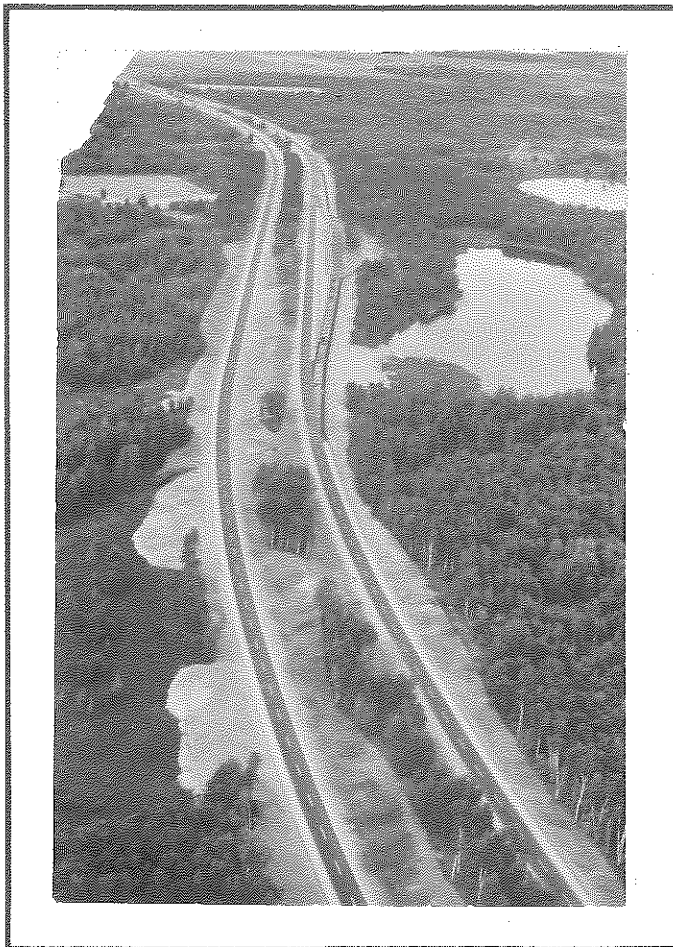


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1967 MICHIGAN REST AREA STUDY

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Prepared by:

TRANSPORTATION SURVEY & ANALYSIS SECTION
TRANSPORTATION PLANNING DIVISION
BUREAU OF ENGINEERING
MICHIGAN DEPARTMENT OF STATE HIGHWAYS

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REST AREA STUDY 1967

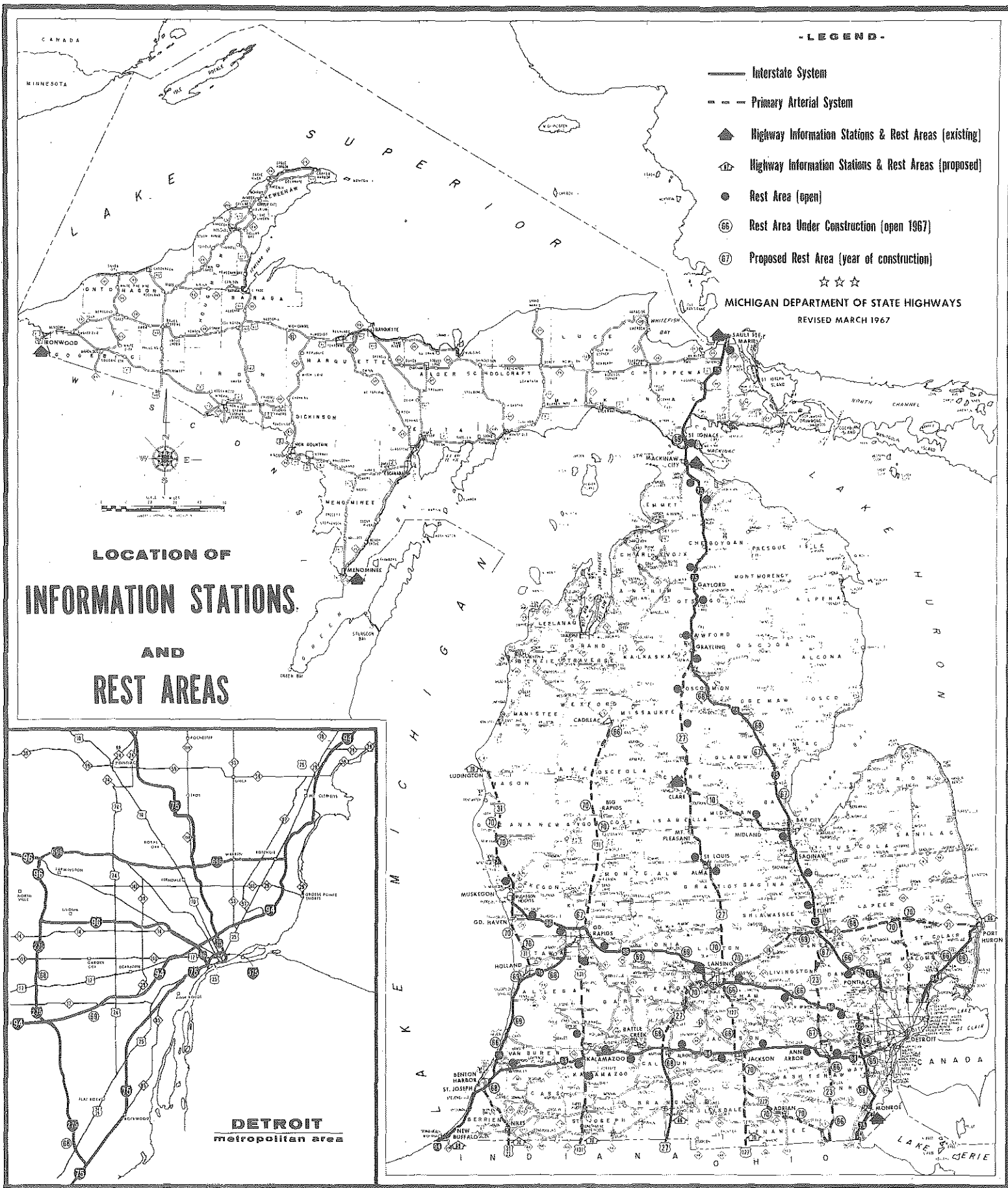
In the Fall of 1961, Michigan placed into operation three Rest Areas on the Interstate System. To best determine the extent and type of use these original Rest Areas were receiving, a Rest Area Use Study was conducted during 1961. The information obtained was used for future Rest Area planning and design.

By 1967, the Michigan Department of State Highways had opened 51 complete Rest Areas on the freeway system of which 21 were equipped with modern flush type toilet facilities. The ultimate long range Rest Area program calls for a total of 96 Rest Areas of which 66 will be provided with modern toilet facilities.

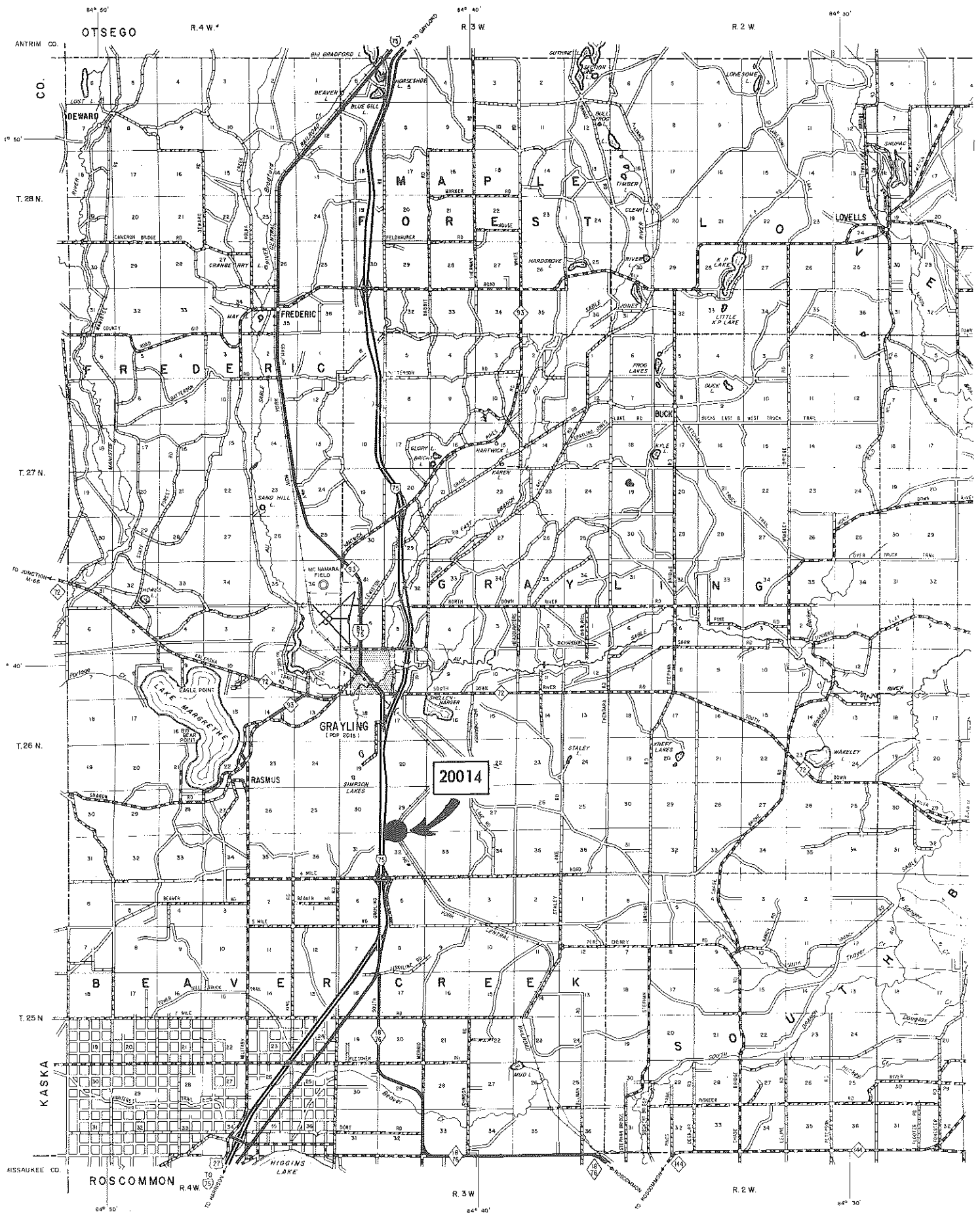
To better recognize the desires and demands of the traveling public using the Rest Areas, a follow up to the 1961 survey was conducted during the summer of 1967.

It is the intent of the Michigan Department of State Highways to continue to conduct periodic Rest Area Surveys to determine use changes which may occur as the Rest Area program approaches completion.

Every effort is being made to locate, design, and construct future Rest Areas as an integral part of a "complete highway system" offering economy, utility, safety, and beauty to the traveling public.



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SOUTH OF GRAYLING

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TRAFFIC VOLUMES BY DAY			
	From: 8/2/67		To: 8/9
	Expressway	Rest Area	%
SUNDAY	7,607	883	11.6
MONDAY	7,286	751	10.3
TUESDAY	5,815	655	11.3
WEDNESDAY	5,569	593	10.6
THURSDAY	5,964	609	10.2
FRIDAY	10,909	937	8.6
SATURDAY	13,020	1,368	10.5
TOTAL	56,170	5,776	10.3

HOURLY DISTRIBUTION

% Entering R.A.		% Entering R.A.	
12 PM-1	13.4	12 N-1	10.5
1-2	15.2	1-2	10.7
2-3	12.6	2-3	9.7
3-4	16.1	3-4	10.8
4-5	12.2	4-5	9.5
5-6	12.7	5-6	8.7
6-7	10.3	6-7	6.0
7-8	10.0	7-8	6.8
8-9	11.0	8-9	8.2
9-10	10.3	9-10	9.0
10-11	11.0	10-11	7.9
11-12	13.2	11-12	10.2

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF- STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	1948	256	15	1.4	1.4	0.1
2	48	6	15	1.3	0.3	0.0
3	38	12	21	2.5	1.8	0.1
6	13	6	16	1.3	1.0	0.3
7	177	48	20	2.0	2.0	0.3

CARDS REJECTED

TOTALS	2224	334	16	1.5	1.5	0.1
--------	------	-----	----	-----	-----	-----

Average Persons Per
Vehicle: 3.32

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	1
Washing Facilities Required	21
More Rest Areas Needed	6
Flush Toilets Required	13
Rest Area Satisfactory	87
Rest Area Good	24
Refreshments Required	6
Facilities Unsatisfactory	2
No Comment	25
Larger Rest Rooms Required	6

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC VOLUMES AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.97
Tuesday	.90
Wednesday	.93
Thursday	.87
Friday	.92
Saturday	.94
Sunday	.97

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .88

Out-Of-State Vehicles

36 out-of-state vehicles stopped at the rest area during the 4-hour study.

The average length-of-stay in the rest area of these vehicles was 19 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 16 minutes.

Rest Room Usage by Sex

157 males out of a total of 263 used the rest rooms, giving a male's percentage usage of 59.7.

144 females out of a total of 258 used the rest rooms, giving a female's percentage usage of 55.8.

31 children under 5 years of age entered the rest area.

Sheet 1 of 2 Date 8/2-8/9 19 67

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	1 NB														
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.							
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9							
TIME															
12-1 A.M.		42	88	271	129	59	58	57							
1-2		46	67	179	80	37	41	38							
2-3		35	50	175	91	48	29	32							
3-4		40	45	172	76	32	32	31							
4-5		45	67	139	57	48	32	37							
5-6		52	68	157	55	62	49	50							
6-7		108	118	233	74	106	72	91							
7-8		144	199	426	129	169	171	147							
8-9		217	242	570	257	307	263	204							
9-10		357	366	890	410	397	444	344							
10-11		571	539	1184	644	601	539	531							
11-12		464	567	1231	735	774	555	529							
12-1 P.M.		460	628	1112	724	728	504	492							
1-2		486	592	1055	725	750	517	507							
2-3		426	640	1093	646	698	536	495							
3-4	417	415	712	872	563	606	472								
4-5	325	418	738	748	506	483	366								
5-6	316	368	770	594	437	396	293								
6-7	221	314	702	500	367	292	221								
7-8	210	266	855	414	283	244	236								
8-9	168	219	900	346	242	161	137								
9-10	132	225	780	251	164	118	102								
10-11	109	147	735	232	137	98	80								
11-12	86	99	441	176	76	72	66								
TOTAL	1984	5964	10909	13020	7607	7286	5815	3585							
		.9322	Road 8658	.9200	.9390	.9663	.9732	.9036							

Sta. No.	Direction	Type	Width (ft.)	Route	Location	C.S. No.
1	NB	Bit.	26	I-78	South of Grayling	

1
-
9

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village
or Twp. _____ County Crawford

Sheet 2 of 2 Date 8/2-8/9 19 67

Location I-75 - Rest Area (South of Grayling)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	2 NB																			
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.												
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9												
TIME																				
12-1A.M.		17	16	26	11	8	8	8												
1-2		6	7	28	7	7	6	13												
2-3		6	2	19	15	7	4	5												
3-4		3	12	18	4	4	9	19												
4-5		2	6	24	7	6	0	7												
5-6		8	7	19	4	18	8	8												
6-7		2	3	41	12	8	9	8												
7-8		7	15	37	16	16	37	11												
8-9		20	25	81	37	31	21	13												
9-10		29	31	111	45	37	43	34												
10-11		48	54	140	76	71	74	48												
11-12		75	70	149	105	94	84	62												
12-1P.M.		55	60	102	106	88	70	65												
1-2		50	60	100	86	88	48	64												
2-3		54	70	85	70	68	41	50												
3-4	39	63	72	76	66	60	64													
4-5	33	44	63	81	50	42	28													
5-6	23	26	55	55	59	28	29													
6-7	12	11	48	25	26	21	13													
7-8	17	15	60	29	19	20	11													
8-9	15	27	63	32	16	15	10													
9-10	20	14	46	38	18	2	22													
10-11	9	10	53	17	16	9	8													
11-12	10	17	39	15	12	3	8													
TOTAL	178	609	937	1348	883	751	655	415												

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	N Bd.	Bit.	18	I-75 Ramp	Entrance to Rest Area - South of Grayling	

NOTES ON CHARACTERISTICS OF REST AREA
SOUTH OF GRAYLING

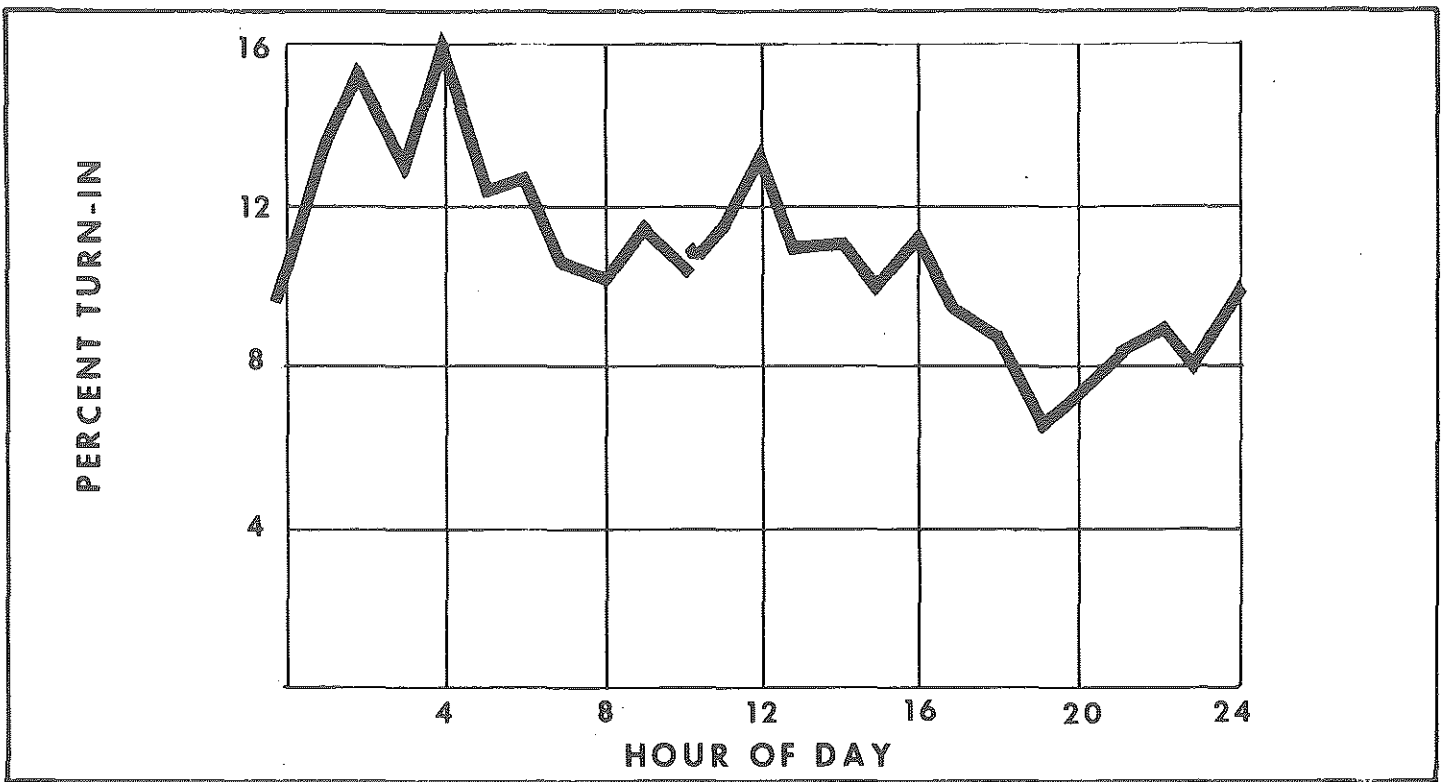
This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are seventy-four parking spaces for cars as well as twenty-four separate truck spaces. Likewise, twenty picnic tables and 5 separate cooking facilities can be found. As an added convenience, general tourist information is available. This rest area is about 6 acres in size.

This rest area has a reasonably constant percentage turn-in by day of the week, except for Friday when a lower percentage turn-in is encountered. The expressway volume increased on Friday and Saturday although percentage turn-in usually increases as expressway volume decreases. The reason for the somewhat abnormal pattern of usage of this rest area was that the type of traffic was very largely recreational.

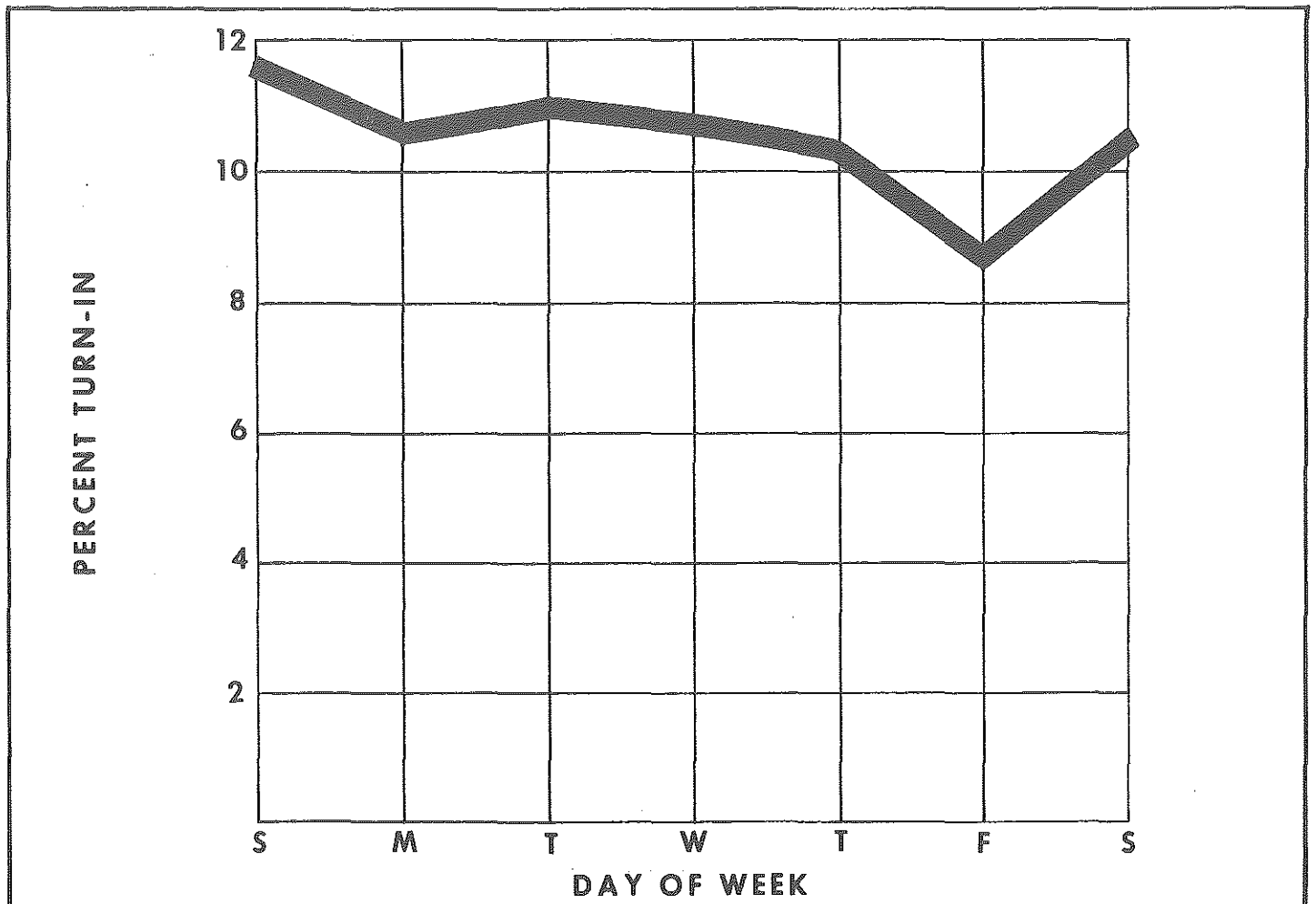
The correlation between daily expressway volume and daily turn-in is reasonably high.

The average length-of-stay of out-of-state vehicles is slightly longer than the average length-of-stay of all vehicles.

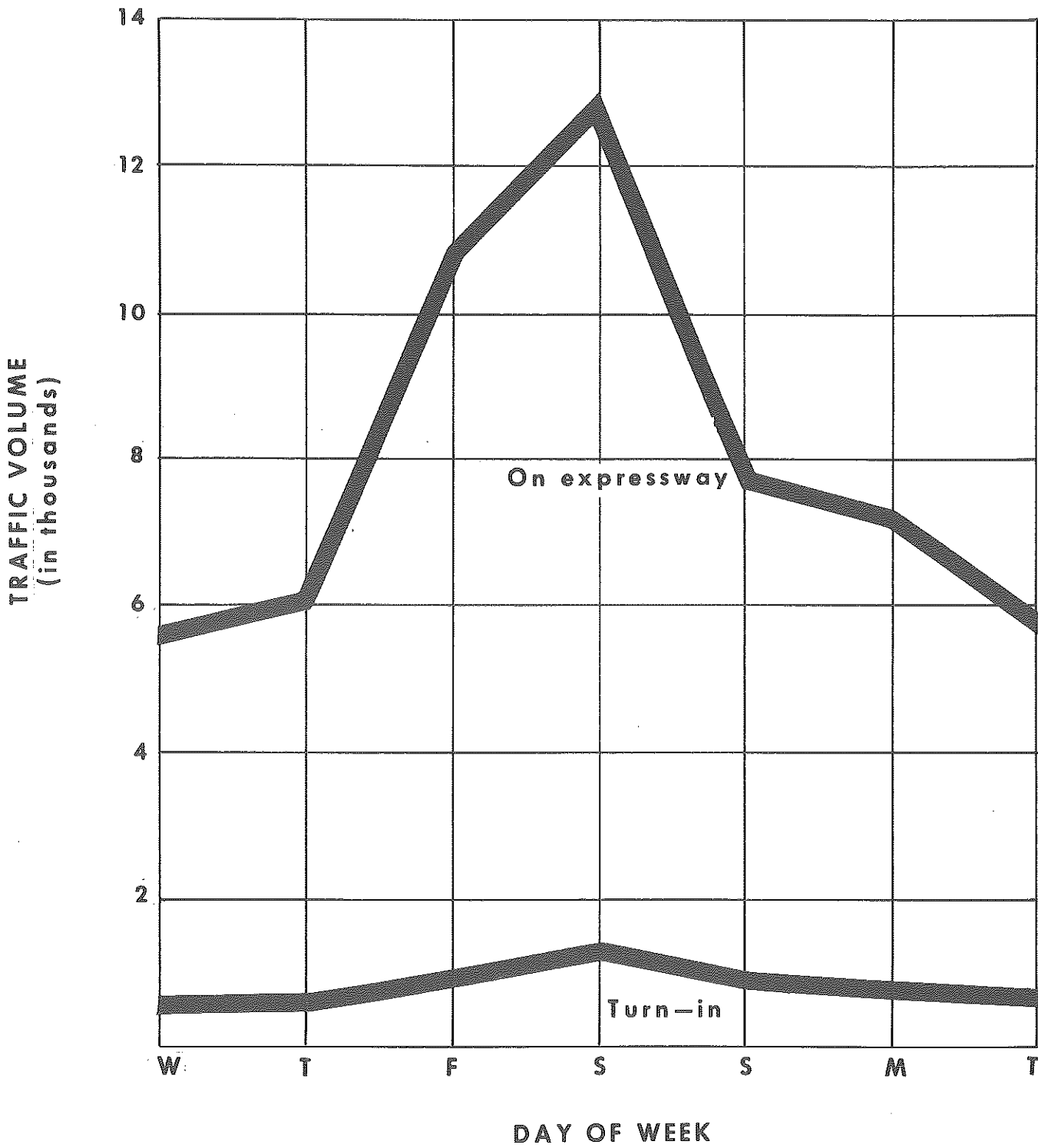
The rest area visitors are distributed equally between males and females.



Graph I

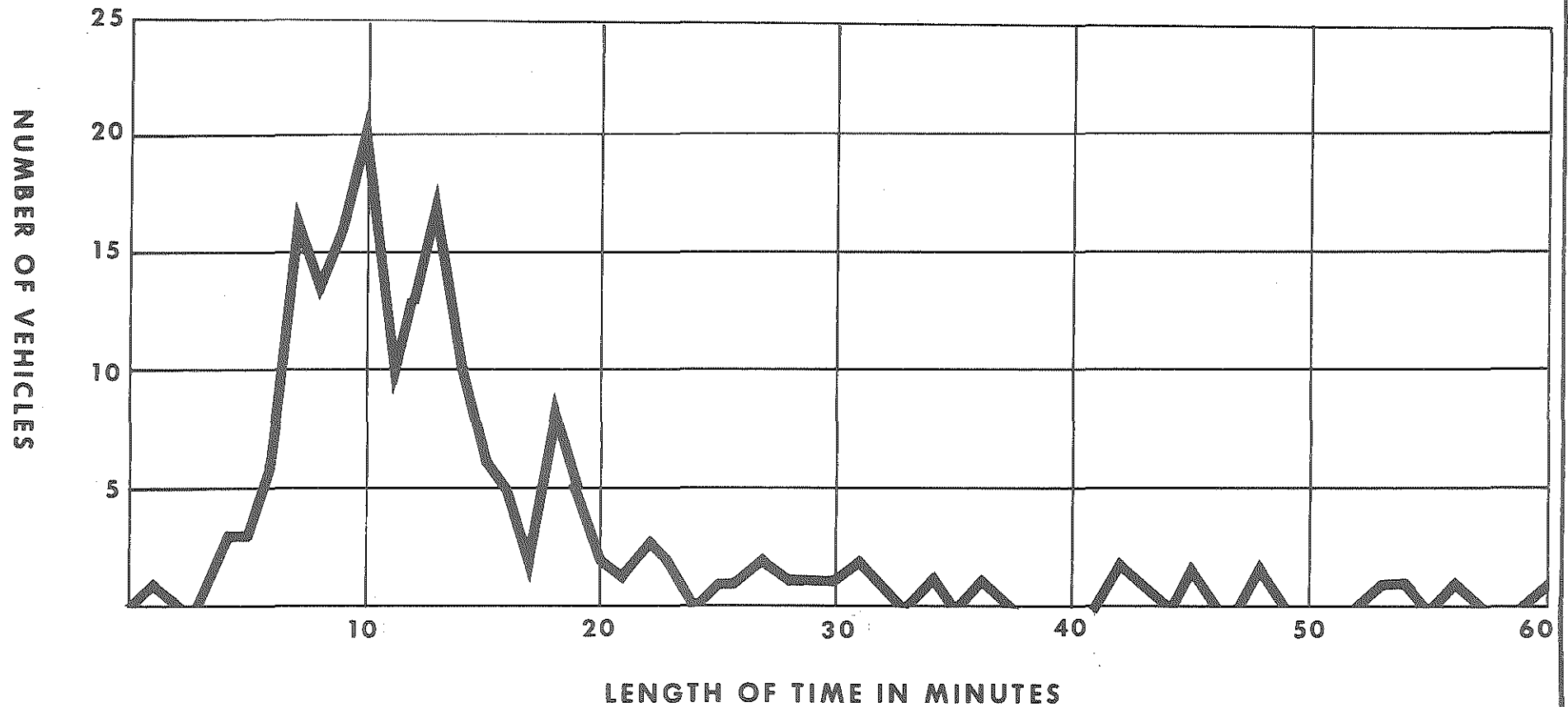


Graph II



Graph III

DISTRIBUTION OF LENGTH OF STAY



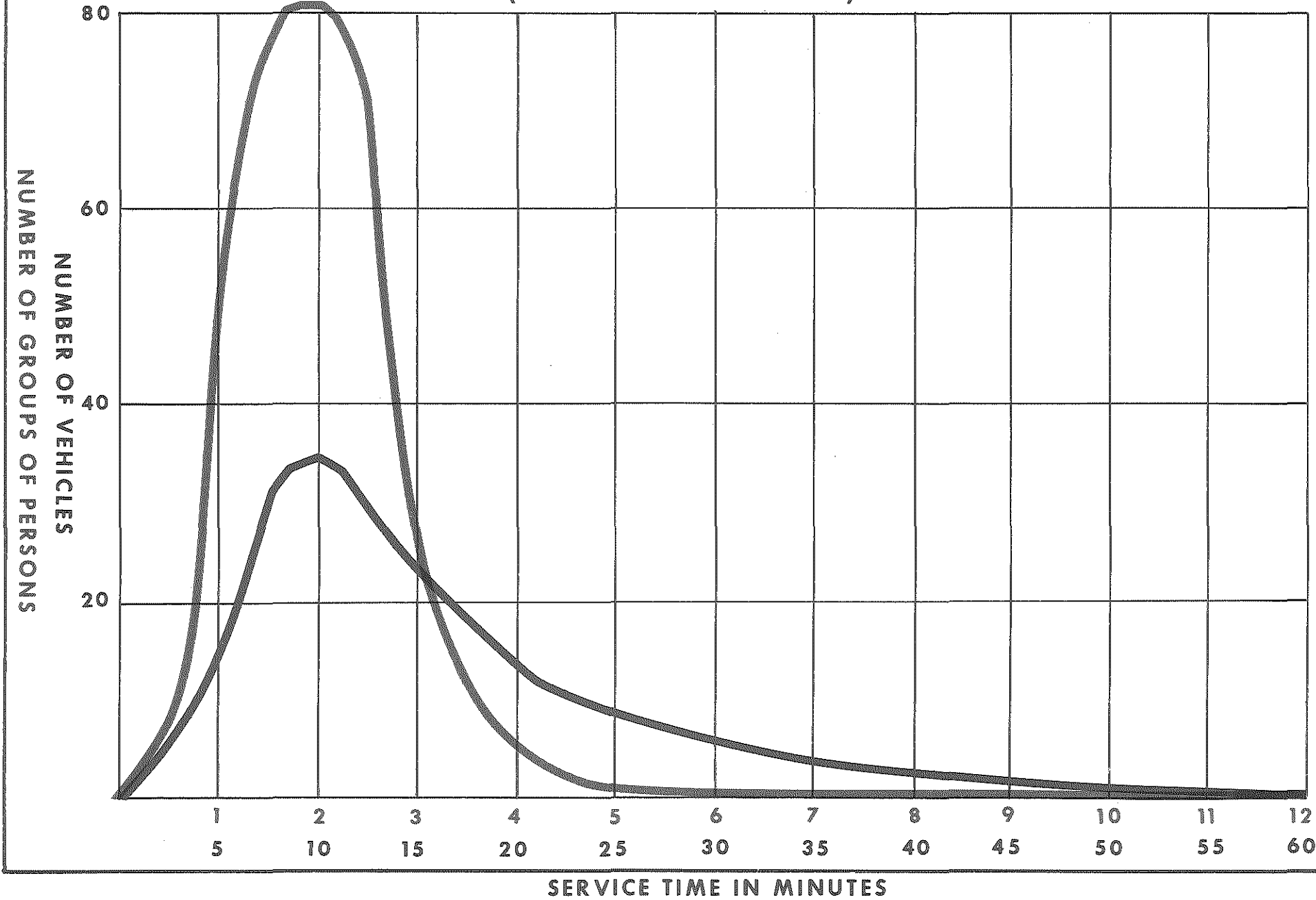
SERVICE TIME DISTRIBUTIONS

(Person-Groups in rest rooms)

