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MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

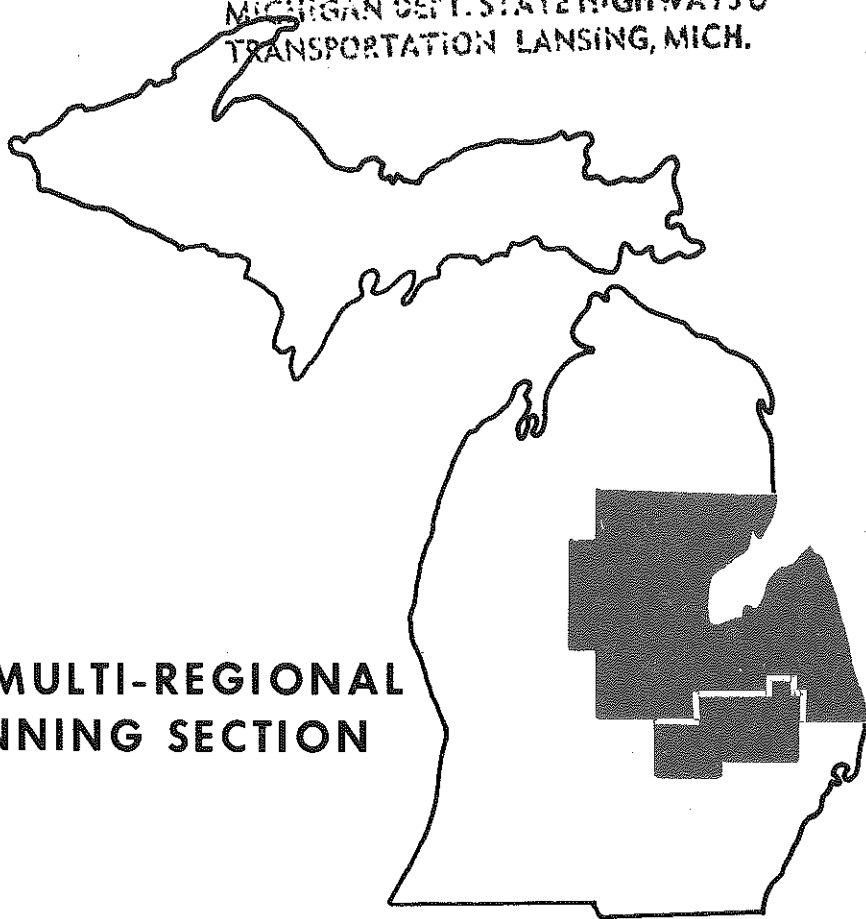
FRANKENMUTH AREA TRANSPORTATION PLAN

PART I

1975 FRANKENMUTH ORIGIN AND DESTINATION
STUDY

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EAST MULTI-REGIONAL
PLANNING SECTION



FRANKENMUTH AREA TRANSPORTATION PLAN

PART I

1975 FRANKENMUTH ORIGIN AND DESTINATION
STUDY

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MICHIGAN DEPARTMENT
OF
STATE HIGHWAYS AND TRANSPORTATION

Frankenmuth Area Transportation Plan
Part I
1975 Frankenmuth Origin and Destination Study

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DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

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

JOHN P. WOODFORD, DIRECTOR

July 23, 1975

Mr. Sam F. Cryderman
Deputy Director
Bureau of Transportation Planning
Lansing, Michigan 48904

Dear Mr. Cryderman:

Data presented in this report provides the Frankenmuth area decision makers with an additional evaluation tool. Field information for this report was collected in the month of June, 1975, under the direction of Milton Lamb, Origin and Destination Unit Manager.

Transportation Planner/Analyst, John Jennings prepared the report under the direction of East Planning Section Manager, Maynard Christensen. Regional Coordinator, Richard Baibak provided additional area knowledge and study material.

Sincerely,

Keith E. Bushnell, Administrator
Multi-Regional Planning Division

Enclosure

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This report represents the findings and/or professional opinions of the Michigan Department of State Highways and Transportation staff and not an official opinion of the State Highway Commission.

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TERMINOLOGY AND DEFINITIONS

Cordon Line	An imaginary line around the area under study.
External Station	A point on a highway at the limits of the study area (Cordon Line) where drivers of vehicles are stopped and interviewed.
Study Area	The area enclosed by the Cordon Line.
Origin	The place where a trip begins.
Destination	The place where a trip ends.
Origin-Destination Zone	(Internal Analysis Zone) a basic subdivision of the study area having a single or dominant land use, designated as such for purposes of tabulation and analysis.
Trip	One way travel between an origin and destination.
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 or districts).
Internal Trip	A trip with both ends inside the study area. (Beginning and ending at one of the internal analysis zones or districts)
Through Trip	A trip passing through the study area. (Both ends of the trip outside the Cordon Line).
Trip End	The origin or destination of a trip, each trip has two trip ends, i.e., 15,150 trips has 30,300 trip ends.

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REGIONAL LOCATION

Frankenmuth Michigan is in the eastern part of Saginaw County in the Saginaw Bay region. Located on state highway M-83, twelve miles southeast of Saginaw and twenty-two miles north of Flint (See Map 1). The Cass River bisects the city in an east-west direction and M-83 divides the city into north and south sections. Designated locally as Main Street, M-83 is the major north-south route in the area.

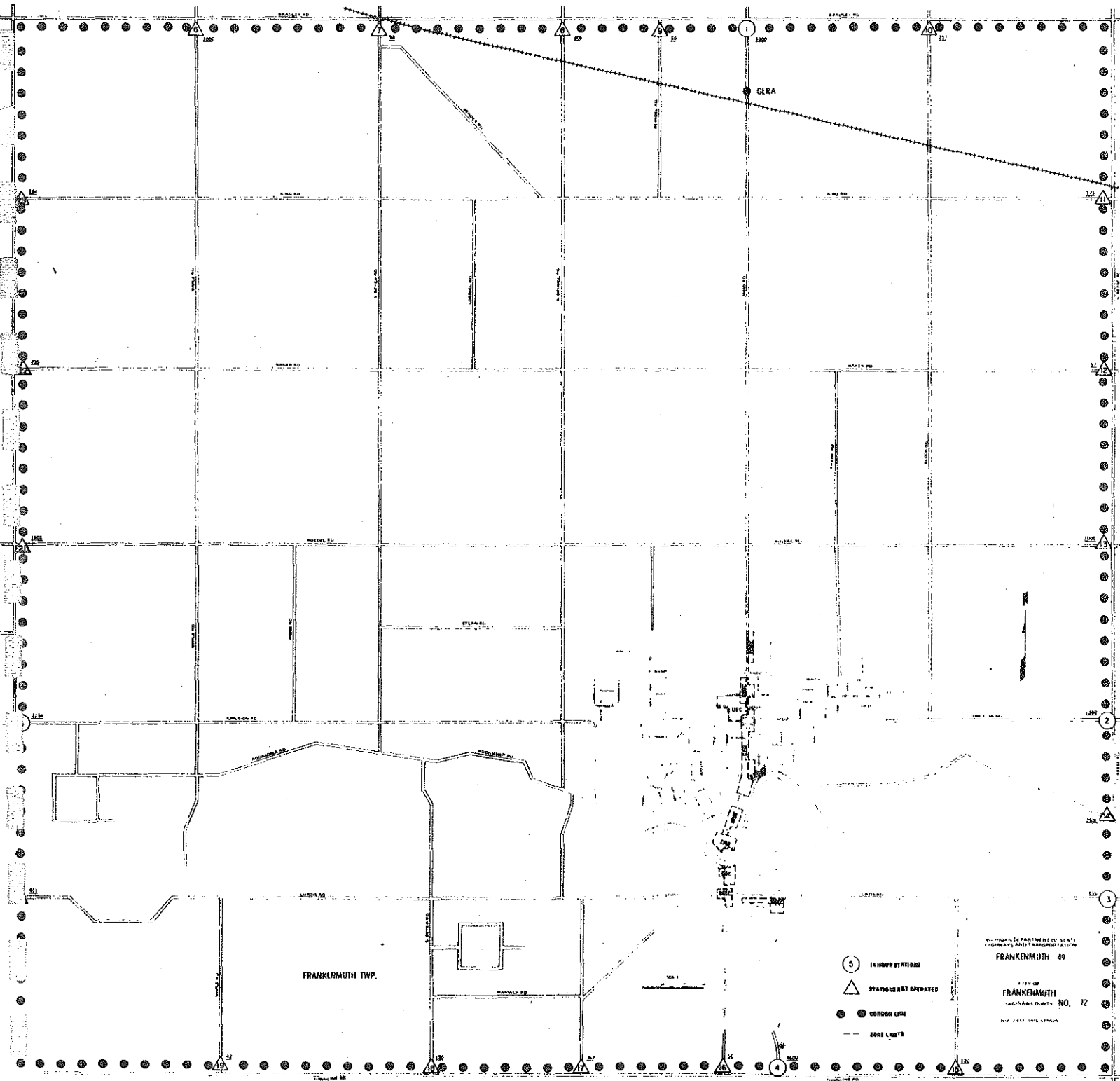
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INTRODUCTION

