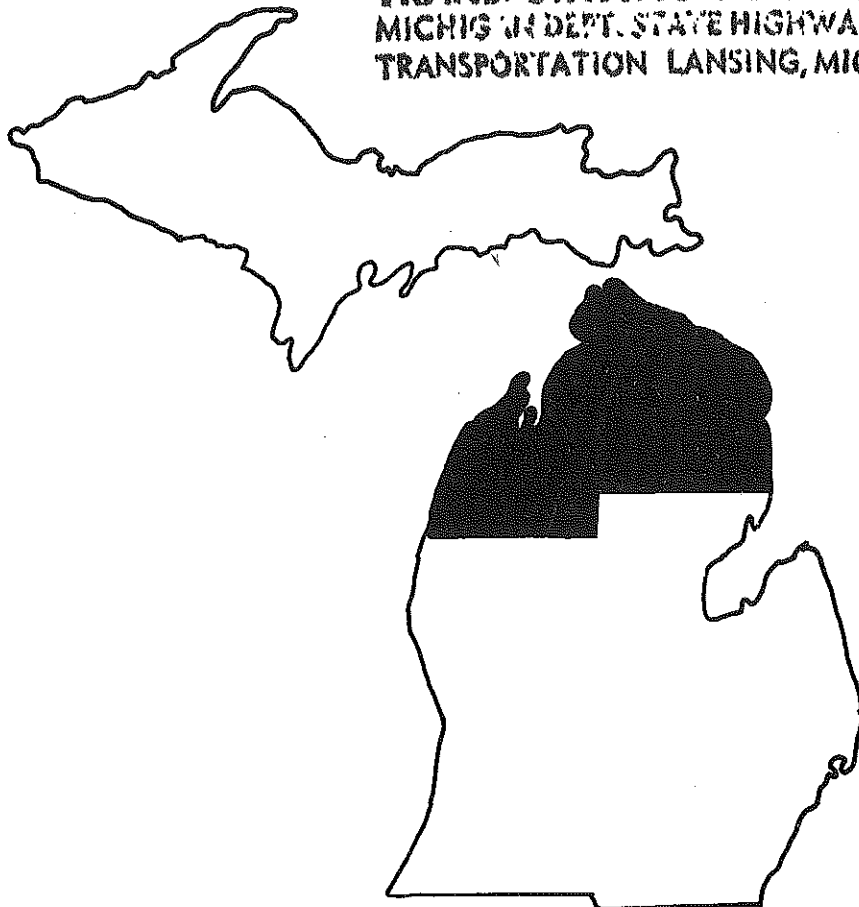
MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

EAST JORDAN 1973

EXTERNAL
ORIGIN DESTINATION
SURVEY

FACTUAL DATA REPORT

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MICHIGAN DEPARTMENT
OF
STATE HIGHWAYS AND TRANSPORTATION

EAST JORDAN 1973
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STATE HIGHWAYS BUILDING, 425 WEST OTTAWA PHONE 517-373-2090
POST OFFICE DRAWER K, LANSING, MICHIGAN 48904

JOHN P. WOODFORD, DIRECTOR

Weston E. Vivian
Commissioner

May 27, 1976

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

Dear Mr. Cryderman:

The Multi-Regional Planning Division of the Bureau of Transportation Planning has documented the results of the "East Jordan 1973 External Origin Destination Survey". The purpose of the origin-destination survey, conducted in July and August 1973, was to determine the traffic patterns in the area in order to provide a sound basis for planning an efficient future transportation system.

This report was jointly prepared by Sam Wallace and Steve Schafer under the direct guidance of Thomas Pickens, Traffic Analyst for the North Regional Planning Section.

Sincerely,

Keith E. Bushnell, Administrator
Multi-Regional Planning Division



TABLE OF CONTENTS

	PAGE
Study Area	1
Terminology and Definitions	4
Field Procedure	5
Station Locations	7
All Stations	9
Station 1 (M-32 & 66, North)	16
Station 2 (Boyne Road)	25
Station 3 (State Street)	34
Station 4 (M-32, South)	43
Station 5 (M-66, South)	52
Station 6 (Water Street)	61
Appendix	70
Interview Form	71
Manual Vehicle Classification Form	72

STUDY AREA

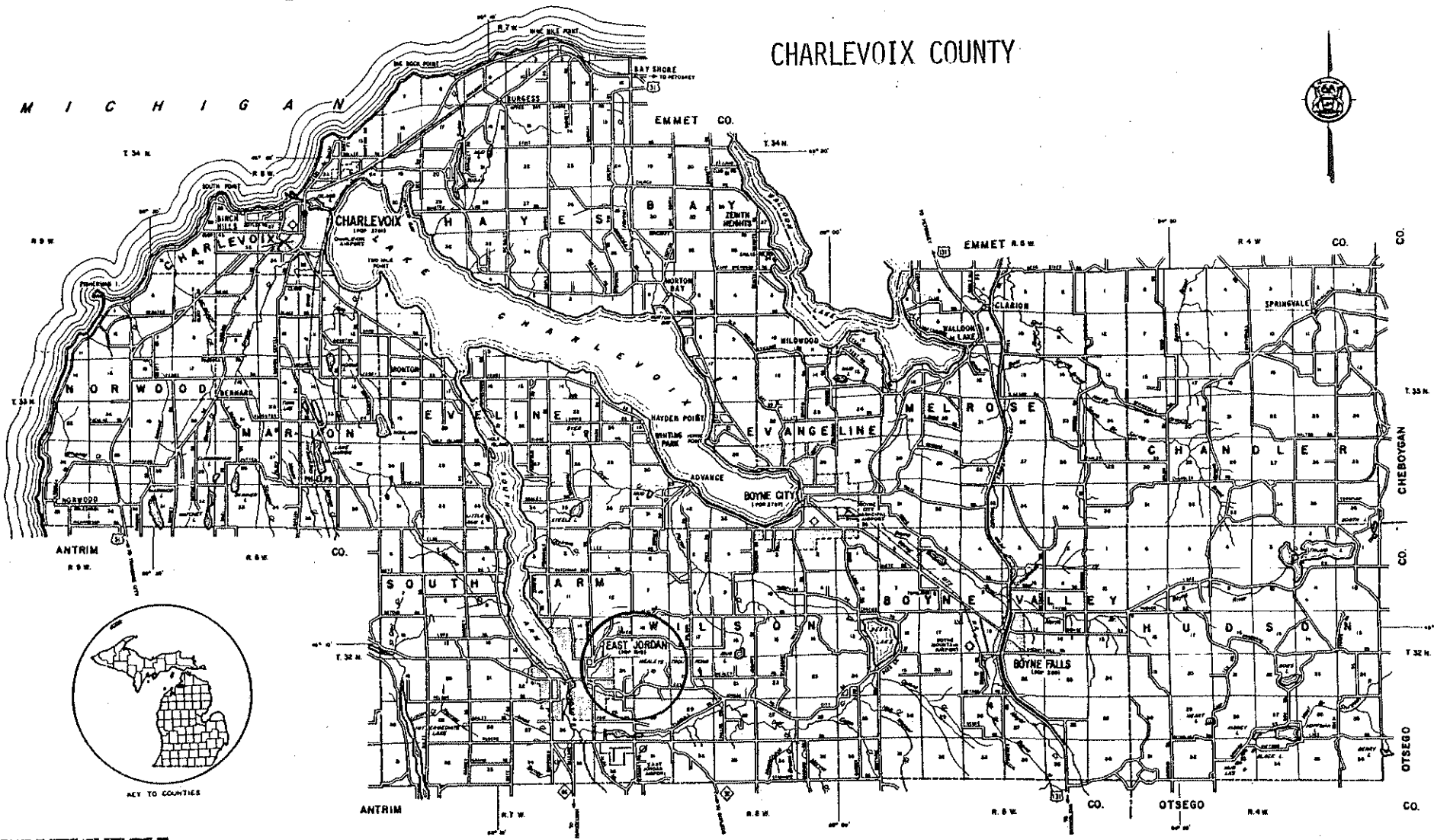
The City of East Jordan, which has a population of approximately 2,000 (1970), is located in the northwest portion of lower Michigan approximately 250 miles from Detroit and about 170 miles from Grand Rapids.

The city is located on highway M-66 at the tip of the south arm of Lake Charlevoix. The Jordan Valley and Lake Charlevoix provide the area with many scenic attractions. Major manufacturers in the area include: East Jordan Iron Works Inc., Gulf and Western Stamping Plants, Sherman Brothers Canning Company, ITT - Thompson Industry Inc.

Two state trunk lines which service the area are M-66 and M-32. M-66 provides access to Charlevoix, Mancelona and Kalkaska. M-32 services the area to the east and connects with Gaylord and Alpena.

L A K E

CHARLEVOIX COUNTY



- 3 -



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TERMINOLOGY AND DEFINITIONS

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

Classification Counts --- A survey of vehicles in which those passing through the study area are placed in categories (passenger cars, single unit trucks, etc.).

Cordon Line --- An imaginary line around the area under study.

Destination --- The place where a trip ends.

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

Interview Counts --- A survey of vehicles in which those passing through the study area are stopped and drivers interviewed regarding the origin, destination and purpose of the trip.

Origin --- The place where a trip begins.

Origin - Destination Zone --- (Analysis Zone) a basic subdivision of the study area having a single or dominant land use, designed as such for purposes of tabulation and analysis.

Study Area --- The geographical area selected for the origin and destination study.

Terminal Trip --- A trip with one end outside the study area and the other end inside the study area. (Beginning or ending at one of the internal analysis zones).

Through Trip --- A trip passing through the study area. (Both ends of the trip outside the cordon line).

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

Trip Ends --- Each trip has two ends; an origin and a destination.

Trip Length-Average --- The value that is determined by summing all of the recorded trip lengths and dividing by the number of trips.

Trip Length-Median ---- The value that is determined by dividing the trip length distribution so that an equal number of trips are on either side of it.

FIELD PROCEDURE

Field work for the East Jordan External Origin-Destination Study was conducted during July and August of 1973. The purpose of the study was to collect data on traffic movement into, out of, and through the East Jordan area.

A cordon line was drawn around the East Jordan area in order to define the study area. Where the cordon line crossed a road an external interview station was established. Ten such stations were created for the East Jordan area of which three were on state trunk line. Four of the original ten external interview stations were not operated since preliminary counts indicated that traffic passing through these stations was negligible when compared to the remaining six stations.

Each of the six external stations were operated for fourteen hours. During the hours of operation, vehicles were stopped and drivers interviewed regarding the origin, destination and purpose of the trip. These interviews were made of vehicles traveling in each direction, i.e. inbound and outbound. Manual vehicle classification counts were taken in conjunction with interviews and the remainder of a twenty-four hour day.

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In addition, the study area was sub-divided into analyses zones based generally on homogeneous land uses. Each trip inbound or outbound from these zones was recorded.

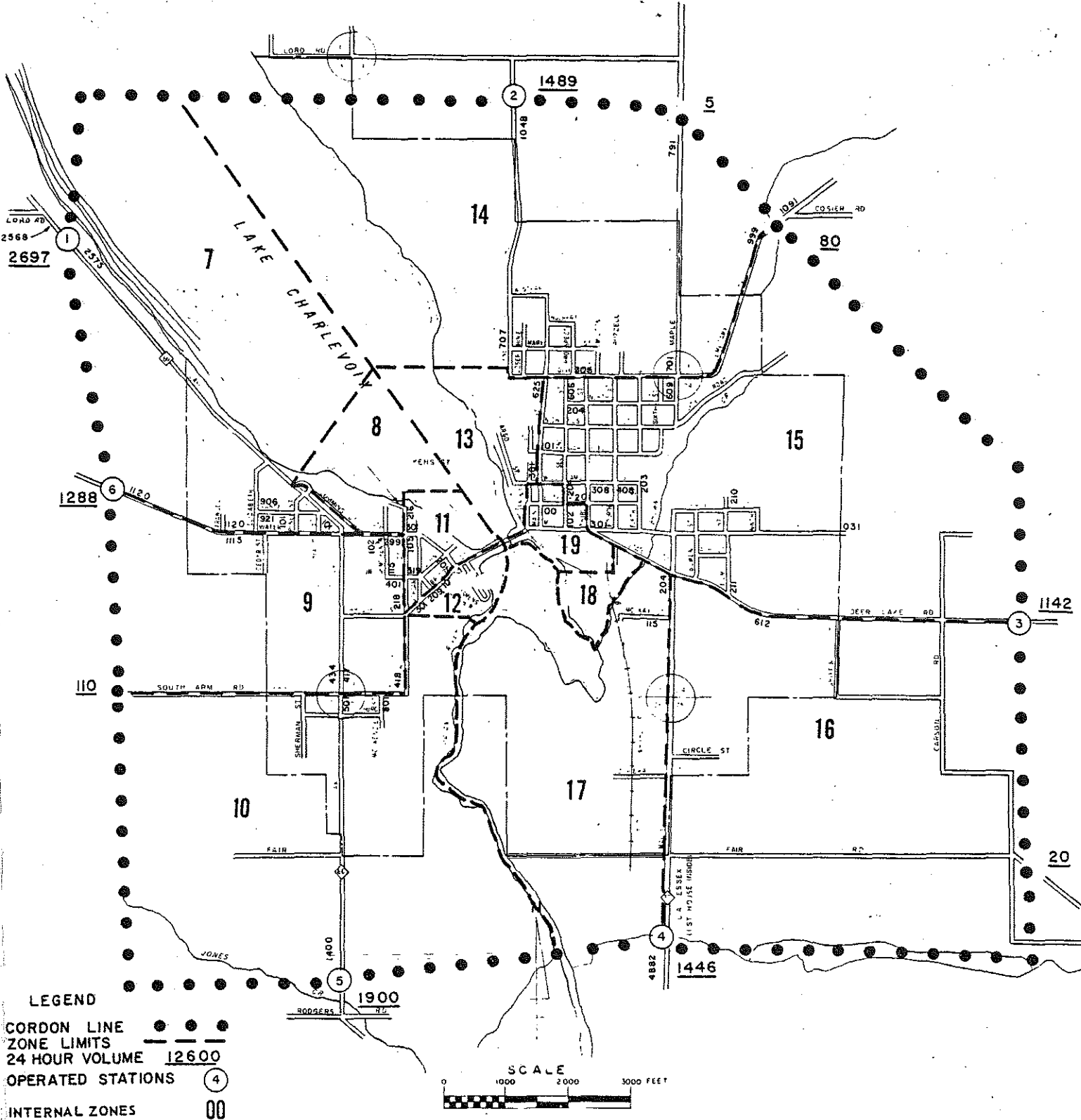
Sample interview forms for both interviews and Manual Vehicle Classification counts appear in the Appendix.