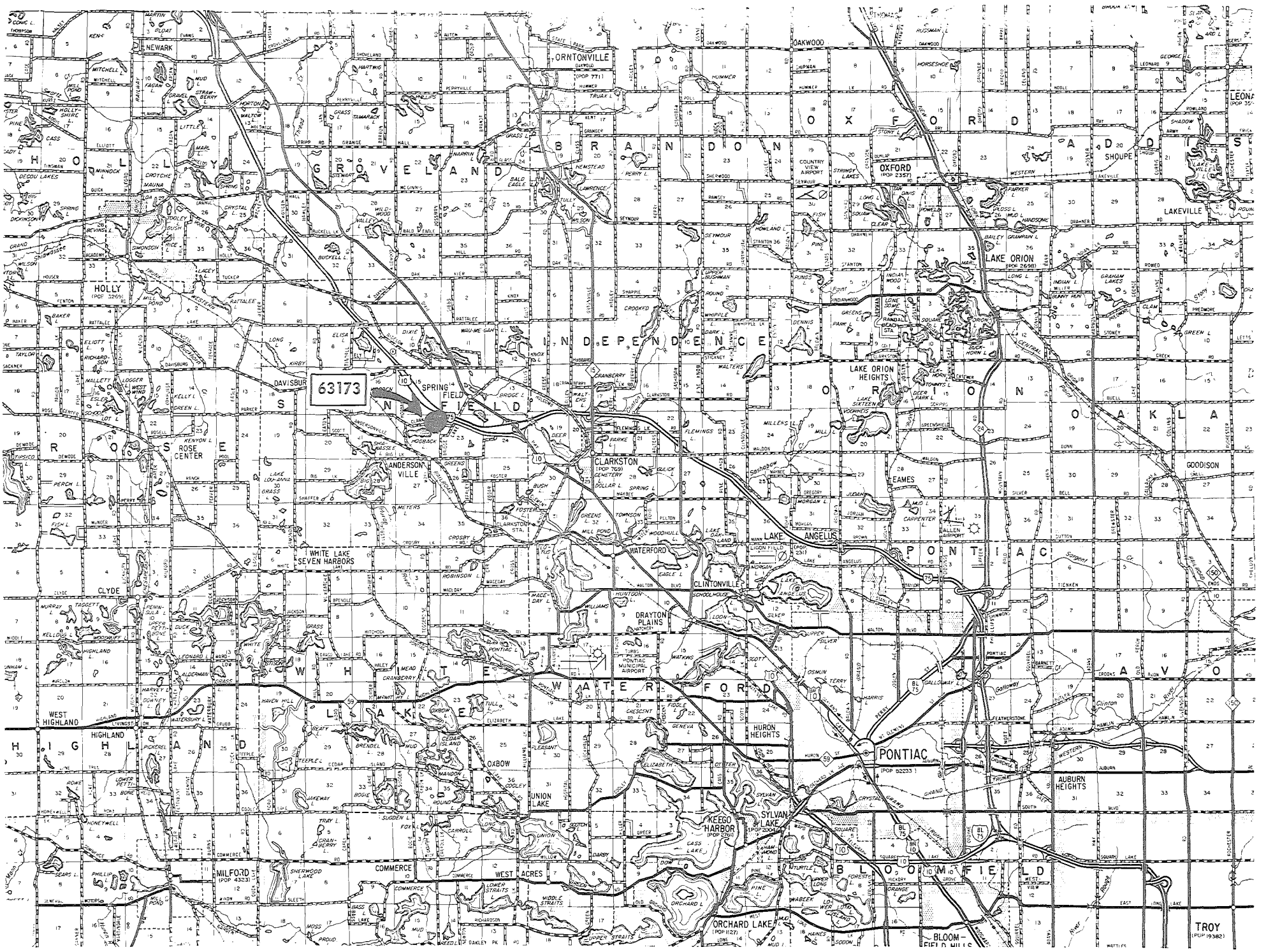
(Vehicles in rest area)

REST ROOM USAGE TIME

CAR PARKING TIME







63173

TROY (POP 19,982)

PONTIAC (POP 82,233)

ORCHARD LAKE (POP 112)

MILFORD (POP 43,331)

CLARKSTON (POP 700)

LAKE ORION (POP 26,840)

LAKE ORION HEIGHTS

INDEPENDENCE

SPRINGFIELD

HOLLY (POP 32,000)

ORRONTONVILLE (POP 771)

OXFORD (POP 23,571)

LEONARD (POP 350)

LAKEVILLE

GOODISON

AVO

AUBURN HEIGHTS

BLOOMFIELD (POP 11,211)

BLOOMFIELD (POP 11,211)

14

NORTH OF CLARKSTON

(6 3 1 7 3)

TRAFFIC VOLUMES BY DAY				From: 8/3/67	To: 8/8
	Expressway	Rest Area	%		
SUNDAY	16,877	1,041	6.2		
MONDAY	11,762	727	6.2		
TUESDAY	5,970	396	6.6		
WEDNESDAY	-----	---	---		
THURSDAY (3P-12P)	4,465	263	5.9		
FRIDAY	9,836	708	7.2		
SATURDAY	10,343	622	6.0		
TOTAL	59,253	3,757	6.3		

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	7.8	12 N-1	7.4
1-2	7.6	1-2	6.8
2-3	6.4	2-3	7.2
3-4	9.3	3-4	6.5
4-5	14.3	4-5	8.4
5-6	5.4	5-6	5.8
6-7	3.7	6-7	5.3
7-8	3.4	7-8	6.1
8-9	3.9	8-9	5.2
9-10	7.8	9-10	4.3
10-11	6.4	10-11	3.8
11-12	6.4	11-12	7.1

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	1341	56	11	1.2	0.8	0.3
2	158	32	17	1.0	0.0	0.0
7	36	3	6	1.6	1.3	0.0
CARDS REJECTED		3				
TOTALS	1535	94	13	1.1	0.5	0.2
				Average Persons Per Vehicle: <u>1.84</u>		

LIBRARY
 michigan department of
 state highways
 LANSING

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	0
Washing Facilities Required	4
More Rest Areas Needed	9
Flush Toilets Required	8
Rest Area Satisfactory	30
Rest Area Good	22
Refreshments Required	5
Facilities Unsatisfactory	0
No Comment	20
Larger Rest Rooms Required	3

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
 VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.83
Tuesday	.69
Wednesday	
Thursday	.89
Friday	.81
Saturday	.90
Sunday	.97

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .99

Out-Of-State Vehicles

10 out-of-state vehicles stopped at the rest area during the 4-hour study.

The average length-of-stay in the rest area of these vehicles was 7 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 13 minutes.

Rest Room Usage by Sex

66 males out of a total of 113 used the rest rooms, giving a male's percentage usage of 58.4.

38 females out of a total of 51 used the rest rooms, giving a female's percentage usage of 66.7.

10 children under 5 years of age entered the rest area.

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village _____
or Twp. _____ County Oakland

Sheet 1 of 1 Date 9-1 19 67

Location I-75 Rest Area

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

(North of Clarkston)

STATION NO.	1 SB	2 SB													
DAY	Fri.	Fri.													
DATE	9-1	9-1													
TIME															
12-1 A.M.															
1-2															
2-3															
3-4															
4-5															
5-6															
6-7															
7-8															
8-9															
9-10															
10-11	269	34													
11-12	319	36													
12-1 P.M.	312	40													
1-2	351	49													
2-3															
3-4															
4-5															
5-6															
6-7															
7-8															
8-9															
9-10															
10-11															
11-12															
TOTAL	1257	159													

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	S Bd.	conc	36	I-75	N. of Clarkston	
2	S Bd.	Conc	16	I-75 Ramp	Entrance to Rest Area -- North of Clarkston	

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village _____
or Twp. _____ County Oakland

Sheet 1 of 1 Date 7/26-7/27 19 67

Location I-75 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(North of Clarkston)

STATION NO.	1 SB			2 SB (Ramp)										
DAY	Wed.	Thurs.		Wed.	Thurs.									
DATE	7-26	7-27		7-26	7-27									
TIME														
12-1 A.M.		101			5									
1-2		56			1									
2-3		38			1									
3-4		36			7									
4-5		49			1									
5-6		168			8									
6-7		305			14									
7-8		361			12									
8-9	234	304		20	19									
9-10	280	298		16	30									
10-11	319	284		29	14									
11-12	337	436		42	41									
12-1 P.M.	400	493		36	41									
1-2	465	540		48	51									
2-3	595	627		41	48									
3-4	641			78	48									
4-5	677			49										
5-6	661			33										
6-7	563			30										
7-8	427			18										
8-9	322			17										
9-10	228			14										
10-11	143			10										
11-12	112			9										
TOTAL	6404	4096		490	341									

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Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	S Bd	Conc	36	I-75	North of Clarkston	
2	S Bd	Conc	15	I-75 Ramp	Entrance to Rest Area -- North of Clarkston	

NOTES ON CHARACTERISTICS OF REST AREA
NORTH OF CLARKSTON

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are fifty parking spaces for cars as well as twenty separate truck spaces. Likewise, twenty picnic tables and 5 separate cooking facilities can be found. As an added convenience, tourist information is available. This rest area is located in a high and natural wooded area with a lovely view to the South and West.

Also, this rest area has a low percentage turn-in. The reason for this is that the traffic consists mainly of business or commercial vehicles, the rest area being located in an urban area. The percentage turn-in by day of week is fairly constant, being only slightly higher on Friday.

The hourly percentage turn-in reaches a peak around 4 AM and another at about 4 PM, but there is no wide variation over the twenty-four hours.

The average number of persons per vehicle is low reflecting the fact that the traffic does not consist of many vehicles on social, recreational trips.

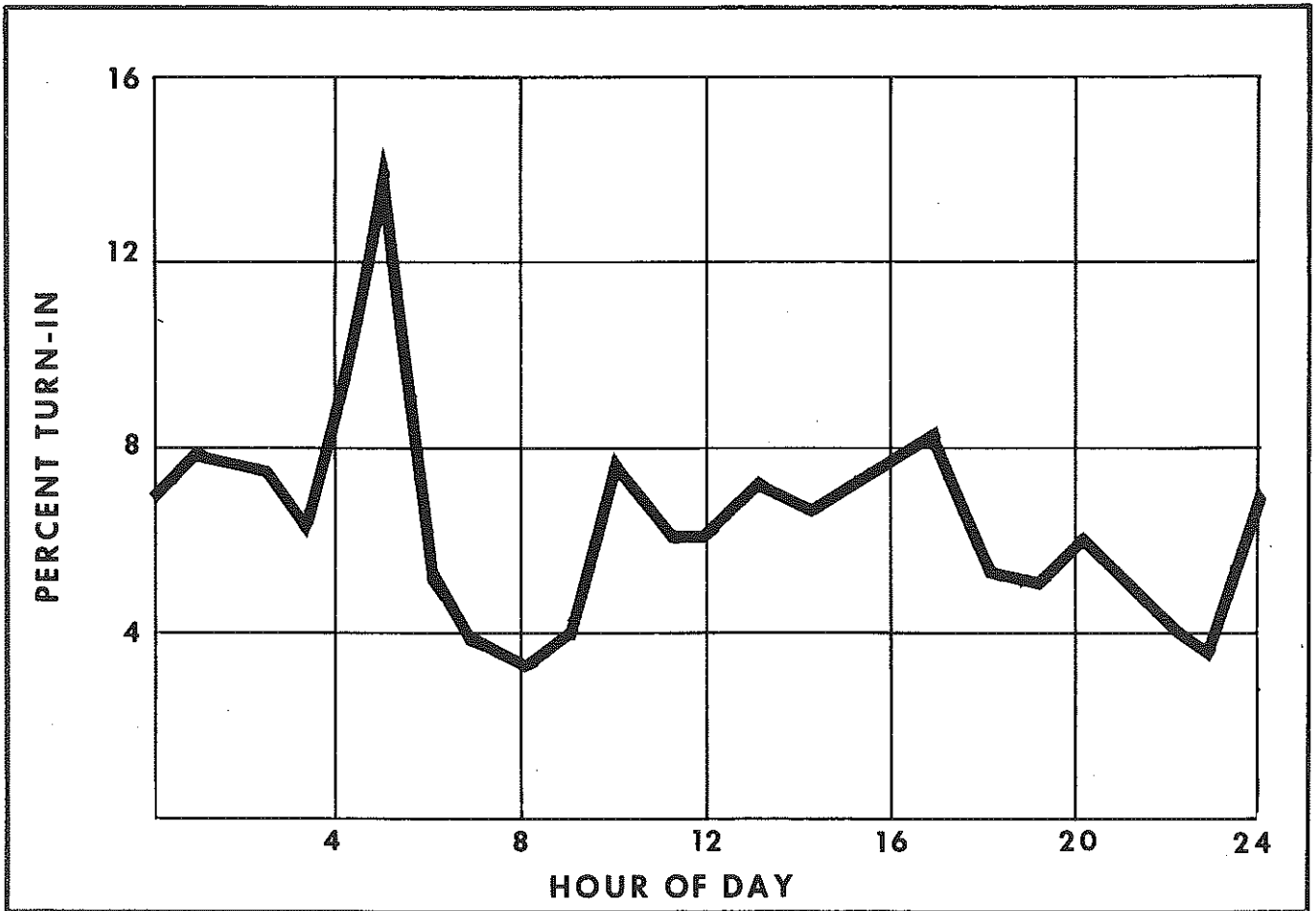
The correlation between expressway volume and volume turn-in by day of week is reasonably high especially at the weekend.

The correlation between total traffic per day and daily total entering rest area is extremely high.

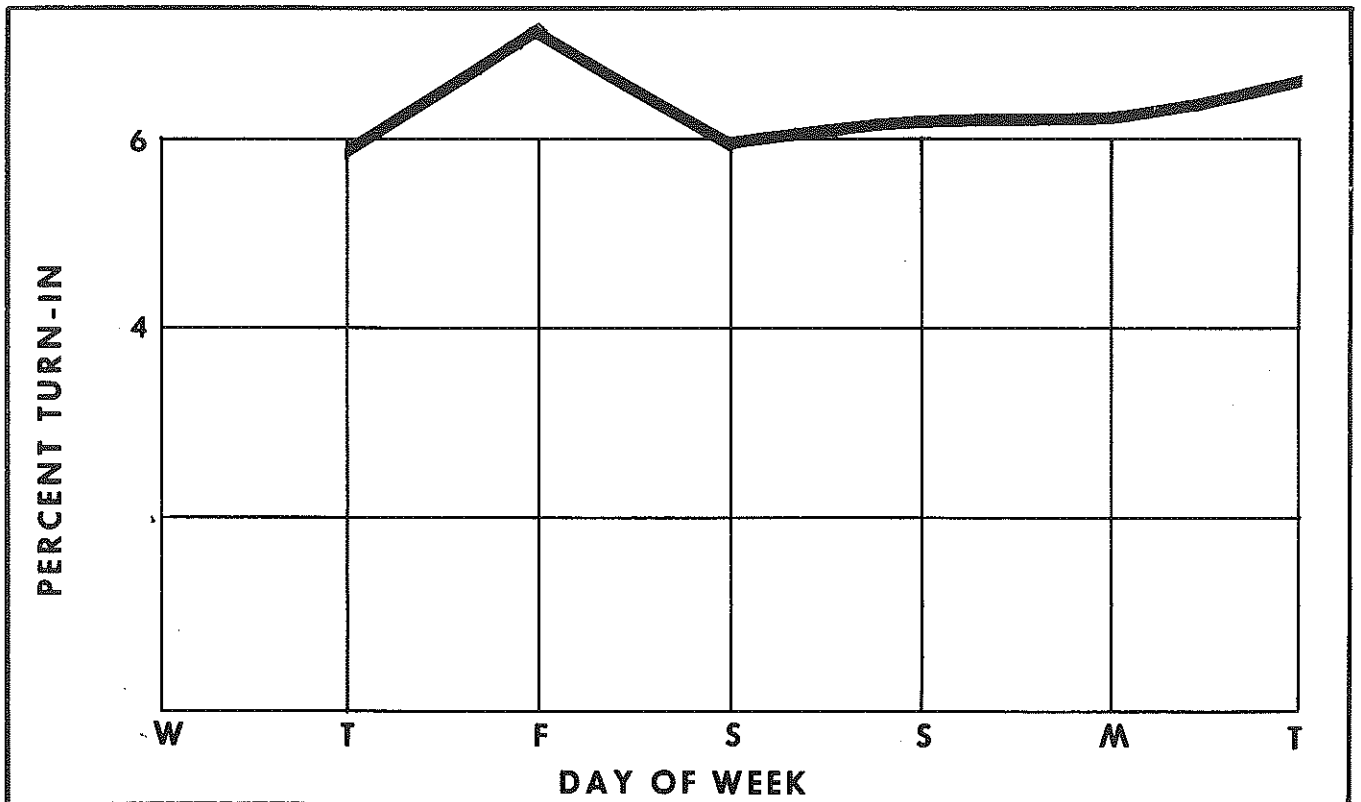
Only ten out-of-state vehicles stopped at the rest area during the 4-hour study. The average length-of-stay of these vehicles was considerably less than that of the overall average length-of-stay. However, with such a small number of out-of-state vehicles, this figure is not very reliable.

Percentage rest room usage is high, particularly for females.

The comments concerning the rest area were favorable with only a few persons requiring flush toilets or an increase in the number of rest areas.

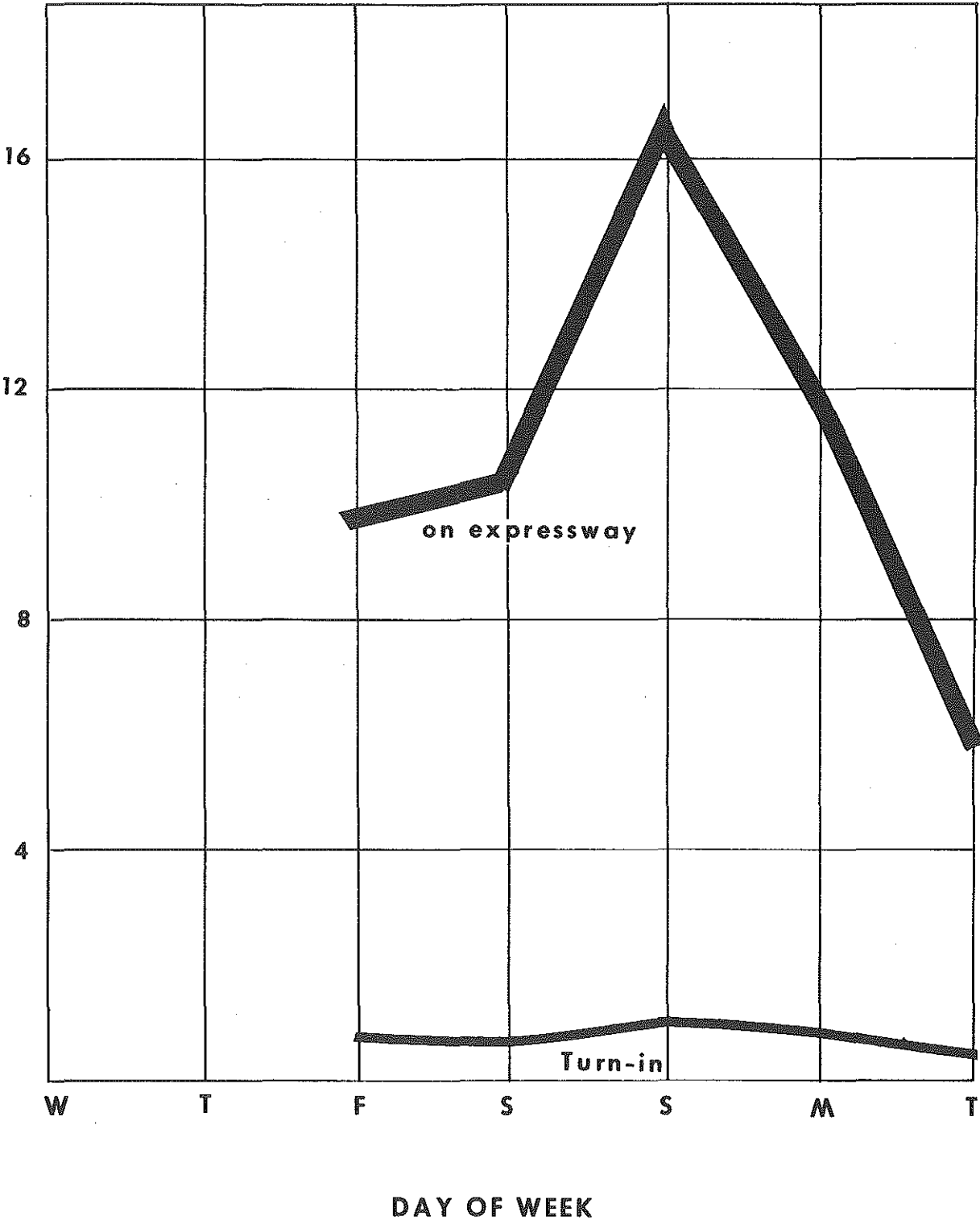


Graph I



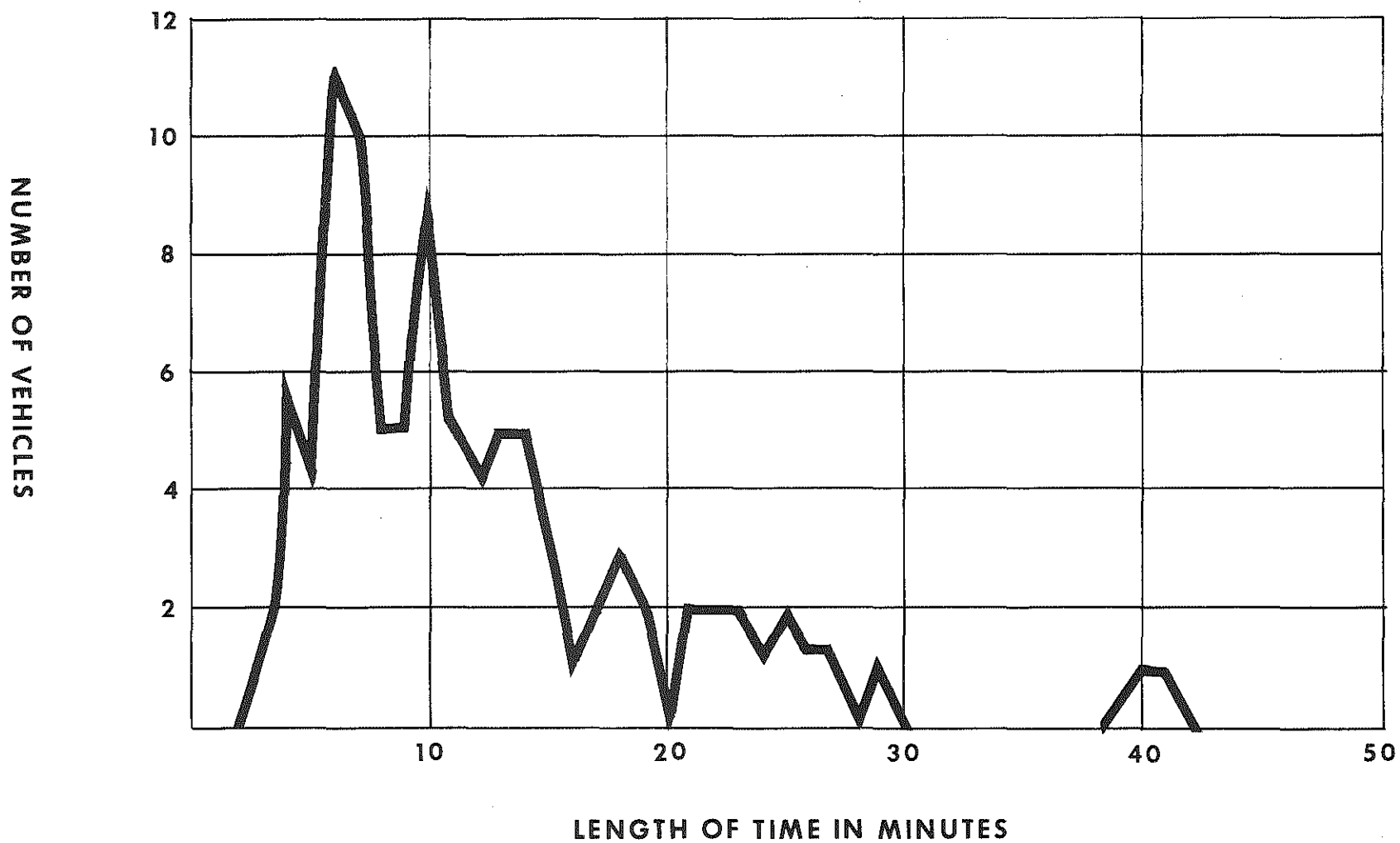
Graph II

TRAFFIC VOLUME (in thousands)



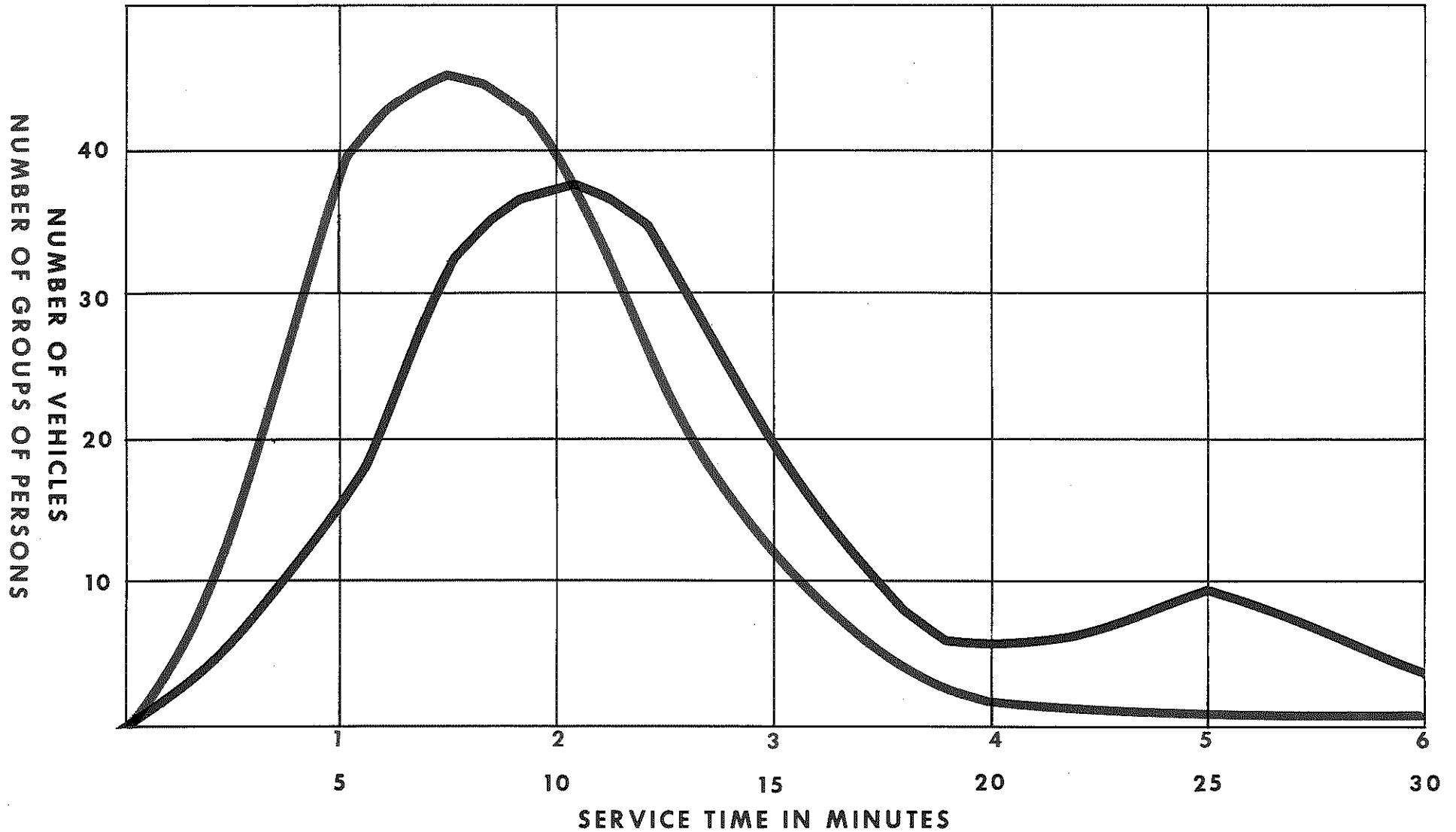
Graph III

DISTRIBUTION OF LENGTH OF STAY



SERVICE TIME DISTRIBUTIONS
(Person—Groups in rest rooms)
(Vehicles in rest area)

REST ROOM USAGE TIME
CAR PARKING TIME



WEST OF JACKSON

(3 8 1 0 1)

TRAFFIC VOLUMES BY DAY		From: 8/3/67 To: 8/10	
	Expressway	Rest Area	%
SUNDAY	11,587	894	8.5
MONDAY	10,448	925	8.9
TUESDAY	9,903	844	8.5
WEDNESDAY	10,244	860	8.4
THURSDAY	5,690	651	11.4
(Except 6P-12P)			
FRIDAY	8,298	701	8.4
(Except 12P-11A)			
SATURDAY	11,302	1,055	9.3
TOTAL	67,472	6,020	8.9

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	9.9	12 N-1	11.6
1-2	11.8	1-2	10.7
2-3	10.3	2-3	8.7
3-4	8.8	3-4	10.2
4-5	10.1	4-5	8.4
5-6	9.4	5-6	7.8
6-7	6.8	6-7	6.8
7-8	6.4	7-8	7.0
8-9	7.2	8-9	7.1
9-10	6.6	9-10	6.7
10-11	8.5	10-11	7.9
11-12	10.7	11-12	10.2

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	2835	168	13	1.4	1.6	0.3
2	75	5	11	1.6	1.2	0.0
3	35	3	42	2.0	2.6	0.0
4	4	1	9	1.0	0.0	0.0
6	1	1	32	4.0	5.0	4.0
7	108	8	18	2.3	1.5	0.1

CARDS REJECTED

TOTALS	3058	186	13	1.6	1.6	0.3
--------	------	-----	----	-----	-----	-----

Average Persons Per
Vehicle: 3.57

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	11
Washing Facilities Required	28
More Rest Areas Needed	24
Flush Toilets Required	26
Rest Area Satisfactory	74
Rest Area Good	23
Refreshments Required	14
Facilities Unsatisfactory	14
No Comment	26
Larger Rest Rooms Required	12

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC VOLUME
AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.88
Tuesday	.87
Wednesday	.69
Thursday	.40
Friday	.32
Saturday	.85
Sunday	.95

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .88

Out-of-State Vehicles

41 out-of-state vehicles stopped at the rest area during the 3-hour study.

The average length-of-stay in the rest area of these vehicles was 11 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 13 minutes.

Rest Room Usage by Sex

96 males out of a total of 300 used the rest rooms, giving a male's percentage usage of 32.0.

85 females out of a total of 309 used the rest rooms, giving a female's percentage usage of 27.5.

57 children under 5 years of age entered the rest area.

Sheet 1 of 2 Date 8/3-8/10 19 67

Location I-94 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(West of Jackson)

STATION NO.	1 EB																	
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.										
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10										
TIME																		
12-1A.M.		207	307	172	271	215	121	244										
1-2		203	178	195	223	163	184	199										
2-3		208	185	129	184	223	182	189										
3-4		207	145	102	151	166	158	234										
4-5		255	183	68	205	201	257	208										
5-6		276	149	79	231	258	229	283										
6-7		337	224	120	384	338	371	408										
7-8		481	336	163	471	385	481	440										
8-9	468	417	471	218	438	467	577	481										
9-10	463	558	565	343	478	478	503	465										
10-11	579	580	717	482	550	554	582	590										
11-12	563	643	765	626	628	587	541	511										
12-1P.M.	453	595	759	623	594	580	479											
1-2	458	601	721	541	560	527	549											
2-3	605	688	777	642	648	632	615											
3-4	627	745	750	746	755	659	617											
4-5	665	852	706	827	721	712	659											
5-6	677	814	784	959	721	539	706											
6-7	542	743	680	1028	562	485	569											
7-8	450	647	513	1062	427	448	455											
8-9	396	597	434	899	391	356	402											
9-10	317	515	397	695	348	376	331											
10-11	322	450	319	481	280	331	349											
11-12	214	408	237	387	227	223	216											
TOTAL	7799	12027	11302	11587	10448	9903	10224	4252										

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Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	E Bd	Conc	24	I-94	West of Jackson	

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village
or Twp. _____ County Jackson

Sheet 2 of 2 Date 8/3-8/10 19 67

Location I-94 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(West of Jackson)

STATION NO.	2 EB																	
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.										
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10										
TIME																		
12-1 A.M.			26	20	27	23	25	20										
1-2			28	22	22	9	25	29										
2-3			20	14	31	9	14	25										
3-4			13	4	5	15	24	23										
4-5			16	11	20	18	22	26										
5-6			22	7	18	11	26	31										
6-7			17	7	39	18	18	26										
7-8			21	20	25	28	27	25										
8-9	25		34	15	34	50	31	35										
9-10	22		27	37	44	34	24	32										
10-11	50	*	55	39	50	52	45	42										
11-12	64	59	89	62	71	66	57	59										
12-1 P.M.	60	59	120	59	72	50	53											
1-2	68	55	75	50	52	66	59											
2-3	61	50	70	48	61	46	65											
3-4	48	94	80	69	74	58	78											
4-5	36	74	81	75	64	56	46											
5-6	12	91	62	92	64	44	42											
6-7	*	45	46	86	35	31	35											
7-8		49	36	67	21	41	35											
8-9		36	36	64	23	25	35											
9-10		40	25	39	21	23	30											
10-11		25	29	36	30	39	16											
11-12		24	27	41	22	32	28											
TOTAL	446	701	1055	984	925	844	860	373										

Sta. No.	Direction	Road Type	Width (ft.)	Route	Location	C.S. No.
2	E Bd	B.T.	16	I-94 Ramp	Entrance to Rest Area	
					* Hose up.	