The MDSH&T initiated the 1975 Frankenmuth Origin and Destination Study to aid local and regional authorities in their planning efforts. A comprehensive survey of the external origins and destinations of traffic in the Frankenmuth area was undertaken to determine which attractions account for a substantial portion of the areas economic vitability and traffic generation.

During the week of June 23-27, 1975, motorists entering or leaving the study area (see Map 2) were interviewed as to their; origin, destination, trip purpose, and other details. Over 15,000 vehicles passed through the interview points and over 10,500 motorists were interviewed during the study period.

MAP 2
 1975 FRANKENMUTH O & D STUDY AREA



- ⑤ 15 HOUR STATIONS
- △ STATIONS NOT OPERATED
- CORROSION LINE
- EDGE LINE

MICHIGAN DEPARTMENT OF STATE
 HIGHWAYS AND TRANSPORTATION
FRANKENMUTH 49
 CITY OF
FRANKENMUTH
 SAGINAW COUNTY, NO. 12
 NOV. 2, 1975. 1:2500 SCALE

STUDY AREA

Cordon lines establishing the study area were similar to the Frankenmuth Township boundaries:

North Boundary - Bradley Road

South Boundary - Townline Road

East Boundary - S. Reese Rd.

West Boundary - Reimer Road

Major east-west routes in the study area are Curtis, Rodammer, and Junction Roads, respectively designated in the city as Jefferson, Tuscola, and Genesee Streets (see Map 2).

INTERVIEWS AND CLASSIFICATION COUNTS

During the week of June 23-27, 1975, motorists entering or leaving the study area were interviewed at one of five interview stations (see Table 1). Interview stations were located at major points of entrance and exit to the study area. Motorist interviews were conducted for 14 hour periods, 6 am to 8 pm. During the same week classification counts were taken for 24 hour periods at each interview station location (see Table 2).

Interview information collected consisted of the motorists:

- 1 Origin
- 2 Destination
- 3 Trip Purpose
- 4 Type of Vehicle
- 5 Number of passengers
- 6 Where the vehicle is garaged
- 7 Other interview data:
 - a) County where interviewed
 - b) Station number
 - c) Time of interview
 - d) Direction of travel
 - e) Date
 - f) Exit or entrance route

Classification counts consisted of counting the number of vehicles passing through each of the interview points and also recording the type of vehicle:

VEHICLE TYPE CODES

- | | |
|---------------------------------|--------------------------------------|
| 1. Pass. car w/o trailer | 5. Other (larger) single unit trucks |
| 2. Pass car with trailer | 6. Truck combinations |
| 3. Panel or Pickup w/o trailer | 7. Buses |
| 4. Panel or Pickup with trailer | 8. Motorcycles |

1975 FRANKENMUTH O/D STUDY
INTERVIEW STATION LOCATIONS

<u>CITY NO</u>	<u>STATEWIDE NO</u>	<u>LOCATION</u>
1	571	M-83, 0.1 mile south of Bradley Road
2	573	Junction Road East, 0.2 mile west of Reese Road
3	574	Jefferson St. (Curtis Road) East, 0.3 mile west of Reese Road
4	116	M-83 South, 0.1 mile north of Town- line Road at bridge
5	575	Junction Road West, 0.1 mile east of Reimer Road

Interviews and classification counts were taken at these locations.
(See Map 2)

TABLE 1

INTERVIEW AND CLASSIFICATION COUNTS

<u>STATION</u>	<u>CLASSIFICATION COUNTS (24 HOURS)</u>	<u>INTERVIEWS (6 am to 8 pm)</u>	<u>PERCENT OF TOTAL INTERVIEW</u>
571	3538	2503	71 %
573	1805	1368	76 %
574	707	526	74 %
116	4958	3226	65 %
575	4308	2919	69 %
TOTAL	15,316	10,542	

<u>STATION</u>	<u>MOTORCYCLES¹ AND BUSES</u>	<u>INTERNAL ZONE² TRIPS</u>
571	50	14
573	40	33
574	29	20
116	68	11
575	46	24
TOTAL	233	102

¹Motorcycles and buses are included in the classification counts but were not interviewed.

²Internal Zone trip information is not part of a minor O & D Study.

TABLE 2

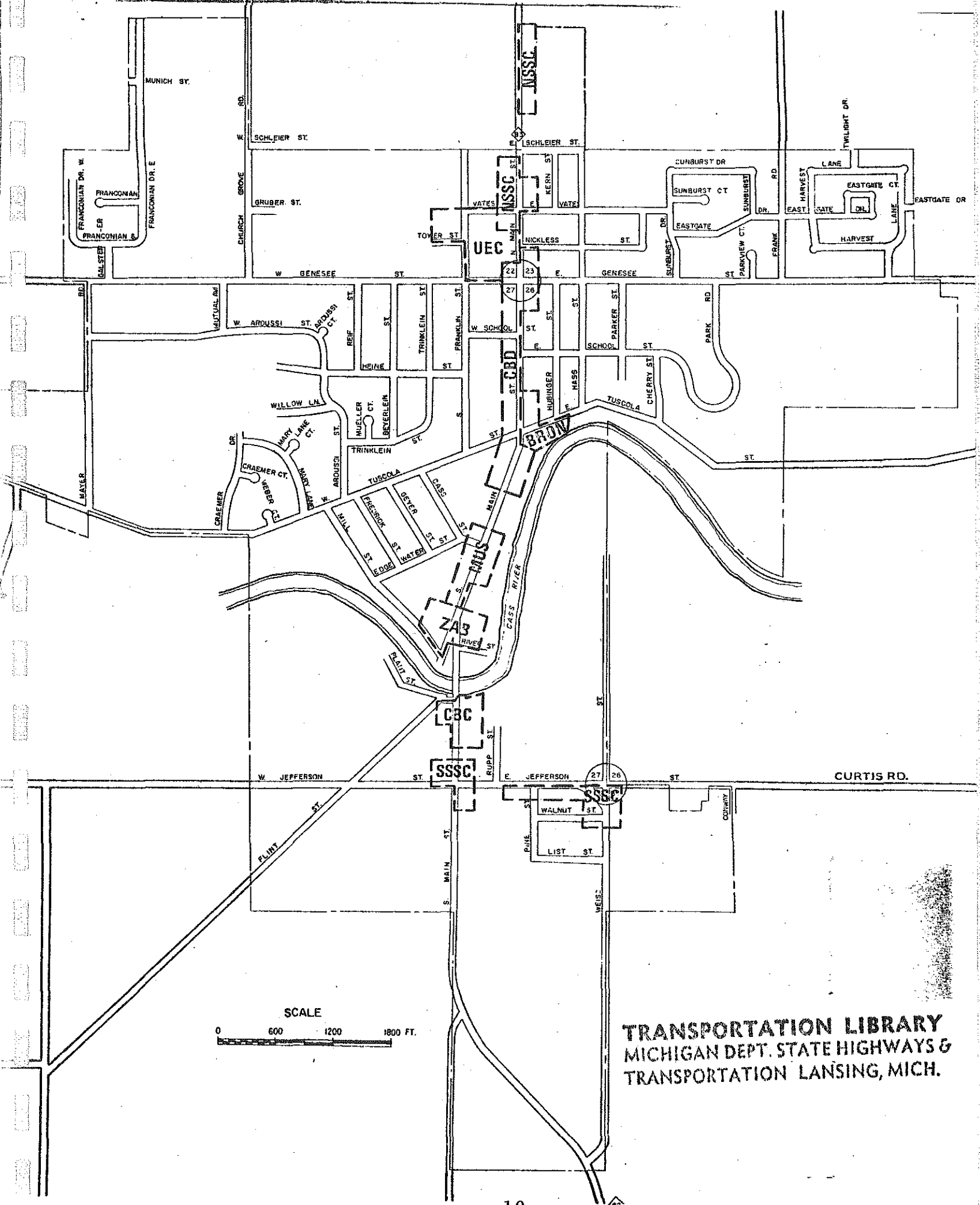
METHOD OF TABULATING DATA BY COMPUTER SYSTEM

