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# MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

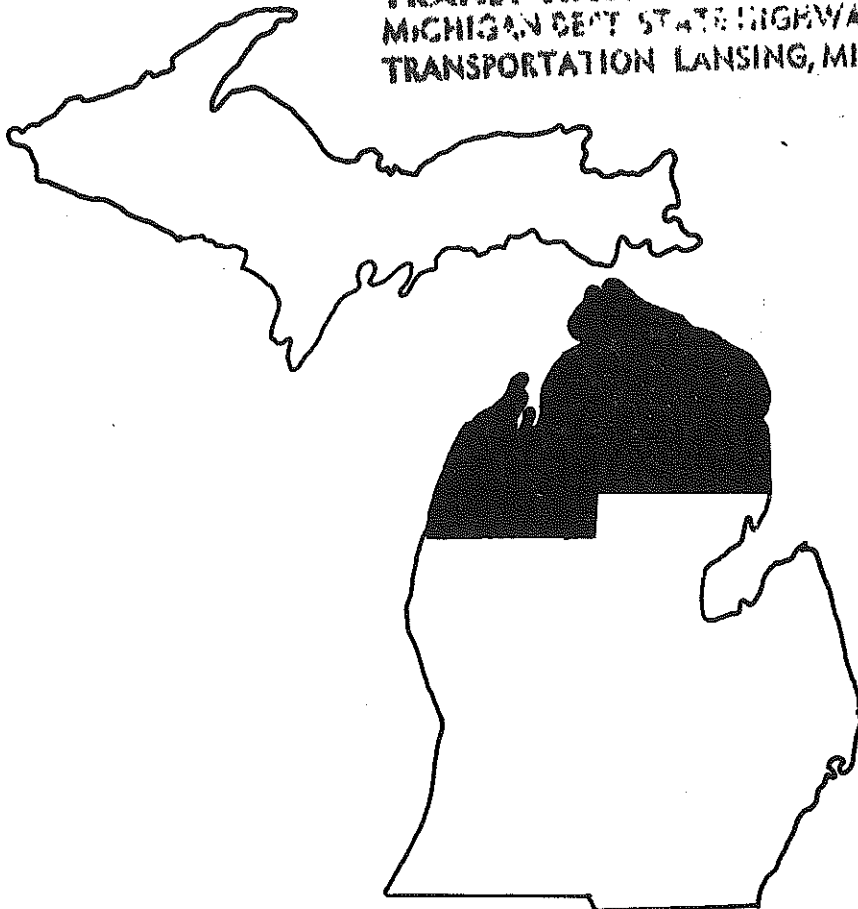
M-22 EXTERNAL  
ORIGIN-DESTINATION STUDY

LEELANAU COUNTY

- 1973 -

FACTUAL DATA REPORT

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MICHIGAN DEPARTMENT  
OF  
STATE HIGHWAYS AND TRANSPORTATION

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STATE OF MICHIGAN



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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

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 "M-22 External Origin-Destination Survey". The purpose of the origin-destination survey, conducted in 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 Region Planning Section.