- 33 -

NOTES ON CHARACTERISTICS OF REST AREA
WEST OF JACKSON

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are seventy parking spaces for cars as well as twenty separate truck spaces. Likewise, twenty-four picnic tables and 4 separate cooking facilities can be found. As an added convenience, tourist information is available.

The percentage of expressway traffic which turns into the rest area is constant by day of the week. (Thursday's figures will give a high percentage since the hours from 6 PM to 12 PM were not tabulated and these hours have a lower than average percentage turn-in.)

The hourly percentage turn-in is also reasonably constant. This is explained by the high volume of traffic on the expressway, even during the night - this part of the expressway being used by a large percentage of commercial vehicles.

The fact that the vehicle occupancy is high is accounted for by the fact that the survey was carried out from 4 PM to 7 PM on a Sunday.

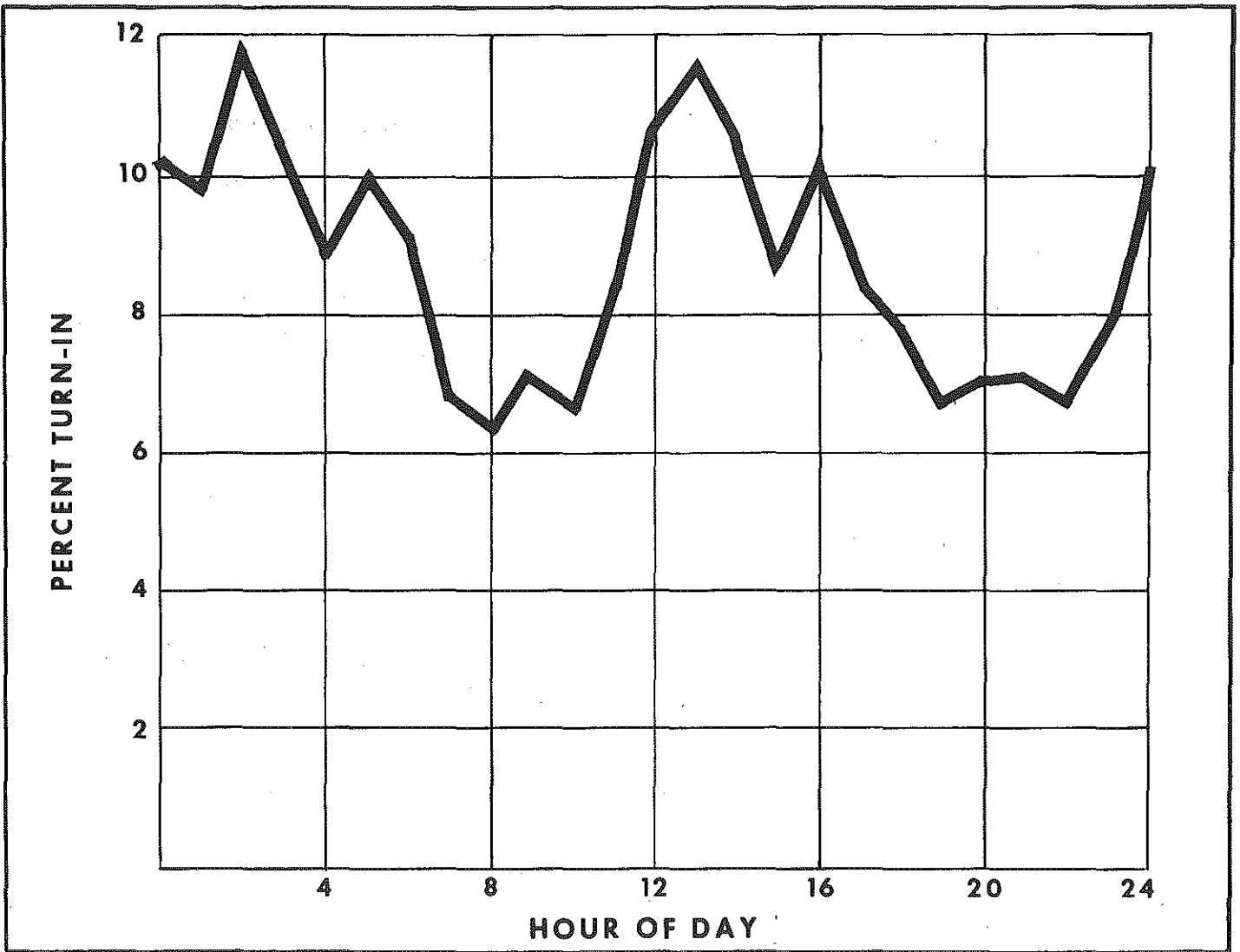
Almost exactly fifty percent of the visitors were male.

The correlation between expressway volume and volume turn-in by hour of the day is reasonably good except for Thursday and Friday. This is mainly due to the fact that traffic counts for the whole twenty-four hours were not available for these two days.

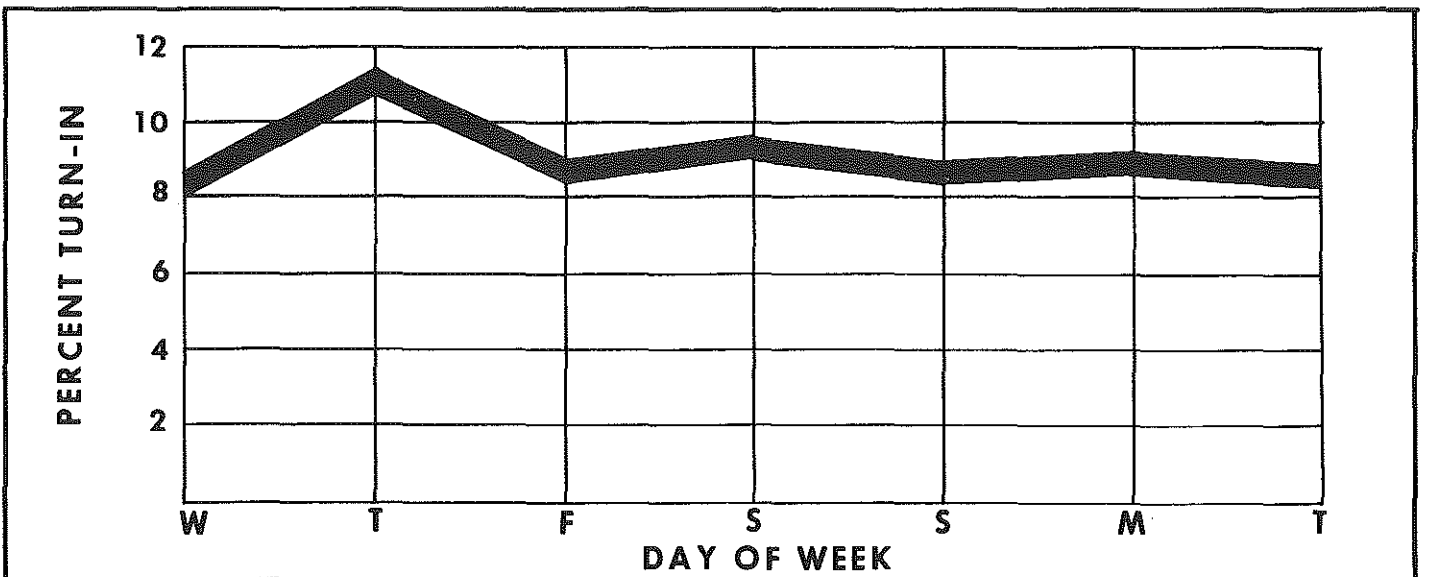
The correlation between daily expressway volumes and daily turn-in is meaningless without more complete counts.

The rest room usage is low. This is because we have high vehicle occupancy and also a large number of vehicles using the rest area. The large number of children under 5 years old indicates that the traffic was largely recreational, tying in with the high vehicle occupancy.

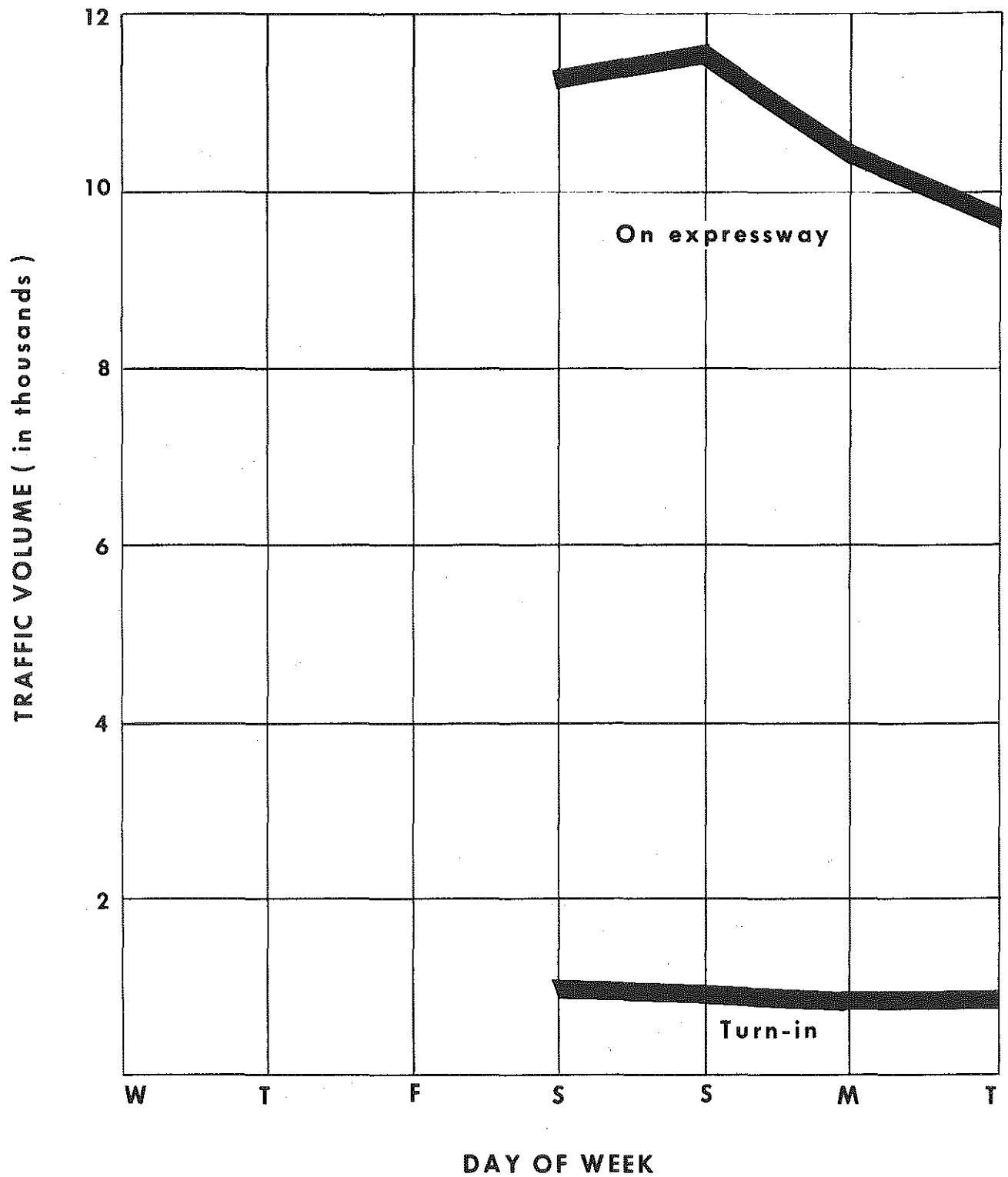
A significant number of persons using the rest area were dissatisfied with the condition of the rest rooms, many of them requiring flush toilets. This would also, in part, account for the low percentage usage of the rest room facilities.



Graph I

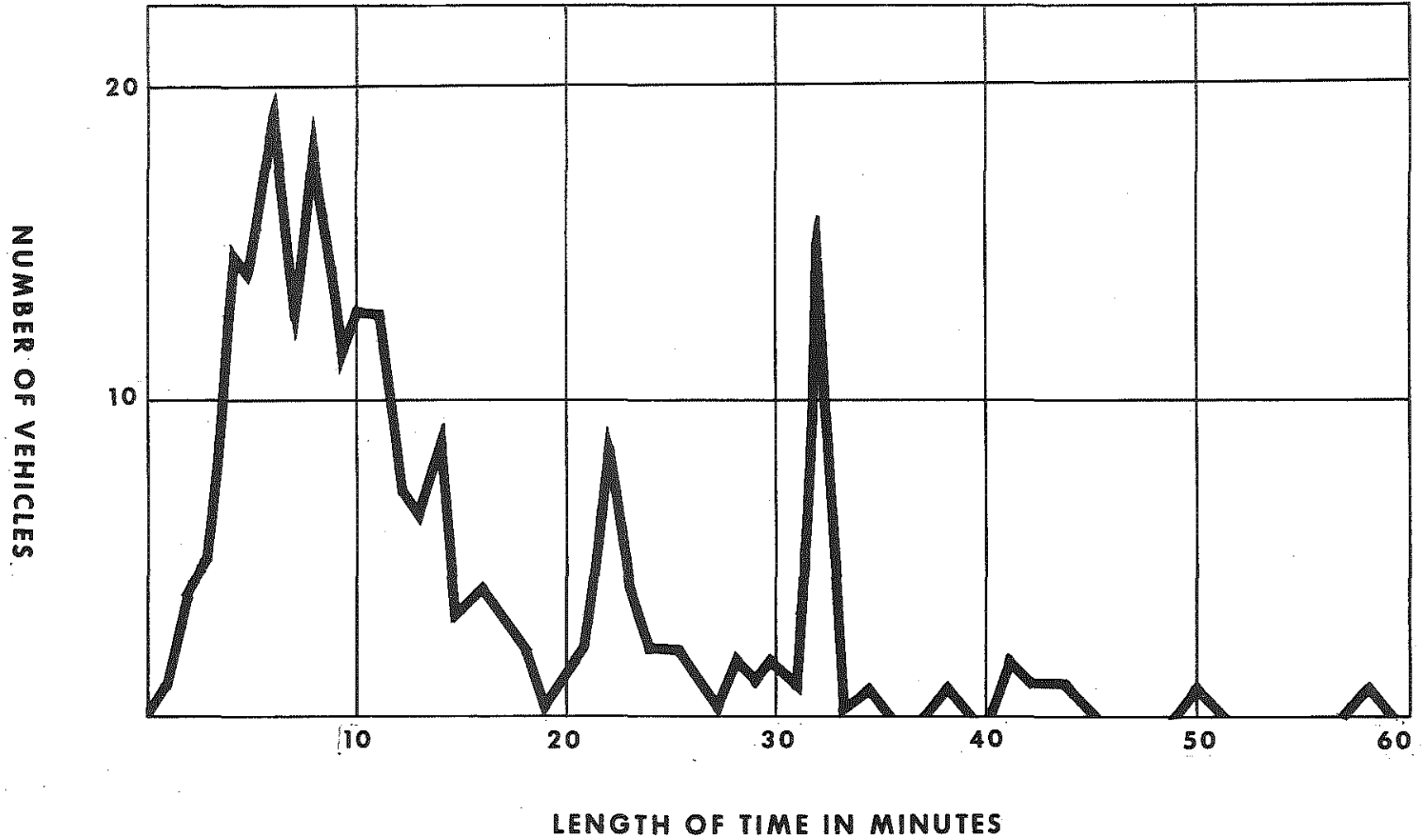


Graph II



Graph III

DISTRIBUTION OF LENGTH OF STAY



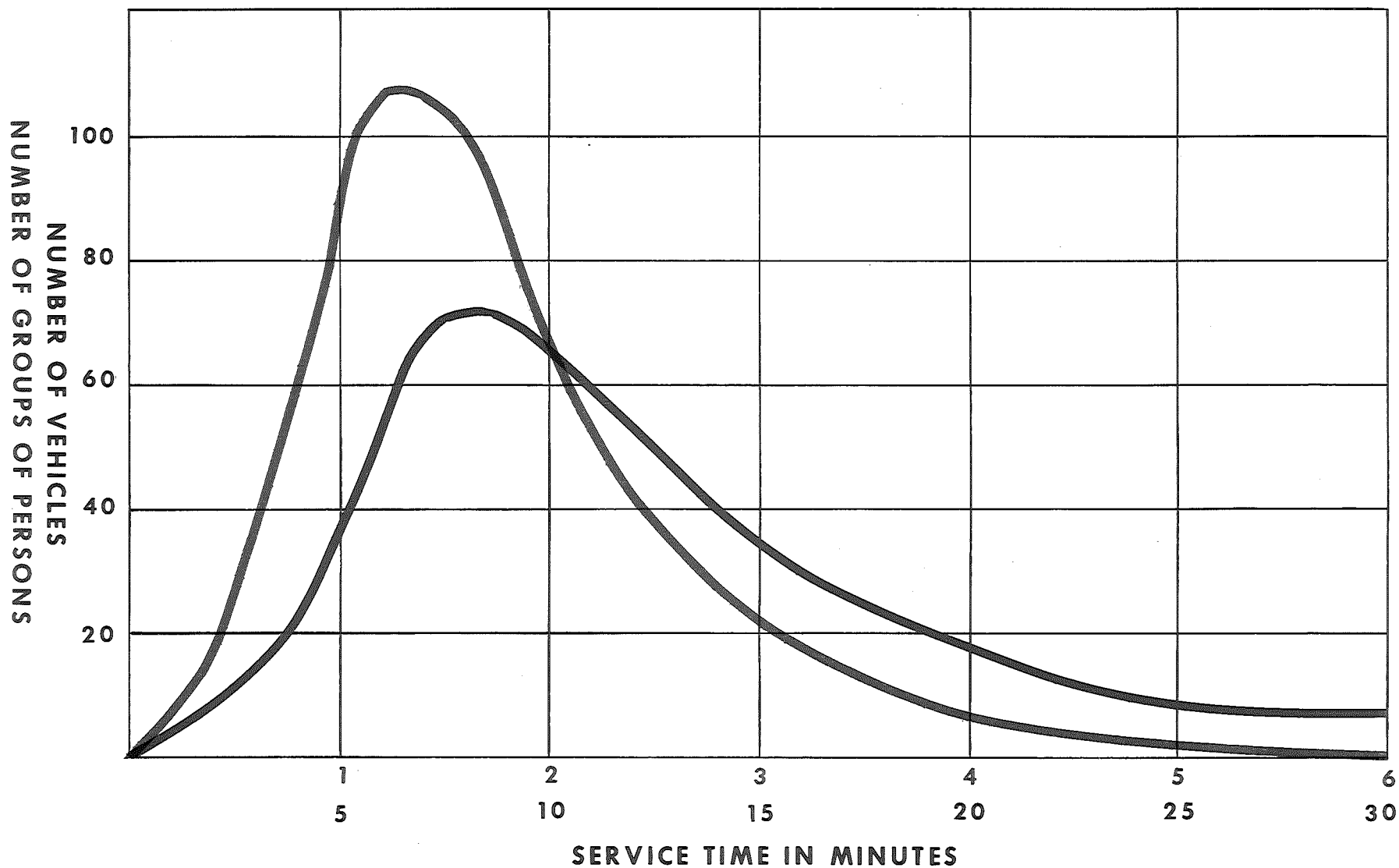
SERVICE TIME DISTRIBUTIONS

(Person—Groups in rest rooms)

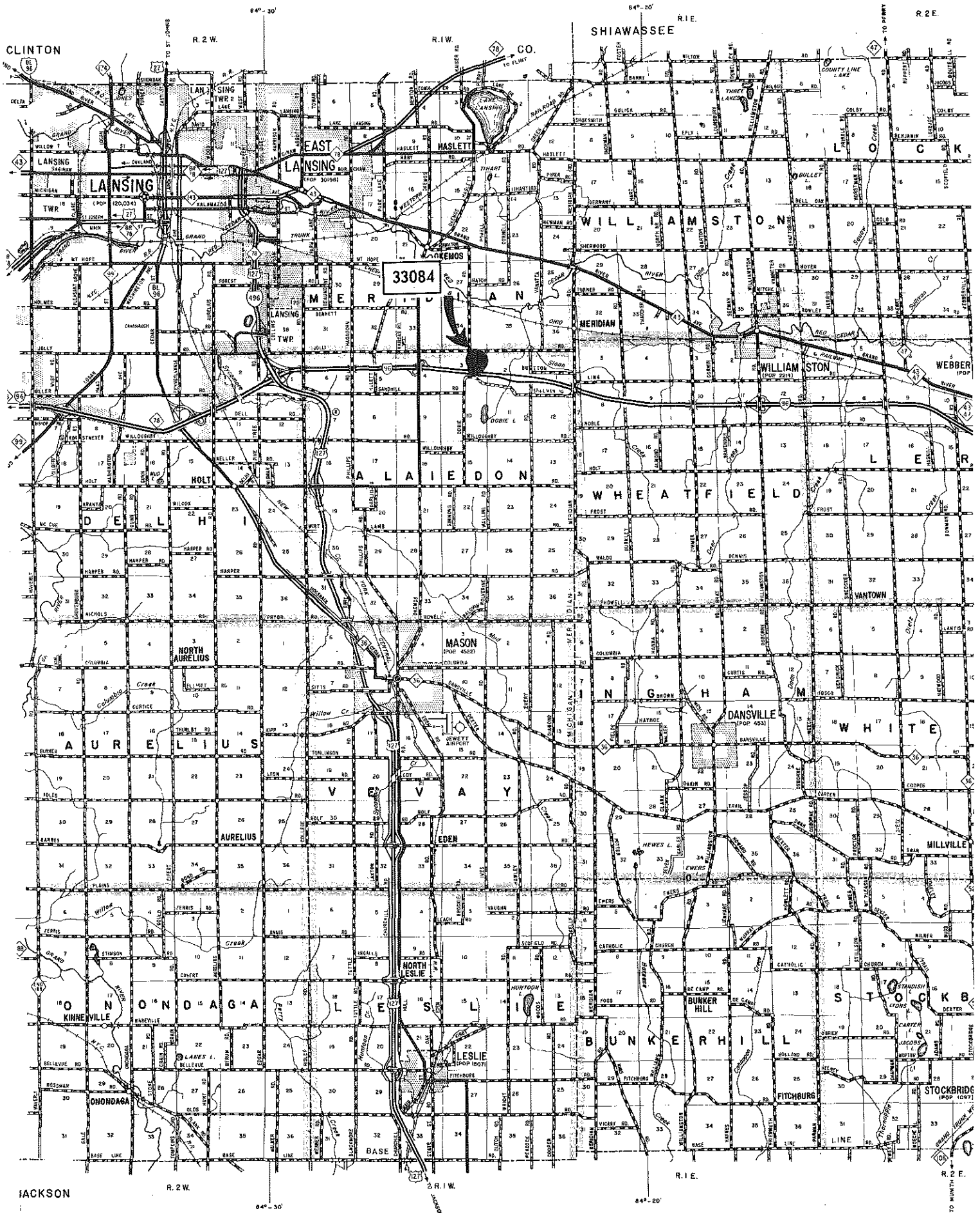
(Vehicles in rest area)

REST ROOM USAGE TIME

CAR PARKING TIME







33084

EAST OF LANSING

(3 3 0 8 4)

TRAFFIC VOLUMES BY DAY		From: 8/2/67 To: 8/8	
	Expressway	Rest Area	%
SUNDAY	7,640	888	11.6
MONDAY	7,555	922	12.2
TUESDAY (Except 6P-12P)	5,885	786	13.4
WEDNESDAY (Except 12-1P)	3,174	368	11.6
THURSDAY	6,733	1,071	15.9
FRIDAY	8,807	1,094	12.4
SATURDAY	7,362	992	13.5
TOTAL	47,156	6,421	13.6

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.	
12 PM-1	14.0	12N-1	14.8	
1-2	14.6	1-2	14.7	
2-3	28.0	2-3	16.8	
3-4	22.2	3-4	12.6	
4-5	29.7	4-5	10.9	
5-6	29.3	5-6	11.7	
6-7	11.5	6-7	10.7	
7-8	10.4	7-8	8.9	
8-9	12.9	8-9	9.6	
9-10	14.1	9-10	9.8	
10-11	15.7	10-11	8.6	
11-12	14.1	11-12	11.4	

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	2447	165	9	1.2	0.7	0.1
2	183	39	11	1.0	0.0	0.0
3	21	2	26	1.0	3.5	0.5
6	2	1	13	1.0	0.0	0.0
7	31	4	8	2.0	1.5	0.2

CARDS REJECTED

TOTALS	2684	211	10	1.1	0.6	0.0
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Average Persons Per
Vehicle: 1.93

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	15
Washing Facilities Required	15
More Rest Areas Needed	32
Flush Toilets Required	24
Rest Area Satisfactory	47
Rest Area Good	27
Refreshments Required	12
Facilities Unsatisfactory	5
No Comment	65
Larger Rest Rooms Required	3

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.86
Tuesday	.83
Wednesday	.75
Thursday	.75
Friday	.83
Saturday	.93
Sunday	.79

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .91

Out-Of-State Vehicles

20 out-of-state vehicles stopped at the rest area during the 4-hour study.

The average length-of-stay in the rest area of these vehicles was 9 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 10 minutes.

Rest Room Usage by Sex

121 males out of a total of 251 used the rest rooms, giving a male's percentage usage of 48.2.

58 females out of a total of 137 used the rest rooms, giving a female's percentage usage of 42.3.

21 children under 5 years of age entered the rest area.

Shee. 1 of 2 Date 8/2-8/8 19 67

Location I-96 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(East of Lansing.)

STATION NO.	1 WB														
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.						
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10						
TIME															
12-1A.M.		92	113	142	139	143	92								
1-2		73	163	112	82	142	64								
2-3		56	72	80	65	48	86								
3-4		58	56	96	42	83	79								
4-5		69	74	56	28	72	78								
5-6		83	83	72	28	136	138								
6-7		207	247	160	57	263	306								
7-8		493	461	260	83	661	596								
8-9		484	244	458	166	508	614								
9-10		512	462	483	286	580	573								
10-11		505	446	638	364	532	582								
11-12		443	487	536	478	538	493								
12-1P.M.		342	448	439	490	413	377								
1-2	360	343	430	459	486	417	370								
2-3	353	364	496	432	432	359	365								
3-4	394	364	551	453	401	411	379								
4-5	398	459	606	401	420	407	373								
5-6	375	375	673	427	561	373	320								
6-7	306	331	711	417	605	397	*								
7-8	280	303	694	351	634	291									
8-9	206	250	525	311	603	271									
9-10	193	203	346	218	544	229									
10-11	165	177	229	218	415	161									
11-12	144	147	190	143	231	138									
TOTAL	3174	6733	8807	7362	7640	7555	5885								

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Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	W Bd	Conc	24	I-96	East of Lansing	

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village
or Twp. _____ County Ingham

Sheet 2 of 2 Date 8/2-8/10 19 67

Location I-96 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(East of Lansing)

STATION NO.	2 WB (Ramp)														
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.						
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10						
TIME															
12-1 A.M.		12	9	23	14	30	13	5	27						
1-2		17	12	21	16	15	9	21	22						
2-3		22	20	15	13	24	20	31	18						
3-4		32	10	10	7	20	13	25	6						
4-5		34	22	17	2	28	9	9	14						
5-6		63	30	9	4	20	32	18	21						
6-7		17	20	27	10	33	35	22	23						
7-8		94	26	37	17	56	39	26	49						
8-9		65	52	71	27	53	50	31	43						
9-10		81	59	87	39	65	77	79	59						
10-11		74	67	105	76	73	86	46							
11-12		58	76	72	75	71	68	68							
12-1 P.M.		56	68	73	66	58	51	60							
1-2	60	66	50	65	54	62	63	62							
2-3	55	72	86	79	63	43	73	70							
3-4	38	66	64	57	47	48	53	59							
4-5	43	52	61	37	61	31	49	61							
5-6	34	35	78	55	59	55	46	50							
6-7	40	38	68	50	67	32	26	31							
7-8	23	26	66	38	43	30	23	26							
8-9	43	21	46	35	38	24	19	20							
9-10	17	31	43	30	27	22	16	24							
10-11	6	23	27	12	35	15	18	11							
11-12	9	16	34	12	28	14	16	22							
TOTAL	368	1071	1094	1037	888	922	904	877	282						

1 47 1

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	W Bd	B.T.	12	I-96 Ramp	Entrance to Rest Area -- East of Lansing	

NOTES ON CHARACTERISTICS OF REST AREA
EAST OF LANSING

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are seventy parking spaces for cars as well as twenty separate truck spaces. Likewise, twenty picnic tables and 3 separate cooking facilities can be found. As an added convenience, tourist information is available.

This rest area has a percentage turn-in which varies from 11.6 to 15.9. The highest percentage turn-in occurs on a Thursday and the lowest on a Sunday.

The hourly percentage distribution will be reasonably stable even through the hours of darkness since the traffic volumes are fairly high.

The average number of persons per vehicle reflects the fact that there were nearly twice as many males as females using the rest area during the survey.

The correlation between expressway volume and volume turn-in by hour of the day is only fairly good except for Saturday when the correlation coefficient was very good.

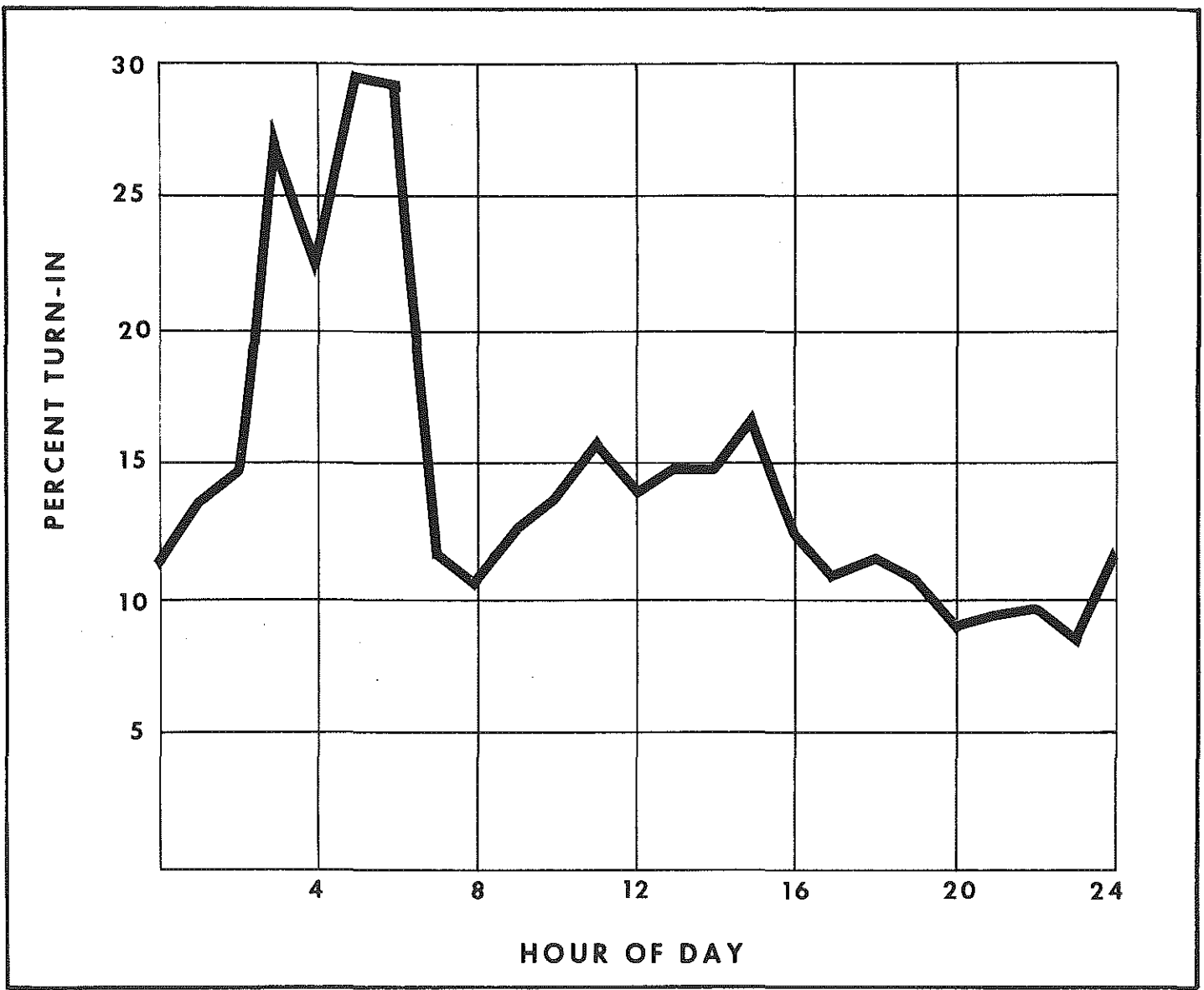
The correlation between daily expressway traffic and daily turn-in is very good.

The average length-of-stay for out-of-state vehicles does not differ significantly from the overall average length-of-stay.

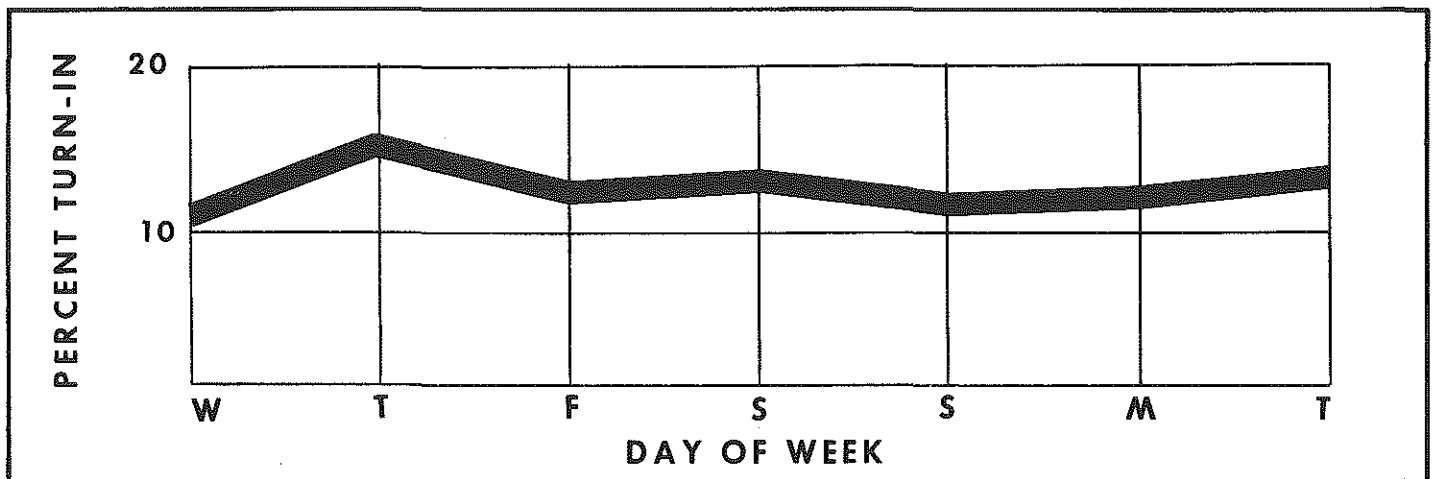
The percentage rest room usage is slightly higher for males than females.