Processing of the interview and classification data for use in the MDSH&T computer system enables the planner/analyst to use programs consisting of: Interview Station Data; Total Station Data; Trip Purpose and Vehicle Type Data; Trip End Summary Data; Trip Length Frequency Distribution Data.

Fourteen hour interview data was expanded, by computer programming, to represent 24 hour periods. Due to the expansion program different totals will appear in some of the reports, all within an acceptable range of difference.

To enable a more precise study of traffic movement, the study area was divided into zones (see Map 3). The concept of zoning is based upon the division of the area according to land use and traffic volumes (see Table 3). This concept ensures a more detailed process of data collection and tabulation.

1975 FRANKENMUTH O & D STUDY - INTERNAL ZONES



SCALE
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1975 FRANKENMUTH O & D STUDY

ZONAL CODES IN STUDY AREA

<u>ZONE</u>	<u>ABBREVIATION</u>	<u>AREA</u>
24	CBD	Central Business District
25	UEC	Universal Engineering Company
26	NSSC	Northside Shopping Center
27	BRON	Bronners
28	SSSC	Southside Shopping Center
29	CBC	Carlings Brewery Company
30	ZAB	Zenders and Bavarian Inn
31	MUS	Museum
32	All Others	Frankenmuth Township and Gera

TABLE 3

TOTAL STATION DATA

This program is designed to show the total number of through and terminal trips for all stations. Individual station percentages, for through and terminal trips, can also be computed from this program data.

Mathematical interpretation of the Total Station Data shows 75% of the total trips are terminal trips and 25% are through trips (see Table 4).

1975 FRANKENMUTH O & D STUDY

TOTAL STATION DATA

<u>STATION NO.</u>	<u>24-HOUR CLASS¹ COUNT</u>	<u>14-HOUR INTERVIEW</u>	<u>PERCENT INTERVIEW</u>	<u>TOTAL² TRIPS</u>	<u>TERMINAL TRIPS</u>	<u>% OF TOTAL STA. TRIPS</u>	<u>THRU TRIPS</u>	<u>% OF TOTAL STA. TRIPS</u>	<u>TOTAL TRIPS</u>	<u>% OF TOTAL STA. TRIPS</u>
571	3538	2503	71%	3495	2221	64%	1274	36%	3495	23%
573	1805	1368	76%	1763	1290	73%	473	27%	1763	12%
574	707	526	74%	675	497	74%	178	26%	675	04%
116	4958	3226	65%	4968	3644	73%	1324	27%	4968	33%
574	4308	2919	68%	4249	3747	88%	502	12%	4249	28%
TOTAL	15,316	10,542	69%	15,150	11,399	75%	3751	25%	15,150	100%
TOTAL TRIPS					11,399	86%	1876 ³	14%	13,275	

13

¹24 Hour Classification Counts include motorcycle and bus counts, See Table 2.

²Total Trips are expanded from the 14-Hour Interview Data and do not include the motorcycle and bus counts. Internal Zone trip information is not part of a minor O & D Study. See Table 2.

³Through Trip Data is divided in half because the motorists are interviewed at both entrance and exit points. An interview at one station determines information of the through trips, otherwise, the data would be computed as two individual trips.

TABLE 4

STATION DATA

Individual station interview data showing the total number of trip purposes and vehicle type (See Tables 5-9) is the end product of this report. Also shown on the tables are the percentage figures relating individual station data to the total number of trip purposes and vehicle type data.

Numerical inspection of the tables show the greatest percentage of both trip purposes and vehicle type are work trips and passenger cars without trailers.

1975 FRANKENMUTH O & D STUDY

STATION 1 (571)

TRIP PURPOSE

<u>PURPOSE</u>	<u>NO. OF TRIPS</u>	<u>% OF TOTAL TRIPS</u>
Work	1719	11%
Personal Business	302	02%
Shopping	302	02%
Vacation	266	02%
Other Social or Rec.	611	04%
All Other	299	02%
TOTAL	3499	23%

VEHICLE TYPE

<u>TYPE</u>	<u>NUMBER</u>	<u>% OF TOTAL</u>
Pass. cars w/o trailers	2695	18%
Pass. cars with trailers	38	01%
Panel or pickup trucks w/o trailers	439	03%
Panel or pickup trucks with trailers	35	01%
Other (Larger) Single Unit Trucks	154	01%
Truck Combinations	138	01%
TOTAL	3499	23%

TABLE 5

1975 FRANKENMUTH O & D STUDY

STATION 2 (573)

TRIP PURPOSE

<u>PURPOSE</u>	<u>NO. OF TRIPS</u>	<u>% OF TOTAL TRIPS</u>
Work	904	06%
Personal Business	154	01%
Shopping	255	02%
Vacation	37	01%
Other Social or Rec.	257	02%
All Other	157	01%
TOTAL	1764	12%

VEHICLE TYPE

<u>TYPE</u>	<u>NUMBER</u>	<u>% OF TOTAL</u>
Pass. cars w/o trailers	1443	10%
Pass. cars with trailers	9	01%
Panel or pickup trucks w/o trailers	230	02%
Panel or pickup trucks with trailers	11	01%
Other (Larger) Single Unit Trucks	51	01%
Truck Combinations	19	01%
TOTAL	1763	12%

TABLE 6

1975 FRANKENMUTH O & D STUDY

STATION 3 (574)

TRIP PURPOSE

<u>PURPOSE</u>	<u>NO. OF TRIPS</u>	<u>% OF TOTAL TRIPS</u>
Work	311	02%
Personal Business	54	01%
Shopping	131	01%
Vacation	5	01%
Other Social or Rec.	96	01%
All Other	78	01%
TOTAL	675	02%

VEHICLE TYPE

<u>TYPE</u>	<u>NUMBER</u>	<u>% OF TOTAL</u>
Pass. cars w/o trailers	519	03%
Pass. cars with trailers	---	01%
Panel or pickup trucks w/o trailers	127	01%
Panel or pickup trucks with trailers	5	01%
Other (Larger) Single Unit Trucks	20	01%
Truck Combinations	2	01%
TOTAL	673	03%

TABLE 7

1975 FRANKENMUTH O & D STUDY

STATION 4 (116)

TRIP PURPOSE

<u>PURPOSE</u>	<u>NO. OF TRIPS</u>	<u>% OF TOTAL TRIPS</u>
Work	1665	11%
Personal Business	295	02%
Shopping	549	04%
Vacation	446	03%
Other Social or Rec.	1100	07%
All Other	913	18%
TOTAL	4968	45%

VEHICLE TYPE

<u>TYPE</u>	<u>NUMBER</u>	<u>% OF TOTAL</u>
Pass. cars w/o trailers	4004	26%
Pass cars with trailers	59	01%
Pannel or pickup trucks w/o trailers	475	03%
Panel or pickup trucks with trailers	28	01%
Other (Larger) Single Unit Trucks	186	04%
Truck Combinations	215	04%
TOTAL	4967	37%

TABLE 8

1975 FRANKENMUTH O & D STUDY

STATION 5 (575)

TRIP PURPOSE

<u>PURPOSE</u>	<u>NO. OF TRIPS</u>	<u>% OF TOTAL TRIPS</u>
Work	1927	13%
Personal Business	365	02%
Shopping	576	04%
Vacation	212	01%
Other Social or Rec.	734	05%
All Other	434	03%
TOTAL	4248	28%

VEHICLE TYPE

<u>TYPE</u>	<u>NUMBER</u>	<u>% OF TOTAL</u>
Pass. cars w/o trailers	3617	24%
Pass. cars with trailers	27	01%
Panel or pickup trucks w/o trailers	453	03%
Panel or pickup trucks with trailers	11	01%
Other (Larger) Single Unit Trucks	107	01%
Truck Combinations	34	01%
TOTAL	4249	27%

TABLE 9

TYPE AND PURPOSE

This program relates the factors: trip purposes; vehicle types; through or terminal trips, numerically (See Table 10). Also shown on the tables are the individual and total factor percentages.