Sincerely,

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

Keith E. Bushnell, Administrator  
Multi-Regional Planning Division



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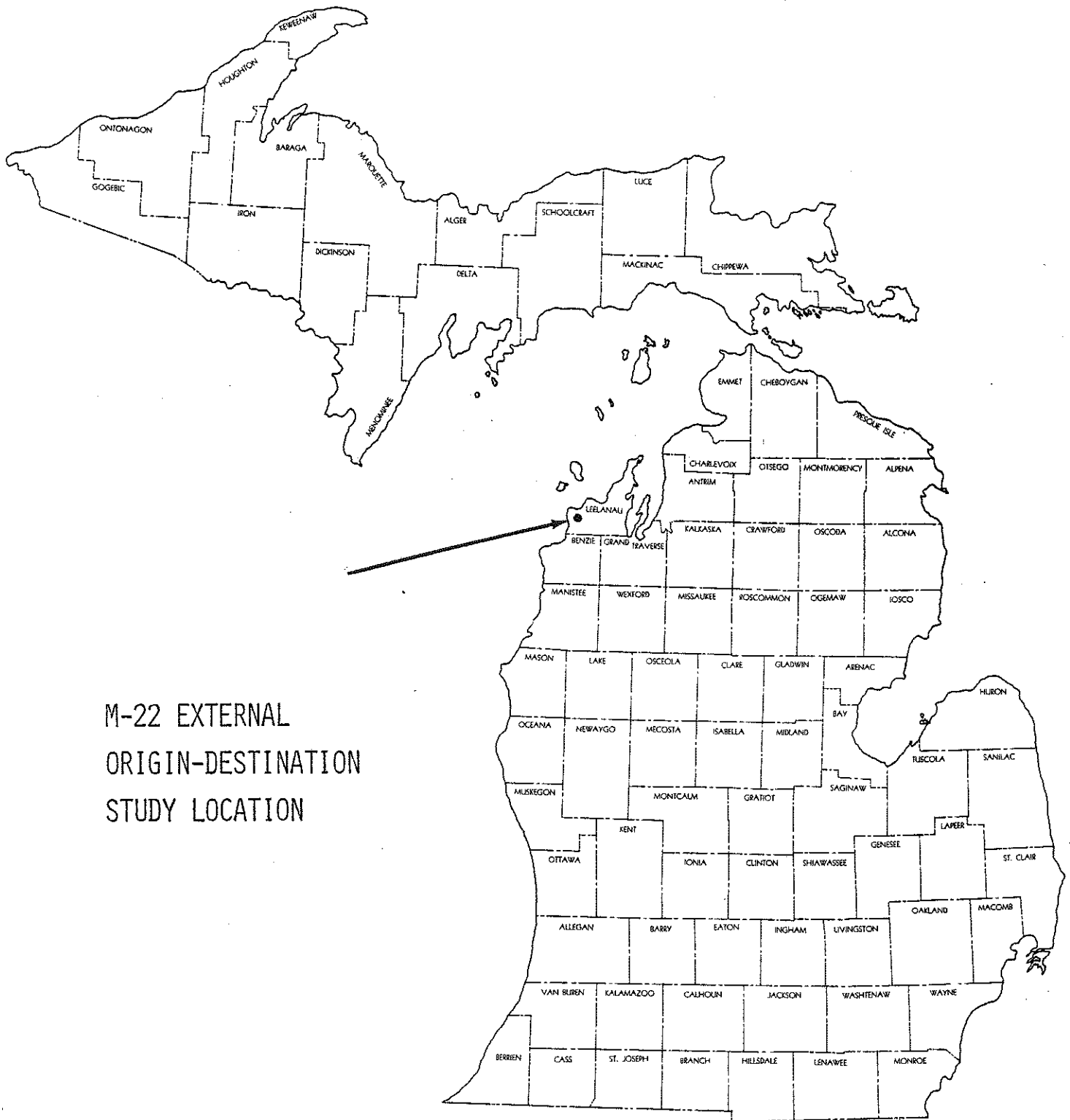
## STUDY AREA

Leelanau County is located in the northwest portion of lower Michigan approximately 260 miles from Detroit and about 160 miles from Grand Rapids.

The tourist trade is a major economic base of the area. Over 80% of the public recreation areas in the county are federal. The primary tourist attraction of the county is Sleeping Bear Dunes National Lakeshore. Major manufacturers in the county include Frigid Food Products Inc. in Sutton's Bay and Northport Cherry Factories in Northport.

Two major state trunk lines which service the area are M-22 and M-72, providing north-south and east-west access, respectively. Several smaller trunk lines exist in the area, i.e. M-109, M-201, M-204 and M-209.