STATION LOCATIONS

<u>Station Number</u>	<u>Route</u>	<u>Location</u>
1	M-32 and 66, North	0.1 Mi. South of Lord Road
2	Boyne Road	North of East Jordan city limits
3	State Street	0.6 Mi. East of East Jordan eastern city limits
4	M-32 South	At the bridge
5	M-66, South	0.4 Mi. South of East Jordan southern city limits
6	Water Street	0.7 Mi. West of M-66/32

CITY OF
 EAST JORDAN
 CHARLEVOIX COUNTY

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All Stations

On an average July or August weekday in 1973, there were 10,544 vehicles which passed through the six interview stations located on the cordon line around the East Jordan Study Area. Of the 10,544 vehicles recorded during classification counts, 5,708 (54.1 percent) traveled on the state highways.

There were 7,115 interviews taken for 14-hours at the six stations. This is 67.5 percent of the 10,544 vehicles counted during the 24-hour period. Station 1 (M-32 & 66, North) had 1,401 interviews taken in the 14-hour period or 53.1 percent of the 24-hour volume of 2,636 vehicles. This is the lowest percentage for any of the six stations. The highest percentage of 14-hour interviews of 24-hour volume was 74.0 percent at Station 6 (Water Street).

Station 1 (M-32 & 66, North) had the highest volume of 2,636 vehicles for a 24-hour period or 25.0 percent of the 10,544 counted vehicles at all stations. Station 3 (State Street) had the lowest volume of traffic for a 24-hour period-1,157 vehicles or 11.0 percent of the total 10,544 vehicles.

Station 2 (Boyer Road) had the highest percentage of terminal traffic-69.3 percent or 1,415 vehicles out of the 2,042 total. Station 1 (M-32 & 66, North) had the lowest percent of terminal traffic-48.0 percent or 1,155 vehicles out of the 2,406 total.

There were 5,861 terminal trips. These are trips that have one end of the trip inside the study area and the other end outside the area. Zone 19 (Central Business District) generated the largest number of terminal trips-2,047 trips or 34.9 percent

of the 5,861 total terminal trips. Four zones (9, 13, 15, and 19) accounted for 4,275 terminal trips or 72.9 percent of the total 5,861 terminal trips.

The traffic volume at each station is as follows:

Station	Traffic	% of Grand Total
1 - M-32 & 66, North	2,636	25.0
2 - Boyne Road	2,057	19.5
3 - State Street	1,157	11.0
4 - M-32, South	1,194	11.3
5 - M-66, South	1,878	17.8
6 - Water Street	<u>1,622</u>	<u>15.4</u>
GRAND TOTAL	10,544	100.0

	Traffic	% of Grand Total
Trunk line (Stations 1, 4, and 5)	5,708	54.1
Non-Trunk line (Stations 2, 3, and 6)	<u>4,836</u>	<u>45.9</u>
GRAND TOTAL	10,544	100.0

* The above totals are based on 24-Hour Classification Counts.

EAST JORDAN

TOTAL STATION TRIPS

Station	24-Hour ¹ Traffic Counts	14-Hour Interviews	Percent Interviewed	Vehicle ² Trips	Percent of Total Traffic
1	2636	1401	53.1	2406	23.7
2	2057	1473	71.6	2042	20.1
3	1157	852	73.6	1142	11.2
4	1194	818	68.5	1162	11.4
5	1878	1371	73.0	1838	18.1
6	1622	1200	74.0	1567	15.5
TOTAL	10544	7115	67.5	10157	100.0

Station	Vehicle Trips	Terminal Trips	Percent of Total	Through Trips	Percent of Total
1	2406	1155	48.0	1251	52.0
2	2042	1415	69.3	627	30.7
3	1142	717	62.8	425	37.2
4	1162	668	57.5	494	42.5
5	1838	916	49.8	922	50.2
6	1567	990	63.2	577	36.8
Vehicle Trips	10157	5861	57.7	4296	42.3
Adjusted Vehicle Total ³	8009	5861	73.2	2148	26.8

1 Based on 24-Hour Classification Counts.

2 Based on 24-Hour Expanded Interview Counts. Expanded Interview Counts do not correspond exactly with Classification Counts due to two factors: (1) Motorcycles and buses, although counted in the Classification Counts, were not interviewed and do not appear in the Expanded Interview Counts. Listed below are the totals of these vehicle types counted at each station.

Station	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>Total</u>
	29	11	5	27	15	9	96

(2) Due to the convention of certain computer programs, Expanded Interview Counts may not correspond exactly with 24-Hour Classification Counts.

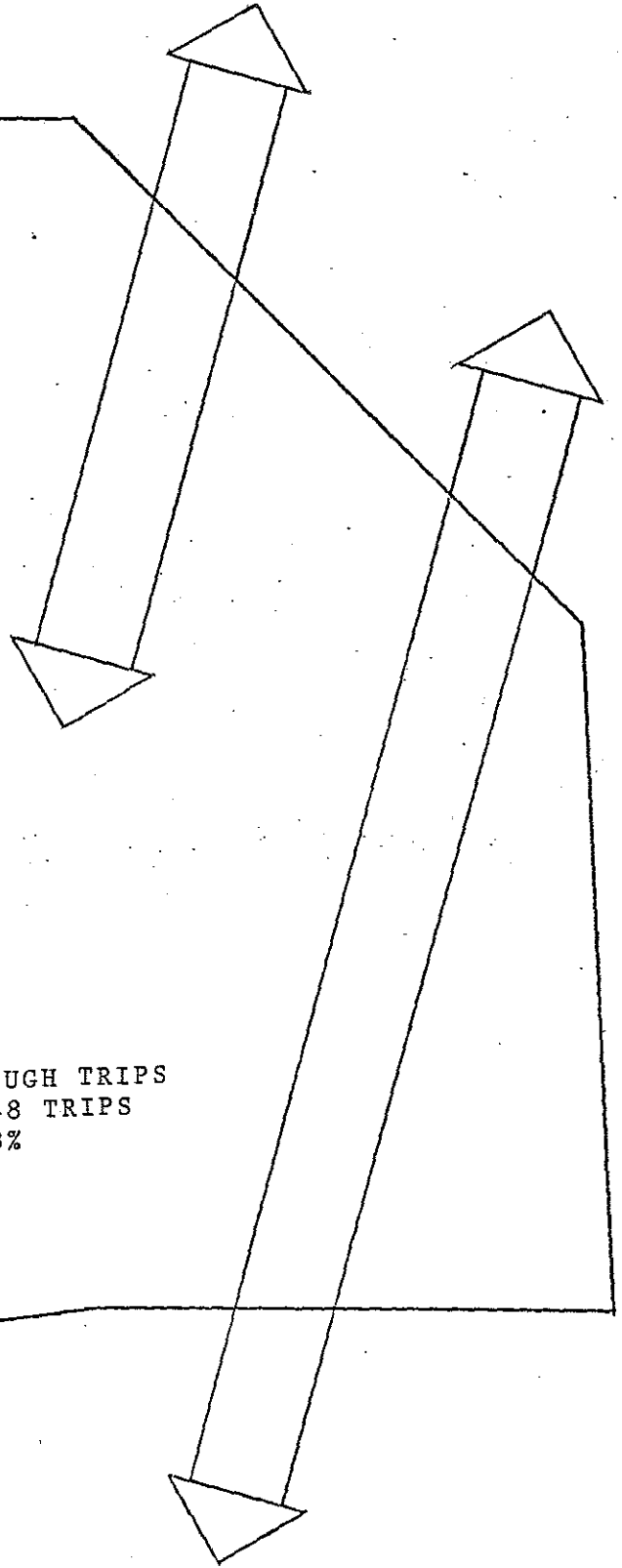
3 A through trip is counted both at the station of entrance and exit. To adjust for this double counting it was necessary to half-factor through trip records.

TRIP MOVEMENTS
1973 JULY-AUGUST WEEKDAY
TOTAL 8,009 TRIPS

TERMINAL TRIPS
5,861 TRIPS
73.2%

EAST JORDAN AREA

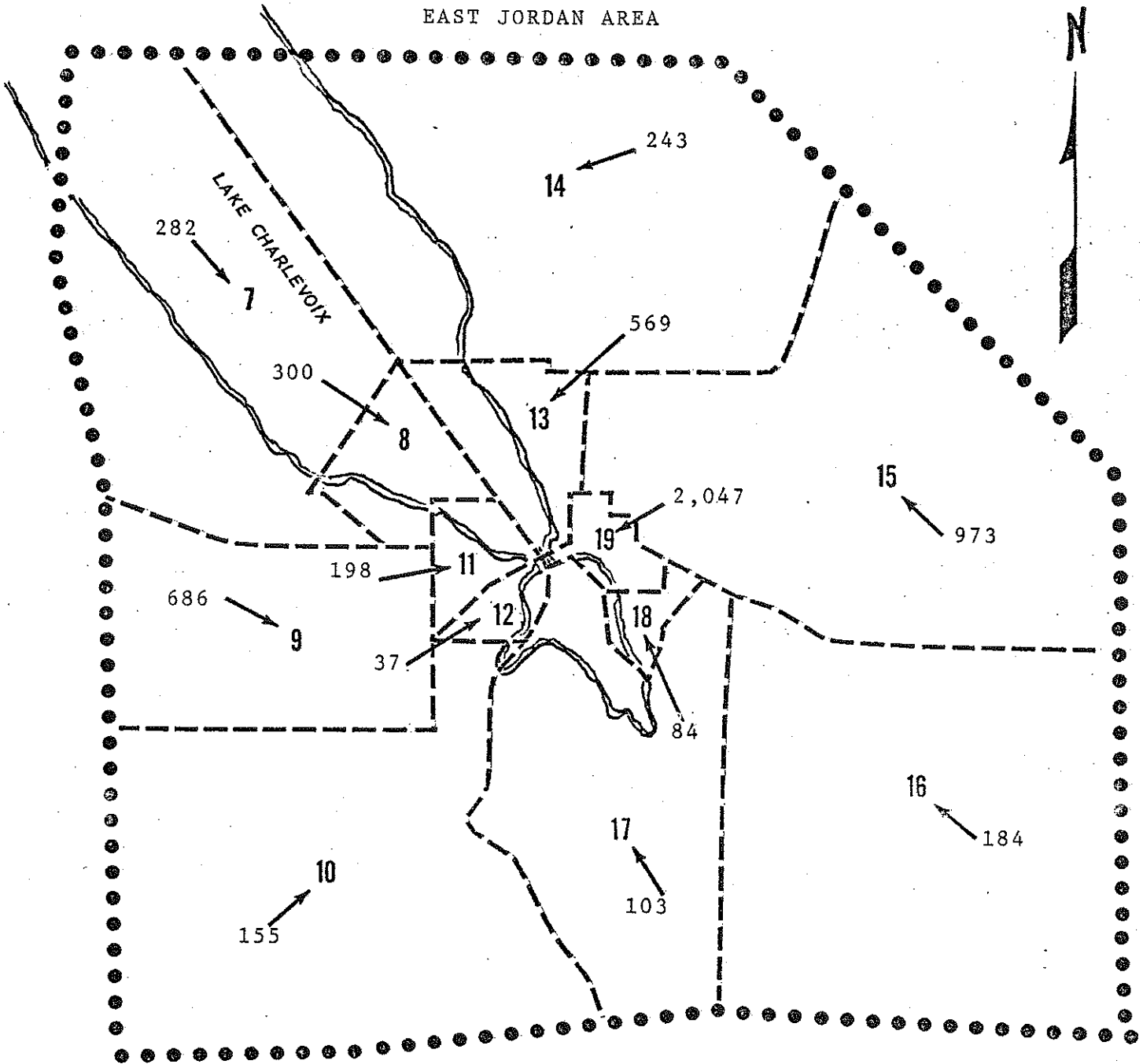
THROUGH TRIPS
2,148 TRIPS
26.8%



ALL STATIONS COMBINED
TERMINAL TRIPS TO STUDY ZONES

<u>Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
7	282	4.8
8	300	5.1
9	686	11.7
10	155	2.7
11	198	3.4
12	37	0.6
13	569	9.7
14	243	4.2
15	973	16.6
16	184	3.1
17	103	1.8
18	84	1.4
19	<u>2,047</u>	<u>34.9</u>
TOTAL	5,861	100.0

TERMINAL TRAFFIC BETWEEN
ALL STATIONS AND INTERNAL ZONES
5,861 VEHICLE TRIPS



LEGEND

- ● ● CORDON LINE
- ZONE LIMITS
- 00 INTERNAL ZONES

Station 1 (M-32 & 66, North)

Station 1 is located .1 miles south of Lord Road. M-22 & 66, North is a state trunk line and provides access from the study area to the City of East Jordan.

A total of 2,406 vehicles were recorded during the expanded interview counts. Tabulations on the following pages give a detailed documentation of this traffic.

Approximately 5 out of every 10 vehicles had a terminal inside the study area. There were 8 out of every 10 vehicles which were autos and 10 out of every 100 vehicles which were panels of pickups irregardless of 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 762 trips or 31.7 percent of the 2,406 total trips.

Station 5 (M-66 South) accounted for 470 trips or 37.6 percent of the 1,251 through trips. Stations 4 and 5 accounted for 845 trips or 67.5 percent of the 1,251 through trips.

Zone 19 (Central Business District) accounted for 379 trips or 32.8 percent of the 1,155 terminal trips. Zones 9, 15, and 19 accounted for 683 trips or 59.1 percent of the 1,155 terminal trips.

There were 987 trips or 41.0 percent of the 2,406 trips that had a trip length of 20-40 minutes. 1,886 trips (78.3 percent) had a trip length of one hour or less.

The origins and destinations of all the trips which passed through the station were tabulated by county, Ontario and 7 states. There are two ends for each trip; an origin and a destination. There were 2,406 trips which passed through Station 1, accounting for 4,812 total trip ends.

There were 3,806 trip ends (79.1 percent) in Charlevoix County. There were 19 trip ends (0.4 percent) in the Upper Peninsula. The Lower Peninsula accounted for 4,755 trip ends (98.8 percent). There were 38 origins and/or destinations (0.8 percent) outstate.