1975 FRANKENMUTH O & D STUDY

<u>VEHICLE TYPE</u>							
<u>THRU TRIP</u>	<u>THROUGH TRIP %</u>	<u>TERMINAL TRIP</u>	<u>TERM TRIP %</u>	<u>TOTAL THRU/TERM</u>	<u>TOTAL %</u>	<u>VEHICLE TYPE CODES</u>	<u>VEHICLE TYPE CODES</u>
2700	72%	9580	84%	12,280	81%	Pass. car w/o trailer	1
60	02%	70	01%	132	009%	Pass. car with trailer	2
554	15%	1170	10%	1,730	11%	Panel or pickup w/o trailer	3
50	01%	40	004%	90	006%	Panel or pickup with trailer	4
162	04%	360	03%	520	03%	Other (larger) single unit trucks	5
230	06%	182	02%	410	03%	Truck combinations	6
3750	100	11,400	100	15,150	100		

<u>TRIP PURPOSE</u>							
<u>THRU TRIP</u>	<u>THROUGH TRIP %</u>	<u>TERMINAL TRIP</u>	<u>TERM TRIP %</u>	<u>TOTAL THRU/TERM</u>	<u>TOTAL %</u>	<u>TRIP PURPOSE CODES</u>	<u>TRIP PURPOSE CODES</u>
1780	47%	4740	42%	6520	43%	Work	1
360	10%	810	07%	1170	08%	Personal Business	2
240	06%	1570	14%	1810	12%	Shopping	3
280	08%	690	06%	970	06%	Vacation	4
760	20%	2040	18%	2800	18%	Other social or rec.	5
330	09%	1550	14%	1880	12%	All Other	6
3750	100	11,400	100	15,150	100		

NOTE: Numbers rounded to nearest tenth

TABLE 10

TRIP END SUMMARY

This program is designed to reflect, by zone, the origin and destination of each trip. The total number of trips produced in this study is 15,150 therefore trip ends equal 30,300 (see Maps 4-8 and Table 11).

The zoning pattern is:

<u>ZONES</u>	<u>PATTERN</u>
1-32	The Study Area
32-83	Other Michigan Areas
84-95	Other States and *Canada

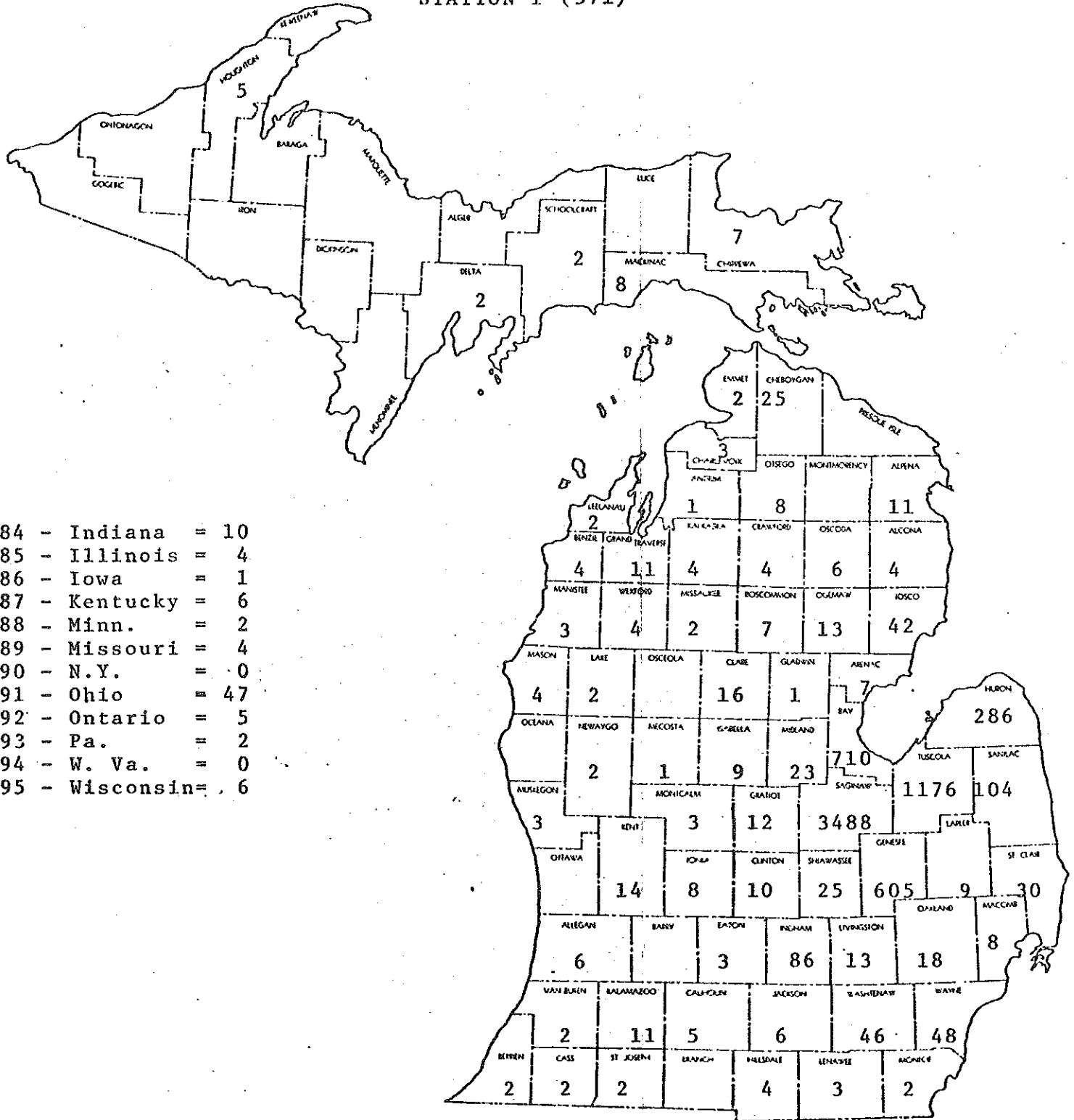
* Ontario, Canada

MAP 4

1975 FRANKENMUTH O/D STUDY

TRIP END SUMMARY

STATION 1 (571)