There were a significant number of adverse comments about the condition of the rest area. A large number of people required more rest areas but since the date of the survey, a new rest area has been opened east of Howell.

LIBRARY
michigan department of
state highways
LANSING

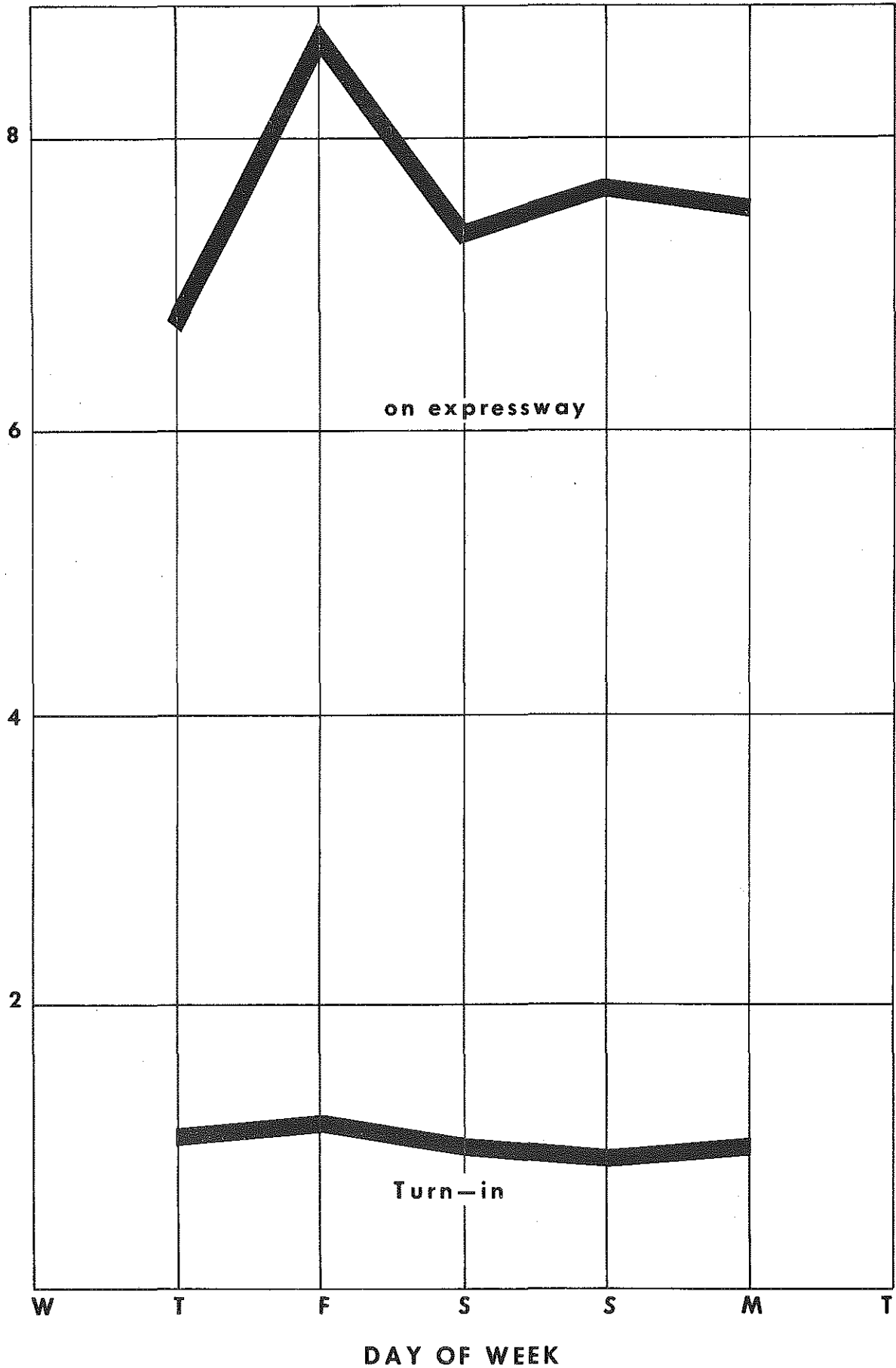


Graph I



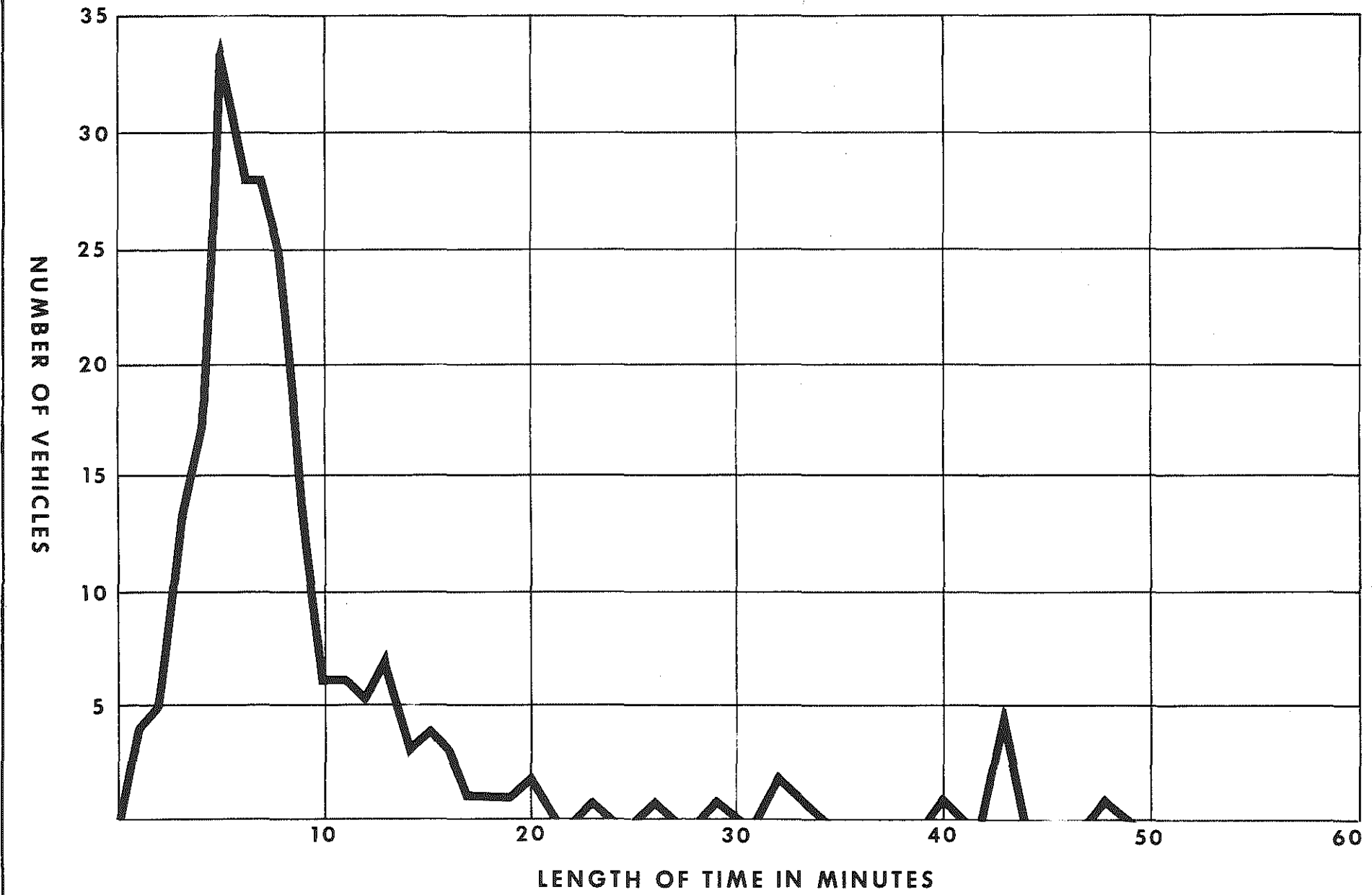
Graph II

TRAFFIC VOLUME
(in thousands)



DAY OF WEEK

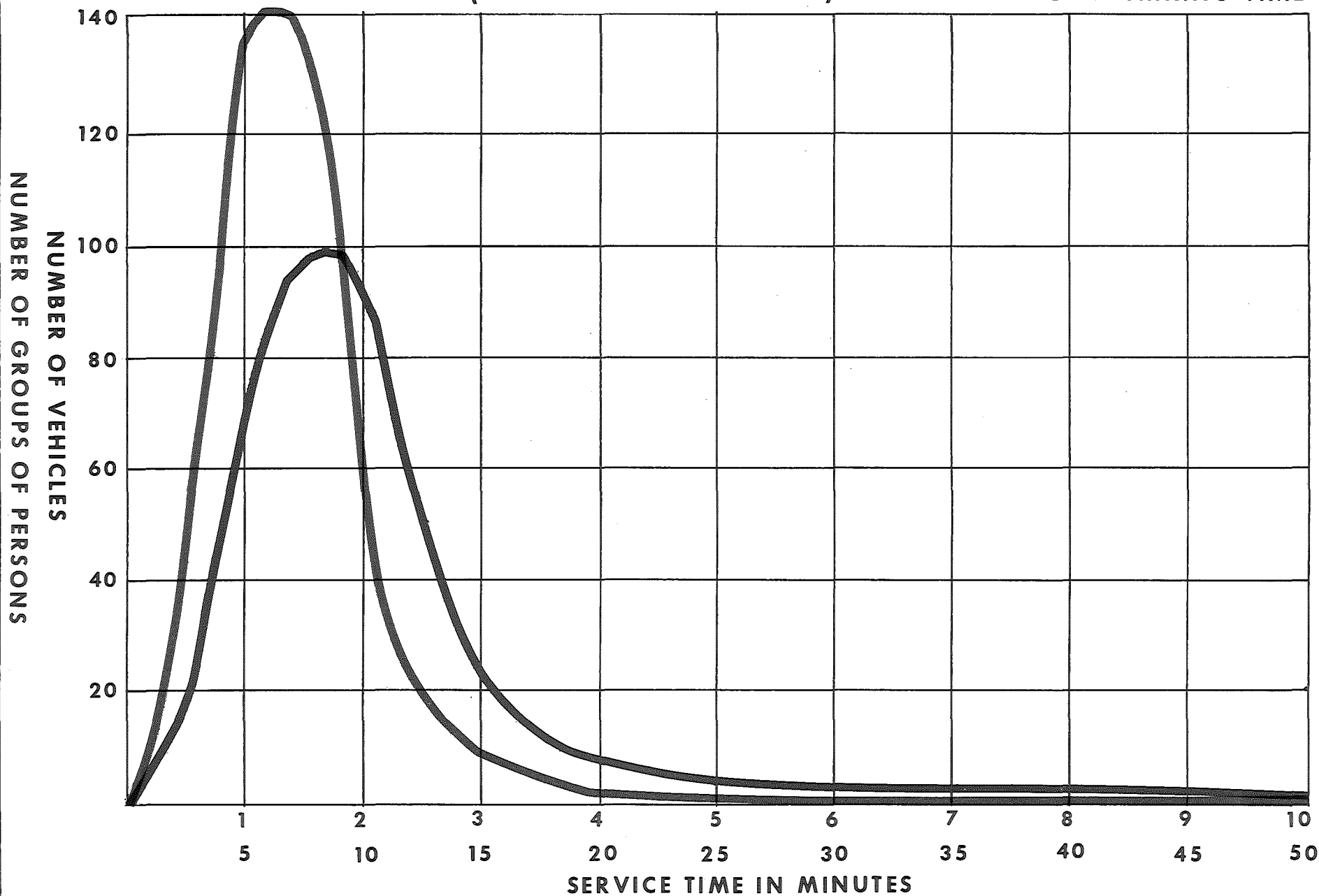
DISTRIBUTION OF LENGTH OF STAY

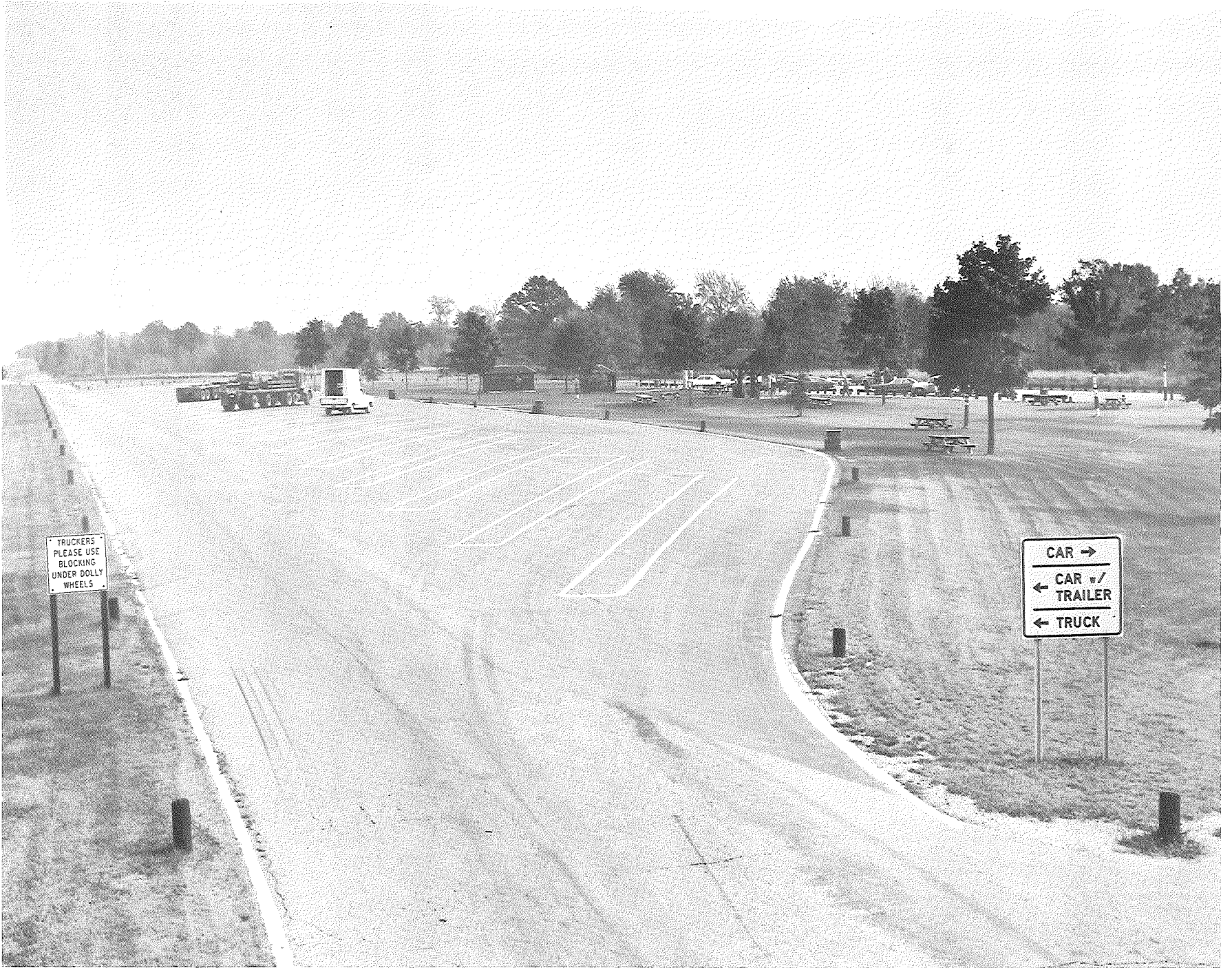


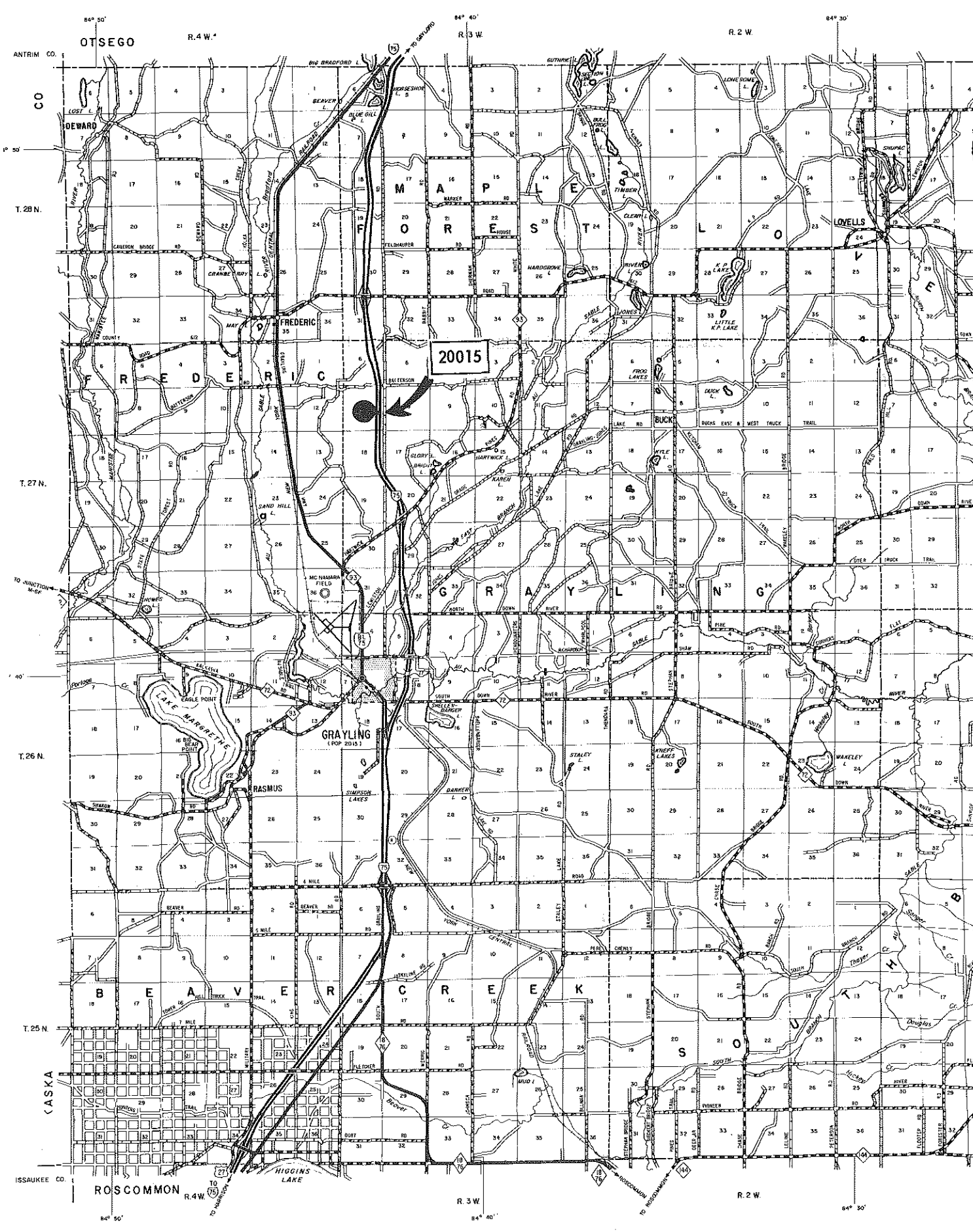
SERVICE TIME DISTRIBUTIONS

(Person—Groups in rest rooms)
(Vehicles in rest area)

REST ROOM USAGE TIME
CAR PARKING TIME







2015

GRAYLING
(POP 2015)

NORTH OF GRAYLING

[2 0 0 1 5]

TRAFFIC VOLUMES BY DAY		From: 8/2/67	To: 8/9
	Expressway	Rest Area	%
SUNDAY			
MONDAY (Except 12P-2P)	2445	248	10.1
TUESDAY	3831	421	11.0
WEDNESDAY (Except 3P-4P)	3865	566	14.6
THURSDAY	4342	622	14.3
FRIDAY	5803	734	12.6
SATURDAY (Except 2P-12P)	3055	393	12.9
TOTAL	23341	2984	12.8

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12p.m. - 1	19.4	12N - 1	16.3
1 - 2	14.7	1 - 2	15.5
2 - 3	17.2	2 - 3	12.9
3 - 4	18.6	3 - 4	13.0
4 - 5	16.7	4 - 5	11.2
5 - 6	21.4	5 - 6	11.1
6 - 7	10.4	6 - 7	9.8
7 - 8	19.5	7 - 8	10.8
8 - 9	10.5	8 - 9	8.3
9 - 10	10.3	9 - 10	9.4
10 - 11	11.7	10 - 11	10.0
11 - 12	13.6	11 - 12	12.4

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF- STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	1833	130	12	1.6	1.5	0.2
2	54	7	18	1.5	0.4	0.0
3	50	5	21	2.8	2.0	0.2
6	7	1	81	2.0	1.0	0.0
7	173	19	23	1.7	1.4	0.1

CARDS REJECTED

TOTALS	2117	162	15	1.7	1.4	0.2
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Average Persons Per
Vehicle: 3.43

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	3
Washing Facilities Required	22
More Rest Areas Needed	11
Flush Toilets Required	15
Rest Area Satisfactory	75
Rest Area Good	23
Refreshments Required	6
Facilities Unsatisfactory	3
No Comment	28
Larger Rest Rooms Required	8

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.95
Tuesday	.88
Wednesday	.98
Thursday	.94
Friday	.90
Saturday	.95
Sunday	

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .98

Out-Of-State Vehicles

21 out-of-state vehicles stopped at the rest area during the 3-hour study.

The average length-of-stay in the rest area of these vehicles was 23 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 15 minutes.

Rest Room Usage by Sex

91 males out of a total of 283 used the rest rooms, giving a male's percentage usage of 32.2.

82 females out of a total of 243 used the rest rooms, giving a female's percentage usage of 33.7.

36 children under 5 years of age entered the rest area.

Sheet 1 of 2 Date 8/2 19 67

Location I-75 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(North of Grayling)

STATION NO.	1 SB														
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.							
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9							
TIME															
12-1A.M.		40	41	77			35	39							
1-2		11	31	43			24	27							
2-3		11	16	26			13	21							
3-4		23	15	22			22	20							
4-5		20	10	27			14	13							
5-6		20	29	42			27	27							
6-7		50	45	39			45	43							
7-8		68	93	105			85	64							
8-9		113	169	167			123	115							
9-10		204	281	323			165	187							
10-11		307	366	504			267	293							
11-12		388	462	638			275	362							
12-1P.M.		348	488	590			286	340							
1-2		335	473	452			280	366							
2-3		325	534	*		490	306	401							
3-4		377	514			410	357								
4-5	335	383	517			400	307								
5-6	298	308	425			312	284								
6-7	264	249	322			236	244								
7-8	194	214	291			207	205								
8-9	154	234	230			140	148								
9-10	136	137	199			116	153								
10-11	96	105	152			82	104								
11-12	68	72	100			52	62								
TOTAL	1545	4342	5803	3055		2445	3831	2320							

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	S Bd	B.T.	26	I-75	North of Grayling	
					* Hose up	

- 09 -

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village
or Twp. _____ County Crawford

Sheet 2 of 2 Date 8/2-8/9 19 67

Location I-75 Rest Area
(North of Grayling)

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

STATION NO.	2 SB (Ramp)																		
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.											
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9											
TIME																			
12-1A.M.		7	16	12	10	11	2	8											
1-2		3	2	7	5	8	3	5											
2-3		3	3	4	6	4	3	2											
3-4		1	9	7	5	2	2	0											
4-5		2	5	2	6	4	0	5											
5-6		8	2	6	2	1	9	6											
6-7		3	6	11	10	12	0	3											
7-8		13	46	9	2	10	4	9											
8-9		18	24	13	6	14	8	9											
9-10		14	29	34	31	14	20	23											
10-11		41	57	54	55	37	19	33											
11-12		66	53	70	62	49	51	48											
12-1P.M.		52	73	80	91	70	42	47											
1-2		67	54	84	101	48	43	48											
2-3		56	59	71	75	54	38	59											
3-4	48	57	68	43	80	56	34	43											
4-5	46	49	55	69	93	38	30												
5-6	34	46	33	47	77	37	30												
6-7	32	26	43	42	52	15	13												
7-8	16	32	27	39	44	23	22												
8-9	12	13	25	31	40	11	14												
9-10	16	20	17	15	35	2	15												
10-11	10	14	15	7	15	5	10												
11-12	4	11	13	17	16	7	9												
TOTAL	218	622	734	774	919	532	421	348											

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Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	S Bd	B.T.	22	I-75 Ramp	Entrance to Rest Area -- North of Grayling.	

NOTES ON CHARACTERISTICS OF REST AREA
NORTH OF GRAYLING

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are fifty-two parking spaces for cars as well as twenty separate truck spaces. Likewise, twenty picnic tables and 4 separate cooking facilities can be found. As an added convenience, tourist information is available. This rest area is about 8 acres in size.

The rest area has a fairly high percentage of expressway traffic turning into the rest area. The percentage turn-in varies quite a considerable amount from day to day. (Unfortunately the traffic counting apparatus failed to operate on Sunday).

The hourly distribution is well behaved and will be fairly stable.

This vehicle occupancy is reasonably high as a result of the fact that the traffic was of a recreational nature.

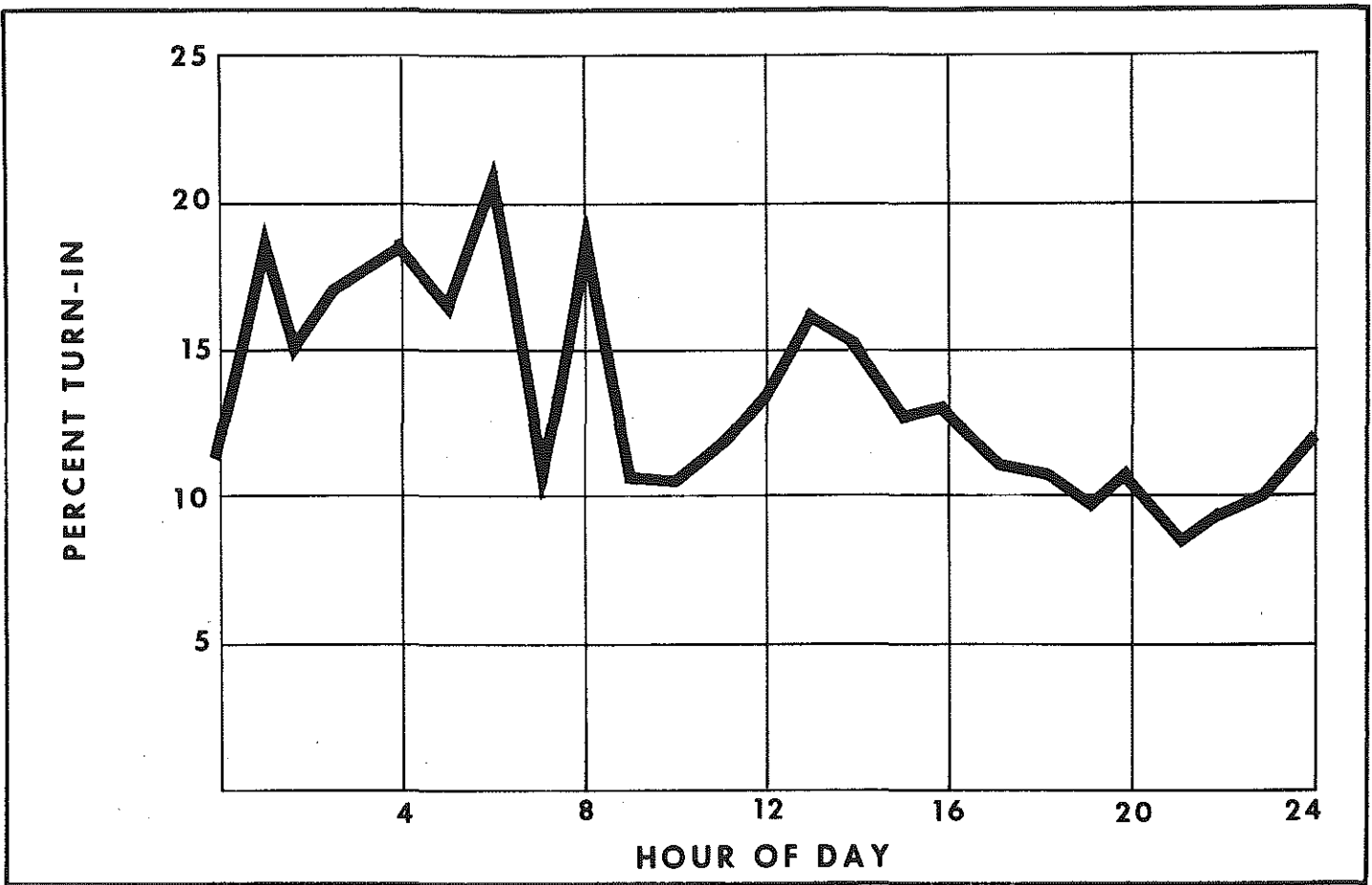
The correlation between expressway volume and volume turn-in by hour of the day is very high for each day of the week.

The correlation between daily expressway volume and daily rest area turn-in is very high.

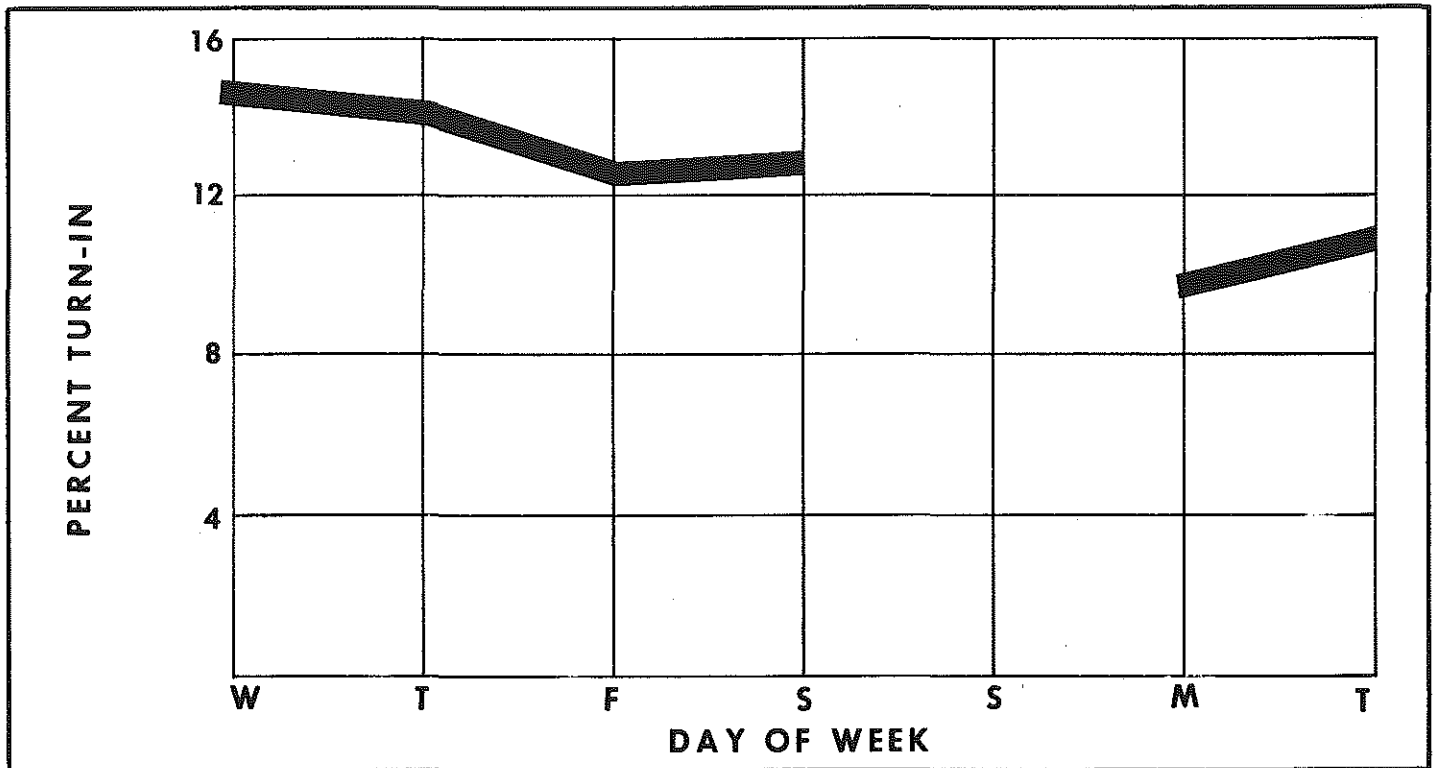
The length-of-stay of out-of-state vehicles was considerably longer than the average length-of-stay of all vehicles.

The percentage rest room usage is low for both males and females.