STATION 1, M-32 & 66, 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	1948	81.0	995	51.1	953	48.9
Passenger Car with Trailer	29	1.2	2	6.9	27	93.1
Panel or Pickup	232	9.6	120	51.7	112	48.3
Panel or Pickup with Trailer	21	0.9	5	23.8	16	76.2
Other Single Unit Trucks	120	5.0	23	19.2	97	80.8
Combinations and Trucks with Trailers	<u>56</u>	<u>2.3</u>	<u>10</u>	<u>17.9</u>	<u>46</u>	<u>82.1</u>
TOTAL	2406	100.0	1155	48.0	1251	52.0

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	762	31.7	323	42.4	439	57.6
Personal Business	180	7.5	92	51.1	88	48.9
Shopping	311	12.9	268	86.2	43	13.8
Vacation	381	15.8	58	15.2	323	84.8
Other Soc. or Rec.	479	19.9	223	46.6	256	53.4
All Other	<u>293</u>	<u>12.2</u>	<u>191</u>	<u>65.2</u>	<u>102</u>	<u>34.8</u>
TOTAL	2406	100.0	1155	48.0	1251	52.0

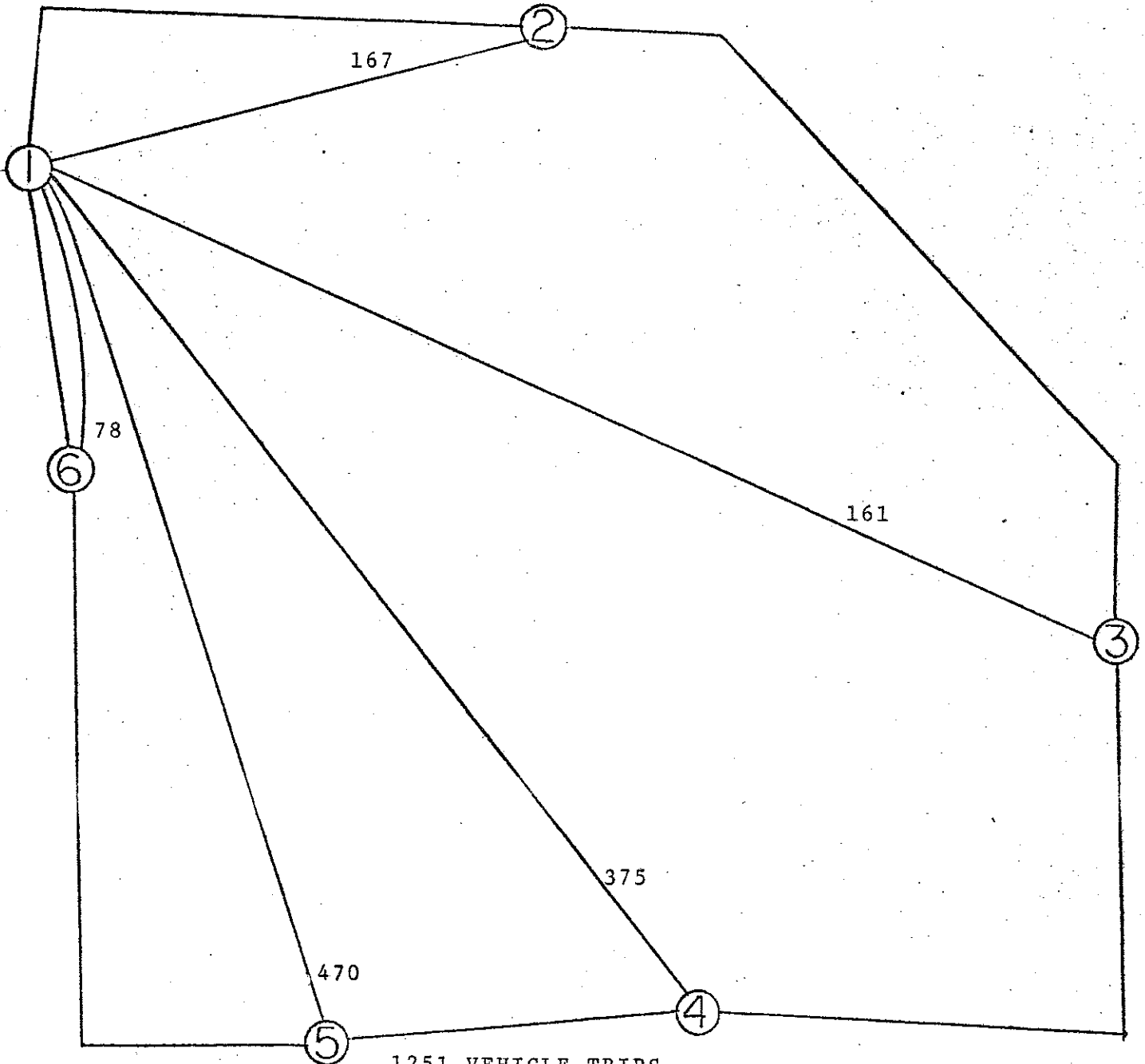
STATION 1, M-32 & 66, NORTH

THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
2 - Boyne Road	167	13.3
3 - State Street	161	12.9
4 - M-32, South	375	30.0
5 - M-66, South	470	37.6
6 - Water Street	78	6.2
TOTAL	<u>1251</u>	<u>100.0</u>

THROUGH TRAFFIC INTERCHANGE
STATION 1, M-32 & 66, NORTH

EAST JORDAN AREA
EXTERNAL O-D STUDY



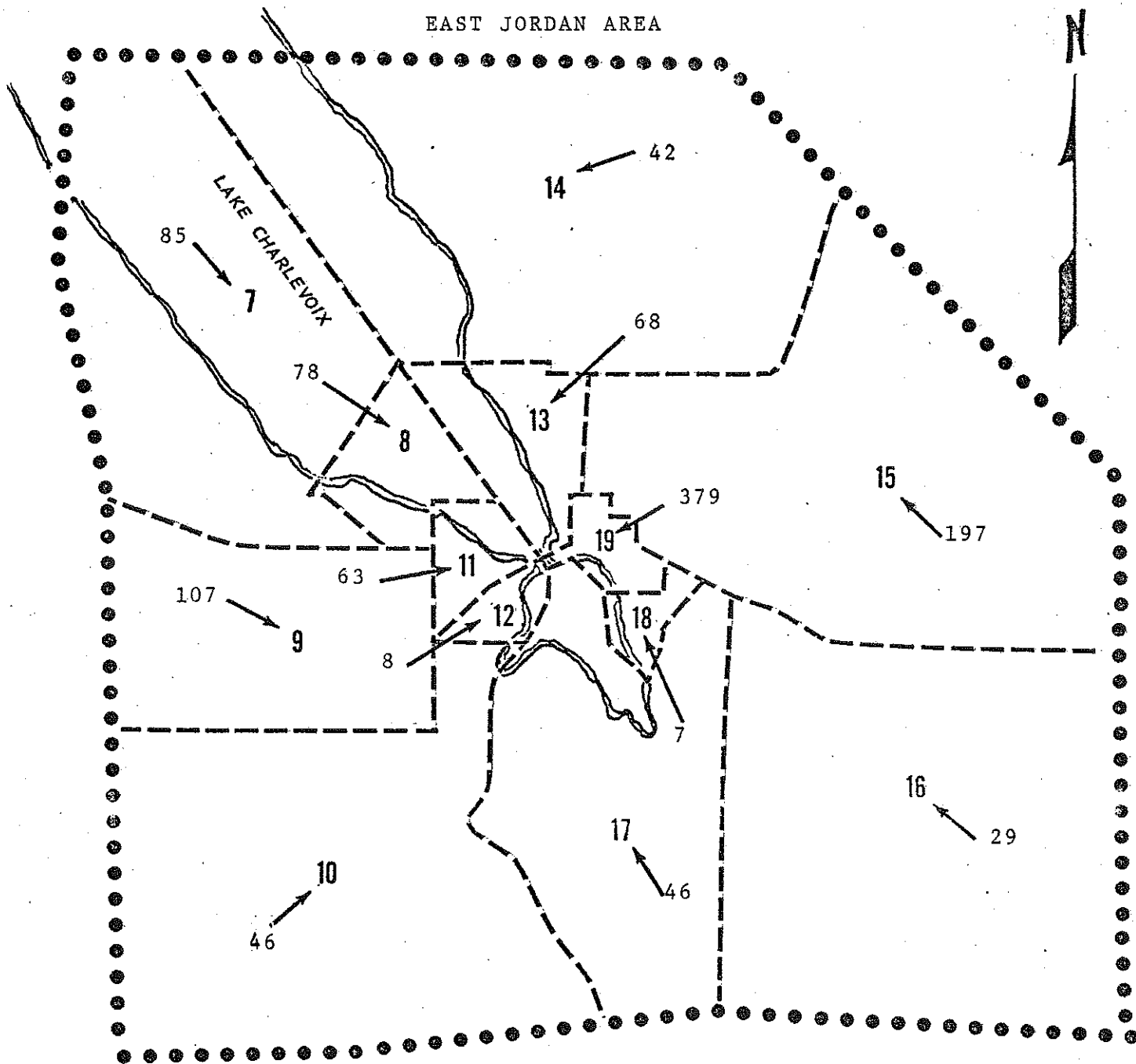
1251 VEHICLE TRIPS
JULY-AUGUST WEEKDAY 1973

STATION 1, M-32 & 66, NORTH
 TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
7	85	7.4
8	78	6.7
9	107	9.3
10	46	4.0
11	63	5.4
12	8	0.7
13	68	5.9
14	42	3.6
15	197	17.1
16	29	2.5
17	46	4.0
18	7	0.6
19	<u>379</u>	<u>32.8</u>
TOTAL	1155	100.0

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TERMINAL TRAFFIC BETWEEN
 STATION 1 (M-32 & 66 NORTH) AND INTERNAL ZONES
 1,155 VEHICLE TRIPS



LEGEND

- ● ● CORDON LINE
- ZONE LIMITS
- 00 INTERNAL ZONES

STATION 1, M-32 & 66, NORTH

TRIP LENGTHS

<u>Minutes</u>	<u>No. of Trips</u>	<u>Percent of Total</u>
1-20	684	28.4
20-40	987	41.0
40-60	215	8.9
60-90	113	4.7
90-120	53	2.2
120-180	74	3.1
180-240	112	4.7
240-300	119	4.9
300-360	36	1.5
360-420	5	0.2
420-540	4	0.2
540-660	3	0.1
600-780	<u>1</u>	<u>0.1</u>
TOTAL	2406	100.0

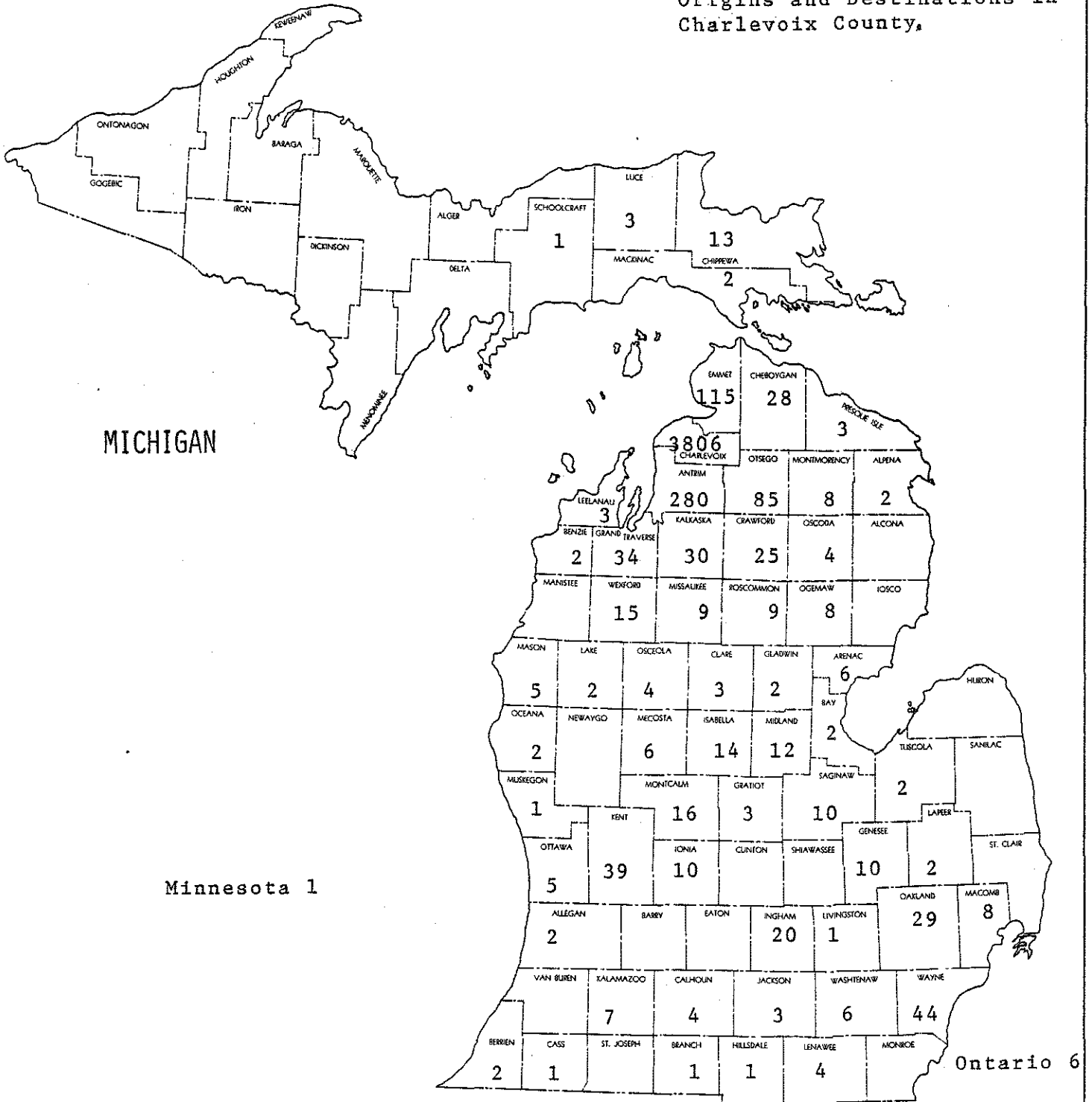
Longest Trip = 13 Hr. Average Trip Length = 62 Min.