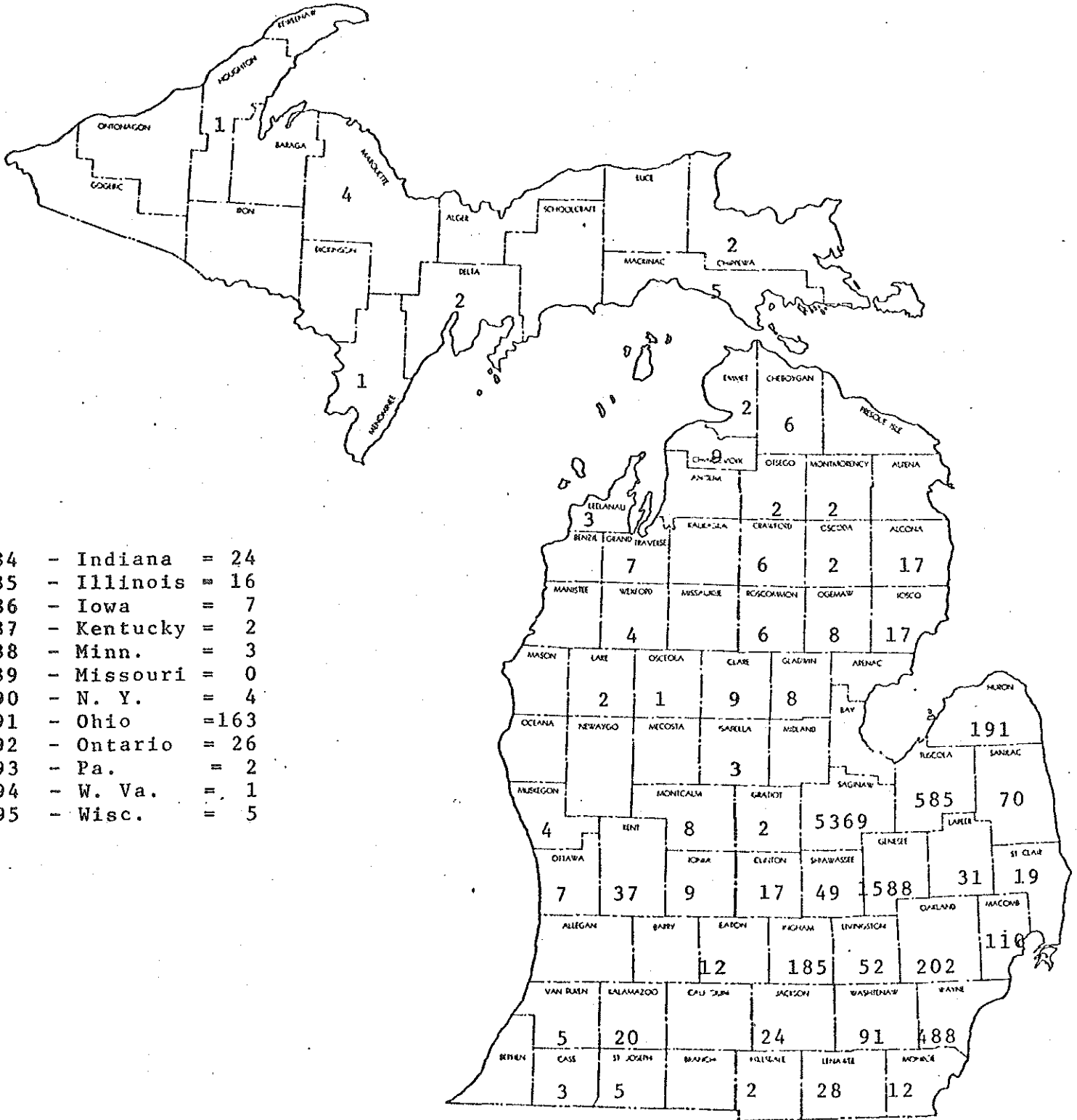
STATION 1 TOTAL TRIP ENDS = 7082

MAP 7

1975 FRANKENMUTH O/D STUDY

TRIP END SUMMARY

STATION 4 (116)



STATION 4 TOTAL TRIP ENDS = 9928

STUDY AREA INTERNAL ZONES

TRIP END SUMMARY

ZONE	STA. 1	STA. 1 %	STA.2	STA.2 %	STA.3	STA.3 %	STA.4	STA.4 %	STA. 5	STA. 5 %	ZONE TOTAL	ZONE %
24	205	(20%)	120	(18%)	59	(24%)	344	(19%)	277	(14%)	1005	18%
25	40	04%	41	06%	6	03%	43	02%	57	03%	187	03%
26	87	08%	116	18%	29	12%	124	07%	139	07%	495	09%
27	25	02%	13	02%			48	03%	34	02%	120	02%
28	17	02%	20	12%	29	12%	30	02%	28	01%	124	02%
29	62	06%	24	04%	12	05%	88	05%	31	02%	217	04%
30	199	19%	56	09%	31	13%	626	35%	251	13%	1163	21%
31	4		6	01%			7		2		19	
32	403	39%	256	39%	77	32%	501	28%	1100	57%	2337	41%
STATION TOTAL	1041	100%	652	100%	244	100%	1811	100%	1919	100%	5667	100%

NOTE: All numbers are rounded off

ZONE CODES

24 = CBD 29 = CBC
 25 = UEC 30 = ZAB
 26 = NSSC 31 = MUS
 27 = BRON 32 = All Other
 28 = SSSC

TRIP LENGTH FREQUENCY DISTRIBUTION

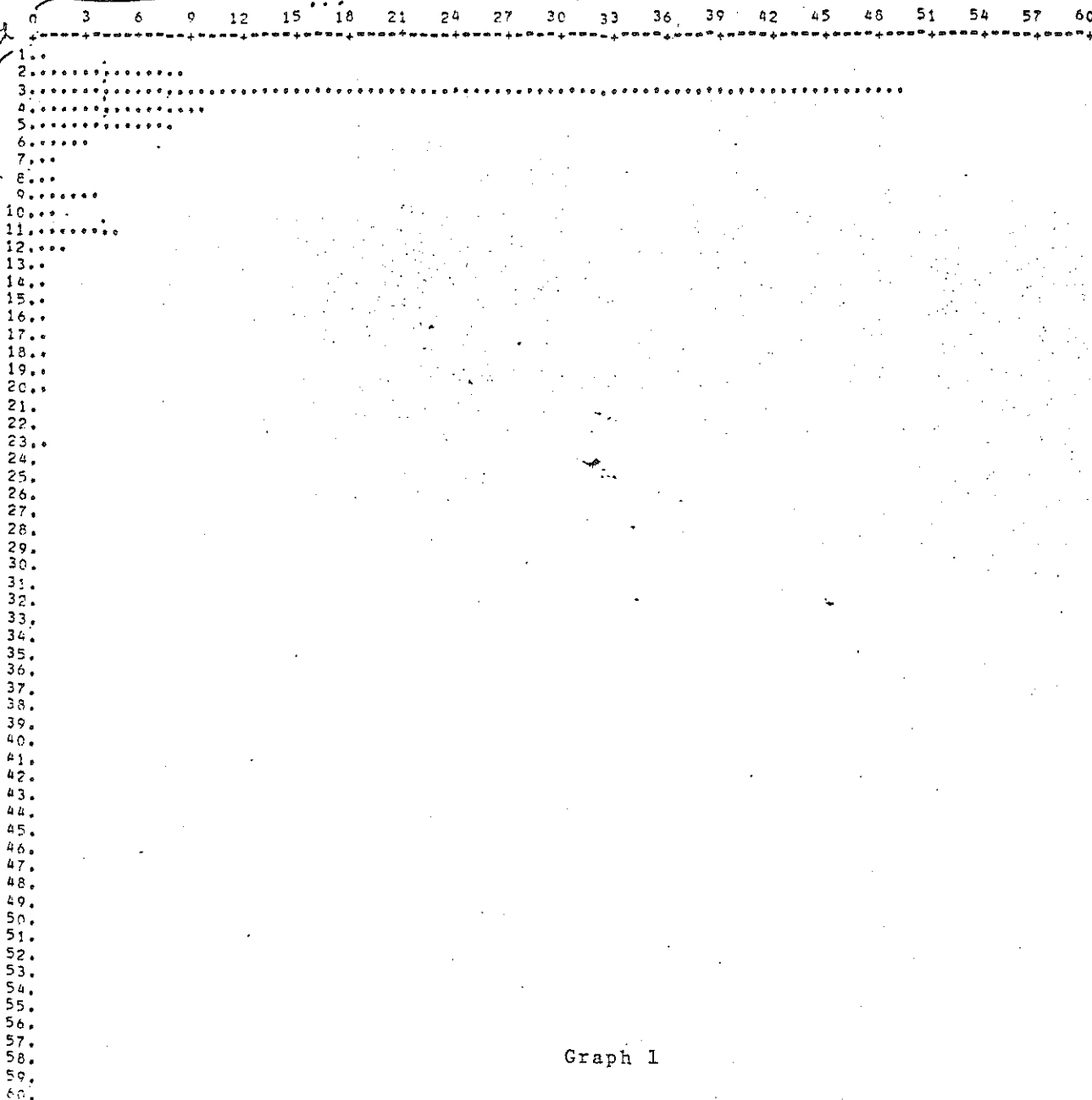
The numerical data from this program establishes the percentage of trips in specific travel time periods (See Graphs 1-6). The vertical axis, on the graphs, represents travel time in ten minute segments and the horizontal axis is the percentage of trips traveling in each specific time period.