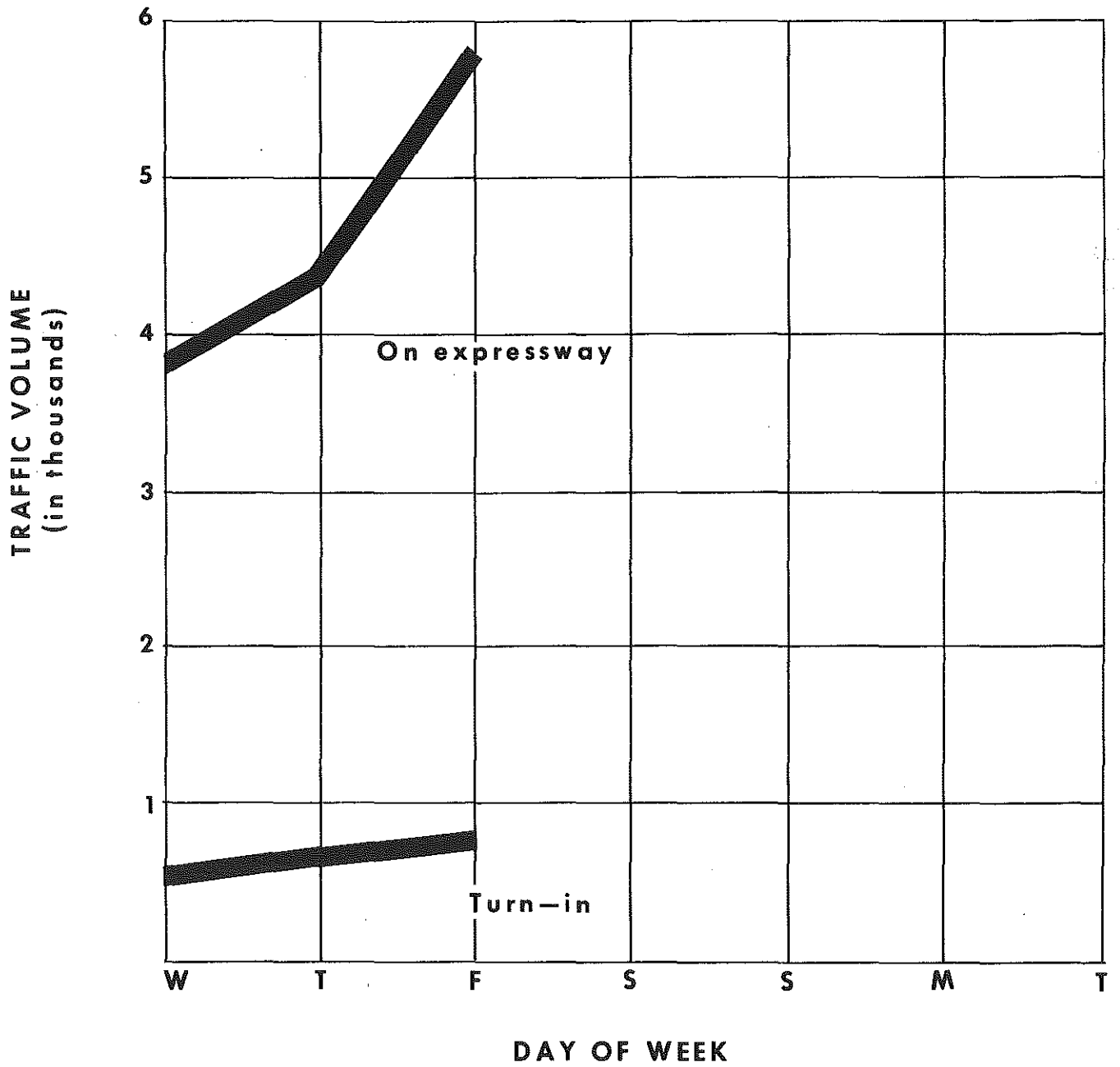
The number of unfavorable comments was small, but a significant number of visitors required flush toilets and more frequent rest areas on the expressway.



Graph I

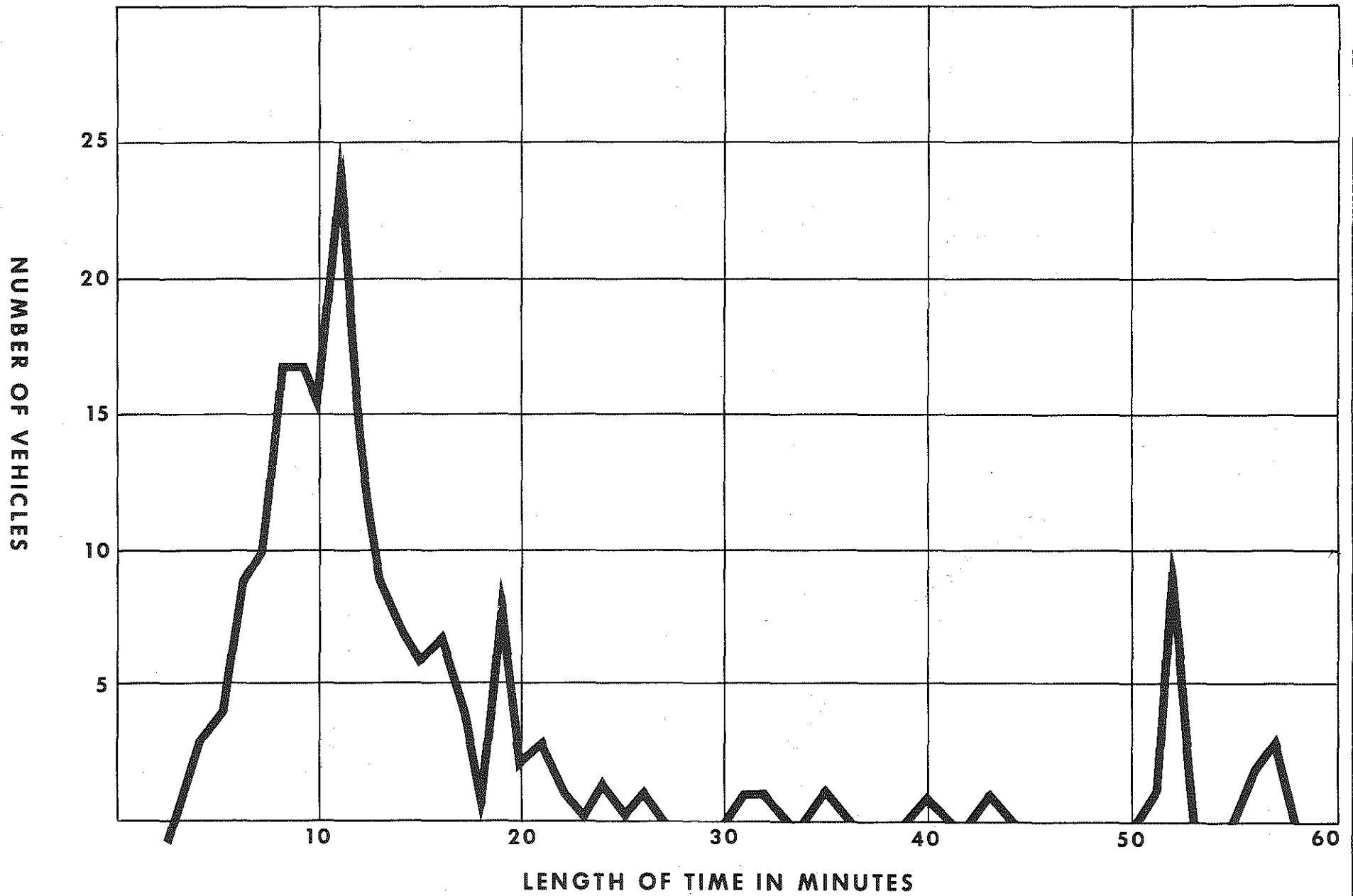


Graph II



Graph III

DISTRIBUTION OF LENGTH OF STAY



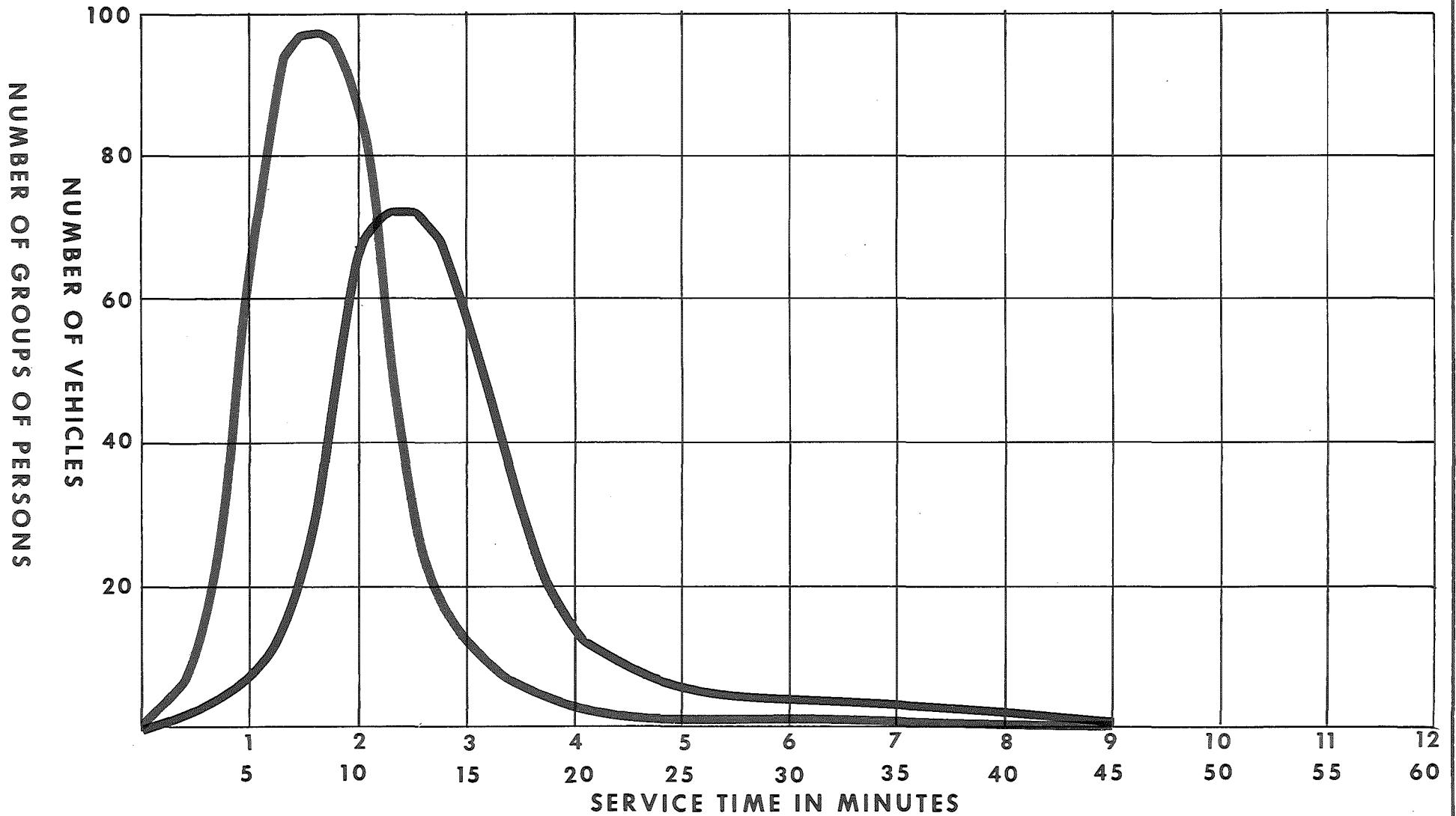
SERVICE TIME DISTRIBUTIONS

(Person—Groups in rest rooms)

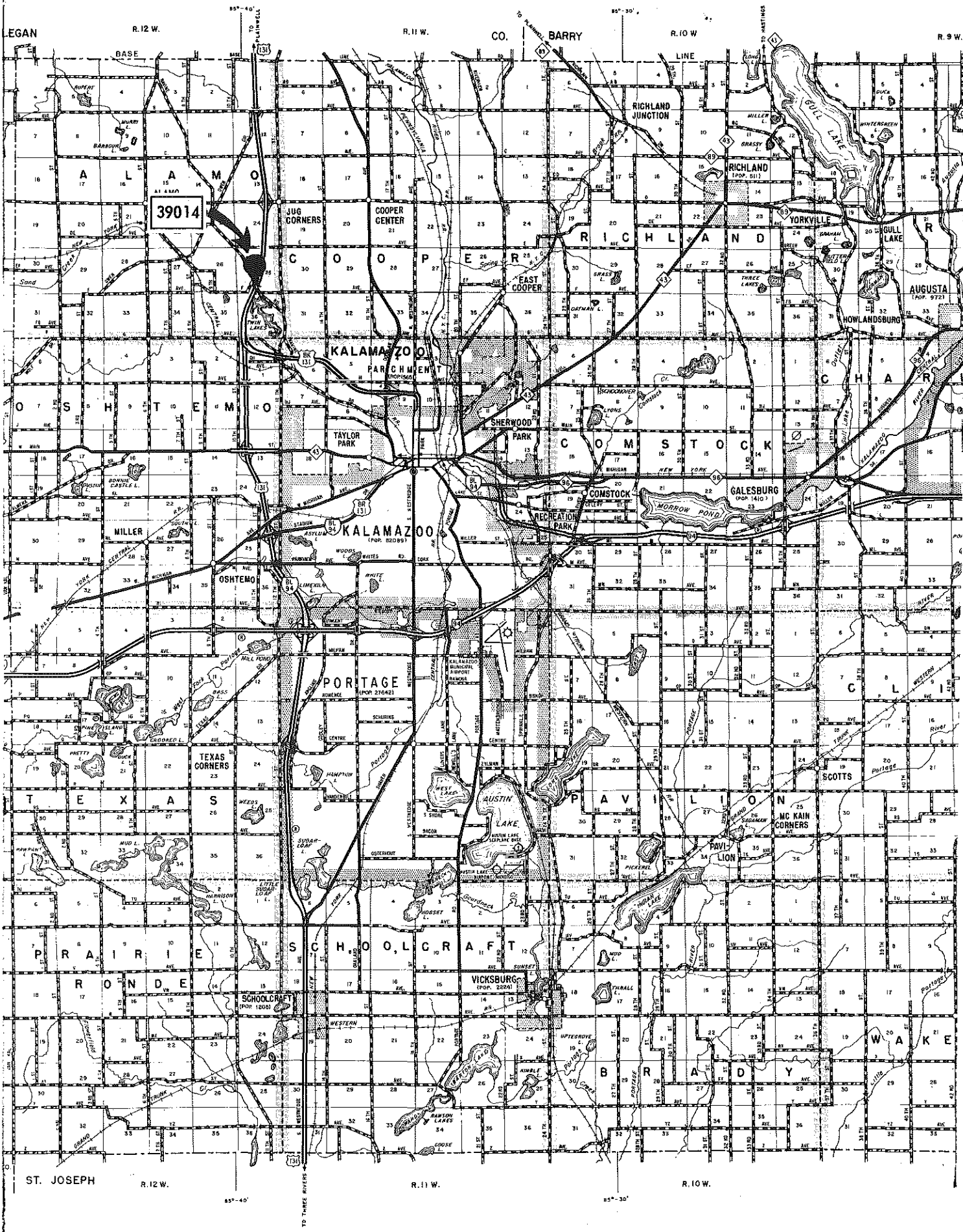
(Vehicles in rest area)

REST ROOM USAGE TIME

CAR PARKING TIME







39014

NORTH OF KALAMAZOO

(3 9 0 1 4)

TRAFFIC VOLUMES BY DAY			
		From: 8/3/67	To: 8/9
	Expressway	Rest Area	%
SUNDAY	4,541	734	16.2
MONDAY	4,576	580	12.7
TUESDAY	4,139	522	12.6
WEDNESDAY (12P-2P)	2,427	265	10.9
THURSDAY (1P-12P)	3,185	305	9.6
FRIDAY	5,620	549	9.8
SATURDAY	6,227	442	7.1
TOTAL	30,715	3,397	11.1

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	7.5	12 N-1	14.5
1-2	11.1	1-2	13.0
2-3	12.1	2-3	13.6
3-4	12.4	3-4	12.4
4-5	10.7	4-5	11.9
5-6	5.3	5-6	10.3
6-7	4.2	6-7	9.9
7-8	4.7	7-8	8.8
8-9	6.4	8-9	7.4
9-10	10.0	9-10	7.4
10-11	11.6	10-11	6.3
11-12	13.1	11-12	8.7

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	1391	56	15	1.0	0.3	0.0
2	189	23	24	1.0	0.0	0.0
3	19	1	5	1.0	0.0	0.0
7	14	2	20	2.0	0.5	0.0

CARDS REJECTED

TOTALS	1613	82	17	1.0	0.2	0.0
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Average Persons Per
Vehicle: 1.35

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	1
Washing Facilities Required	3
More Rest Areas Needed	7
Flush Toilets Required	20
Rest Area Satisfactory	23
Rest Area Good	12
Refreshments Required	2
Facilities Unsatisfactory	1
No Comment	21
Larger Rest Rooms Required	1

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC VOLUMES AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.65
Tuesday	.59
Wednesday	.69
Thursday	.67
Friday	.77
Saturday	.65
Sunday	.38

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .54

Out-Of-State Vehicles

22 out-of-state vehicles stopped at the rest area during the 4-hour study.

The average length-of-stay in the rest area of these vehicles was 28 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 17 minutes.

Rest Room Usage by Sex

67 males out of a total of 86 used the rest rooms, giving a male's percentage usage of 77.9.

17 females out of a total of 23 used the rest rooms, giving a female's percentage usage of 73.9.

2 children under 5 years of age entered the rest area.

Sheet 1 of 2 Date 8/3-8/10 19 67

Location US-131 Rest Area
(North of Kalamazoo)

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

STATION NO.	1 SB																
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.									
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10									
TIME																	
12-1A.M.		105	327	87	49	58	51										
1-2		79	180	51	43	54	39										
2-3		50	60	39	24	35	39										
3-4		25	44	39	29	39	43										
4-5		42	43	42	44	42	37										
5-6		72	56	140	103	89	94										
6-7		223	89	340	311	277	274										
7-8		230	80	359	372	326	317										
8-9		247	118	281	298	268	257										
9-10		259	205	260	265	215	249										
10-11		310	255	280	262	234	249										
11-12		357	259	267	268	196	251										
12-1P.M.		322	336	235	219	195	250										
1-2	298	349	371	251	221	182	277										
2-3	385	363	367	268	275	229											
3-4	330	348	345	247	255	255											
4-5	372	320	475	263	278	230											
5-6	381	295	453	210	270	254											
6-7	321	264	445	217	207	227											
7-8	300	270	454	171	184	178											
8-9	237	271	431	142	169	157											
9-10	211	242	400	148	170	162											
10-11	200	297	280	134	164	138											
11-12	150	280	154	70	96	99											
TOTAL	3185	5620	6227	4541	4576	4139	2427										

- 74 -

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	S Bd	Conc	24	US-131	North of Kalamazoo	

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village _____
or Twp. _____ County Kalamazoo

Sheet 2 of 2 Date 8-3 19 67

Location US-131 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(North of Kalamazoo)

STATION NO.	2 SB (Ramp)																		
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.											
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10											
TIME																			
12-1 A.M.		4	5	19	12	5	10	10											
1-2		8	15	12	15	3	3	7											
2-3		9	4	7	3	8	3	9											
3-4		7	0	0	5	8	11	1											
4-5		6	6	0	10	6	2	4											
5-6		2	2	5	9	5	8	12											
6-7		19	5	5	18	8	11	15											
7-8		12	7	10	21	18	15	14											
8-9		22	13	10	24	20	12	17											
9-10		27	19	24	31	27	34	45											
10-11		31	30	29	53	29	36	45											
11-12	28	40	26	46	52	40	36	28											
12-1 P.M.	33	49	44	54	45	28	43	35											
1-2	38	30	31	48	54	50	41	29											
2-3	61	47	32	68	42	47	45												
3-4	39	47	40	50	34	42	50												
4-5	46	50	33	52	43	40	39												
5-6	21	29	20	65	31	49	28												
6-7	25	32	25	54	31	18	28												
7-8	14	22	26	61	10	18	20												
8-9	11	25	18	37	15	7	20												
9-10	18	20	8	31	11	18	13												
10-11	13	3	12	31	9	13	15												
11-12	19	8	21	16	2	15	6												
TOTAL	366	549	442	734	580	522	529	271											

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	S Bd	B.T.	16	US-131 Ramp	Entrance to Us-131 -- North of Kalamazoo	

NOTES ON CHARACTERISTICS OF REST AREA
NORTH OF KALAMAZOO

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are seventy parking spaces for cars as well as twenty-four separate truck spaces. Likewise, fifteen picnic tables and 2 separate cooking facilities can be found. As an added convenience, tourist information is available.

This rest area has an extremely wide range of percentage turn-in by day of week. Expressway traffic turn-in on Sunday was 16.2 percent, whereas, only 7.1 percent turned in on Saturday. The reason for this large difference lies in the fact that Sunday traffic on US-131 (southbound) is highly recreational. Thus, the trip lengths will be considerably larger on Sunday than the trip lengths of the Saturday traffic, which will consist of much more short distance trips.

The percentages of the hourly distribution turn-in will not be too reliable as the number of vehicles turning in during the hours of darkness is very low.

The average number of persons per vehicle is very low since the survey was carried out from 3 PM to 7 PM on a Friday and a large proportion of vehicles turning in were in the commercial classification.

The correlation between expressway volume and volume turn-in by hour of the day is extremely low for every day of the week.

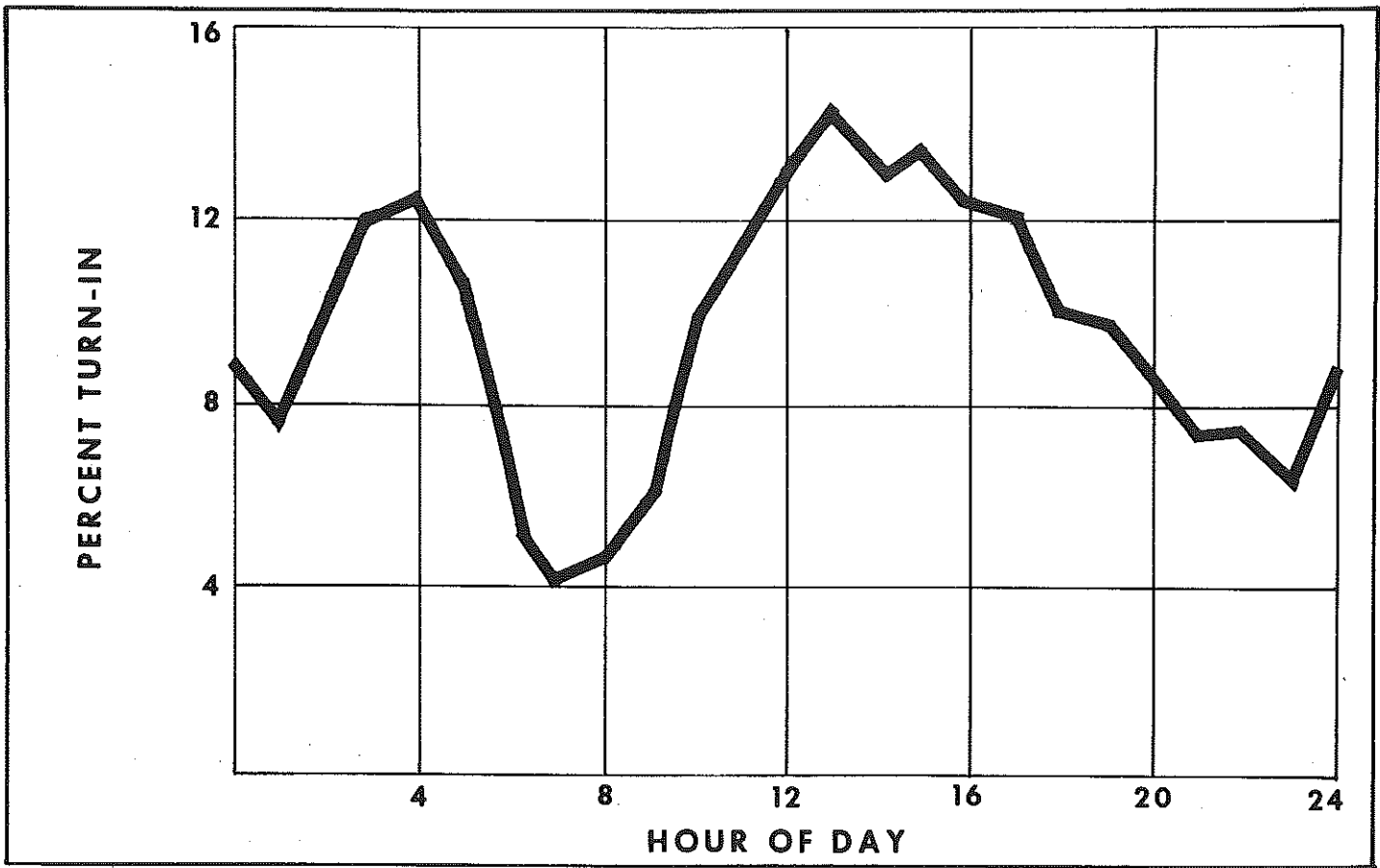
The correlation between daily expressway volumes and daily rest area turn-in is also very low.

The correlation coefficients are low mainly because of the great difference between the type of traffic on the expressway on Saturday and the type of traffic on the expressway on a Sunday. Any projections required for this rest area must be very carefully considered and it is suggested that further counts be taken at this rest area if a finer breakdown is required than purely weekly totals.

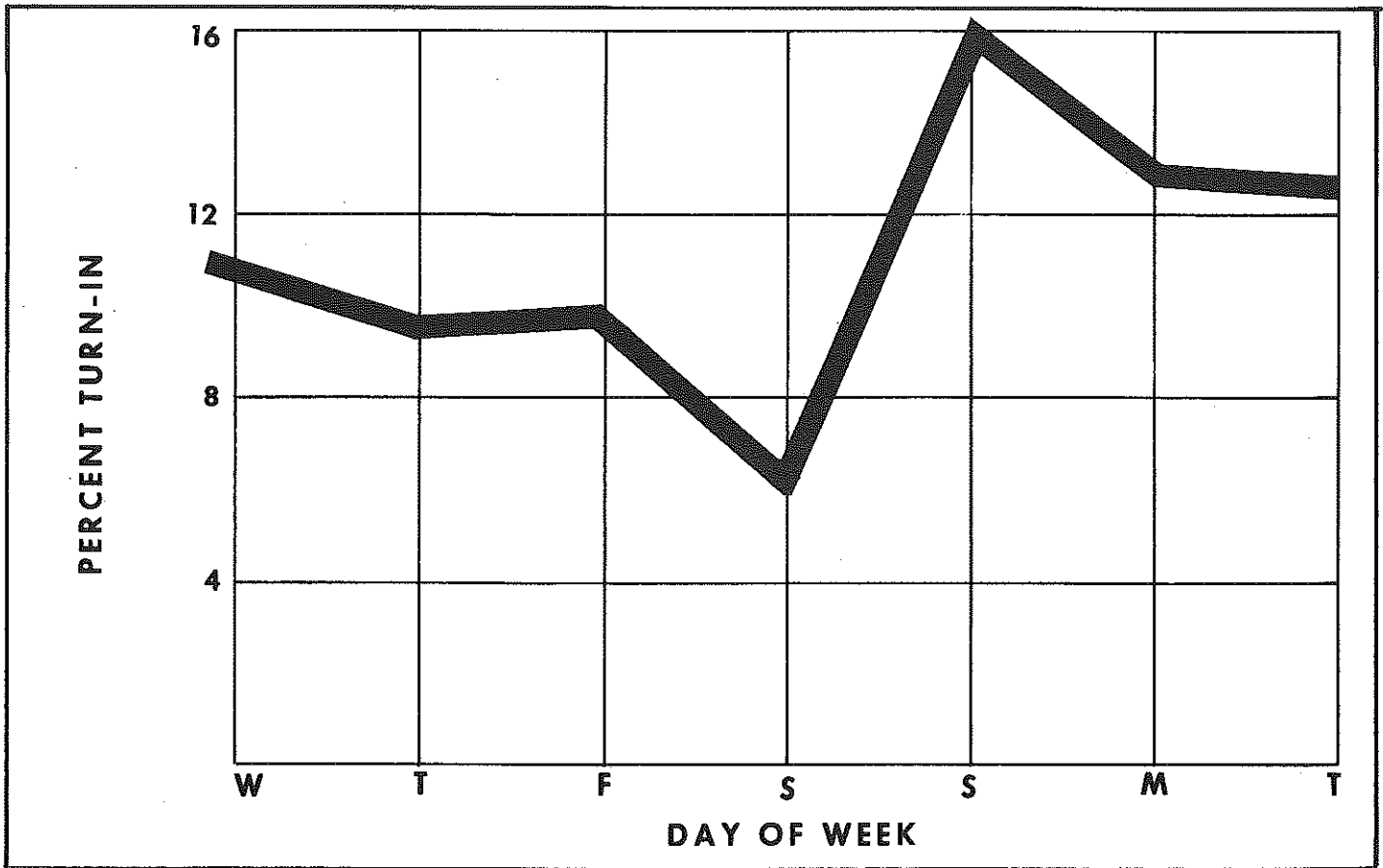
The average length-of-stay of out-of-state vehicles is considerably larger than the overall average length-of-stay. This is mainly due to the fact that most out-of-state vehicles were commercial.

The percentage rest room usage was extremely high for both males and females, however, the sample is rather small so again it is suggested a further study be carried out if rest room usage is required for a peak period.

Very few adverse comments were obtained; however, a significant number of persons required flush toilets.

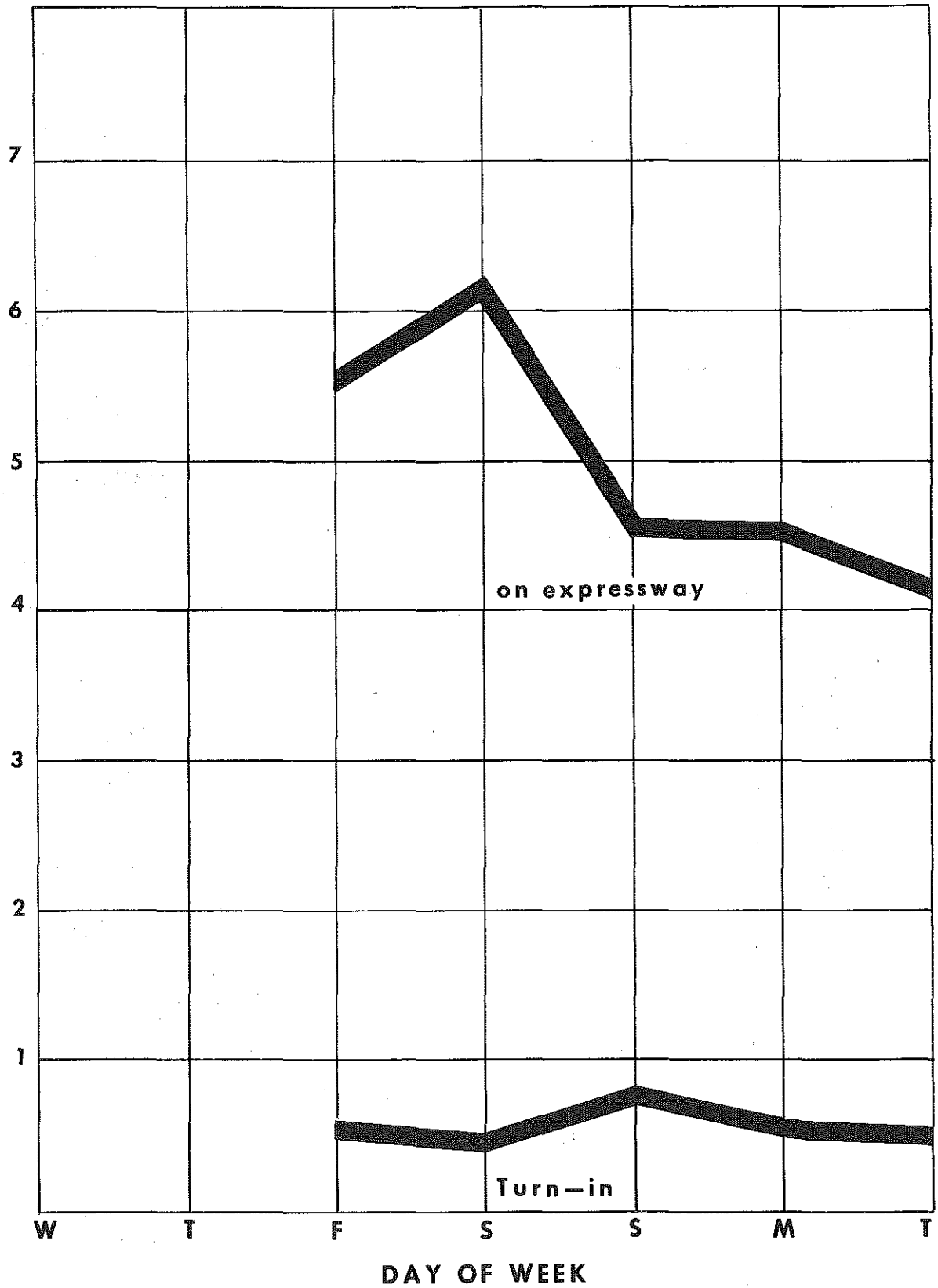


Graph I



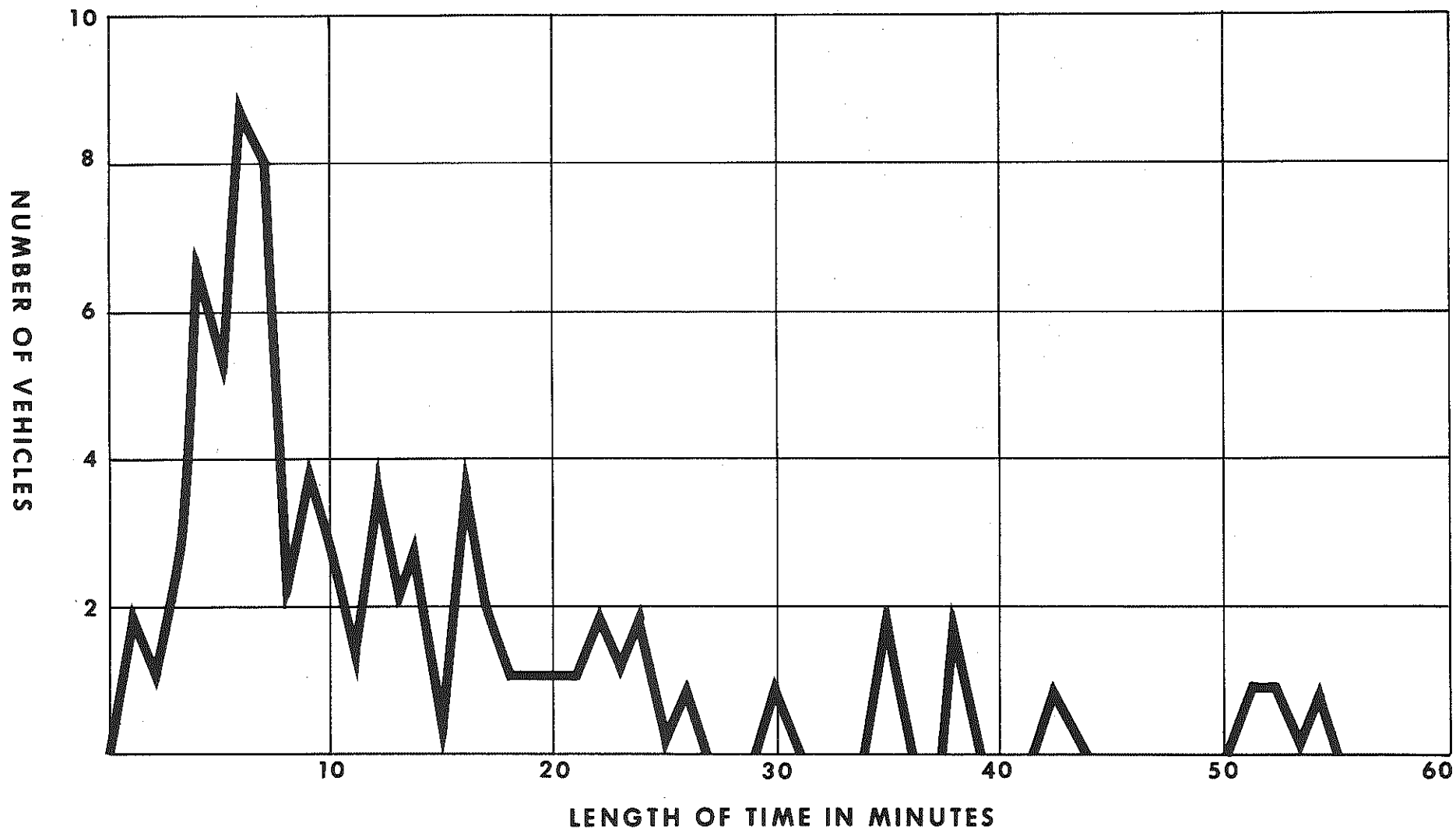
Graph II

TRAFFIC VOLUME
(in thousands)