Median Trip Length = 20 Min.*

* Due to the convention of the computer program, this value can be approximated only in 10 minute intervals.

EAST JORDAN EXTERNAL O-D STUDY
 STATION 1, M-32 & 66, NORTH

Total: 2,406 Trips, 4,812
 Trip ends. There were
 1,500 trips that had both
 Origins and Destinations in
 Charlevoix County.



Illinois 5
 Missouri 1
 Indiana 7
 Kentucky 1
 Ohio 15
 Pennsylvania 2

Station 2 (Boyne Road)

Station 2 is located north of the city limits of East Jordan. Boyne Road provides access from the study area to the City of Boyne City.

A total of 2,042 vehicles were recorded during the expanded interview counts. 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. There were 8 of every 10 vehicles which were autos and 13 out of every 100 vehicles which were panels or pickups irregardless of whather 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.

The largest trip purpose was work with 727 trips or 35.6 percent of the 2,042 total trips. All trip purposes except vacation had more than 60 percent terminal traffic.

Station 6 (Water Street) accounted for 200 trips or 31.9 percent of the 627 through trips. Stations 1, 5, and 6 accounted for 528 trips or 84.2 percent to the 627 through trips.

Zone 19 (Central Business District) accounted for 547 trips or 38.7 percent of the 1,415 terminal trips. Zones 15 and 19 accounted for 805 trips or 56.9 percent of the 1,415 terminal trips.

There were 1,084 trips or 53.1 percent of the 2,042 trips that had a trip length of 20-40 minutes. 1,938 trips (95.0 percent) 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, and 1 state. There are two ends for each trip; an origin and a destination. There were 2,042 trips which passed through Station 2, accounting for 4,084 total trip ends.

There were 3,574 trip ends (87.5 percent) in Charlevoix County. There were 7 trip ends (0.2 percent) in the Upper Peninsula. The Lower Peninsula accounted for 4,075 trip ends (99.8 percent). There were 2 origins and/or destinations outstate.

STATION 2, BOYNE 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	1651	80.9	1147	69.5	504	30.5
Passenger Car with Trailer	10	0.5	3	30.0	7	70.0
Panel or Pickup	274	13.4	212	77.4	62	22.6
Panel or Pickup with Trailer	6	0.3	1	16.7	5	83.3
Other Single Unit Trucks	88	4.3	50	56.8	38	43.2
Combinations and Trucks with Trailers	<u>13</u>	<u>0.6</u>	<u>2</u>	15.4	<u>11</u>	84.6
TOTAL	2042	100.0	1415	69.3	627	30.7

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	727	35.6	489	67.3	238	32.7
Personal Business	163	8.0	126	77.3	37	22.7
Shopping	459	22.5	373	81.3	86	18.7
Vacation	133	6.5	53	39.8	80	60.2
Other Soc. or Rec.	355	17.4	223	62.8	132	37.2
All Other	<u>205</u>	<u>10.0</u>	<u>151</u>	73.7	<u>54</u>	26.3
TOTAL	2042	100.0	1415	69.3	627	30.7

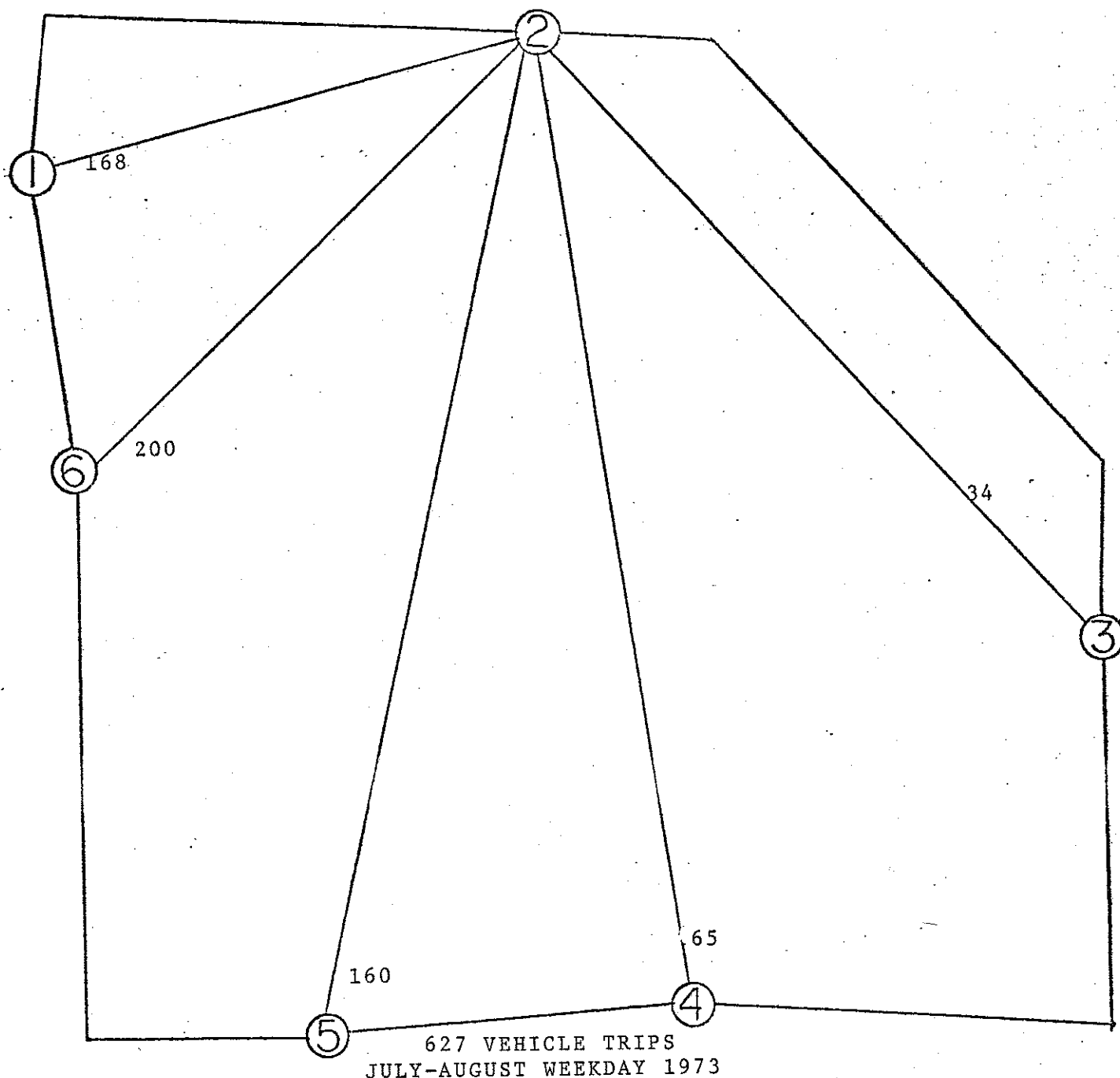
STATION 2, BOYNE ROAD

THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 - M-32 & 66, North	168	26.8
3 - State Street	34	5.4
4 - M-32, South	65	10.4
5 - M-66, South	160	25.5
6 - Water Street	200	31.9
TOTAL	<u>627</u>	<u>100.0</u>

THROUGH TRAFFIC INTERCHANGE
STATION 2, BOYNE ROAD

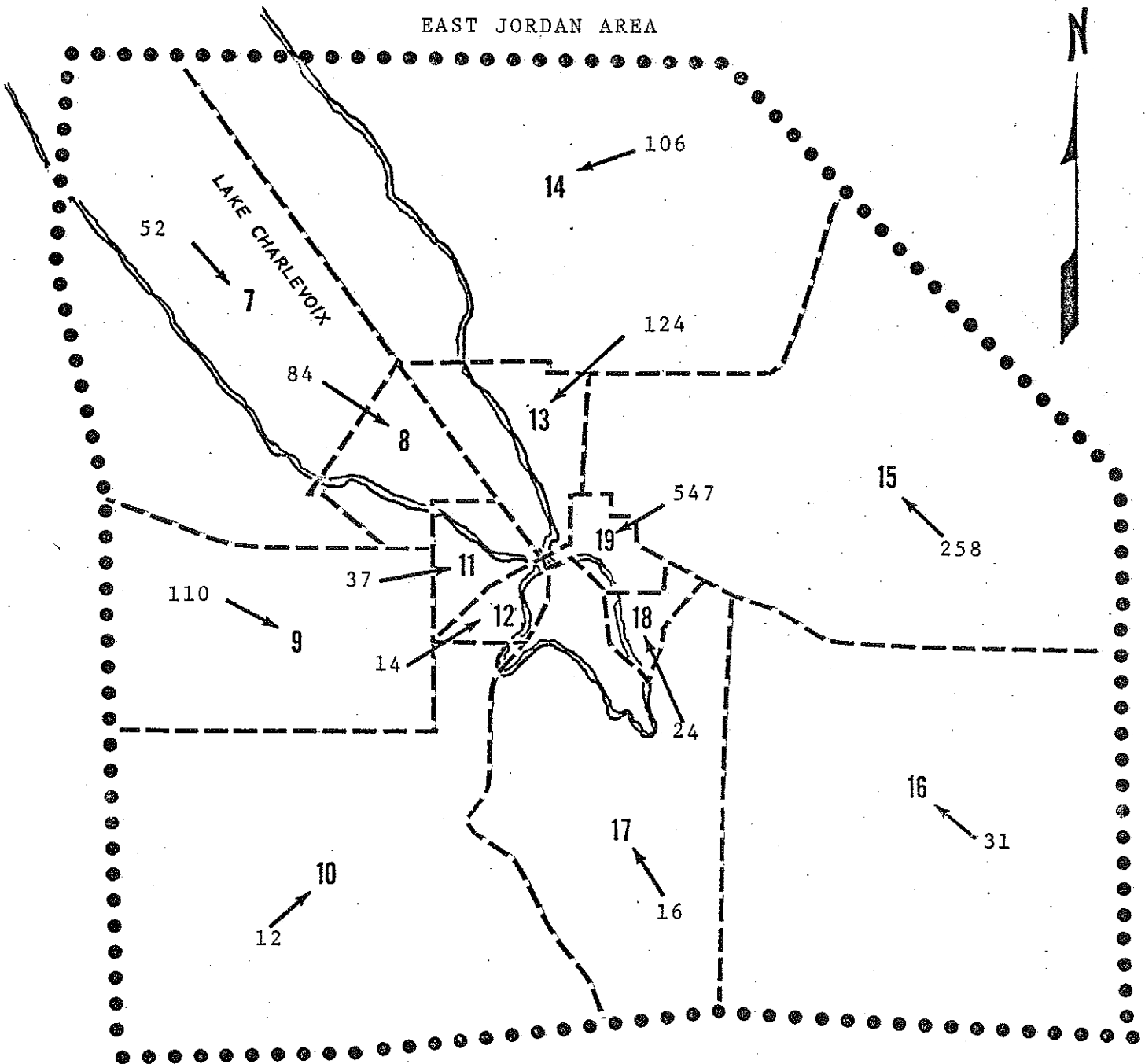
EAST JORDAN AREA
EXTERNAL O-D STUDY



STATION 2, BOYNE ROAD
 TERMINAL TRIPS TO STUDY ZONES

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
7	52	3.7
8	84	5.9
9	110	7.8
10	12	0.8
11	37	2.6
12	14	1.0
13	124	8.8
14	106	7.5
15	258	18.2
16	31	2.2
17	16	1.1
18	24	1.7
19	<u>547</u>	<u>38.7</u>
TOTAL	1415	100.0

TERMINAL TRAFFIC BETWEEN
 STATION 2 (BOYNE ROAD) AND INTERNAL ZONES
 1,415 VEHICLE TRIPS



LEGEND

- ● ● CORDON LINE
- ZONE LIMITS
- 00 INTERNAL ZONES

STATION 2, BOYNE ROAD

<u>Minutes</u>	<u>TRIP LENGTHS</u>	<u>Percent of Totals</u>
	<u>No. of Trips</u>	
1-20	767	37.6
20-40	1,084	53.1
40-60	87	4.3
60-90	63	3.1
90-120	6	0.3
120-180	4	0.2
180-240	21	1.0
240-300	5	0.2
300-360	2	0.1
360-420	<u>3</u>	<u>0.1</u>
TOTAL	2042	100.0

Longest Trip = 6 Hr. 50 Min. Average Trip Length = 30 Min.
 Median Trip Length = 30 Min.*

* Due to the convention of the computer program, this value can be approximated only in 10 minute intervals.

Station 3 (State Street)

Station 3 is located .6 miles east of East Jordan's eastern city limits.

A total of 1,142 vehicles were recorded during the expanded interview counts. 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. There were 7 of every 10 vehicles which were autos and 16 out of every 100 vehicles which were panels or pickups irregardless of whather they traveled into or through the area. More than 60 percent of the passenger cars and panels or pickups had a terminal inside the study area.

The largest trip purpose was work with 481 trips or 42.1 percent of the 1,142 total trips.

Station 6 (Water Street) accounted for 142 trips or 33.4 percent of the 425 through trips. Station 1 and 6 accounted for 277 trips or 65.2 percent of the 425 through trips.

Zone 19 (Central Business District) accounted for 219 trips or 30.5 percent of the 717 terminal trips. Zones 13, 15, and 19 accounted for 475 trips or 66.2 percent of the 717 terminal trips.

There were 590 trips or 51.7 percent of the 1,142 trips that had a trip length of 20-40 minutes. 1,044 trips (91.4 percent) 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, and 1 state. There are two ends for each trip; an origin and a destination. There were 1,142 trips which passed through Station 3, accounting for 2,284 total trip ends.

There were 1,844 trip ends (80.7 percent) in Charlevoix County. There were 10 trip ends (0.4 percent) in the Upper Peninsula. The Lower Peninsula accounted for 2,272 trip ends (99.5 percent). There were 2 origins and/or destinations (0.1 percent) outstate.