Statistical information such as mean and standard deviation is printed at the end of graph. The average travel time of the total number of trips (See Graph 1) was 56 minutes.

16NOV75

90% of trips

FRANKENMUTH TOTAL AREA TRIP LENGTH FREQUENCY DISTRIBUTION



P.C.	CUM.	ACTUAL
0.761	0.761	102
8.104	8.865	1086
49.011	57.876	6568
9.805	67.682	1314
7.940	75.621	1064
3.239	78.860	434
1.075	79.934	144
1.254	81.188	168
3.358	84.546	450
1.283	85.829	172
4.716	90.545	632
1.515	92.060	203
0.881	92.941	118
0.806	93.747	108
0.821	94.568	110
0.784	95.351	105
0.522	95.873	70
0.828	96.702	111
0.642	97.343	86
0.321	97.664	43
0.209	97.873	28
0.142	98.015	19
0.545	98.560	73
0.157	98.717	21
0.127	98.843	17
0.097	98.940	13
0.067	99.008	9
0.075	99.082	10
0.090	99.172	12
0.045	99.216	6
0.015	99.231	2
0.060	99.291	8
0.037	99.328	5
0.000	99.328	0
0.112	99.440	15
0.000	99.440	0
0.030	99.470	4
0.067	99.537	9
0.037	99.575	5
0.030	99.605	4
0.022	99.627	3
0.052	99.679	7
0.007	99.687	1
0.030	99.716	4
0.015	99.731	2
0.007	99.739	1
0.000	99.739	0
0.000	99.739	0
0.007	99.746	1
0.015	99.761	2
0.000	99.761	0
0.015	99.776	2
0.015	99.791	2
0.037	99.828	5
0.022	99.851	3
0.030	99.881	4
0.000	99.881	0
0.007	99.888	1
0.000	99.888	0

Graph 1

30

61.
62.
63.
64.
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0.000	99.888	0
0.007	99.896	1
0.000	99.896	0
0.007	99.903	1
0.000	99.903	0
0.000	99.903	0
0.007	99.910	1
0.000	99.910	0
0.000	99.910	0
0.000	99.918	1
0.027	99.940	3
0.000	99.940	0
0.000	99.940	0
0.000	99.940	0
0.007	99.948	1
0.000	99.948	0
0.000	99.948	0
0.007	99.955	1
0.045	100.000	6

REMAINING VALUES ARE ALL ZERO
 NUMBER OF OBSERVATIONS = 13401

SUM = 74553. MEAN = 5.563 VAR = 33.526 SD = 5.790

TOTAL TRIPS OVER MAXP = 0
 TOTAL TRIPS OVER 255 = 0
 VOLUME TABLE NUMBER = 201
 SKIM TREE NUMBER = 101

$$\bar{Y} = \frac{\sum Y}{N}$$

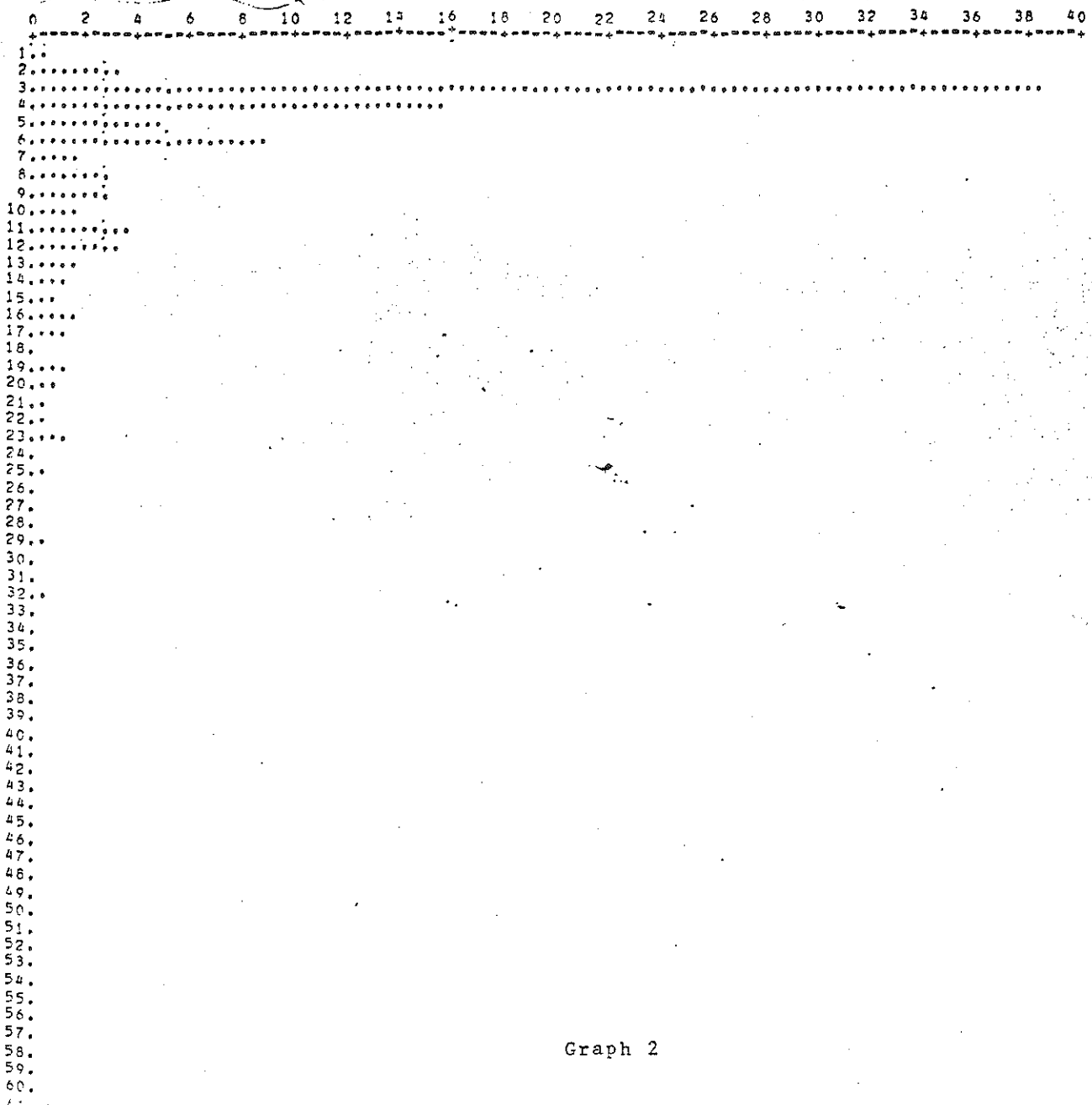
$$S\bar{Y} = \frac{s}{\sqrt{N}}$$

$$6\bar{Y} = \frac{6}{\sqrt{N}}$$

16NOV75

Old Mill

STATION 1
FRANKENMUTH TRIP LENGTH FREQUENCY DISTRIBUTION BY STA 1 THRU 5



	P.C.	CUM.	ACTUAL
1	0.395	0.395	14
2	3.050	3.445	108
3	38.464	41.909	1362
4	15.787	57.696	559
5	4.773	62.468	169
6	6.783	71.251	311
7	1.610	72.861	57
8	2.730	75.600	97
9	2.900	78.509	103
10	1.581	80.090	56
11	3.750	83.846	133
12	3.106	86.953	110
13	1.666	88.619	59
14	1.186	89.805	42
15	0.875	90.681	31
16	1.469	92.149	52
17	1.017	93.166	36
18	0.169	93.335	6
19	1.214	94.550	43
20	0.762	95.312	27
21	0.565	95.877	20
22	0.395	96.272	14
23	1.045	97.317	37
24	0.141	97.458	5
25	0.367	97.825	13
26	0.198	98.023	7
27	0.141	98.164	5
28	0.160	98.334	6
29	0.226	98.560	8
30	0.000	98.560	0
31	0.056	98.616	2
32	0.282	98.899	10
33	0.056	98.955	2
34	0.000	98.955	0
35	0.000	98.955	0
36	0.000	98.955	0
37	0.113	99.068	4
38	0.056	99.125	2
39	0.065	99.209	3
40	0.000	99.209	0
41	0.065	99.294	3
42	0.028	99.322	1
43	0.028	99.350	1
44	0.000	99.350	0
45	0.085	99.435	3
46	0.000	99.435	0
47	0.000	99.435	0
48	0.000	99.435	0
49	0.000	99.435	0
50	0.000	99.435	0
51	0.000	99.435	0
52	0.000	99.435	0
53	0.056	99.492	2
54	0.056	99.548	2
55	0.000	99.548	0
56	0.056	99.605	2
57	0.085	99.689	3
58	0.000	99.689	0
59	0.056	99.746	2
60	0.000	99.746	0