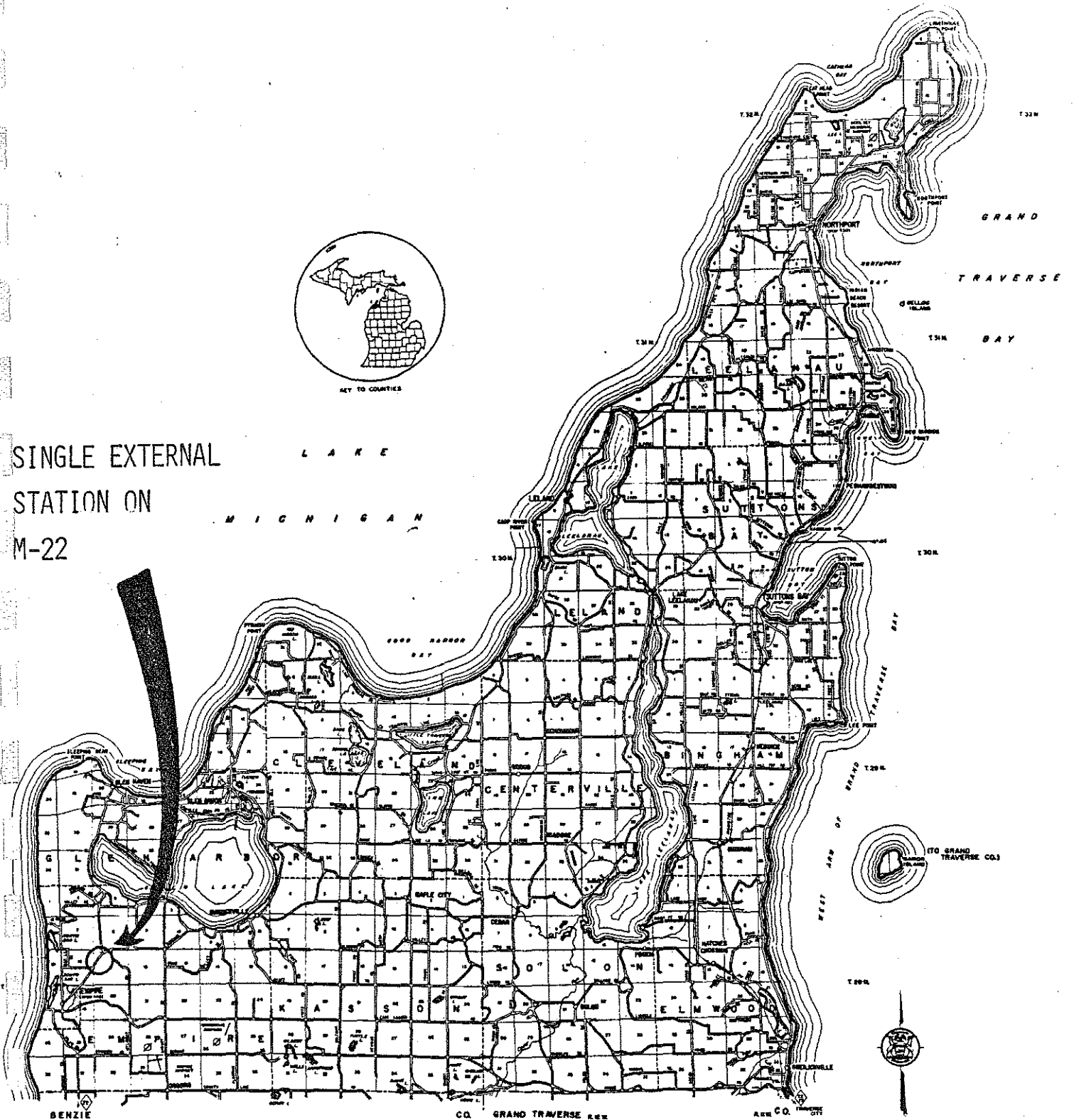
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M-22 EXTERNAL  
ORIGIN-DESTINATION  
STUDY LOCATION



SINGLE EXTERNAL  
STATION ON  
M-22



LEELANAU COUNTY

## TERMINOLOGY AND DEFINITIONS

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

Destination --- The place where a trip ends.