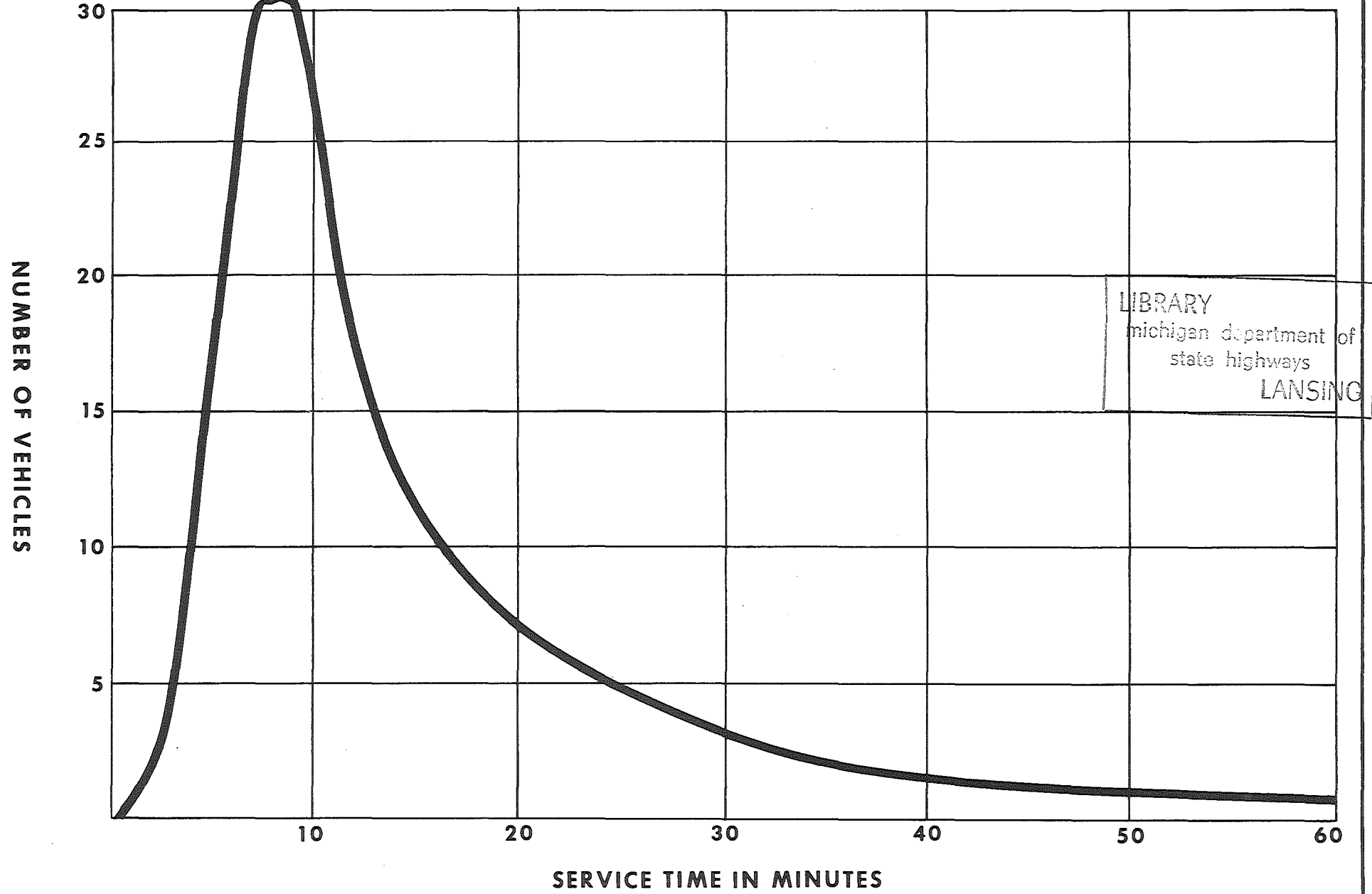


Graph III

DISTRIBUTION OF LENGTH OF STAY

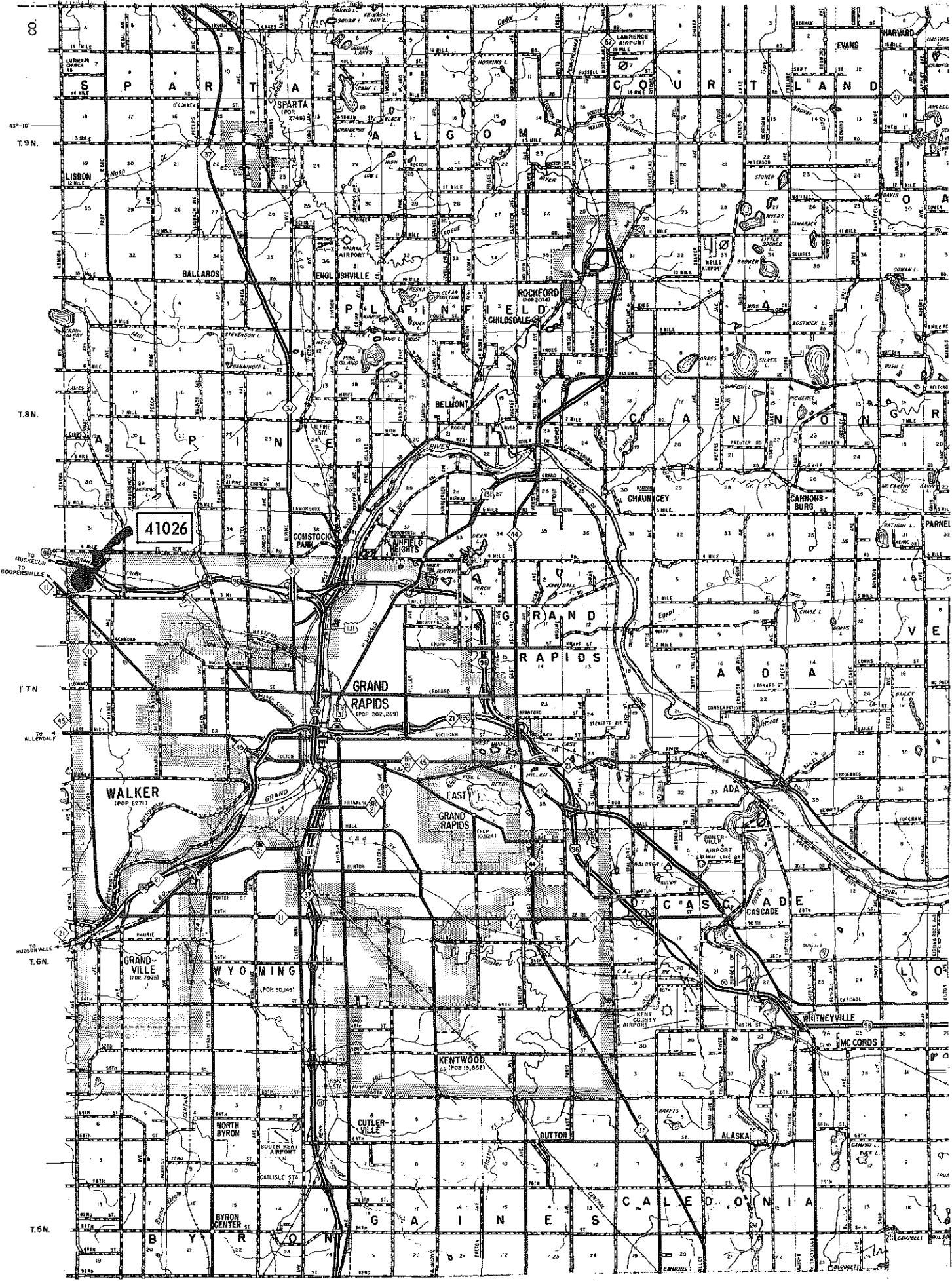


SERVICE TIME DISTRIBUTIONS



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state highways
LANSING





WEST OF GRAND RAPIDS

(4 1 0 2 6)

TRAFFIC VOLUMES BY DAY			
		From: 8/3/67 To: 8/9	
	Expressway	Rest Area	%
SUNDAY	6,415	672	10.5
MONDAY	4,299	464	10.8
TUESDAY	4,473	432	9.7
WEDNESDAY	4,445	379	8.5
THURSDAY	4,744	410	8.6
FRIDAY	5,027	432	8.6
SATURDAY	5,880	494	8.4
TOTAL	35,283	1,283	9.3

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	7.2	12 N-1	12.1
1-2	16.4	1-2	11.6
2-3	26.1	2-3	11.7
3-4	24.2	3-4	11.8
4-5	15.4	4-5	9.5
5-6	3.3	5-6	8.2
6-7	3.8	6-7	8.6
7-8	5.1	7-8	8.5
8-9	6.8	8-9	8.5
9-10	8.1	9-10	10.2
10-11	10.5	10-11	6.5
11-12	13.2	11-12	9.4

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	2171	109	18	1.4	1.4	0.4
3	16	1	15	2.0	1.0	0.0
5	5	1	14	9.0	13.0	0.0
7	99	16	16	1.7	2.1	0.3
CARDS REJECTED		51				
TOTALS	2291	178	18	1.5	1.6	0.3
				Average Persons Per Vehicle: <u>3.58</u>		

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	14
Washing Facilities Required	3
More Rest Areas Needed	9
Flush Toilets Required	8
Rest Area Satisfactory	24
Rest Area Good	18
Refreshments Required	7
Facilities Unsatisfactory	13
No Comment	44
Larger Rest Rooms Required	0

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC VOLUME
AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.58
Tuesday	.77
Wednesday	.78
Thursday	.66
Friday	.67
Saturday	.83
Sunday	.94

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .97.

Out-Of-State Vehicles

6 out-of-state vehicles stopped at the rest area during the 3-hour study.

The average length-of-stay in the rest area of these vehicles was 10 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 18 minutes.

Rest Room Usage by Sex

121 males out of a total of 201 used the rest rooms, giving a male's percentage usage of 60.1.

110 females out of a total of 204 used the rest rooms, giving a female's percentage usage of 53.9.

50 children under 5 years of age entered the rest area.

Sheet 1 of 2 Date 8/2 - 8/10 19 67

Location I - 96 Rest Area
(West of Grand Rapids)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	1 EB														
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.						
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10						
TIME															
12-1 A.M.		113	78	107	167	36	38	28	46						
1-2		50	48	63	69	36	19	20	19						
2-3		16	25	27	50	15	11	17	19						
3-4		28	12	28	29	25	20	23	33						
4-5		17	35	22	18	61	63	83	127						
5-6		76	76	85	45	251	239	208	236						
6-7		230	228	123	39	312	292	294	275						
7-8		337	304	158	63	296	212	190							
8-9		239	267	194	104	234	259	212							
9-10		245	253	254	150	244	251	259							
10-11		258	250	277	197	286	220	213							
11-12		248	244	219	259	234	237	215							
12-1 P.M.		244	213	304	297	244	275	281							
1-2		297	316	300	327	237	259	323							
2-3		268	359	318	366	260	313	300							
3-4		306	338	355	511	241	393	319							
4-5	284	387	374	290	628	252	294	263							
5-6	265	298	337	292	744	223	280	270							
6-7	249	238	327	346	725	217	198	195							
7-8	197	224	230	327	644	174	164	177							
8-9	172	204	185	295	410	152	135	190							
9-10	185	170	171	363	294	103	144	163							
10-11	174	152	182	754	192	97	95	102							
11-12	153	99	175	379	87	69	62	100							
TOTAL	1679	4744	5027	5880	6415	4299	4473	4445	755						

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88
1

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	E Bd.	Conc.	24'	I-96	West of Grand Rapids	

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village _____
or Twp. _____ County Kent

Sheet 2 of 2 Date 8/2 - 8/10 19 67

Location I-96 Rest Area

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

(West of Grand Rapids)

STATION NO.	2 EB	(Ramp)													
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.						
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10						
TIME															
12-1 A.M.		6	7	12	9	5	4	5	4						
1-2		5	3	7	15	10	7	3	0						
2-3		5	4	8	11	4	5	5	1						
3-4		7	7	6	4	7	3	6	3						
4-5		0	5	9	3	20	4	5	7						
5-6		3	5	1	4	5	8	6	8						
6-7		11	2	2	4	13	16	9	12						
7-8		8	8	6	6	24	11	16							
8-9		11	14	12	11	17	24	13							
9-10		12	23	14	11	26	21	27							
10-11		23	28	31	21	26	26	24							
11-12		35	27	33	32	46	24	22							
12-1 P.M.		20	34	25	48	35	32	30							
1-2		39	39	32	36	38	23	32							
2-3		44	40	27	42	21	46	35							
3-4		34	45	43	58	34	43	33							
4-5	53	22	38	23	70	27	33	23							
5-6	19	19	20	25	93	20	10	13							
6-7	18	31	7	36	63	25	21	10							
7-8	12	26	16	21	48	13	16	17							
8-9	19	16	15	22	31	10	28	11							
9-10	20	11	26	32	24	26	9	15							
10-11	18	14	6	48	13	5	10	7							
11-12	19	8	13	19	15	7	8	12							
TOTAL	178	410	432	494	672	464	432	379	35						

1
89
1

Sta. No.	Direction	Road Type	Width (ft.)	Route	Location	C.S. No.
2	E Bd.	Bit.	12'	I-96 Ramp	Entrance to Rest Area - West of Grand Rapids	

NOTES ON CHARACTERISTICS OF REST AREA
WEST OF GRAND RAPIDS

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are fifty parking spaces for cars as well as twenty separate truck spaces. Likewise, twenty-one picnic tables and 5 separate cooking facilities can be found. As an added convenience, tourist information is available.

This rest area has a percentage turn-in by day of week varying from 8.6 to 10.8. The highest percentage turn-in occurs on a Monday, whereas the large daily volume turn-in occurs on a Sunday.

The percentages for the hourly distribution will be stable except for the hours between 12 midnight and 7 AM when the number of vehicles turning into the rest area was very small. A more accurate picture of the nighttime rest area usage could be obtained by grouping the data into longer time intervals than one hour.

The average number of persons per vehicle reflects the fact that almost exactly fifty percent of rest area visitors were male.

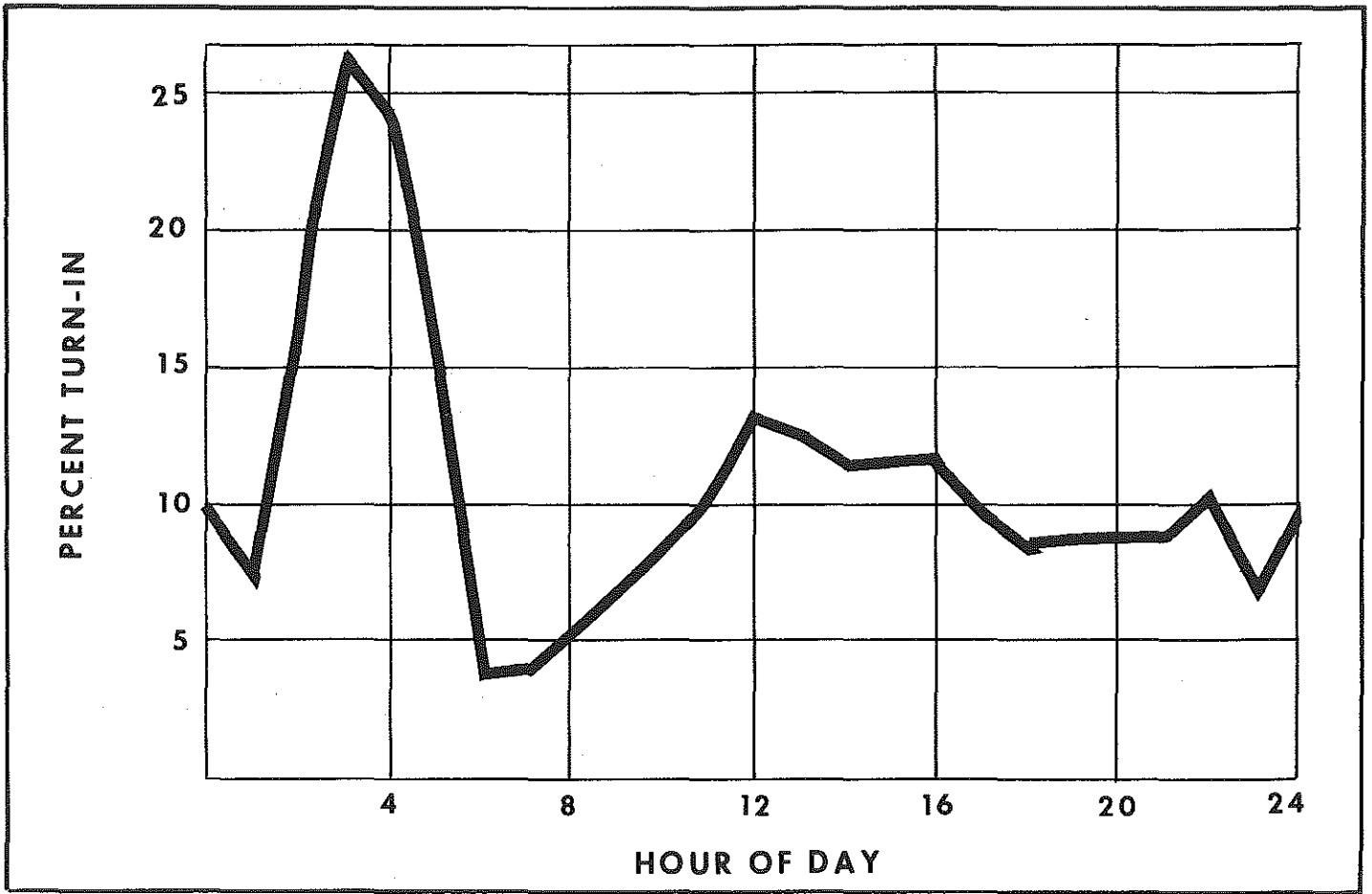
The correlation between expressway volume and volume turn-in by hour of the day is low, except for Sunday, which has a reasonably high correlation coefficient.

The correlation between daily expressway volumes and daily rest area turn-in is, however, very high.

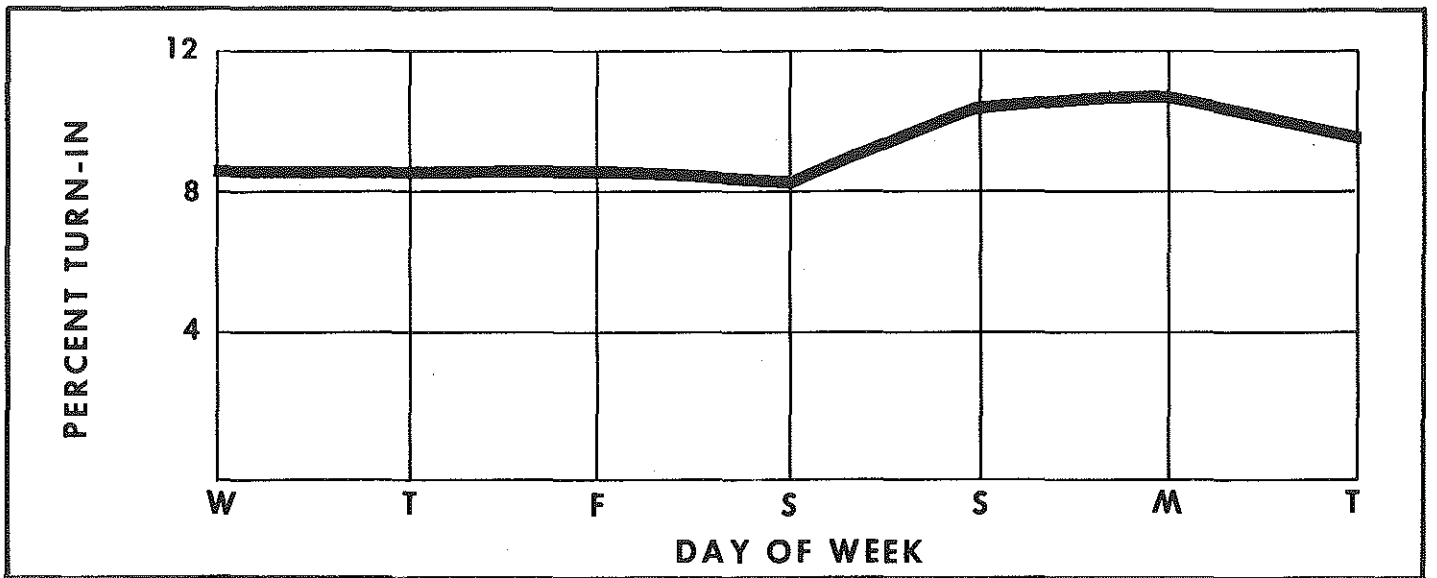
The average length-of-stay of out-of-state vehicles is small compared with the average length-of-stay for all vehicles. However, this figure is obtained from a sample of only six out-of-state vehicles and hence will not be very reliable.

The percentage rest room usage for both males and females is reasonably high. (It can be noted that a large number of children entered the rest area).

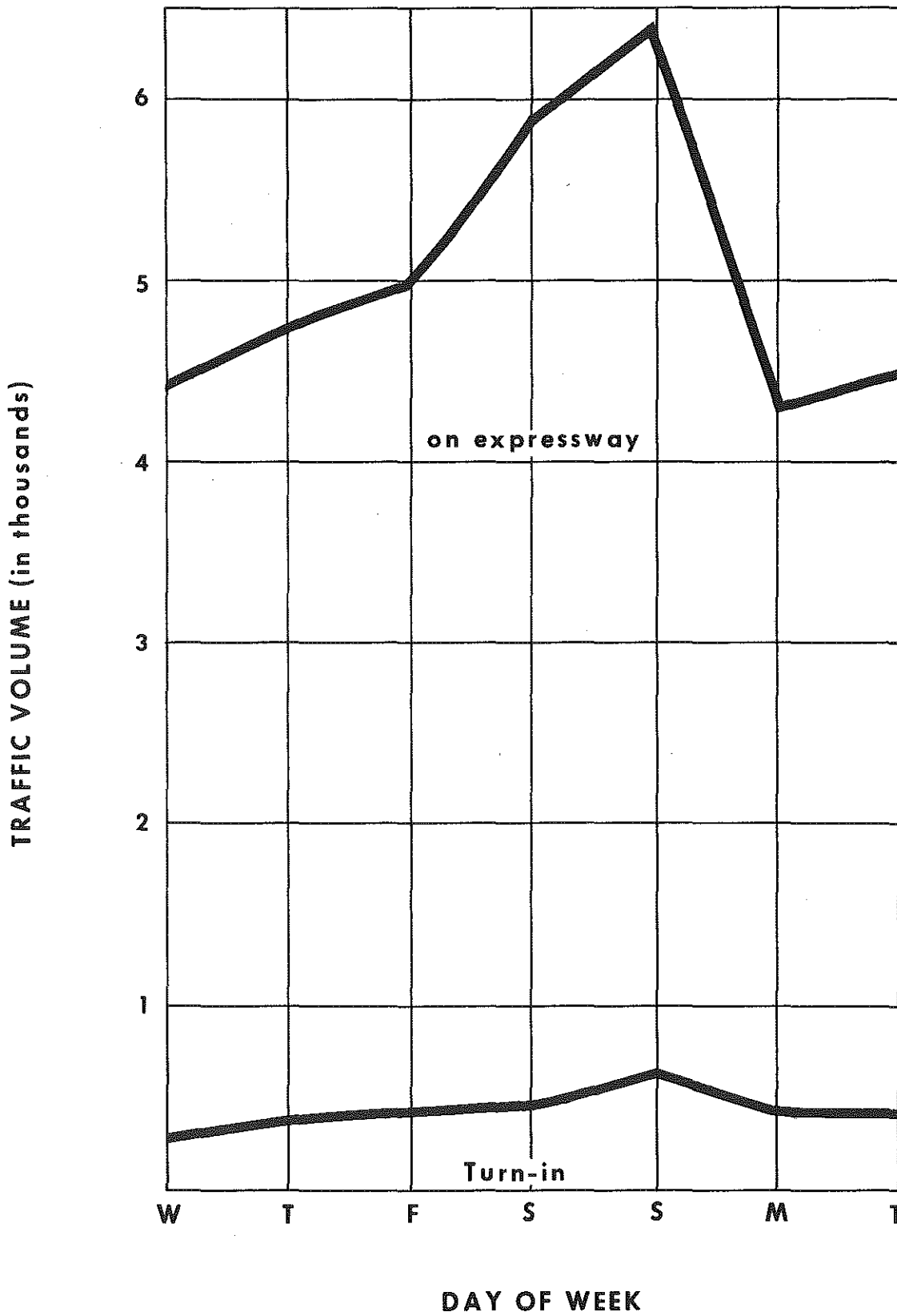
A significant number of adverse comments were obtained - only a small number of comments praising the rest area were, however, forthcoming.



Graph I

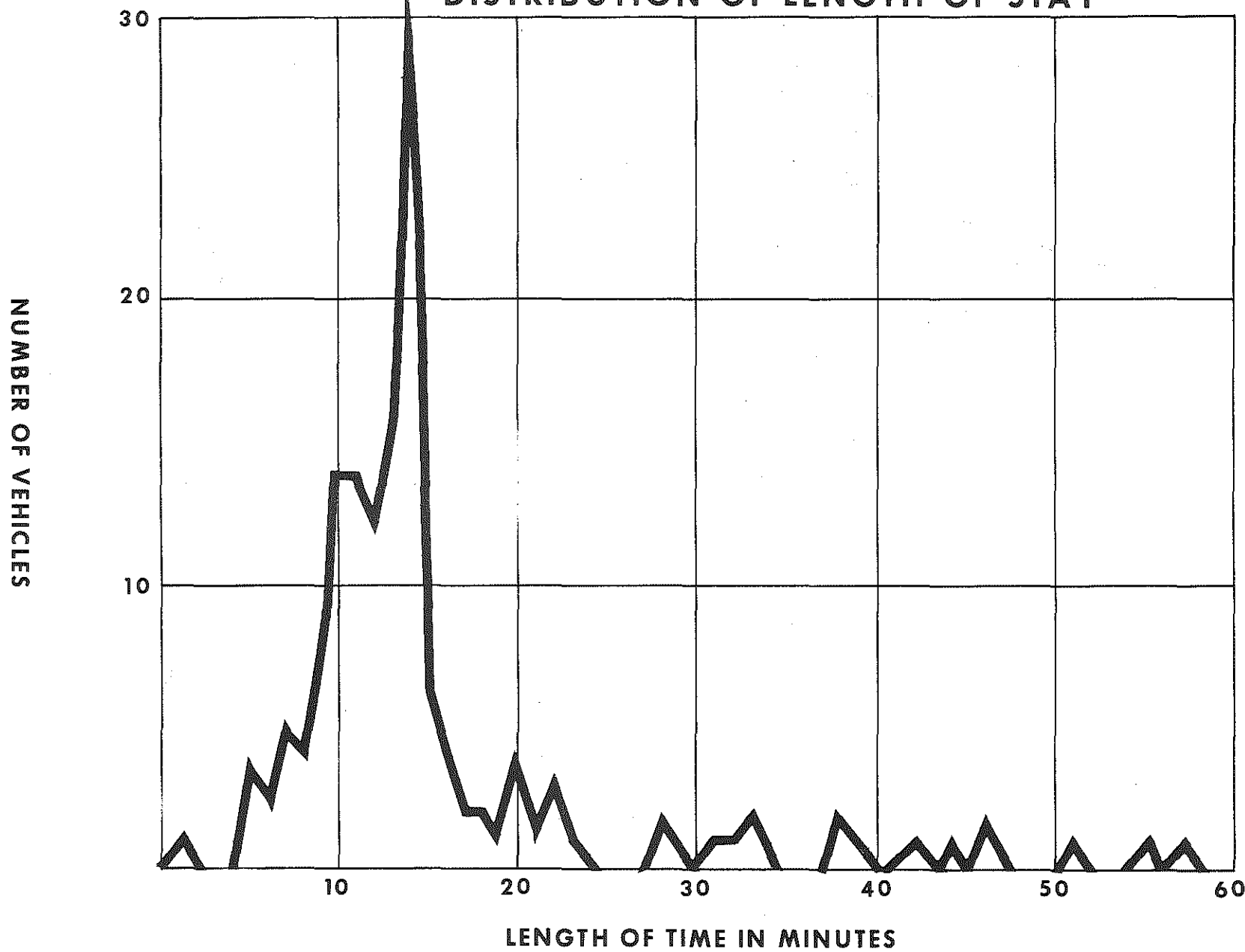


Graph II



Graph III

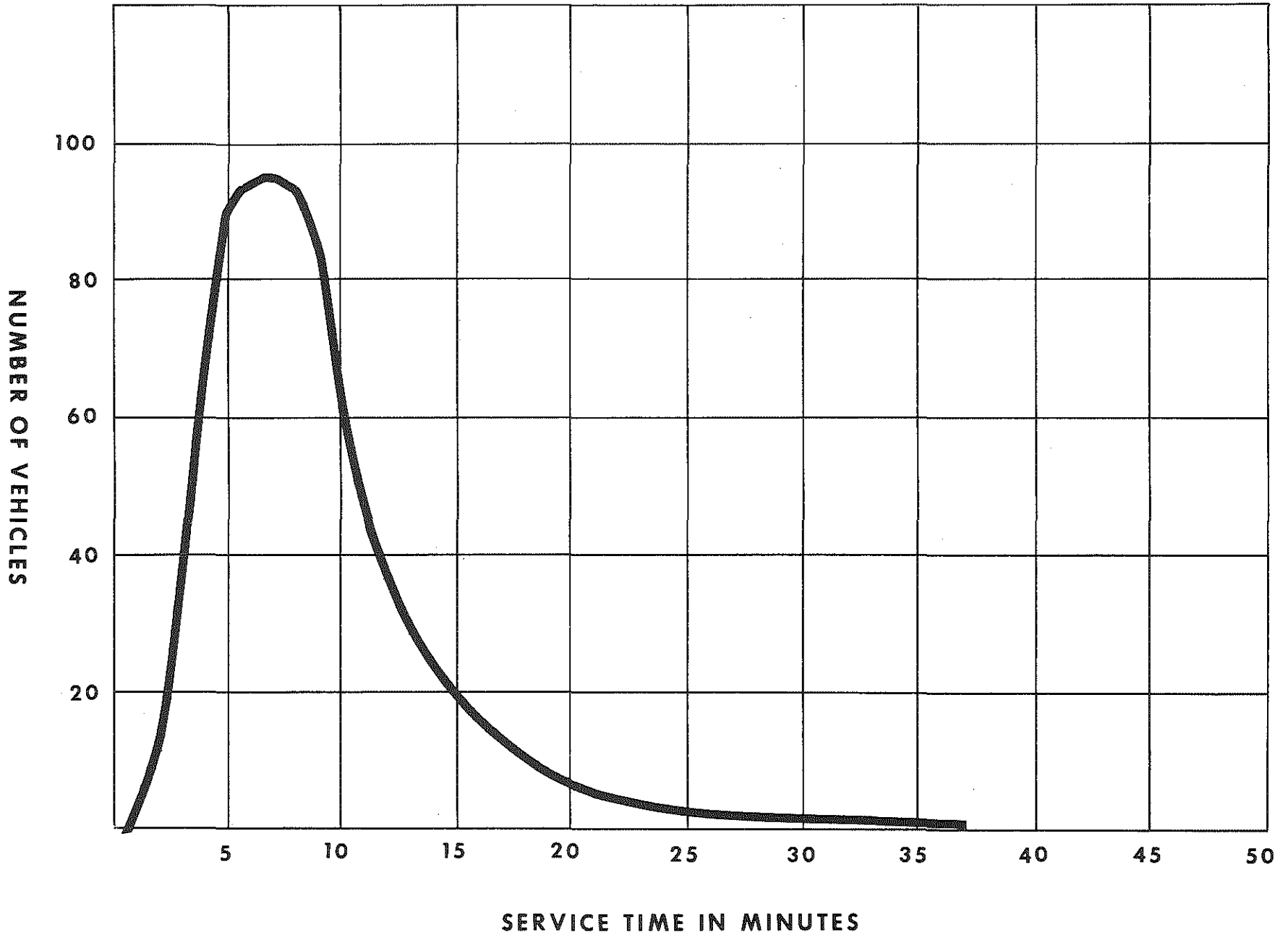
DISTRIBUTION OF LENGTH OF STAY

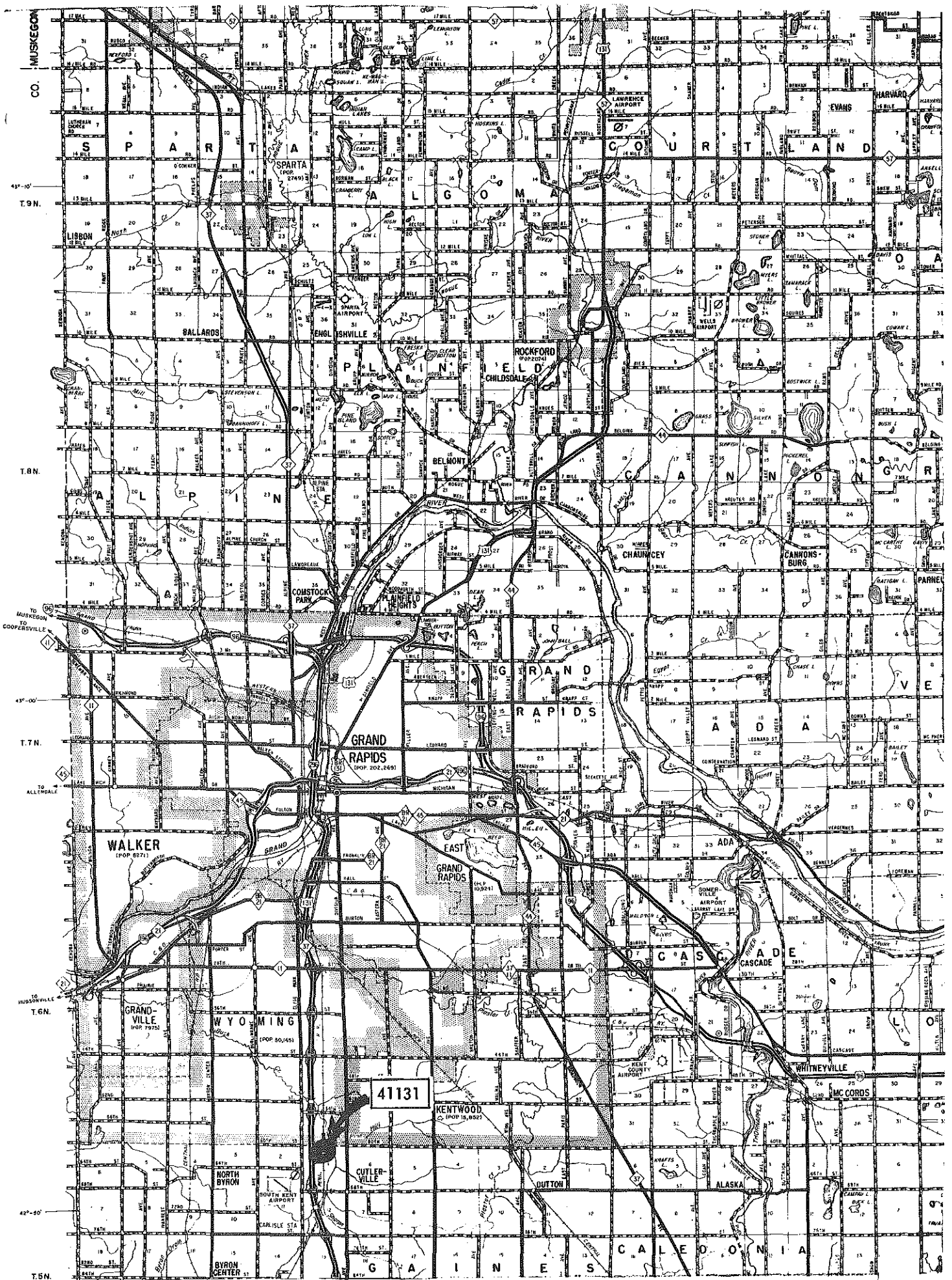


SERVICE TIME DISTRIBUTIONS

(Vehicles in rest area)

CAR PARKING TIME





41131

SOUTH OF GRAND RAPIDS

(4 1 1 3 1)

TRAFFIC VOLUMES BY DAY		From: 3/2/67 To: 8/9	
	Expressway	Rest Area	%
SUNDAY (Except 2P-12P)	2,680	254	9.5
MONDAY (Except 12P-12A)	4,742	322	6.8
TUESDAY	8,745	616	7.0
WEDNESDAY	9,232	591	6.4
THURSDAY	9,103	749	8.2
FRIDAY	10,367	786	7.6
SATURDAY	9,580	658	6.9
TOTAL	54,449	3,976	7.3

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	11.2	12 N-1	9.9
1-2	16.6	1-2	8.2
2-3	19.8	2-3	7.3
3-4	25.4	3-4	8.3
4-5	19.8	4-5	6.3
5-6	7.6	5-6	5.5
6-7	2.7	6-7	5.7
7-8	4.0	7-8	5.9
8-9	6.8	8-9	6.0
9-10	7.7	9-10	6.2
10-11	9.5	10-11	6.4
11-12	9.0	11-12	9.6

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE			
				MALE	FEMALE	CHILD	
1	3910	158	11	1.4	1.2	0.2	
2	143	20	18	1.4	0.4	0.0	
3	32	6	14	1.1	1.6	0.0	
4	18	2	18	1.0	2.0	0.0	
5	6	3	7	1.0	0.0	0.0	
6	8	6	11	1.5	1.6	0.0	
7	163	24	17	1.9	1.7	0.2	
CARDS REJECTED		130					
TOTALS		4280	349	14	1.4	1.2	0.2

Average Persons Per
Vehicle: 2.94

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	0
Washing Facilities Required	0
More Rest Areas Needed	17
Flush Toilets Required	0
Rest Area Satisfactory	46
Rest Area Good	96
Refreshments Required	5
Facilities Unsatisfactory	1
No Comment	70
Larger Rest Rooms Required	0

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.60
Tuesday	.45
Wednesday	.54
Thursday	.69
Friday	.63
Saturday	.84
Sunday	.65

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .97.