(MAX 10)

32

Graph 2

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STATION 1 (continued)

0.056	99.802	2
0.000	99.802	0
0.000	99.802	0
0.000	99.802	0
0.000	99.802	0
0.000	99.802	0
0.000	99.802	0
0.000	99.802	0
0.000	99.802	0
0.000	99.802	0
0.056	99.859	2
0.028	99.887	1
0.000	99.887	0
0.000	99.887	0
0.000	99.887	0
0.056	99.944	2
0.000	99.944	0
0.000	99.944	0
0.000	99.944	0
0.056	100.000	2

REMAINING VALUES ARE ALL ZERO
NUMBER OF OBSERVATIONS= (3501)

SUM= 24568.

MEAN= 6.938

VAR= 52.901

SD= 7.273

TOTAL TRIPS OVER MAXP = 0
TOTAL TRIPS OVER 255 = 0
VOLUME TABLE NUMBER = 201
SKIM TREE NUMBER = 101

33

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STATION 2
FRANKENMUTH TRIP LENGTH FREQUENCY DISTRIBUTION BY STA 1 THRU 5

PAGE 3

n	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	P.C.	CUM.	ACTUAL
1...																					1.890	1.890	33
2.																					0.057	1.947	1
3.....																					68.490	70.447	1196
4.....																					16.438	86.884	287
5.....																					4.926	91.810	86
6....																					1.489	93.299	26
7..																					0.807	94.101	14
8..																					0.916	95.017	16
9..																					0.515	95.533	9
10.																					0.286	95.819	5
11....																					1.203	97.022	21
12..																					0.745	97.766	13
13.																					0.286	98.053	5
14.																					0.344	98.396	6
15.																					0.172	98.568	3
16.																					0.057	98.625	1
17.																					0.229	98.855	4
18.																					0.057	98.912	1
19.																					0.229	99.141	4
20.																					0.172	99.313	3
21.																					0.000	99.313	0
22.																					0.057	99.370	1
23.																					0.115	99.485	2
24.																					0.115	99.599	2
25.																					0.000	99.599	0
26.																					0.000	99.599	0
27.																					0.000	99.599	0
28.																					0.000	99.599	0
29.																					0.115	99.714	2
30.																					0.000	99.714	0
31.																					0.000	99.714	0
32.																					0.000	99.714	0
33.																					0.000	99.714	0
34.																					0.000	99.714	0
35.																					0.000	99.714	0
36.																					0.000	99.714	0
37.																					0.057	99.771	1
38.																					0.000	99.771	0
39.																					0.057	99.828	1
40.																					0.000	99.828	0
41.																					0.000	99.828	0
42.																					0.000	99.828	0
43.																					0.000	99.828	0
44.																					0.000	99.828	0
45.																					0.000	99.828	0
46.																					0.000	99.828	0
47.																					0.000	99.828	0
48.																					0.000	99.828	0
49.																					0.000	99.828	0
50.																					0.000	99.828	0
51.																					0.000	99.828	0
52.																					0.000	99.828	0
53.																					0.000	99.828	0
54.																					0.057	99.885	1
55.																					0.115	100.000	2

REMAINING VALUES ARE ALL ZERO
NUMBER OF OBSERVATIONS= 1746

SUM= 6927. MEAN= 3.979 VAR= 12.313 SD= 3.509

TOTAL TRIPS OVER MAXP = 0
TOTAL TRIPS OVER 255 = 0

Graph 3

34

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STATION 3
FRANKENPUTH TRIP LENGTH FREQUENCY DISTRIBUTION BY STA 1 THRU 5

PAGE 4

	0	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	P.C.	CUM.	ACTUAL
1.....																						3.003	3.003	20
2.....																						0.150	3.153	1
3.....																						52.853	56.006	352
4.....																						32.883	88.889	219
5.....																						6.757	95.646	45
6.....																						2.102	97.748	14
7..																						0.751	98.498	5
8..																						0.300	98.799	2
9.																						0.150	98.949	1
10..																						0.300	99.249	2
11..																						0.300	99.550	2
12.																						0.000	99.550	0
13.																						0.150	99.700	1
14.																						0.150	99.850	1
15.																						0.000	99.850	0
16.																						0.000	99.850	0
17.																						0.000	99.850	0
18.																						0.000	99.850	0
19.																						0.000	99.850	0
20.																						0.000	99.850	0
21.																						0.000	99.850	0
22.																						0.000	99.850	0
23.																						0.000	99.850	0
24.																						0.000	99.850	0
25.																						0.000	99.850	0
26.																						0.000	99.850	0
27.																						0.000	99.850	0
28.																						0.000	99.850	0
29.																						0.000	99.850	0
30.																						0.000	99.850	0
31.																						0.000	99.850	0
32.																						0.000	99.850	0
33.																						0.000	99.850	0
34.																						0.000	99.850	0
35.																						0.000	99.850	0
36.																						0.000	99.850	0
37.																						0.000	99.850	0
38.																						0.000	99.850	0
39.																						0.000	99.850	0
40.																						0.000	99.850	0
41.																						0.000	99.850	0
42.																						0.000	99.850	0
43.																						0.000	99.850	0
44.																						0.000	99.850	0
45.																						0.000	99.850	0
46.																						0.000	99.850	0
47.																						0.000	99.850	0
48.																						0.000	99.850	0
49.																						0.000	99.850	0
50.																						0.000	99.850	0
51.																						0.000	99.850	0
52.																						0.000	99.850	0
53.																						0.000	99.850	0
54.																						0.000	99.850	0
55.																						0.150	100.000	1

35

REMAINING VALUES ARE ALL ZERO
NUMBER OF OBSERVATIONS# 666

SUM# 2447. MEAN# 3.674 VAR# 5.436 SD# 2.331

Graph 4

TOTAL TRIPS OVER MAXP = 0
TOTAL TRIPS OVER 255 = 0

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STATION 4
FRANKENMUTH TRIP LENGTH FREQUENCY DISTRIBUTION BY STA 1 THRU 5

PAGE 5

0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	
1.																					
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59.																					
60.																					
61.																					