External Station --- A point on a route within the study area 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.

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 External O-D Study on M-22 in Leelanau County was conducted during August of 1973. The purpose of the study was to collect data on traffic movement into and out of Leelanau County via M-22.

A single interview station was established on M-22. Interview and classification counts were taken at the station. Classification counts were taken for twenty-four hours and interviews were conducted between the hours of 6 a.m. and 8 p.m.. Both inbound and outbound vehicles were recorded. During the hours of operation, vehicles were stopped and drivers interviewed regarding the origin, destination and purpose of the trip. Manual vehicle classification counts were taken in conjunction with interviews and during the remainder of that twenty-four hour day.

A sample copy of the interview form and the Manual Vehicle Classification count form are shown in the Appendix.

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## Single Station on M-22

This station is located on M-22, north of the Village of Empire and north of M-72. On an average August weekday in 1973, there were 2,535 vehicles recorded during classification counts which passed through this station. Tabulations on the following pages give a detailed documentation of this traffic.

Approximately 9 out of every 10 vehicles were autos and 7 out of every 100 vehicles were panel or pickup trucks.

The largest trip purpose was vacation with 1,081 trips or 43.1 percent of the 2,508 total trips obtained through the expanded interview count.\*

There were 1,057 trips or 42.2 percent of the 2,508 trips that had a trip length of 1-20 minutes. There were 1,786 trips (71.2) 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 8 states. There were two ends for each trip; an origin and a destination. There were 2,508 trips which passed through this station, accounting for 5,016 total trip ends.

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\*24 Hour 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. 24 motorcycles and 1 bus were counted during classification counts. (2) Due to the convention of certain computer programs, expanded counts may not correspond exactly with 24 hour classification counts.

There were 3,595 trip ends (71.7 percent) in Leelanau County. There were 35 trip ends (0.7 percent) in the Upper Peninsula. The Lower Peninsula accounted for 4,916 trip ends (98.0 percent). There were 65 origins and/or destinations (1.3 percent) outstate.

SINGLE STATION ON M-22.

<u>Vehicle Type</u>	<u>Vehicles</u>	<u>Percent of Total</u>
Passenger Car	2153	85.9
Passenger Car with Trailer	90	3.6
Panel or Pickup	166	6.6
Panel or Pickup with Trailer	6	0.2
Other Single Unit Trucks	88	3.5
Combinations and Trucks with Trailers	<u>5</u>	<u>0.2</u>
TOTAL	2508	100.0

<u>Trip Purpose</u>	<u>Vehicles</u>	<u>Percent of Total</u>
Work	266	10.6
Personal Business	137	5.5
Shopping	325	12.9
Vacation	1081	43.1
Other Soc. or Rec.	548	21.9
All Other	<u>151</u>	<u>6.0</u>
TOTAL	2508	100.0

SINGLE STATION ON M-22

TRIP LENGTHS

<u>Minutes</u>	<u>No. of Trips</u>	<u>Percent of Total</u>
1-20	1057	42.2
20-40	491	19.6
40-60	238	9.5
60-90	158	6.3
90-120	111	4.4
120-180	144	5.8
180-240	111	4.4
240-300	71	2.8
300-360	76	3.0
360-420	38	1.5
420-480	0	0.0
480-540	3	0.1
540-600	8	0.3
600-670	0	0.0
670-740	<u>2</u>	<u>0.1</u>
TOTAL	2508	100.0

Longest Trip = 12 Hr. 20 Min.      Average Trip Length = 73 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

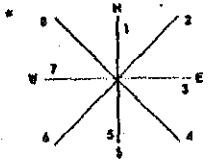
STA. LOCATION AND NUMBER

FORM NUMBER	4	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		

-12-

- 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 WITHOUT TRAILER (5)			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		42	43	44	45	46	47	48	49	50	51													
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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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**

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.		

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-axes 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.