STATION 3, STATE STREET

<u>Vehicle Type</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Passenger Car	860	75.3	550	64.0	310	36.0
Passenger Car with Trailer	7	0.6	2	28.6	5	71.4
Panel or Pickup	186	16.3	135	72.6	51	27.4
Panel or Pickup with Trailer	2	0.2	2	100.0	0	0.0
Other Single Unit Trucks	76	6.7	23	30.3	53	69.7
Combinations and Trucks with Trailers	<u>11</u>	<u>0.9</u>	<u>5</u>	45.5	<u>6</u>	54.5
TOTAL	1142	100.0	717	62.8	425	37.2

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	481	42.1	290	60.3	191	39.7
Personal Business	91	8.0	50	54.9	41	45.1
Shopping	197	17.3	166	84.3	31	15.7
Vacation	70	6.1	23	32.9	47	67.1
Other Soc. or Rec.	210	18.4	118	56.2	92	43.8
All Other	<u>93</u>	<u>8.1</u>	<u>70</u>	75.3	<u>23</u>	24.7
TOTAL	1142	100.0	717	62.8	425	37.2

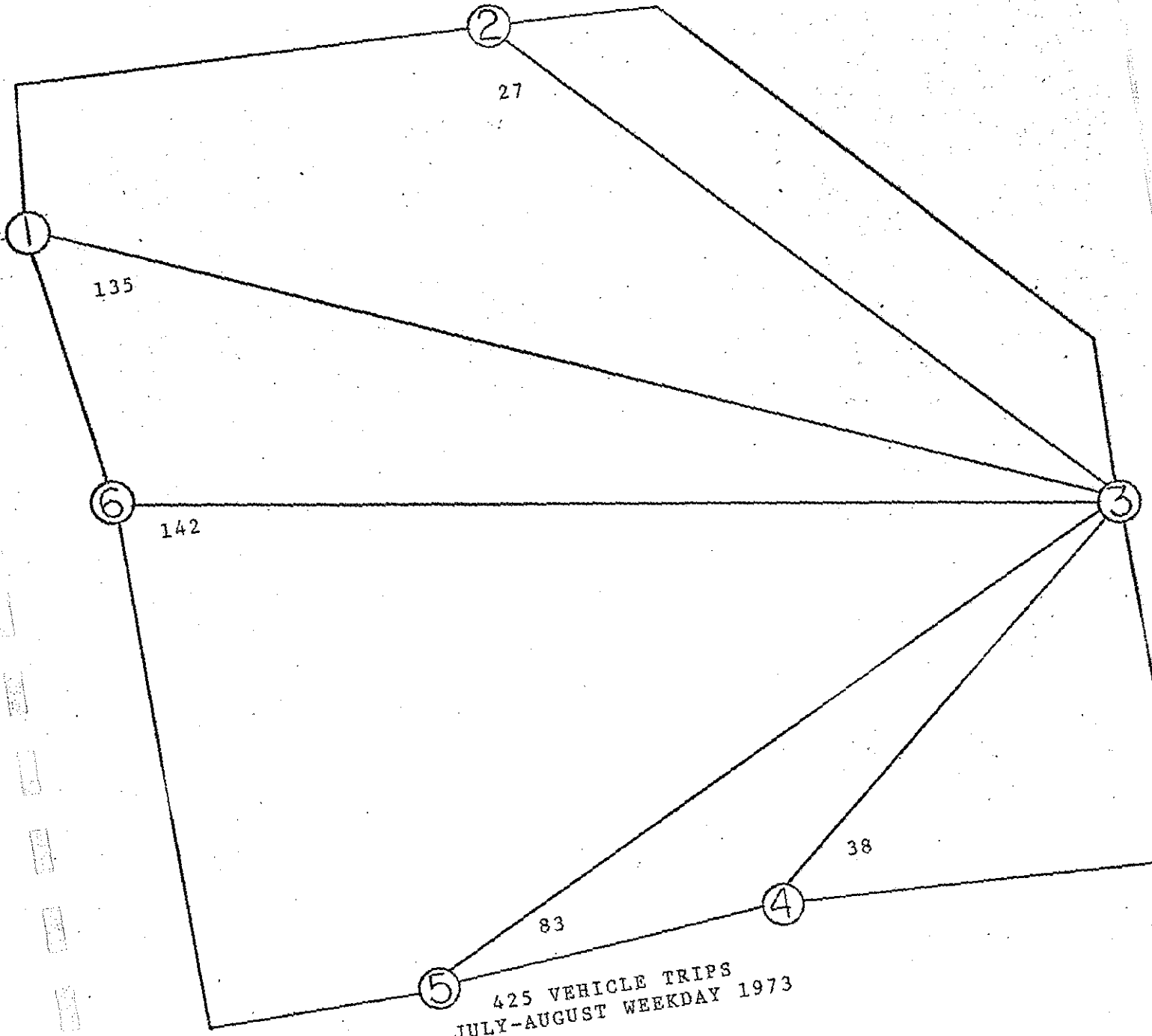
STATION 3, STATE STREET

THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 - M-32 & 66, North	135	31.8
2 - Boyne Road	27	6.4
4 - M-32, South	38	8.9
5 - M-66, South	83	19.5
6 - Water Street	142	33.4
TOTAL	<u>425</u>	<u>100.0</u>

THROUGH TRAFFIC INTERCHANGE
STATION 3, STATE STREET

EAST JORDAN AREA
EXTERNAL O-D STUDY

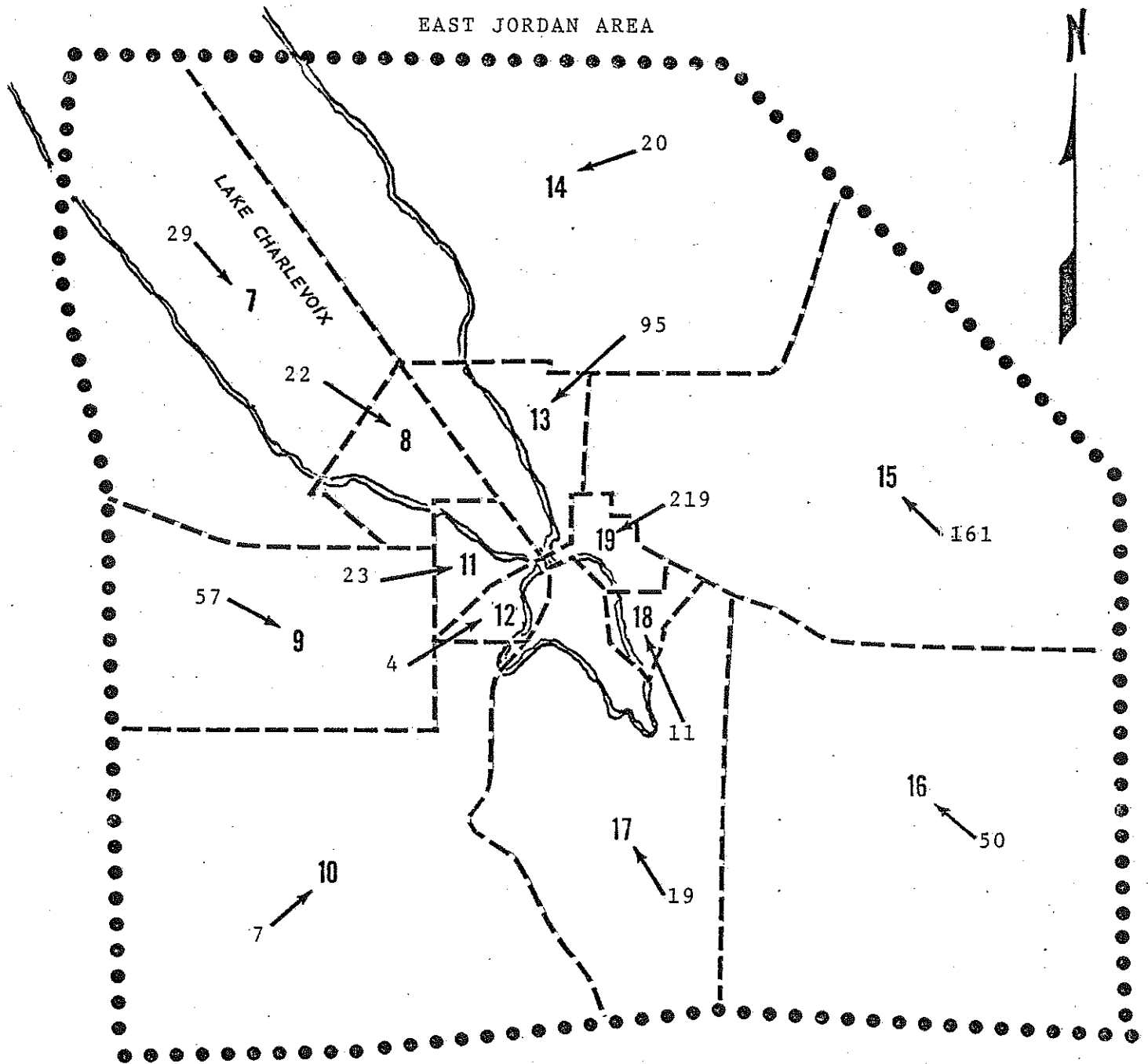


425 VEHICLE TRIPS
JULY-AUGUST WEEKDAY 1973

STATION 3, STATE STREET
 TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
7	29	4.0
8	22	3.1
9	57	8.0
10	7	1.0
11	23	3.2
12	4	0.6
13	95	13.2
14	20	2.8
15	161	22.5
16	50	7.0
17	19	2.6
18	11	1.5
19	<u>219</u>	<u>30.5</u>
TOTAL	717	100.0

TERMINAL TRAFFIC BETWEEN
 STATION 3 (STATE STREET) AND INTERNAL ZONES
 717 VEHICLE TRIPS



LEGEND

- ● ● CORDON LINE
- ZONE LIMITS
- 00 INTERNAL ZONES

STATION 3, STATE STREET

TRIP LENGTHS

<u>Minutes</u>	<u>No. of Trips</u>	<u>Percent of Totals</u>
1-20	351	30.7
20-40	590	51.7
40-60	103	9.0
60-90	48	4.2
90-120	13	1.1
120-180	10	0.9
180-240	9	0.8
240-300	12	1.1
300-360	4	0.3
360-420	0	0.0
420-540	0	0.0
540-660	0	0.0
660-780	<u>2</u>	<u>0.2</u>
TOTAL	1142	100.0

Longest Trip = 13 Hr. Average Trip Length = 39 Min.
 Median Trip Length = 30 Min. *

* Due to the Convention of the computer program, this value can be approximated only in 10 minute intervals.

Station 4 (M-32, South)

Station 4 is located at the bridge. M-32, South provides access to the east and the cities of Gaylord and Alpena.

A total of 1,162 vehicles were recorded during the expanded interview counts. 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. There were 8 out of every 10 vehicles which were autos and 13 out of every 100 vehicles which were panels or pickups irregardless of whether they traveled into or through the area. More than 55 percent of the passenger cars and panels or pickups had a terminal inside the study area.

The largest trip purpose was work with 400 trips or 34.4 percent of the 1,162 total trips.

Station 1 (M-32 & 66, North) accounted for 297 trips or 60.1 percent of the 494 through trips.

Zone 19 (Central Business District) accounted for 244 trips or 36.5 percent of the 668 terminal trips. Zones 15 and 19 accounted for 377 trips or 56.4 percent of the 668 terminal trips.

There were 393 trips or 33.8 percent of the 1,162 trips that had a trip length of 20-40 minutes. 840 trips (72.3 percent) 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 6 states. There are two ends for each trip; an origin and a destination. There were 1,162 trips which passed through Station 4, accounting for 2,324 total trip ends.

There were 1,474 trip ends (63.4 percent) in Charlevoix County. There were 5 trip ends (0.2 percent) in the Upper Peninsula. The Lower Peninsula accounted for 2,289 trip ends (98.5 percent). There were 30 origins and/or destinations (1.3 percent) outstate.

STATION 4, M-32, 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	904	77.8	485	53.7	419	46.3
Passenger Car with Trailer	24	2.1	18	75.0	6	25.0
Panel or Pickup	156	13.4	115	73.7	41	26.3
Panel or Pickup with Trailer	3	0.3	1	33.3	2	66.7
Other Single Unit Trucks	64	5.5	40	62.5	24	37.5
Combinations and Trucks with Trailers	<u>11</u>	<u>0.9</u>	<u>9</u>	81.8	<u>2</u>	18.2
TOTAL	1162	100.0	668	57.5	494	42.5

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	400	34.4	257	64.3	143	35.7
Personal Business	77	6.6	51	66.2	26	33.8
Shopping	143	12.3	115	80.4	28	19.6
Vacation	197	17.0	32	16.2	165	83.8
Other Soc. or Rec.	257	22.1	145	56.4	112	43.6
All Other	<u>88</u>	<u>7.6</u>	<u>68</u>	77.3	<u>20</u>	22.7
TOTAL	1162	100.0	668	57.5	494	42.5