P.C.	CUM.	ACTUAL
0.222	0.222	11
0.262	0.483	13
32.272	32.756	1602
4.815	37.571	239
16.539	54.110	821
5.802	59.911	288
1.390	61.301	69
2.156	63.457	107
6.567	70.024	326
2.534	72.562	126
10.757	83.320	534
2.518	85.838	125
1.833	87.671	91
1.330	89.001	66
1.632	90.633	81
1.632	92.264	81
0.806	93.070	40
1.974	95.044	98
0.866	95.911	43
0.463	96.374	23
0.383	96.757	19
0.201	96.958	10
0.604	97.562	30
0.322	97.885	16
0.322	98.207	16
0.201	98.409	10
0.101	98.509	5
0.141	98.650	7
0.101	98.751	5
0.101	98.852	5
0.000	98.852	0
0.040	98.892	2
0.000	98.892	0
0.000	98.892	0
0.302	99.194	15
0.000	99.194	0
0.060	99.255	3
0.141	99.396	7
0.020	99.416	1
0.060	99.476	3
0.020	99.496	1
0.060	99.557	3
0.000	99.557	0
0.000	99.557	0
0.000	99.557	0
0.020	99.577	1
0.000	99.577	0
0.000	99.577	0
0.040	99.617	2
0.060	99.678	3
0.000	99.678	0
0.040	99.718	2
0.000	99.718	0
0.020	99.738	1
0.000	99.738	0
0.040	99.778	2
0.000	99.778	0
0.000	99.778	0
0.000	99.778	0
0.000	99.778	0

Graph 5

36

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STATION 4 (continued)

0.000	99.778	0
0.000	99.778	0
0.060	99.839	3
0.000	99.839	0
0.000	99.839	0
0.020	99.859	1
0.000	99.859	0
0.000	99.859	0
0.000	99.859	0
0.081	99.940	4
0.000	99.940	0
0.000	99.940	0
0.000	99.940	0
0.000	99.940	0
0.000	99.940	0
0.040	99.980	2
0.020	100.000	1

REMAINING VALUES ARE ALL ZERO
NUMBER OF OBSERVATIONS = 4964 SUM = 38501 MEAN = 7.756 VAR = 45.122 SD = 6.717

TOTAL TRIPS OVER MAXP = 0
TOTAL TRIPS OVER 255 = 0
VOLUME TABLE NUMBER = 204
SKIM TREE NUMBER = 101

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STATION 5
FRANKENMUTH TRIP LENGTH FREQUENCY DISTRIBUTION BY STA 1 THRU 5

PAGE 6

	0	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	P.C.	CUM.	ACTUAL	
1.																						0.567	0.567	24	
2.																							23.010	23.577	974
3.																							57.146	60.723	2419
4.																							5.103	85.826	216
5.																							3.260	89.086	138
6.																							1.276	90.361	54
7.																							0.827	91.188	35
8.																							0.440	91.637	19
9.																							1.394	93.031	59
10.																							0.732	93.763	31
11.																							0.969	94.732	41
12.																							0.472	95.204	20
13.																							0.378	95.582	16
14.																							0.732	96.315	31
15.																							0.425	96.740	16
16.																							0.354	97.094	15
17.																							0.354	97.449	15
18.																							0.425	97.874	18
19.																							0.402	98.275	17
20.																							0.189	98.464	8
21.																							0.189	98.653	8
22.																							0.047	98.701	2
23.																							0.354	99.055	15
24.																							0.094	99.150	4
25.																							0.024	99.173	1
26.																							0.071	99.244	3
27.																							0.047	99.291	2
28.																							0.071	99.362	3
29.																							0.094	99.457	4
30.																							0.024	99.480	1
31.																							0.047	99.528	2
32.																							0.024	99.551	1
33.																							0.094	99.646	4
34.																							0.000	99.646	0
35.																							0.024	99.669	1
36.																							0.000	99.669	0
37.																							0.000	99.669	0
38.																							0.024	99.693	1
39.																							0.000	99.693	0
40.																							0.024	99.717	1
41.																							0.000	99.717	0
42.																							0.071	99.787	3
43.																							0.000	99.787	0
44.																							0.094	99.882	4
45.																							0.000	99.882	0
46.																							0.000	99.882	0
47.																							0.000	99.882	0
48.																							0.000	99.882	0
49.																							0.000	99.882	0
50.																							0.000	99.882	0
51.																							0.000	99.882	0
52.																							0.000	99.882	0
53.																							0.000	99.882	0
54.																							0.000	99.882	0
55.																							0.024	99.906	1
56.																							0.024	99.929	1
57.																							0.000	99.929	0
58.																							0.000	99.929	0
59.																							0.000	99.929	0
60.																							0.000	99.929	0

38

Graph 6

STATION 5 (continued)

62.	0.000	99.929	0
63.	0.000	99.929	0
64.	0.000	99.929	0
65.	0.000	99.929	0
66.	0.000	99.929	0
67.	0.000	99.929	0
68.	0.000	99.929	0
69.	0.000	99.929	0
70.	0.000	99.929	0
71.	0.000	99.929	0
72.	0.000	99.929	0
73.	0.000	99.929	0
74.	0.000	99.929	0
75.	0.000	99.929	0
76.	0.000	99.929	0
77.	0.000	99.929	0
78.	0.000	99.929	0
79.	0.071	100.000	3

REMAINING VALUES ARE ALL ZERO

NUMBER OF OBSERVATIONS= 4233

SUM= 17279.

MEAN= 4.082

VAR= 22.156

SD= 4.707

TOTAL TRIPS OVER MAXP = 0
 TOTAL TRIPS OVER 255 = 0
 VOLUME TABLE NUMBER = 205
 SKIM TREE NUMBER = 101

1975 FRANKENMUTH AREA TRAFFIC COUNTS

In conjunction with the O & D Study, traffic volume counts were taken from Monday, June 7, 1975 through Wednesday, June 9, 1975. Traffic volume counting station locations and traffic volume counts are shown on Tables 18 and 19. (See Map 2 to find intersections where traffic volume counts were taken).

1975 FRANKENMUTH AREA TRAFFIC COUNTS

STATION LOCATIONS

<u>STATION</u>	<u>LOCATION</u>
3602	M-83, 100' S. of Genesee St.
3601	M-83, 100' N. of Genesee St.
3603	E. Genesee St., 100' E of M-83 (Main St.)
3604	W. Genesee St., 100' W of M-83 (Main St.)
118	M-54/M-83, .1 mile E. of Dehmel Rd. (1.3 mile E. of I-75)
95	M-54, .2 mile S. of Jct M-54/M-83 (Birch Run Rd.)
119	M-83, .2 mile N of Jct M-54/M-83 (Birch Run Rd.)
335	Birch Run Road, E. of Jct. M-54/M-83 (Birch Run Twp.)
3613	M-83 (Main St.), 100' S of Jefferson St.
3607	M-83 (Main St.), 100' N of Jefferson St.
3614	Jefferson St., W of M-83
3608	Weiss/Jefferson St., Cutoff between Weiss & Jefferson
3610	M-83 (Main St.) 100' S of Tuscola St.
3600	M-83 (Main St.) 100' N of Tuscola St.
3611	W. Tuscola St., 100' SW of M-83 (Main St.)
3612	W. Tuscola St., 100' NE of M-83 (Main St.)
97	M-83, .1 S of King Road
571	M-83 (Gera), .1 mile S of Bradley Rd.
576	King Road, W of M-83
577	King Road, E of M-83

Table 12

1975 FRANKENMUTH AREA TRAFFIC VOLUME COUNT

<u>Bi-Directional</u>	<u>(N)</u>	<u>(S)</u>	<u>(E)</u>	<u>(W)</u>
3602 = 15,150	8600	6500		
3601 = 8,300	4400	3900		
3603 = 4,400			2600	1800
3604 = 9,500			4000	5500
118 = 5,300			2700	2600
95 = 2,600	1400	1200		
119 = 5,400	2700	n/c		
335 = 2,800			1500	1300
3613 = 4,700	1900	2800		
3607 = 10,600	5000	5600		
3614 = 1,800			X	X
3608 = 800	X	X		
3609 = 4,800			X	X
3610 = 17,500	X	X		
*3600 = *16-17000 7,600	X	X		
3611 = 2,100	NE	SW		
3612 = 2,600	NE	SW		
97 = 4,400	X	X		
571 = 5,000	X	X		
576 = 400			X	X
577 = 300			X	X

*Undercounting note by operator.

Table 13

FUTURE STUDY PLAN

The MDSH&T Region 7 Planning Unit in conjunction with the regional and local Frankenmuth area authorities, has undertaken the task of collecting material and data so a comprehensive area transportation plan can be developed. Part I of the Frankenmuth Area Transportation Plan consists of the 1975 Frankenmuth Origin and Destination Study.

Part II of the Frankenmuth Area Transportation Plan will include land use, population, highway capacity, and other related information and projections. This study will aid planning units in establishing priorities for future study needs.