Out-Of-State Vehicles

46 out-of-state vehicles stopped at the rest area during the 7-hour study.

The average length-of-stay in the rest area of these vehicles was 17 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 14 minutes.

Rest Room Usage by Sex

244 males out of a total of 328 used the rest rooms, giving a male's percentage usage of 74.4.

221 females out of a total of 274 used the rest rooms, giving a female's percentage usage of 80.7.

46 children under 5 years of age entered the rest area.

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village
or Twp. _____ County Kent

Sheet 1 of 2 Date 8/2 - 8/10 1967

Location US-131 - Rest Area
(South of Grand Rapids)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

101

STATION NO.	1 NB														
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tue.	Wed.	Thurs.						
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10						
TIME															
12-1A.M.		157	118	206	272	110	87	88	96						
1-2		214	76	118	171	79	66	66	71						
2-3		88	40	93	67	49	40	56	64						
3-4		39	41	68	38	62	38	52	58						
4-5		60	66	69	24	75	51	64	62						
5-6		149	149	128	51	246	247	280	367						
6-7		736	727	354	55	802	789	711	728						
7-8		615	677	324	92	689	669	701	662						
8-9		488	460	395	182	468	448	455	468						
9-10		401	412	530	299	402	473	477	455						
10-11		453	464	569	298	432	450	430	465						
11-12		417	447	568	367	459	427	432	459						
12-1P.M.		391	454	515	404	446	408	417	473						
1-2		443	461	539	360	510	438	498	510						
2-3		560	647	619	387	592	596	536	550						
3-4	561	555	651	519	474	500	528	592							
4-5	624	610	728	561	533	575	588	663							
5-6	538	572	761	559	689	447	542	547							
6-7	452	443	743	595	751	370	405	488							
7-8	411	421	659	597	614	365	377	390							
8-9	340	404	502	524	653	287	308	347							
9-10	424	401	416	413	555	300	324	358							
10-11	352	313	381	375	425	216	278	281							
11-12	267	173	287	342	247	134	168	163							
TOTAL	3969	9103	10367	9580	8008	8615	8745	9092	5488						

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	N Bd.			US-131	South of Grand Rapids	

Sheet 2 of 2 Date 8/2 - 8/10 19 67

Location US-131 Rest Area
(South of Grand Rapids)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	2 NB (Ramp)																	
DAY	Wed.	Thur.	Fri.	Sat.	Sun.	Mon.	Tue.	Wed.	Thur.									
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10									
TIME																		
12-1A.M.		20	16	21	17		15	15	16									
1-2		8	31	21	36		13	9	14									
2-3		13	7	15	30		9	2	8									
3-4		10	9	17	10		18	6	7									
4-5		4	4	22	6		10	20	13									
5-6		19	17	10	2		8	20	11									
6-7		14	14	26	6		13	17	22									
7-8		49	18	25	3		11	16	24									
8-9		38	50	15	13		32	18	38									
9-10		35	34	44	25		31	30	37									
10-11		46	42	50	23		50	43	35									
11-12		47	47	34	24		41	45	32									
12-1P.M.		48	39	49	34	41	42	47	35									
1-2		42	42	41	25	43	28	47	45									
2-3		64	41	45	*	26	47	37	44									
3-4	35	57	51	43		40	48	31										
4-5	42	51	36	27		30	45	35										
5-6	24	40	39	37		24	25	31										
6-7	26	24	59	28		16	18	27										
7-8	18	29	57	15		30	18	21										
8-9	19	28	32	18		19	25	16										
9-10	23	23	43	22		15	16	17										
10-11	20	21	22	13		16	30	18										
11-12	12	19	36	20		22	23	25										
TOTAL	219	749	786	658	254	322	616	593	381									

Sta. No.	Direction	Road Type	Width (ft.)	Route	Location	C.S. No.
2	NB	Bit.	12'	US-131 Ramp	Entrance to Rest Area - South of Grand Rapids.	

*Hose Up.

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NOTES ON CHARACTERISTICS OF REST AREA
SOUTH OF GRAND RAPIDS

This rest area is equipped with electricity and drinking water. Its rest rooms have lavatories and flush toilets. There are fifty parking spaces for cars as well as twenty separate truck spaces. Likewise, 10 picnic tables and 3 separate cooking facilities can be found. As an added convenience, tourist information is available.

This rest area has a percentage turn-in which varies considerably with day of week. It must be noted that counts were not taken between 2 PM and 12 PM on Sunday and 12 PM and 12 AM on Monday. This means that the percent turn-in estimated for Sunday will be an over estimate and the percent turn-in for Monday will be an underestimate. This is because a higher percentage of traffic turns into the rest area during the night (although the actual volume turn-in is lower at night than during the day.)

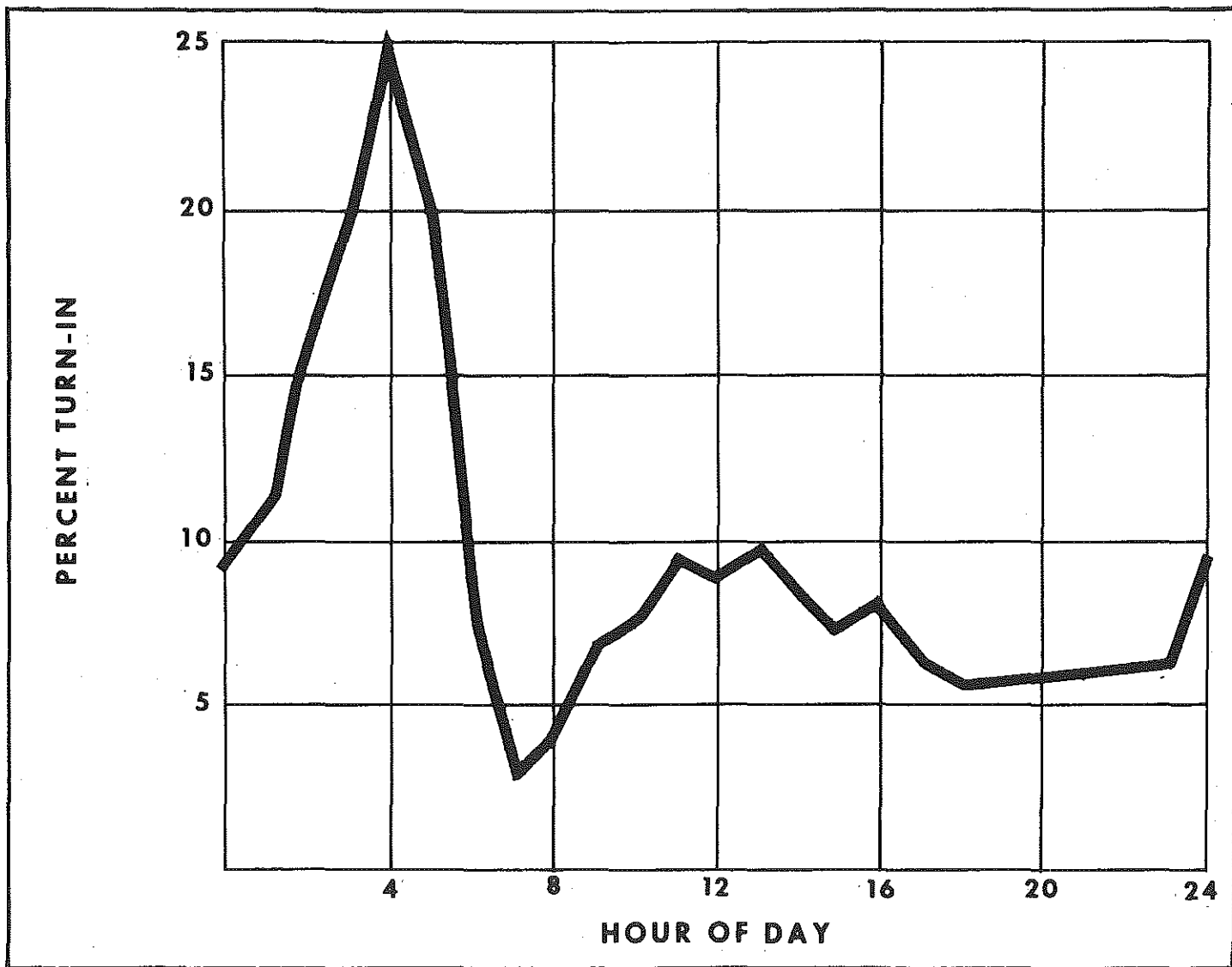
The percentages for the hourly distribution will be unstable between 12 PM and 5 AM since the volume turn-in during these hours is low. Nighttime counts over a longer period will be required to obtain greater accuracy.

Commercial vehicles were seen to account for about nine percent of vehicles stopping at the rest area during the survey. This accounts for the fact that the out-of-state vehicles stopped on average for three minutes longer than the average stopping time for all vehicles.

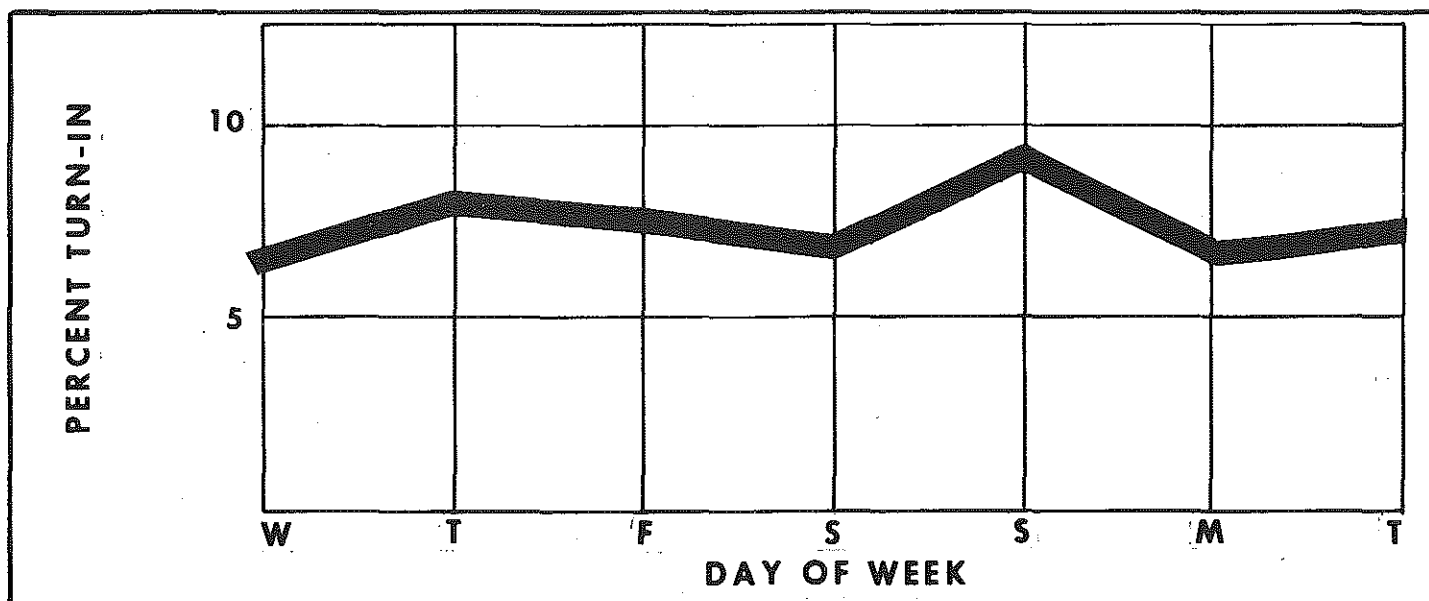
The percentage rest room use is extremely high for males and females.

The comments received were very favorable.

The high percentage usage of the rest rooms is a reflection on the good condition of the rest rooms.

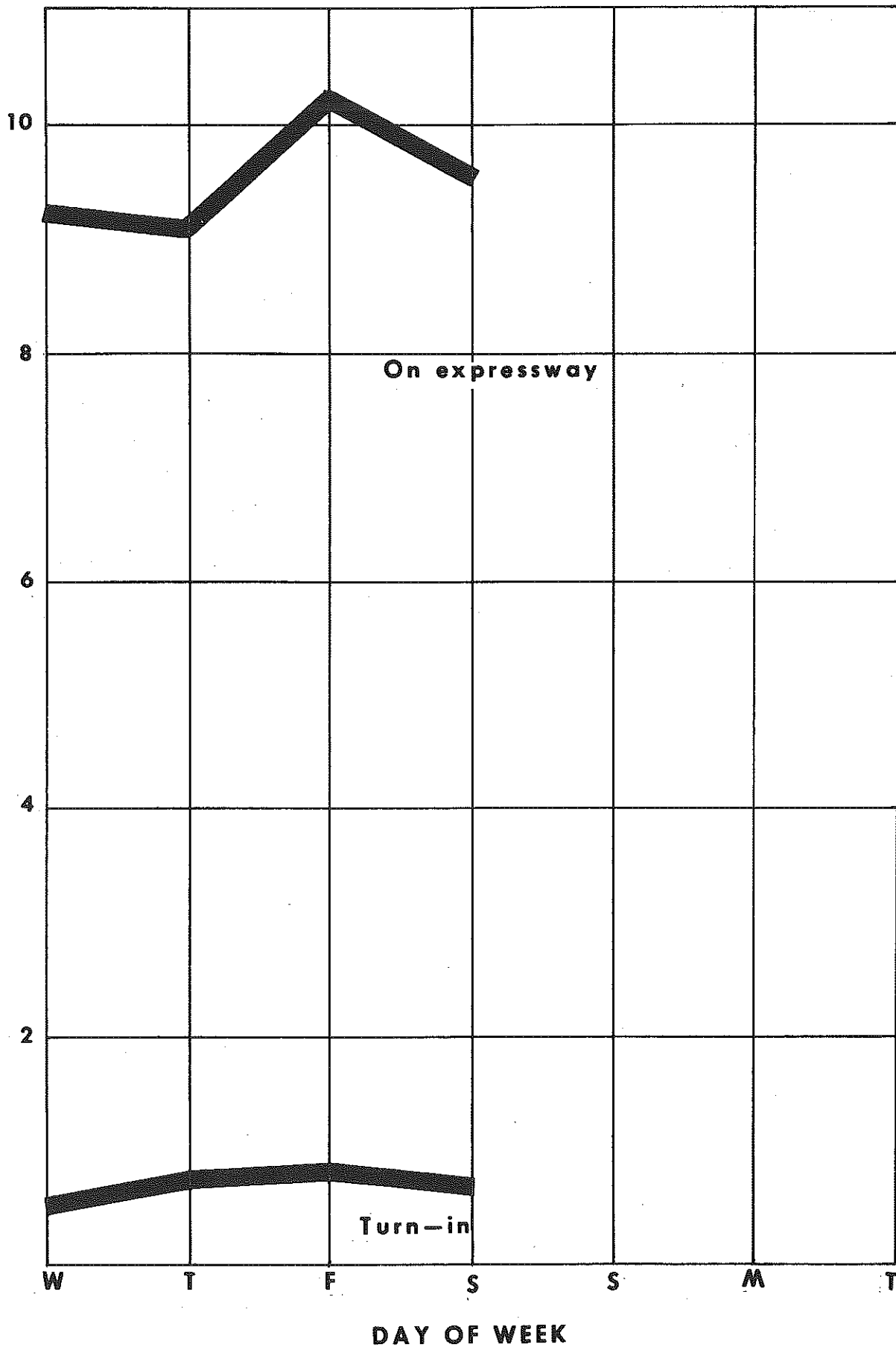


Graph I



Graph II

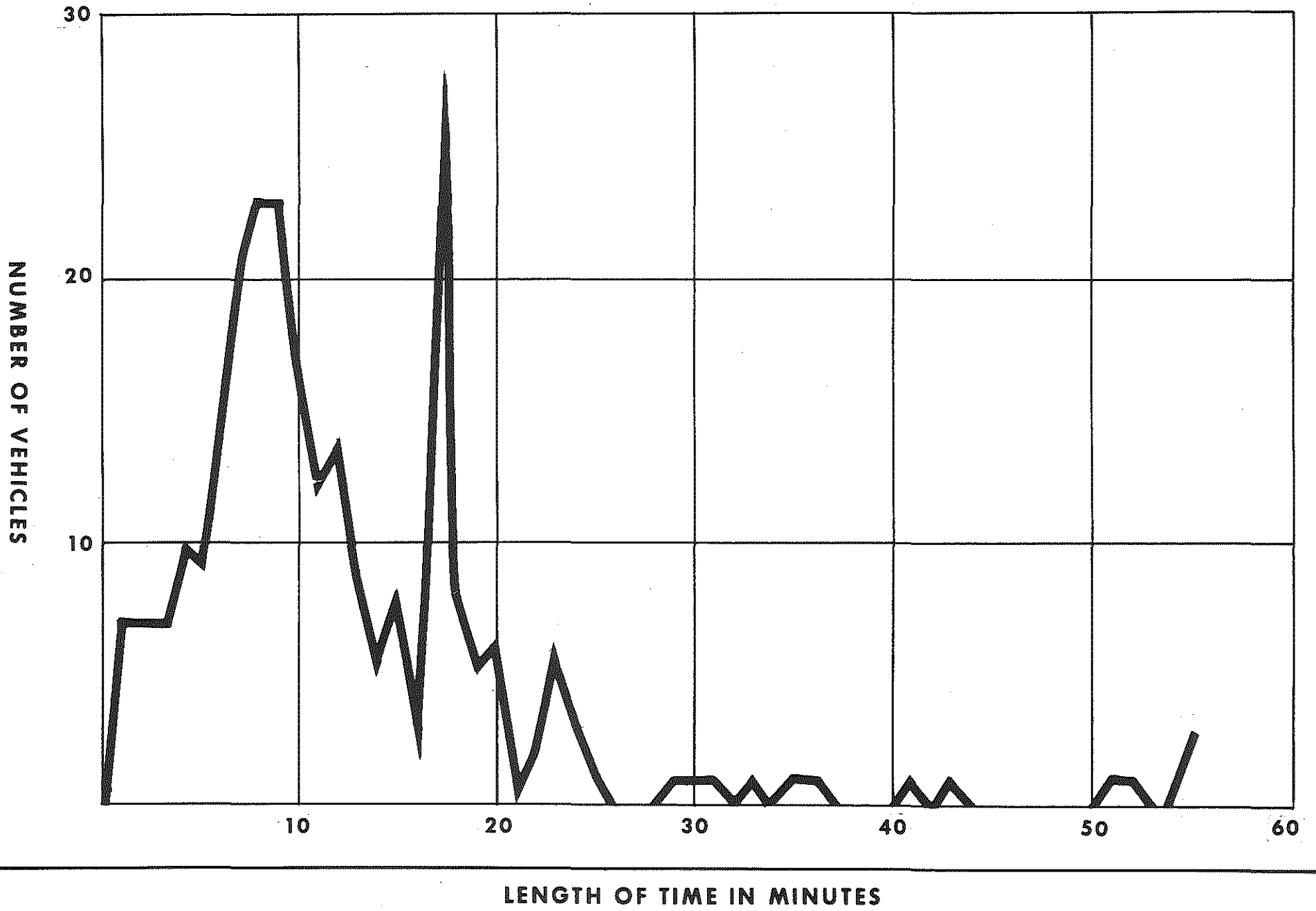
TRAFFIC VOLUME
(in thousands)



DAY OF WEEK

Graph III

DISTRIBUTION OF LENGTH OF STAY



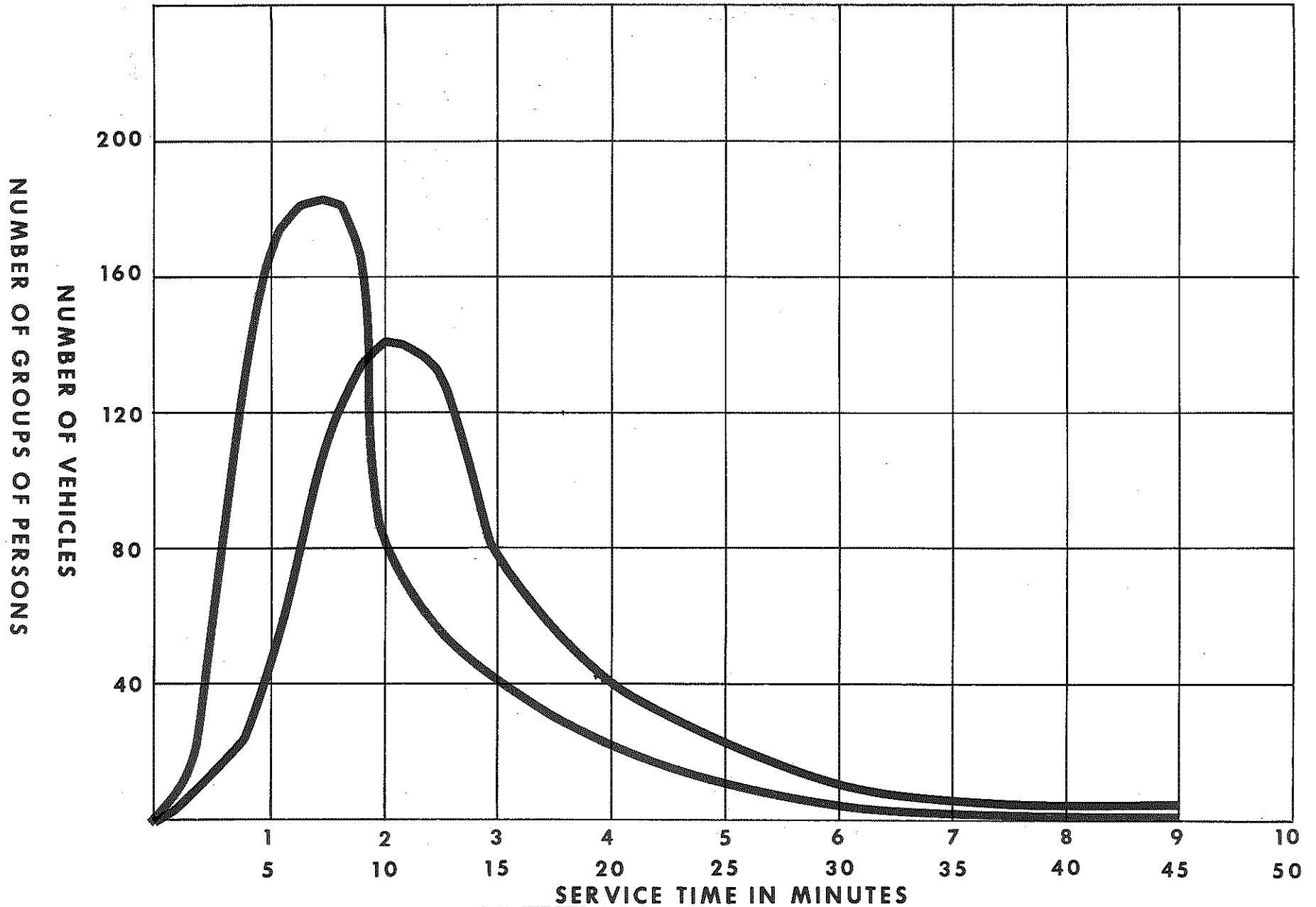
SERVICE TIME DISTRIBUTIONS

(Person—Groups in rest rooms)

(Vehicles in rest area)

REST ROOM USAGE TIME

CAR PARKING TIME







OHIO

SOUTH OF MONROE

(5 8 1 5 1)

TRAFFIC VOLUMES BY DAY			
		From: 8/3/67 To: 8/10	
	Expressway	Rest Area	%
SUNDAY	15,110	1,280	8.5
MONDAY	13,979	1,348	9.6
TUESDAY	12,480	1,115	8.9
WEDNESDAY	12,457	1,128	8.4
THURSDAY (Except 2P-6P)	9,489	892	8.1
FRIDAY	13,428	1,189	8.8
SATURDAY	12,496	1,197	9.6
TOTAL	89,439	8,343	9.3

HOURLY DISTRIBUTION

% Entering R.A.		% Entering R.A.	
12 PM-1	8.6	12 N-1	12.9
1-2	10.1	1-2	11.5
2-3	12.4	2-3	9.8
3-4	12.6	3-4	9.8
4-5	10.2	4-5	9.9
5-6	10.0	5-6	8.4
6-7	6.9	6-7	8.1
7-8	7.3	7-8	6.7
8-9	7.6	8-9	8.5
9-10	8.6	9-10	7.1
10-11	10.2	10-11	6.8
11-12	11.7	11-12	7.1

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	1833	93	14	1.0	0.7	0.1
2	321	12	17	1.0	0.0	0.0
7	15	2	20	1.0	1.0	0.0

CARDS REJECTED

TOTALS	2169	107	15	1.0	0.6	0.0
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Average Persons Per
Vehicle: 1.76

LIBRARY
 michigan department of
 state highways
 LANSING

REST AREA VISITORS' COMMENTS

	<u>Total</u>
Unsanitary	0
Washing Facilities Required	5
More Rest Areas Needed	20
Flush Toilets Required	1
Rest Area Satisfactory	40
Rest Area Good	53
Refreshments Required	6
Facilities Unsatisfactory	2
No Comment	7
Larger Rest Rooms Required	0

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC VOLUME
 AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.77
Tuesday	.73
Wednesday	.65
Thursday	.64
Friday	.70
Saturday	.79
Sunday	.87

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .93

Out-Of-State Vehicles

45 out-of-state vehicles stopped at the rest area during the 4-hour study.

The average length-of-stay in the rest area of these vehicles was 13 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 15 minutes.

Rest Room Usage by Sex

108 males out of a total of 151 used the rest rooms, giving a male's percentage usage of 71.5.

79 females out of a total of 86 used the rest rooms, giving a female's percentage usage of 91.9.

15 children under 5 years of age entered the rest area.

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village
or Twp. _____ County Monroe

Sheet 1 of 2 Date 8/3-8/10 19 67

Location I-75 Rest Area
(S. of Monroe)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	1 NB																	
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues	Wed.	Thurs.										
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10										
TIME																		
12-1 A.M.		288	394	333	509	318	272	352										
1-2		207	329	332	381	256	213	293										
2-3		229	267	270	346	276	254	274										
3-4		256	265	186	349	260	243	294										
4-5		318	200	129	391	286	303	336										
5-6		343	298	146	492	401	358	390										
6-7		543	415	207	702	602	524	538										
7-8		563	369	174	656	586	543	582										
8-9		542	441	262	593	538	627	596										
9-10		545	527	360	605	602	573	546										
10-11		568	577	419	634	685	594	563										
11-12		577	619	542	662	632	584	644										
12-1 P.M.		607	688	635	681	617	571	642										
1-2		683	671	680	739	655	628	629										
2-3		752	695	795	764	662	727	*										
3-4		860	789	857	778	758	695											
4-5		824	757	961	827	782	664											
5-6		862	754	1137	763	739	764											
6-7	667	723	731	1251	659	638	688											
7-8	529	863	698	1339	567	584	592											
8-9	461	666	592	1189	509	505	539											
9-10	418	634	518	1152	502	415	468											
10-11	389	532	462	806	459	383	458											
11-12	346	443	440	948	411	300	575											
TOTAL	2810	13428	12496	15110	13979	12480	12457	6679										

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	NB	Conc.	26'	I-75	S. of Monroe	

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Sheet 2 of 2 Date 8/3 - 8/10 19 67

Location I-75 Rest Area
(S. of Monroe)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	2 NB																	
DAY	Thurs	Fri	Sat.	Sun.	Mon.	Tues	Wed.	Thurs										
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10										
TIME																		
12-1 A.M.		29	24	32	36	25	24	41										
1-2		26	36	25	33	20	30	32										
2-3		36	17	30	43	40	31	40										
3-4		39	38	13	48	26	38	32										
4-5		29	41	21	31	21	33	25										
5-6		39	37	15	58	28	31	34										
6-7		39	29	15	46	33	38	20										
7-8		41	49	16	59	25	39	25										
8-9		35	40	32	57	35	32	42										
9-10		40	48	28	67	49	34	58										
10-11		56	67	39	68	56	63	65										
11-12		62	60	71	81	90	64	70										
12-1 P.M.		62	84	100	88	72	83	84										
1-2		86	72	74	98	78	57	74										
2-3		85	80	67	80	56	64	64										
3-4		64	85	88	76	86	63	69										
4-5		90	74	78	85	75	77	61										
5-6		73	72	93	60	61	62											
6-7	59	54	67	98	57	48	49											
7-8	50	40	38	90	41	39	47											
8-9	38	56	51	89	57	31	58											
9-10	28	35	39	65	30	55	41											
10-11	37	38	21	49	24	29	39											
11-12	37	35	28	52	25	37	31											
TOTAL	249	1189	1197	1280	1348	1115	1128	837										

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	N Bd.	Bit.	16'	I-75 (Ramp)	Entrance to Rest Area - S. of Monroe	

- 911 -

NOTES ON CHARACTERISTICS OF REST AREA
SOUTH OF MONROE

This rest area is equipped with electricity and drinking water. Its rest rooms have lavatories and flush toilets. There are 122 parking spaces for cars as well as twenty-two separate truck spaces. Likewise, twenty-four picnic tables and 3 separate cooking facilities can be found. As an added convenience, general tourist information is available.

This rest area has a reasonably constant percentage turn-in both by day of week and hour of day.

The percentages for the hourly distribution will be fairly stable since the expressway volume was reasonably large even through the hours of darkness.

The survey was conducted from 1 PM to 5 PM on a Monday at the end of October. This resulted in a low figure for the average number of persons per vehicle, since little recreational traffic was on the expressway.

The correlations between expressway volumes and volume turn-in by hour of the day are low.