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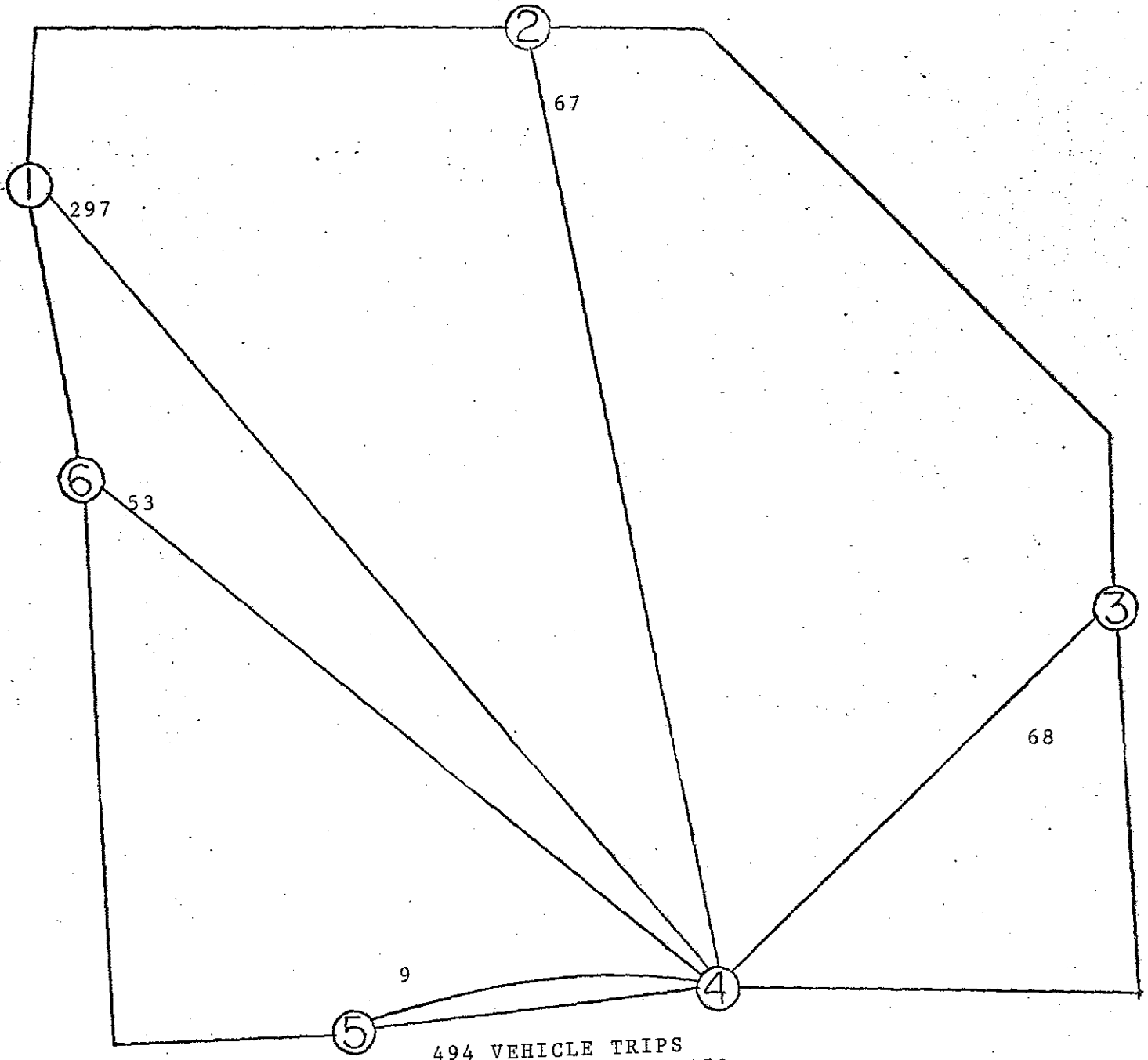
STATION 4, M-32, SOUTH

THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 - M-32 & 66, North	297	60.1
2 - Boyne Road	67	13.6
3 - State Street	68	13.8
5 - M-66, South	9	1.8
6 - Water Street	53	10.7
TOTAL	494	100.0

THROUGH TRAFFIC INTERCHANGE
STATION 4, M-32, SOUTH

EAST JORDAN AREA
EXTERNAL O-D STUDY

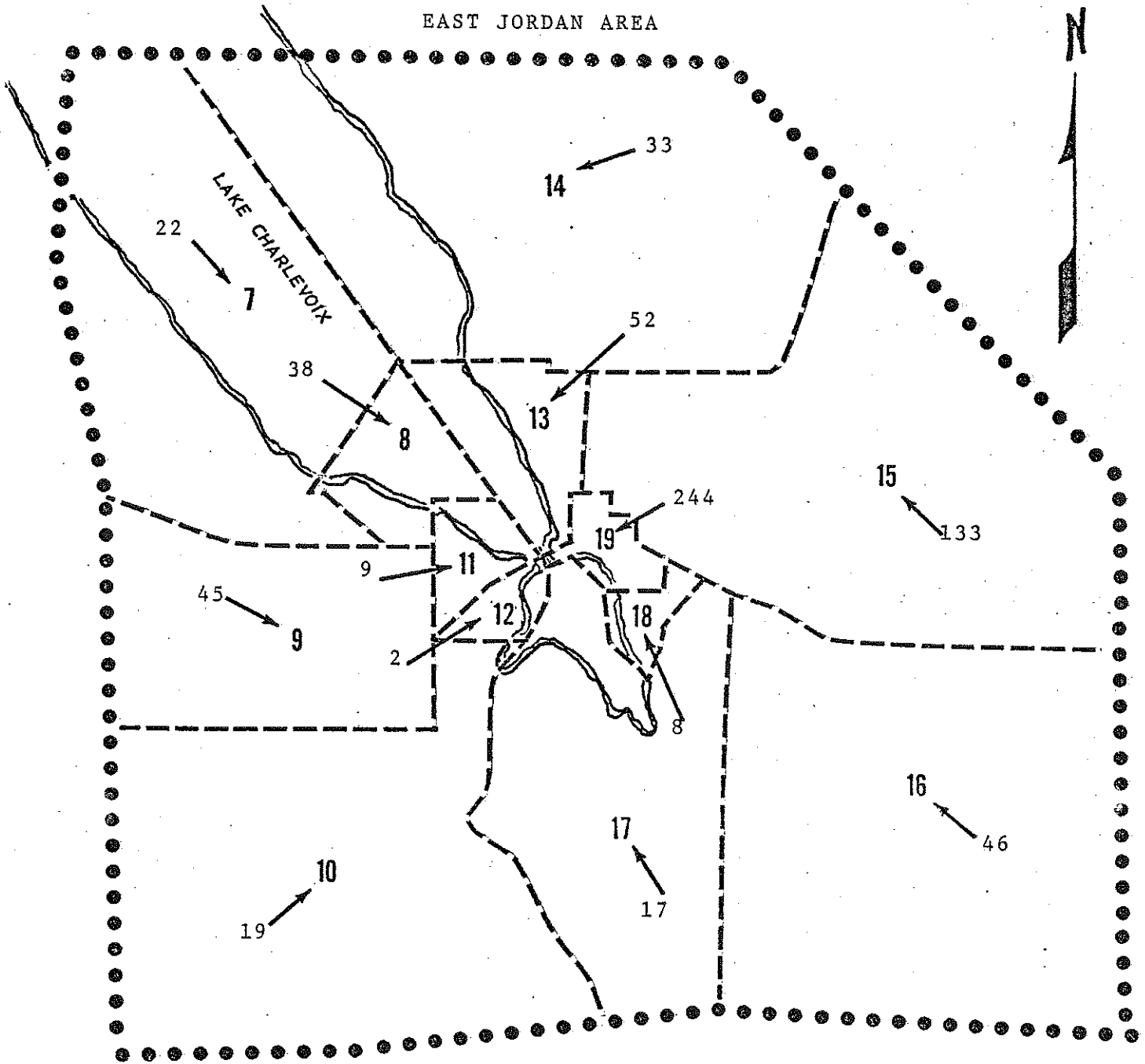


494 VEHICLE TRIPS
JULY-AUGUST WEEKDAY 1973

STATION 4, M-32, SOUTH
 TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
7	22	3.3
8	38	5.7
9	45	6.7
10	19	2.8
11	9	1.4
12	2	0.3
13	52	7.8
14	33	4.9
15	133	19.9
16	46	6.9
17	17	2.6
18	8	1.2
19	<u>244</u>	<u>36.5</u>
TOTAL	668	100.0

TERMINAL TRAFFIC BETWEEN
STATION 4 (M-32 SOUTH) AND INTERNAL ZONES
668 VEHICLE TRIPS



LEGEND

- ● ● CORDON LINE
- ZONE LIMITS
- 00 INTERNAL ZONES

STATION 4, M-32, SOUTH

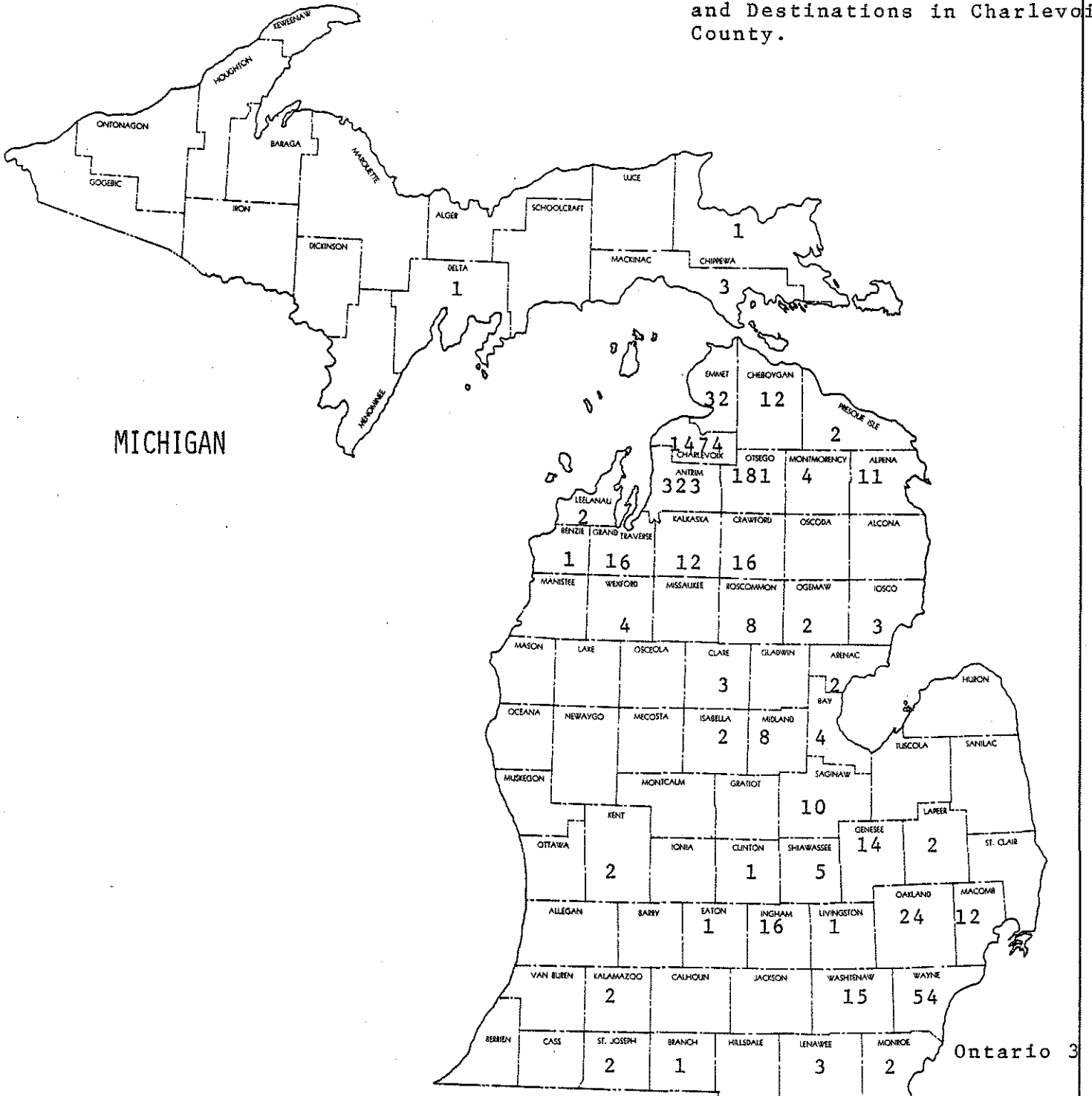
<u>Minutes</u>	<u>TRIP LENGTHS</u>	<u>Percent of Totals</u>
	<u>No. of Trips</u>	
1-20	324	27.9
20-40	393	33.8
40-60	123	10.6
60-90	74	6.4
90-120	18	1.5
120-180	29	2.5
180-240	49	4.2
240-300	108	9.3
300-360	25	2.1
360-420	10	0.9
420-540	3	0.3
540-660	<u>6</u>	<u>0.5</u>
TOTAL	1162	100.0

Longest Trip = 10 Hr. Average Trip Length = 83 Min.
 Median Trip Length = 40 Min.*

* Due to the convention of the computer program, this value can be approximated only in 10 minute intervals.

EAST JORDAN EXTERNAL O-D STUDY
 STATION 4, M-32, SOUTH

Total: 1,162 Trips, 2,324
 Trip Ends. There were 391
 trips that had both Origins
 and Destinations in Charlevoix
 County.



Indiana 3
 Illinois 2

Ohio 16
 West Virginia 3

New York 1
 Pennsylvania 2

Ontario 3

Station 5 (M-66, South)

Station 5 is located .4 miles south of East Jordan's southern city limits. It provides access from the study area to the City of Mancelona.

A total of 1,838 vehicles were recorded during the expanded interview counts. Tabulations on the following pages give a detailed documentation of this traffic.

Approximately 5 out of every 10 vehicles had a terminal inside the study area. There were 7 of every 10 vehicles which were autos and 13 out of every 100 vehicles which were panels or pickups irregardless of whether they traveled into or through the area.

The largest trip purpose was work with 797 trips or 43.3 percent of the 1,838 total trips.

Station 1 (M-32 & 66, North) accounted for 582 trips or 63.1 percent of the 922 through trips. Stations 1, 2, and 6 accounted for 839 trips or 91.0 percent of the 922 through trips.

Zone 19 (Central Business District) accounted for 250 trips or 27.3 percent of the 916 terminal trips. Zones 9, 13, and 19 accounted for 612 trips or 66.8 percent of the 916 terminal trips.

There were 677 trips or 36.8 percent of the 1,838 trips that had a trip length of 20-40 minutes. 1,305 trips (70.9 percent) 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 7 states. There are two ends for each trip; an origin and a destination. There were 1,838 trips which passed through Station 5, accounting for 3,676 total trip ends.

There were 2,057 trip ends (56.0 percent) in Charlevoix County. There were 4 trip ends (0.1 percent) in the Upper Peninsula. The Lower Peninsula accounted for 3,630 trip ends (98.8 percent). There were 42 origins and/or destinations (1.1 percent) outstate.

STATION 5, M-66, 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	1356	73.8	679	50.1	677	49.9
Passenger Car with Trailer	21	1.1	3	14.3	18	85.7
Panel or Pickup	239	13.0	134	56.1	105	43.9
Panel or Pickup with Trailer	7	0.4	5	71.4	2	28.6
Other Single Unit Trucks	85	4.6	42	49.4	43	50.6
Combinations and Trucks with Trailers	<u>130</u>	<u>7.1</u>	<u>53</u>	40.8	<u>77</u>	59.2
TOTAL	1838	100.0	916	49.8	922	50.2

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	797	43.3	433	54.3	364	45.7
Personal Business	104	5.7	58	55.8	46	44.2
Shopping	187	10.2	141	75.4	46	24.6
Vacation	236	12.8	39	16.5	197	83.5
Other Soc. or Rec.	316	17.2	131	41.5	185	58.5
All Other	<u>198</u>	<u>10.8</u>	<u>114</u>	57.6	<u>84</u>	42.4
TOTAL	1838	100.0	916	49.8	922	50.2

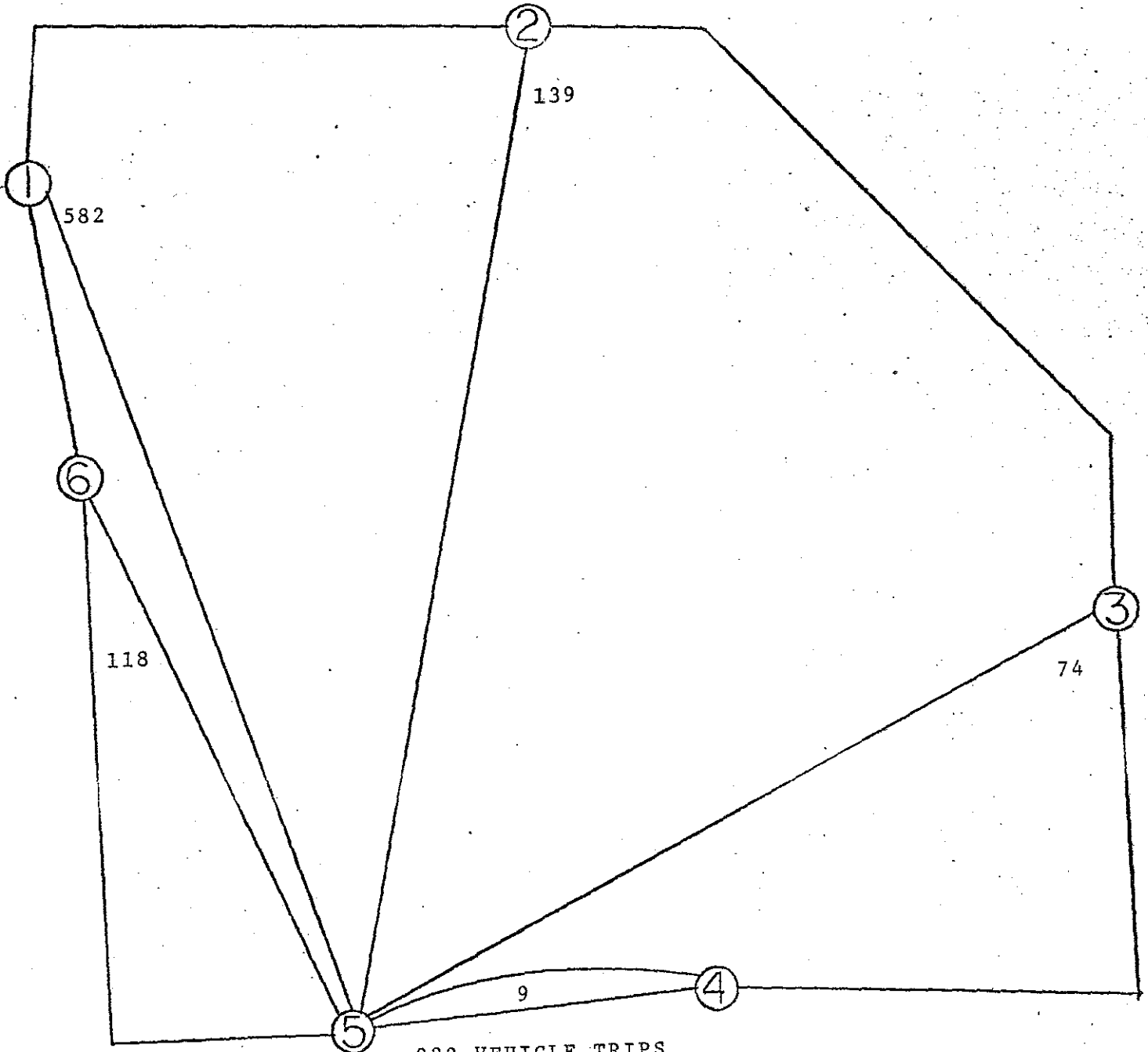
STATION 5, M-66, SOUTH

THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 - M-32 & 66, North	582	63.1
2 - Boyne Road	139	15.1
3 - State Street	74	8.0
4 - M-32, South	9	1.0
6 - Water Street	118	12.8
TOTAL	<u>922</u>	<u>100.0</u>

THROUGH TRAFFIC INTERCHANGE
STATION 5, M-66, SOUTH

EAST JORDAN AREA
EXTERNAL O-D STUDY

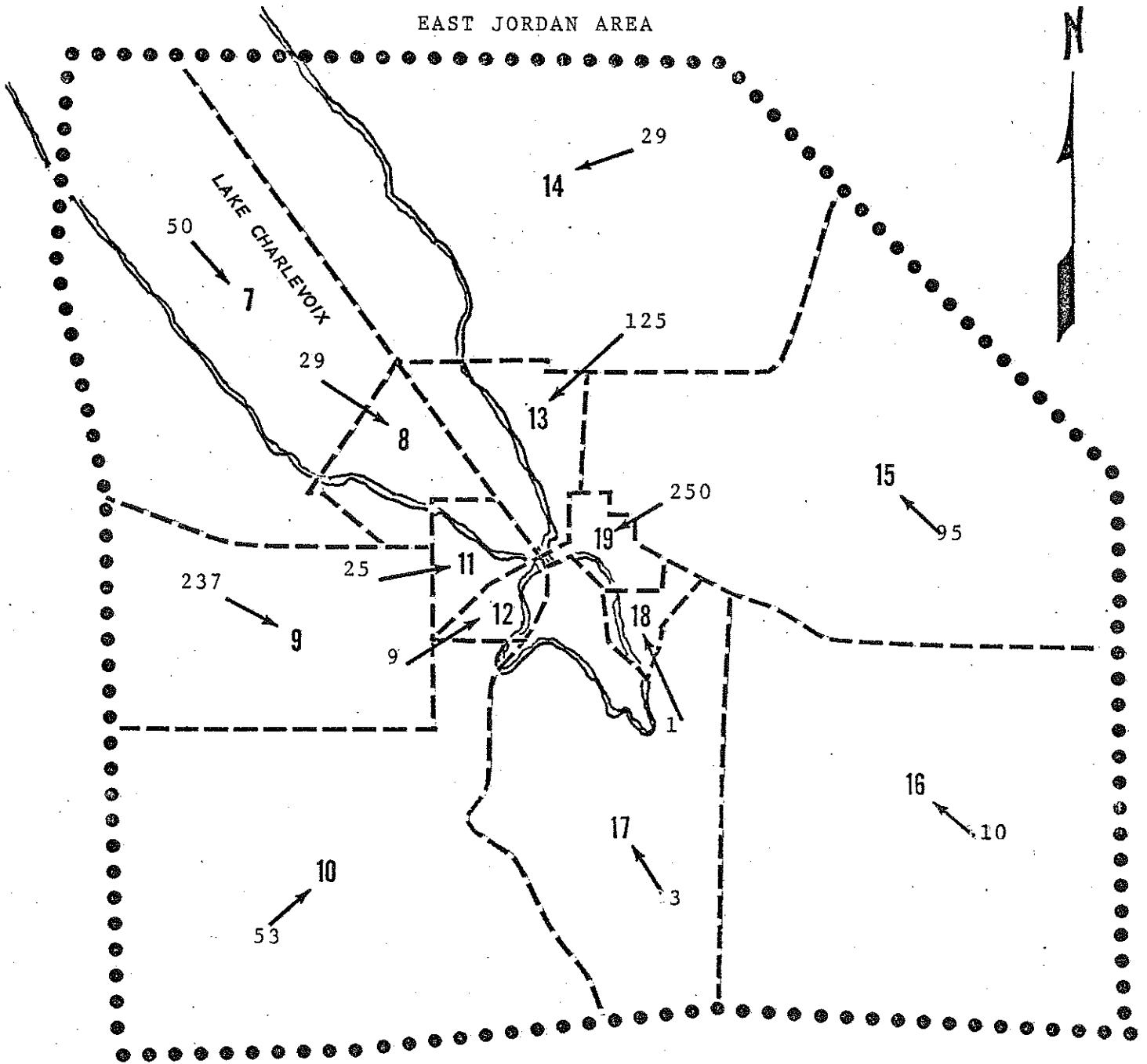


922 VEHICLE TRIPS
JULY-AUGUST WEEKDAY 1973

STATION 5, M-66, SOUTH
 TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
7	50	5.4
8	29	3.2
9	237	25.9
10	53	5.8
11	25	2.7
12	9	1.0
13	125	13.6
14	29	3.2
15	95	10.4
16	10	1.1
17	3	0.3
18	1	0.1
19	<u>250</u>	<u>27.3</u>
TOTAL	916	100.0

TERMINAL TRAFFIC BETWEEN
 STATION 5 (M-66 SOUTH) AND INTERNAL ZONES
 916 VEHICLE TRIPS



LEGEND

- ● ● CORDON LINE
- - - ZONE LIMITS
- 00 INTERNAL ZONES

STATION 5, M-66, SOUTH

TRIP LENGTHS

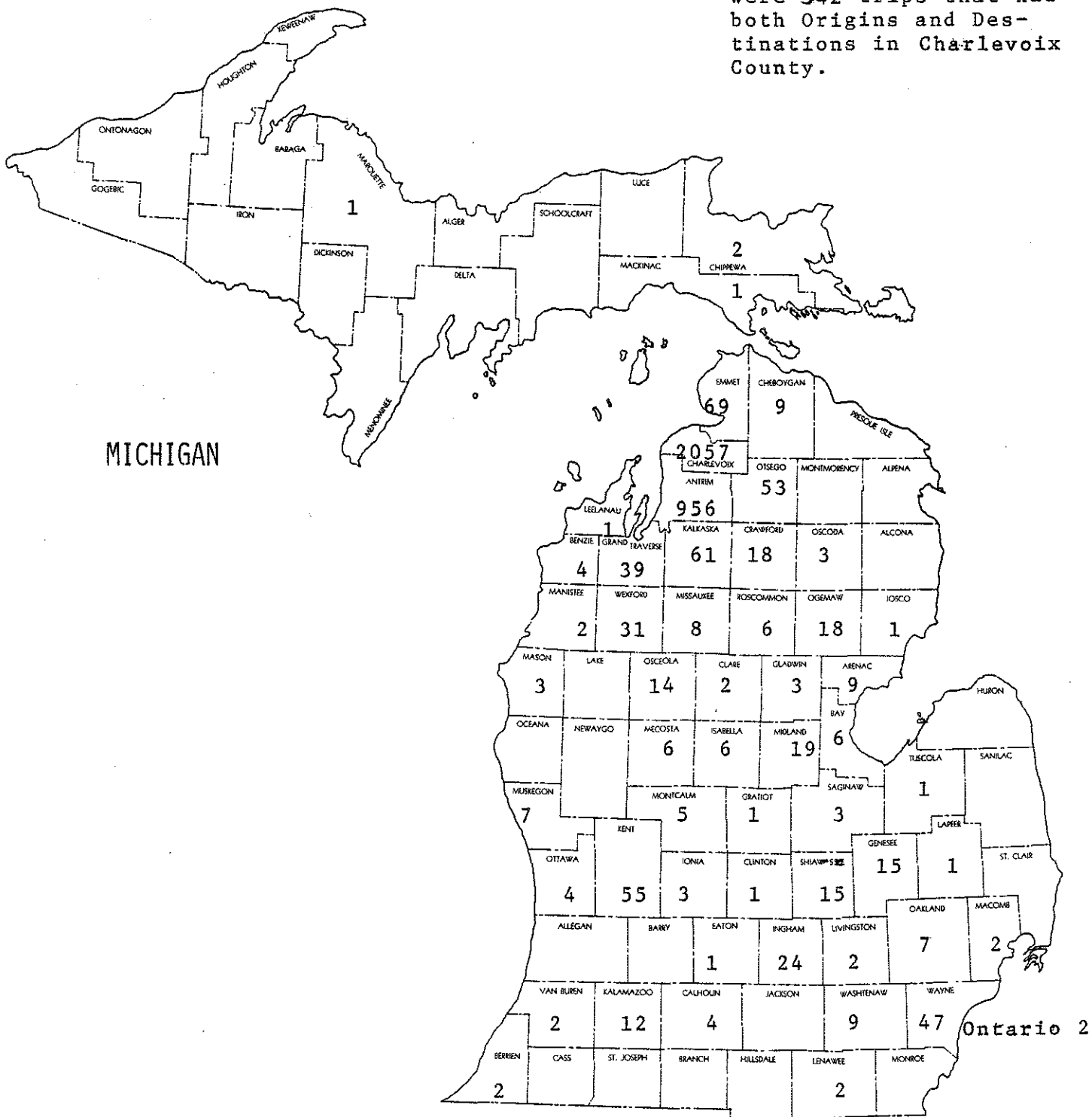
<u>Minutes</u>	<u>No. of Trips</u>	<u>Percent of Totals</u>
1-20	286	15.5
20-40	677	36.8
40-60	342	18.6
60-90	116	6.3
90-120	60	3.3
120-180	82	4.5
180-240	138	7.5
240-300	86	4.7
300-360	20	1.1
360-420	13	0.7
420-540	9	0.5
540-660	3	0.2
660-780	<u>6</u>	<u>0.3</u>
TOTAL	1838	100.0

Longest Trip = 13 Hr. Average Trip Length = 83 Min.
 Median Trip Length = 40 Min.*

* Due to the convention of the computer program, this value can be approximated only in 10 minute intervals.

EAST JORDAN EXTERNAL O-D STUDY
STATION 5, M-66, SOUTH

Total: 1,838 Trips,
3,676 Trip Ends. There
were 342 trips that had
both Origins and Des-
tinations in Charlevoix
County.



Iowa 1 Illinois 17 Indiana 10 Ohio 4
Missouri 5 Kentucky 2 Pennsylvania 1

Station 6 (Water Street)

Station 6 is located .7 miles west of M-66 & 32.

A total of 1,567 vehicles were recorded during the expanded interview counts. 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. There were 8 of every 10 vehicles which were autos and 15 out of every 100 vehicles which were panels or pickups irregardless of whether they traveled into or through the area. More than 60 percent of the passenger cars and panels or pickups had a terminal inside the study area.

The largest trip purpose was work with 557 trips or 35.6 percent of the 1,567 total trips.

Station 3 (State Street) accounted for 159 trips or 27.6 percent of the 577 through trips.

Zone 19 (Central Business District) accounted for 408 trips or 41.2 percent of the 990 terminal trips. Zones 9, 13, 15, and 19 accounted for 772 trips or 78.0 percent of the 990 terminal trips.

There were 980 trips or 62.6 percent of the 1,567 trips that had a trip length of 20-40 minutes. 1,333 trips (85.2 percent) 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 3 states. There are two ends for each trip; an origin and a destination. There were 1,567 trips which passed through Station 6, accounting for 3,134 total trip ends.

There were 1,662 trip ends (53.0 percent) in Charlevoix County. There were 5 trip ends (0.2 percent) in the Upper Peninsula. The Lower Peninsula accounted for 3,123 trip ends (99.6 percent). There were 6 origins and/or destinations (0.2 percent) outstate.

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STATION 6, WATER STREET

<u>Vehicle Type</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Passenger Car	1210	77.2	795	65.7	415	34.3
Passenger Car with Trailer	19	1.2	10	52.6	9	47.4
Panel or Pickup	232	14.8	131	56.5	101	43.5
Panel or Pickup with Trailer	9	0.6	0	0.0	9	100.0
Other Single Unit Trucks	77	4.9	44	57.1	33	42.9
Combinations and Trucks with Trailers	<u>20</u>	<u>1.3</u>	<u>10</u>	50.0	<u>10</u>	50.0
TOTAL	1567	100.0	990	63.2	577	36.8

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>	<u>Terminal</u>	<u>%</u>	<u>Through</u>	<u>%</u>
Work	557	35.6	344	61.8	213	38.2
Personal Business	185	11.8	138	74.6	47	25.4
Shopping	278	17.7	220	79.1	58	20.9
Vacation	104	6.6	33	31.7	71	68.3
Other Soc. or Rec.	244	15.6	126	51.6	118	48.4
All Other	<u>199</u>	<u>12.7</u>	<u>129</u>	64.8	<u>70</u>	35.2
TOTAL	1567	100.0	990	63.2	577	36.8

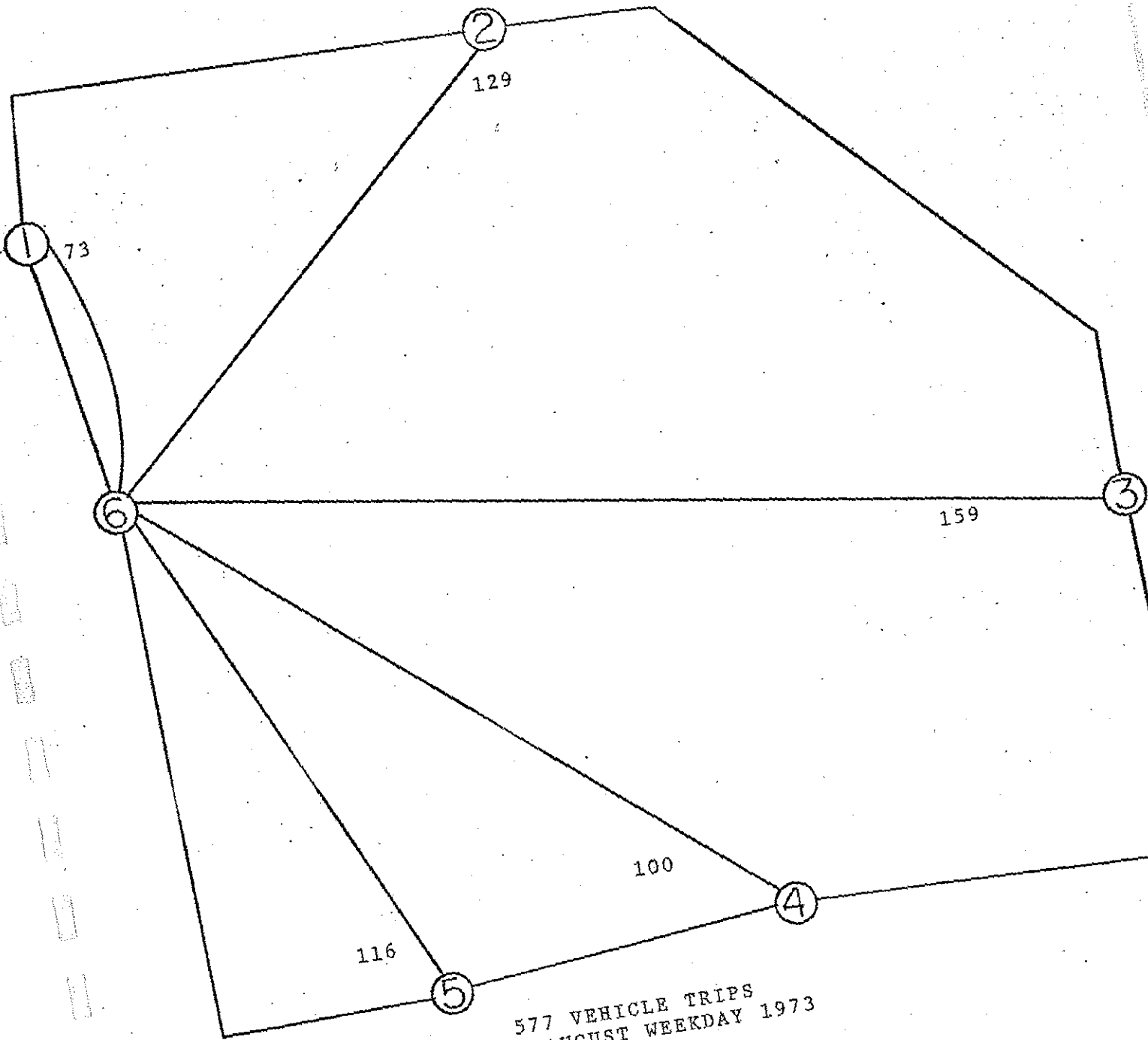
STATION 6, WATER STREET

THROUGH TRIPS TO EXTERNAL STATIONS

<u>External Station</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
1 - M-32 & 66, North	73	12.6
2 - Boyne Road	129	22.4
3 - State Street	159	27.6
4 - M-32, South	100	17.3
5 - M-66, South	116	20.1
TOTAL	<hr/> 577	<hr/> 100.0

THROUGH TRAFFIC INTERCHANGE
STATION 6, WATER STREET

EAST JORDAN AREA
EXTERNAL O-D STUDY



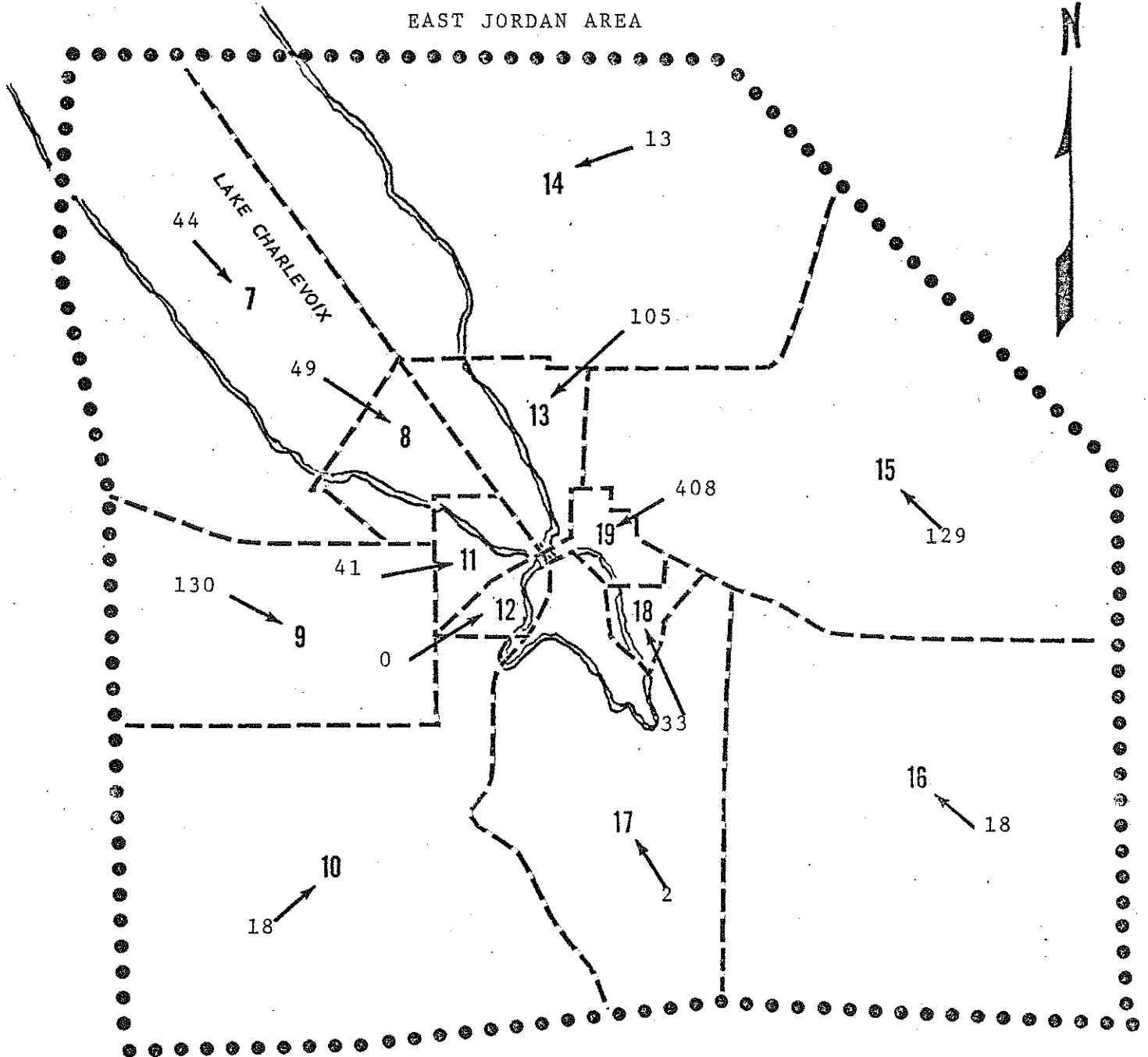
577 VEHICLE TRIPS
JULY-AUGUST WEEKDAY 1973

STATION 6, WATER STREET

TERMINAL TRIPS TO STUDY ZONES

<u>Internal Zone</u>	<u>Total Vehicles</u>	<u>Percent of Total</u>
7	44	4.4
8	49	4.9
9	130	13.2
10	18	1.8
11	41	4.1
12	0	0.0
13	105	10.7
14	13	1.3
15	129	13.1
16	18	1.8
17	2	0.2
18	33	3.3
19	<u>408</u>	<u>41.2</u>
TOTAL	990	100.0

TERMINAL TRAFFIC BETWEEN
 STATION 6 (WATER STREET) AND INTERNAL ZONES
 990 VEHICLE TRIPS



LEGEND

- ● ● CORDON LINE
- - - ZONE LIMITS
- 00 INTERNAL ZONES

STATION 6, WATER STREET

TRIP LENGTHS

<u>Minutes</u>	<u>No. of Trips</u>	<u>Percent of Totals</u>
1-20	211	13.5
20-40	980	62.6
40-60	142	9.1
60-90	154	9.8
90-120	12	0.8
120-180	11	0.7
180-240	19	1.2
240-300	13	0.8
300-360	16	1.0
360-420	2	0.1
420-540	2	0.1
540-660	<u>5</u>	<u>0.3</u>
TOTAL	1567	100.0

Longest Trip = 11 Hr. Average Trip Length = 51 Min.
 Median Trip Length = 40 Min.*

* Due to the convention of the computer program, this value can be approximated only in 10 minute intervals.

APPENDIX

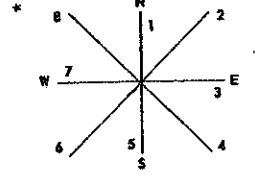
SINGLE STATION RURAL O-D STUDY

FORM NUMBER	6	COUNTY NUMBER		STATEWIDE NUMBER		HOUR PERIOD ENDING		* DIRECTION		DAY ** OF TRAVEL		MO.		DATE	
	1		2 3		4 5 6 7		8 9		10		11		12 13		14 15

INTERVIEW NUMBER	VEH. TYPE	NO. IN VEH.	ORIGIN Where did this trip begin? Co. or State	DESTINATION Where will this trip end? Co. or State	WHERE IS VEHICLE GARAGED	TRIP PURPOSE	ROUTE OF EXIT OR ENT.
					0 0 0		
					0 0 0		
					0 0 0		
					0 0 0		
					0 0 0		
					0 0 0		
					0 0 0		

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68

- VEHICLE TYPE**
- 1 PASSENGER CAR WITHOUT A TRAILER
 - 2 PASSENGER CAR WITH A TRAILER
 - 3 PANEL OR PICK-UP WITHOUT A TRAILER
 - 4 PANEL OR PICK-UP WITH A TRAILER
 - 5 OTHER SINGLE UNIT TRUCKS
 - 6 COMBINATIONS & TRUCKS WITH TRAILERS



- DAY OF TRAVEL ****
- SUNDAY 1 THURSDAY 5
 - MONDAY 2 FRIDAY 6
 - TUESDAY 3 SATURDAY 7
 - WEDNESDAY 4

- GARAGED**
- 1 ORIGIN
 - 2 DESTINATION
 - 3 OTHER

- TRIP PURPOSE**
- 1 WORK
 - 2 PERS. BUSINESS
 - 3 SHOPPING
 - 4 VACATION
 - 5 OTHER SOC. OR REC.
 - 6 ALL OTHER

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 TRUCK WITH TRAILER (6)			(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	55	
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-72-

DAY OF WEEK: Col. 17

STATION TYPE: Col. 20

Sunday	1	Thursday	5	Cordon Line Station	2
Monday	2	Friday	6	Screen Line Station	1
Tuesday	3	Saturday	7	Single Station	3
Wednesday	4			S. W. Winter Class.	4

TRUCK IDENTIFICATION

Panel and Pickup (2 axle, 4 tire)

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

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

All Other Single Unit Trucks

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

- a. All multistop or standup delivery trucks (primarily designed for moving rural and urban goods.)
- b. All large 4-tire trucks with flatbed, dump or other heavy cargo bodies.
- c. Pickups and panels, having heavy truck type hubs or axles, or are noticeably larger and longer than the standard type.
- d. Heavy 2-axle trucks with a higher than cab camper body.
- e. 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.		