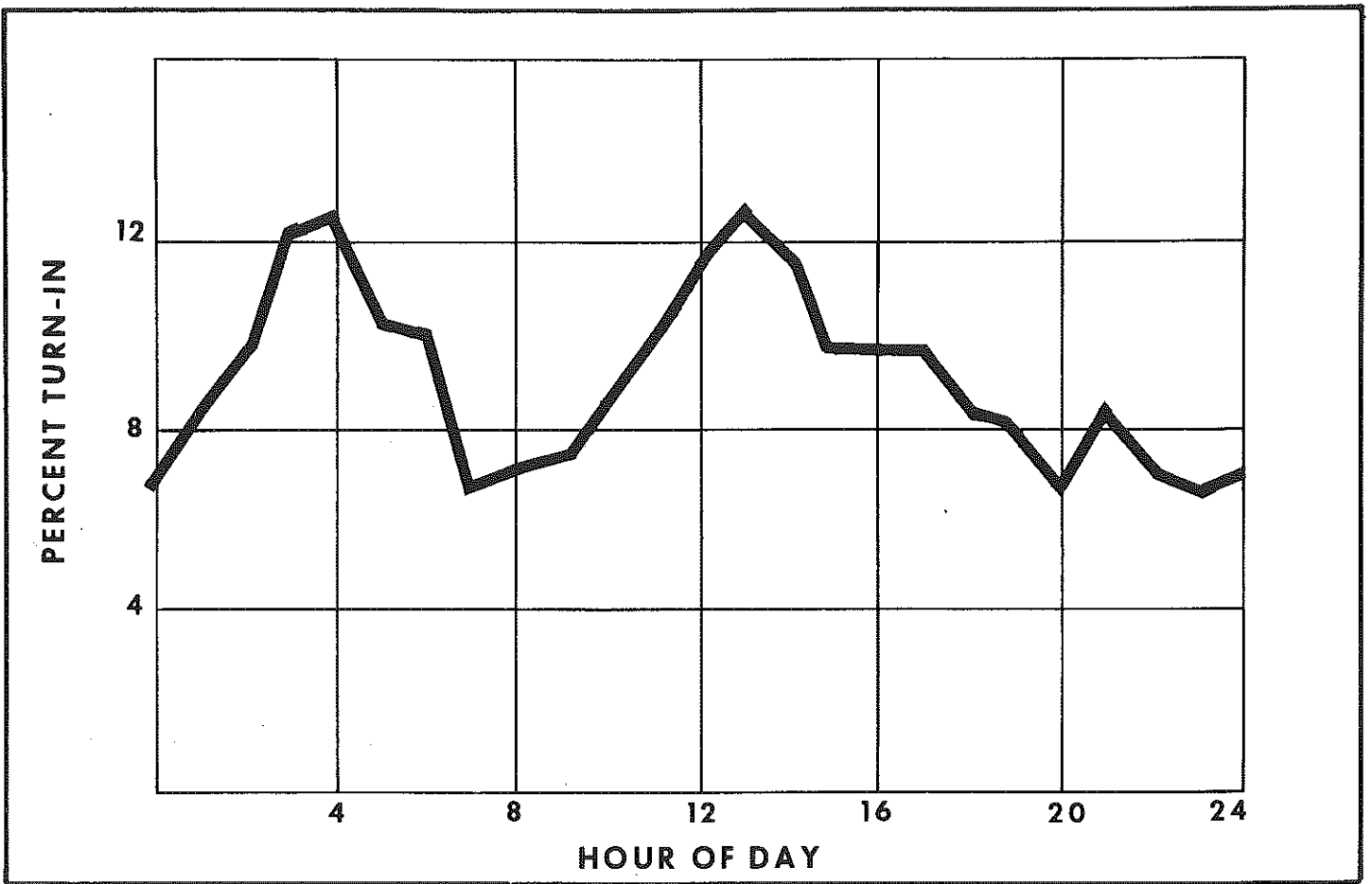
The correlation between daily expressway volumes and daily rest area turn-in is however, reasonably large.

The large number of out-of-state vehicles turning in is accounted for by the proximity of the rest area to the Ohio State Line.

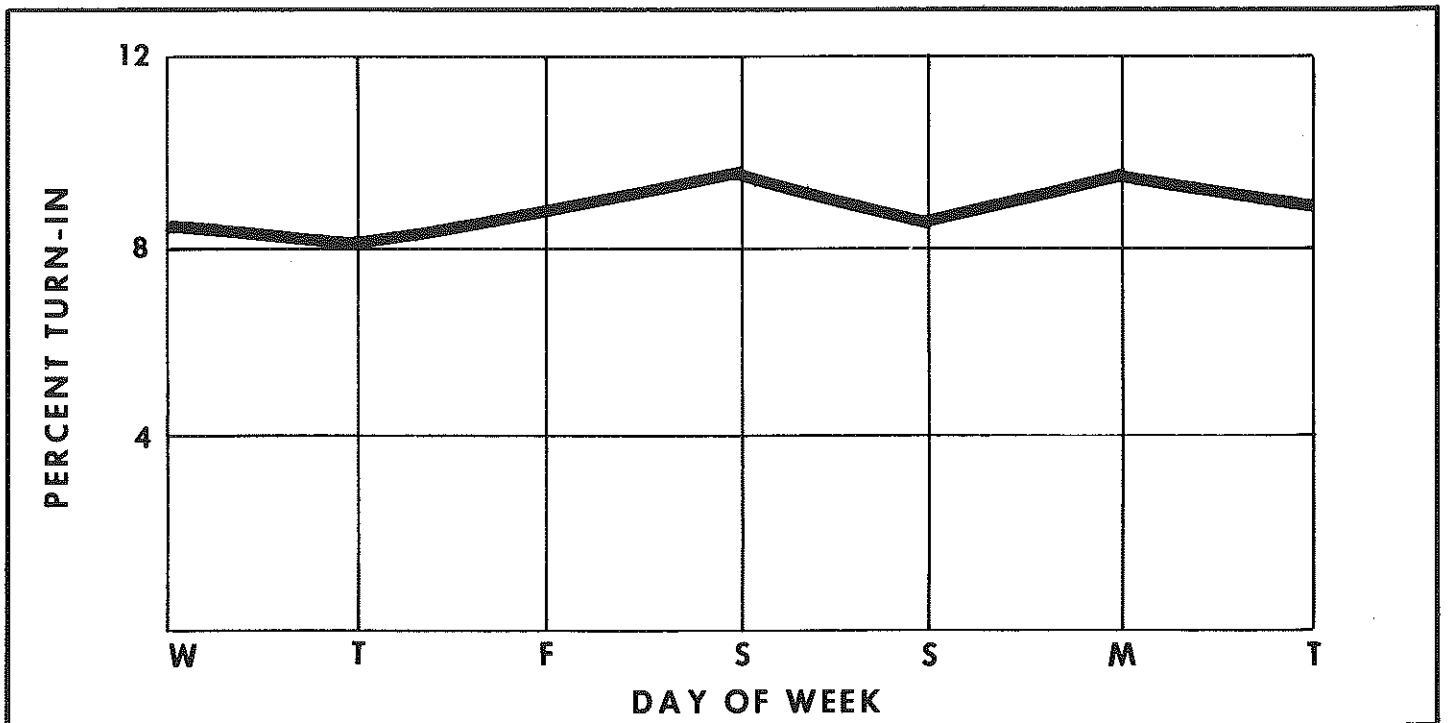
The average length-of-stay for out-of-state vehicles is slightly less than the overall average length-of-stay.

The percentage rest room use is extremely high for females and also very high for males.

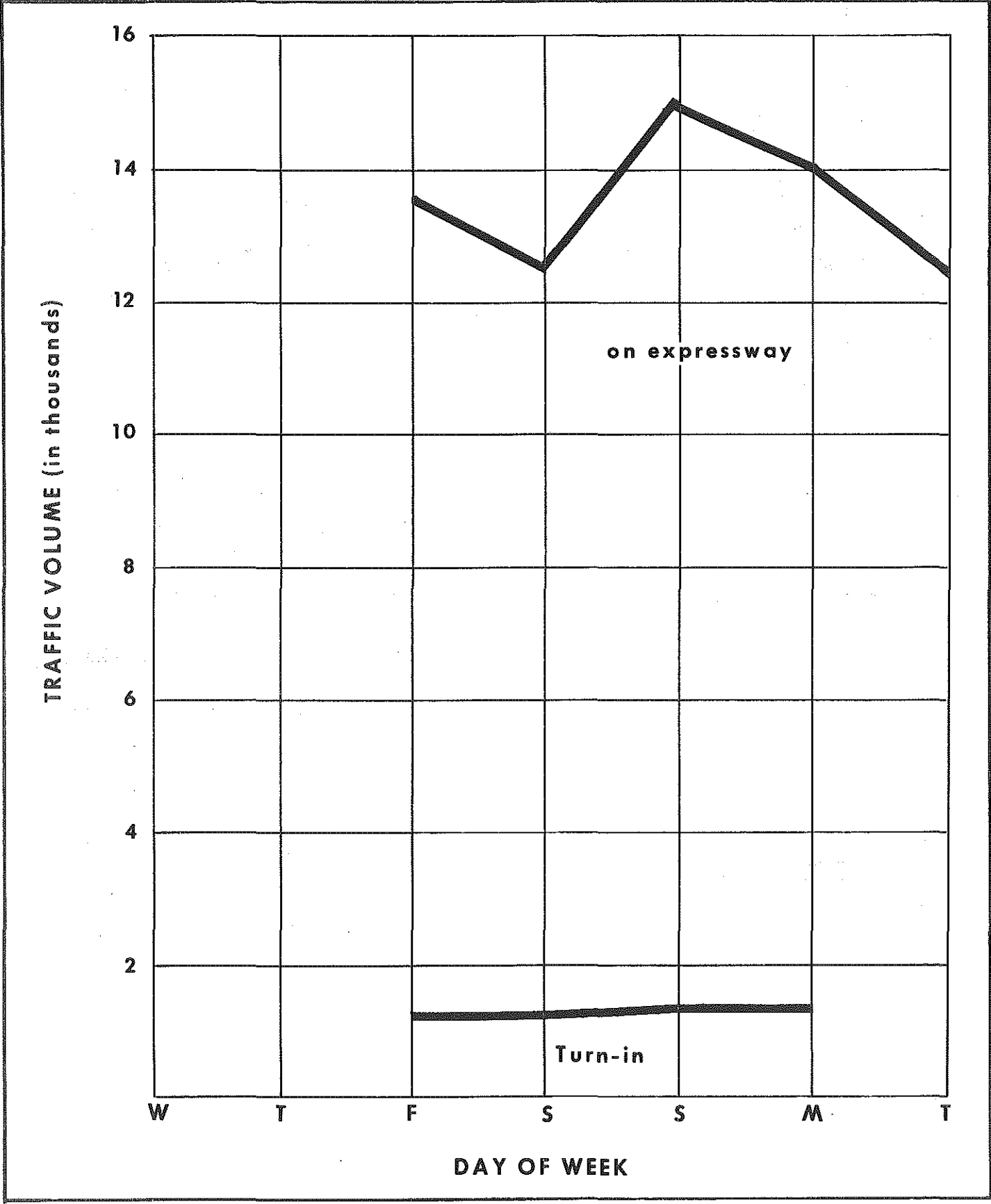
There were very few adverse comments concerning the rest area but a significant number of travelers indicated they would like more rest areas.



Graph I

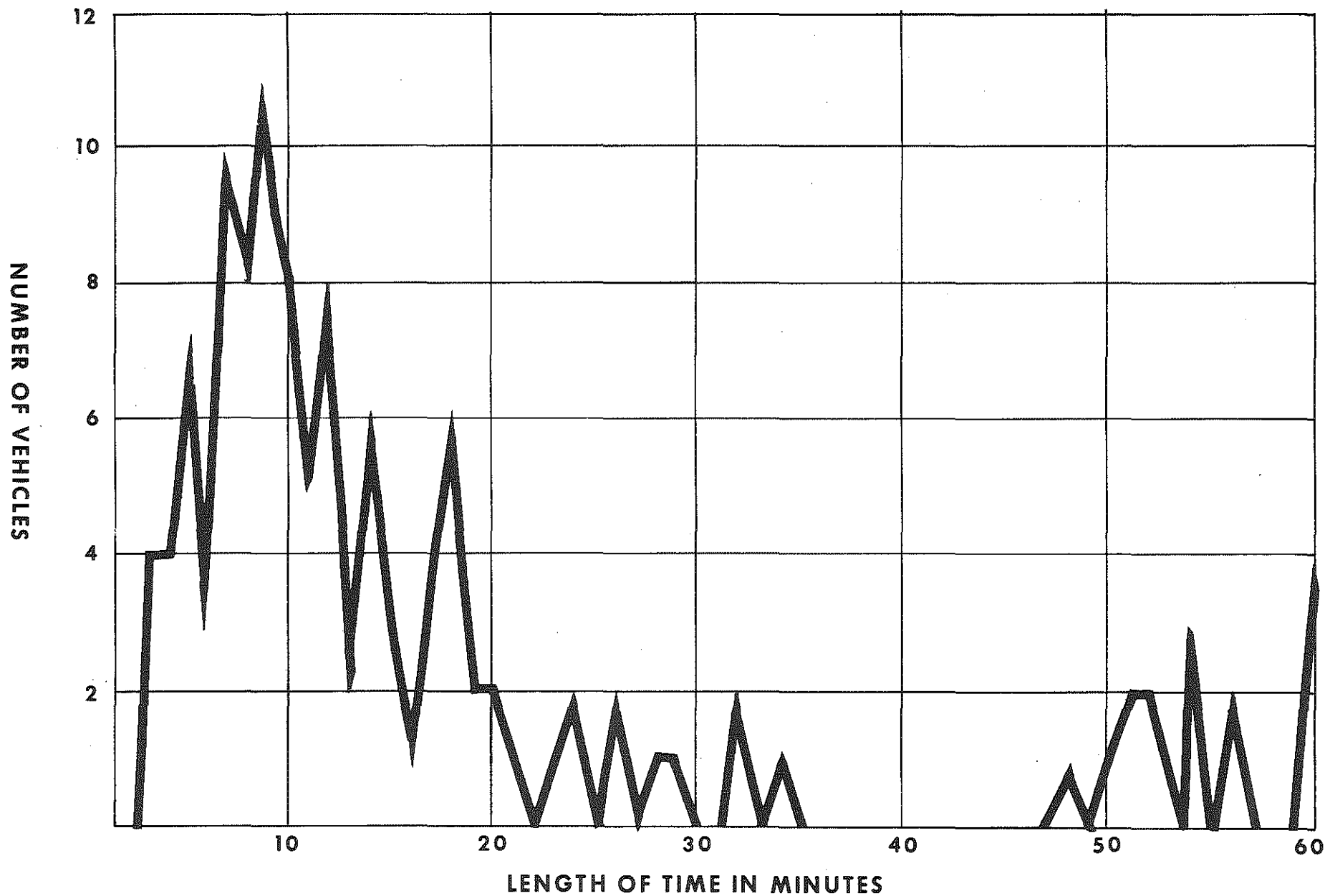


Graph II



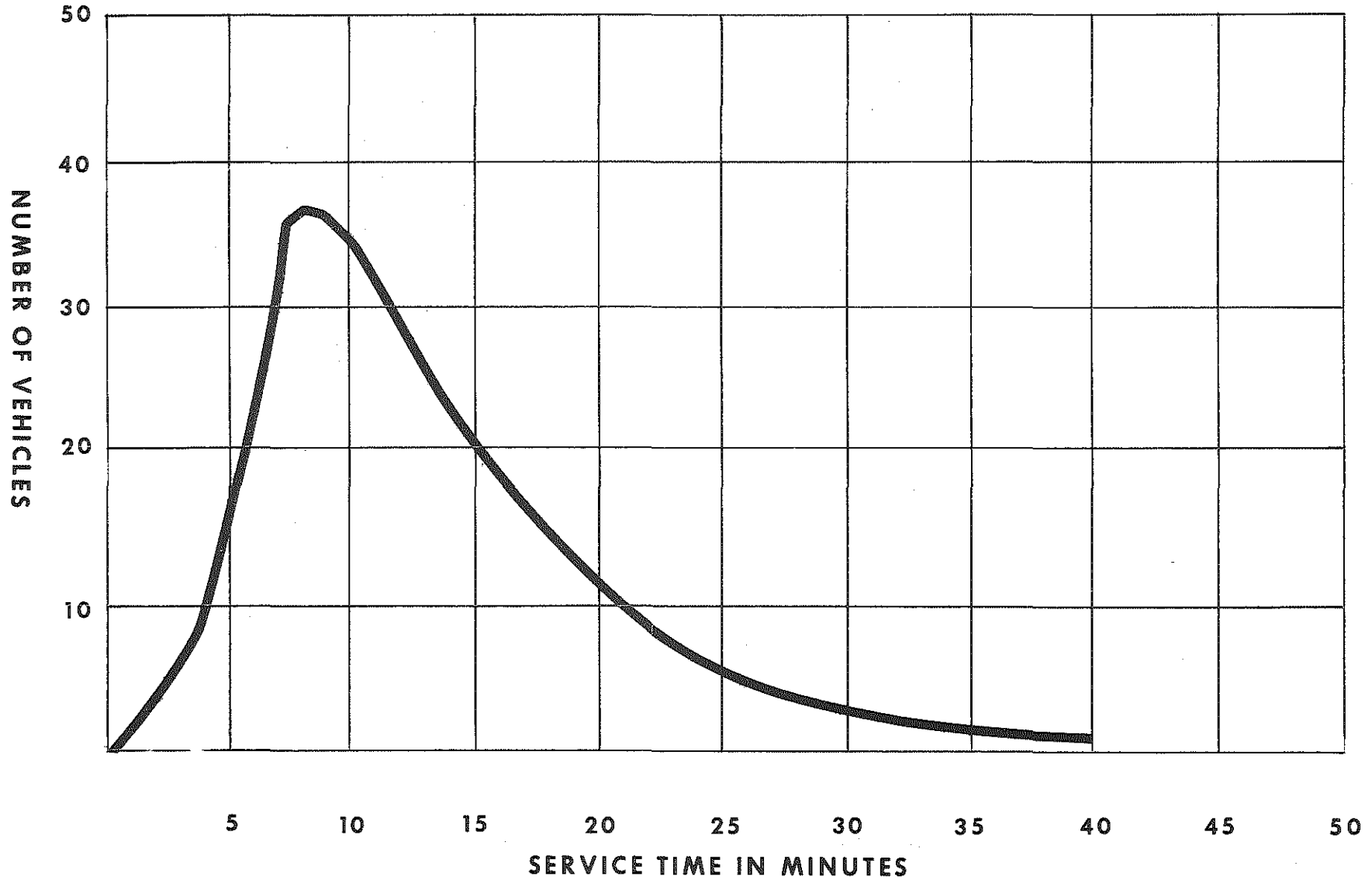
Graph III

DISTRIBUTION OF LENGTH OF STAY

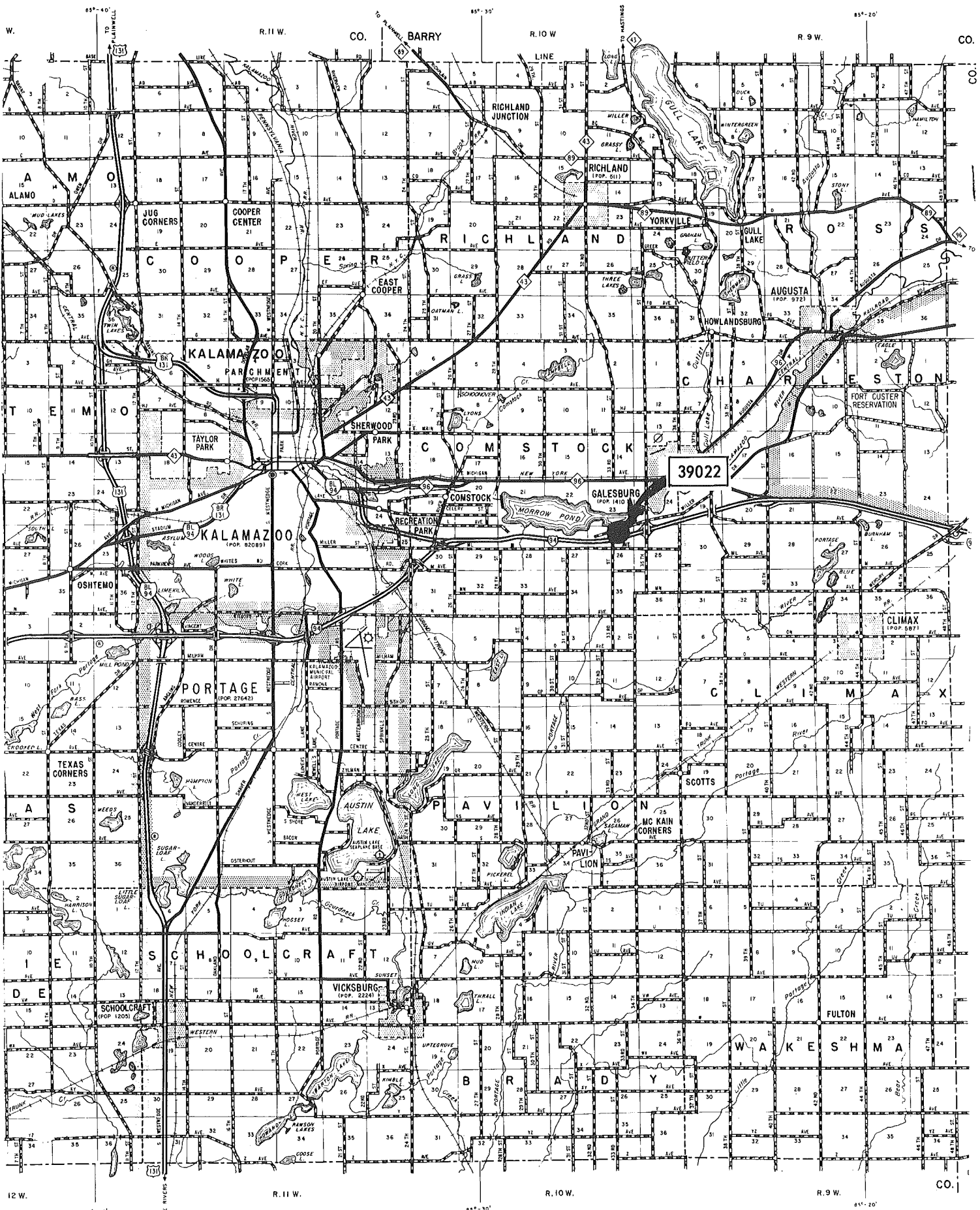


SERVICE TIME DISTRIBUTIONS (Vehicles in rest area)

CAR PARKING TIME







39022

EAST OF KALAMAZOO

(3 9 0 2 2)

TRAFFIC VOLUMES BY DAY			
		From: 8/3/67 To: 8/9	
	Expressway	Rest Area	%
SUNDAY	13,150	844	6.4
MONDAY	12,137	894	7.4
TUESDAY	11,449	818	7.1
WEDNESDAY (Except 10A-12P)	3,503	224	6.4
THURSDAY (Except 12P-10A)	8,728	674	7.7
FRIDAY	15,533	1,221	7.9
SATURDAY	13,532	961	7.1
TOTAL	78,032	5,636	7.2

HOURLY DISTRIBUTION

% Entering R.A.		% Entering R.A.	
12 PM-1	9.2	12 N-1	9.1
1-2	11.0	1-2	7.8
2-3	10.0	2-3	7.8
3-4	11.9	3-4	6.8
4-5	13.9	4-5	5.9
5-6	11.4	5-6	6.4
6-7	4.6	6-7	6.9
7-8	4.2	7-8	6.7
8-9	6.4	8-9	5.0
9-10	8.5	9-10	6.2
10-11	9.2	10-11	6.8
11-12	9.5	11-12	6.5

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	1990	41	12	1.2	0.4	0.0
2	425	19	15	1.0	0.0	0.0

CARDS REJECTED

TOTAL	2415	60	13	1.1	0.3	0.0
-------	------	----	----	-----	-----	-----

Average Persons Per
Vehicle: 1.51

REST AREA VISITORS' COMMENTS

	<u>Total</u>
Unsanitary	0
Washing Facilities Required	0
More Rest Areas Needed	5
Flush Toilets Required	0
Rest Area Satisfactory	19
Rest Area Good	26
Refreshments Required	2
Facilities Unsatisfactory	0
No Comment	14
Larger Rest Rooms Required	0

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.74
Tuesday	.74
Wednesday	.52
Thursday	.67
Friday	.82
Saturday	.91
Sunday	.86

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .98

Out-of-State Vehicles

18 out-of-state vehicles stopped at the rest area during the 4-hour study.

The average length-of-stay in the rest area of these vehicles was 17 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 13 minutes.

Rest Room Usage by Sex

70 males out of a total of 106 used the rest rooms, giving a male's percentage usage of 67.3.

20 females out of a total of 35 used the rest rooms, giving a female's percentage usage of 57.1.

5 children under 5 years of age entered the rest area.

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village _____
or Twp. _____ County Kalamazoo

Sheet 1 of 2 Date 8/3-8/9 19 67

Location I-94 - Rest Area
(East of Kalamazoo)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	1 WB																	
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.											
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9											
TIME																		
12-1A.M.		232	260	258	261	193	227											
1-2		186	243	165	162	154	193											
2-3		186	218	148	132	165	197											
3-4		175	180	103	110	133	137											
4-5		166	169	69	123	125	151											
5-6		200	198	106	206	185	187											
6-7		575	415	182	620	517	526											
7-8		713	517	229	767	698	607											
8-9		668	582	346	697	609	643											
9-10		645	785	505	608	631	635											
10-11	690	740	873	770	771	702	695											
11-12	718	857	864	904	779	483	729											
12-1P.M.	695	825	916	853	766	662												
1-2	840	874	873	830	713	664												
2-3	774	955	869	781	785	764												
3-4	807	1070	777	843	831	744												
4-5	807	1116	752	889	847	787												
5-6	803	1121	676	993	688	738												
6-7	624	1010	686	927	542	575												
7-8	480	882	610	895	423	480												
8-9	485	805	565	832	416	426												
9-10	395	646	445	669	333	372												
10-11	362	485	401	460	263	320												
11-12	348	401	660	392	294	322												
TOTAL	8728	15533	13532	13150	12137	11449	4927											

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Sta. No.	Direction	Road Type	Width (ft.)	Route	Location	C.S. No.
1	WB	Conc.	24'	I-94	East of Kalamazoo	

Sheet 2 of 2 Date 8/3-8/10 19 67

Location I-94 - Rest Area
(East of Kalamazoo)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	2 WB (Ramp)														
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.							
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10							
TIME															
12-1 A.M.		28	12	26	23	21	21	26							
1-2		24	19	5	32	12	29	25							
2-3		19	24	24	16	14	8	25							
3-4		13	20	11	21	19	16	15							
4-5		40	15	6	16	13	22	13							
5-6		48	16	6	17	16	20	21							
6-7		26	28	8	17	25	26	15							
7-8		29	34	10	36	21	18	19							
8-9		57	44	21	35	43	27	34							
9-10		53	75	33	73	51	37	49							
10-11	57	61	66	58	78	60	52	60							
11-12	50	61	67	81	55	70	53	71							
12-1 P.M.	59	73	87	83	61	67	54	67							
1-2	70	79	47	48	65	56	73								
2-3	62	70	68	47	69	69	60								
3-4	54	68	56	69	50	49	55								
4-5	40	81	48	49	47	42	41								
5-6	58	70	44	48	35	48	49								
6-7	35	102	44	56	43	23	39								
7-8	48	70	37	41	24	31	41								
8-9	30	51	31	34	14	15	25								
9-10	45	52	17	27	22	13	20								
10-11	30	30	23	31	23	19	17								
11-12	36	16	39	22	22	21	16								
TOTAL	674	1221	961	844	894	818	819	440							

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	WB	Bit	16'	I-94 - (Ramp)	Entrance to Rest Area - East of Kalamazoo.	

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NOTES ON CHARACTERISTICS OF REST AREA
EAST OF KALAMAZOO

This rest area is equipped with electricity and drinking water. Its rest rooms have lavatories and flush toilets. There are fifty-eight parking spaces for cars as well as fourteen separate truck spaces. Likewise, 9 picnic tables and 3 separate cooking facilities can be found. As an added convenience, general tourist information is available. This rest area is about 8 acres in size.

This rest area has a reasonably constant percentage turn-in by day of week. It should be noted that the traffic counters were not in operation between 10 AM on Wednesday and 10 AM on Thursday.

The percentages for the hourly distribution will be fairly stable since the expressway volume was reasonably large even through the hours of darkness.

The average number of persons per vehicle was low because the survey was taken from 3 PM to 7 PM on a Thursday in October, when a large number of driver-only cars were returning from work.

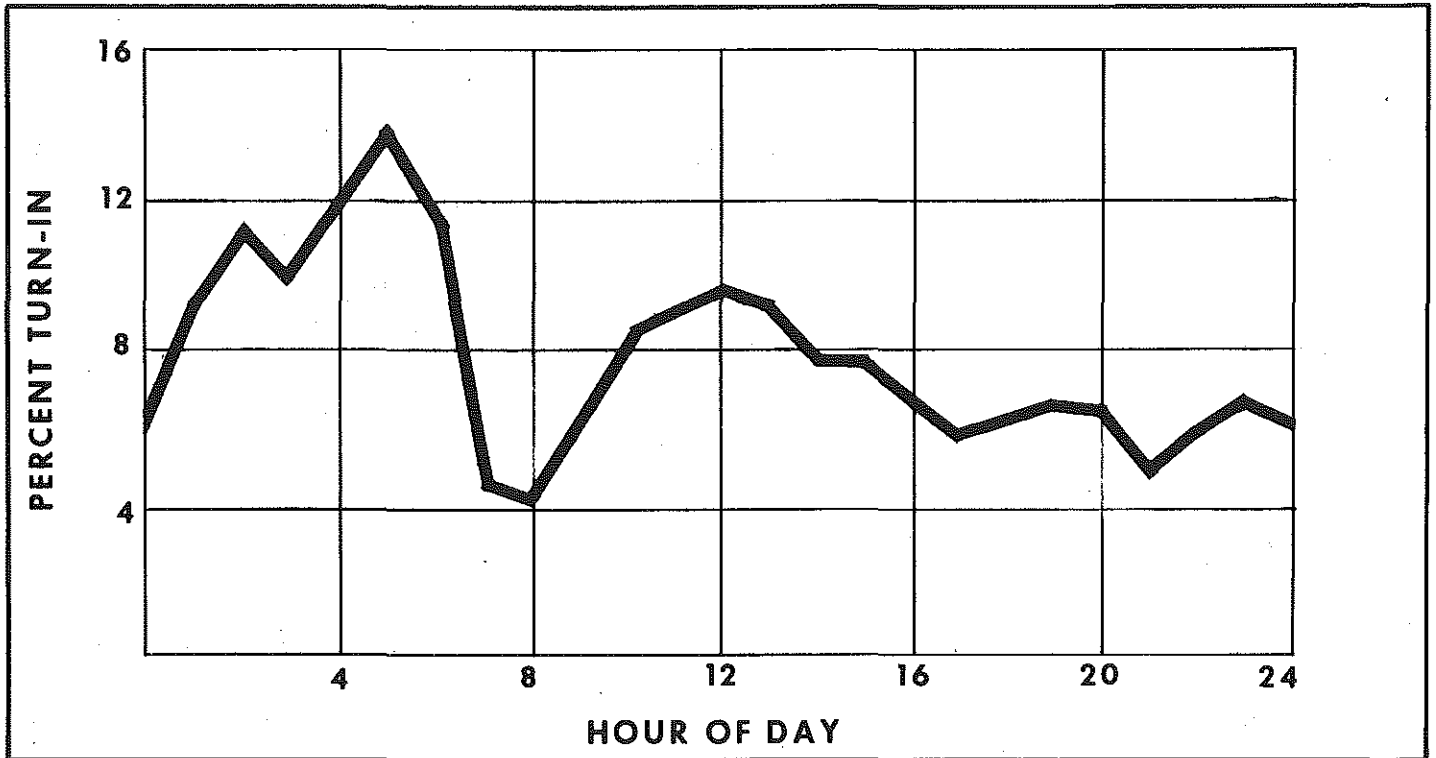
The correlations between expressway volumes and turn-in volumes by hour of day are very low except for the weekend, Saturday having the highest correlation coefficient.

The correlation between daily expressway volumes and daily rest area turn-in is however, extremely high.

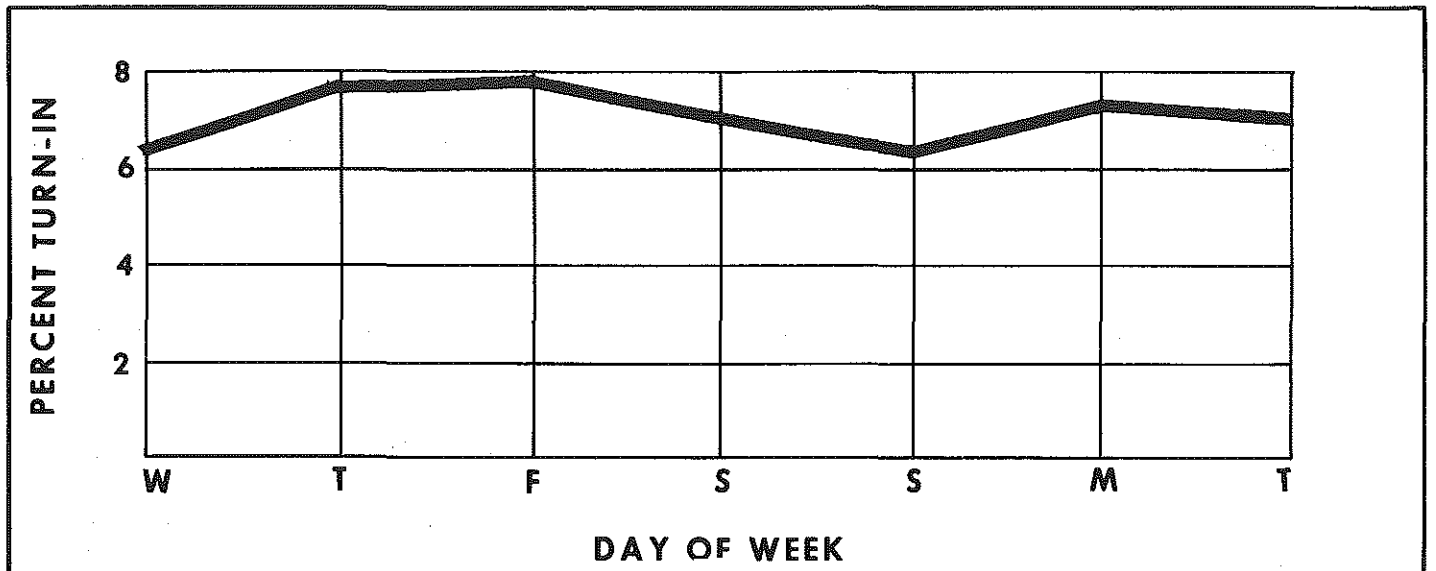
The average length-of-stay for out-of-state vehicles is greater than the average length-of-stay for all vehicles. A high percentage of vehicles stopping were out-of-state vehicles.

The percentage rest room usage was higher for the males than the females but both percentages were fairly high. The percentage of females will be subject to slight variation as only a small sample was obtainable during the survey.

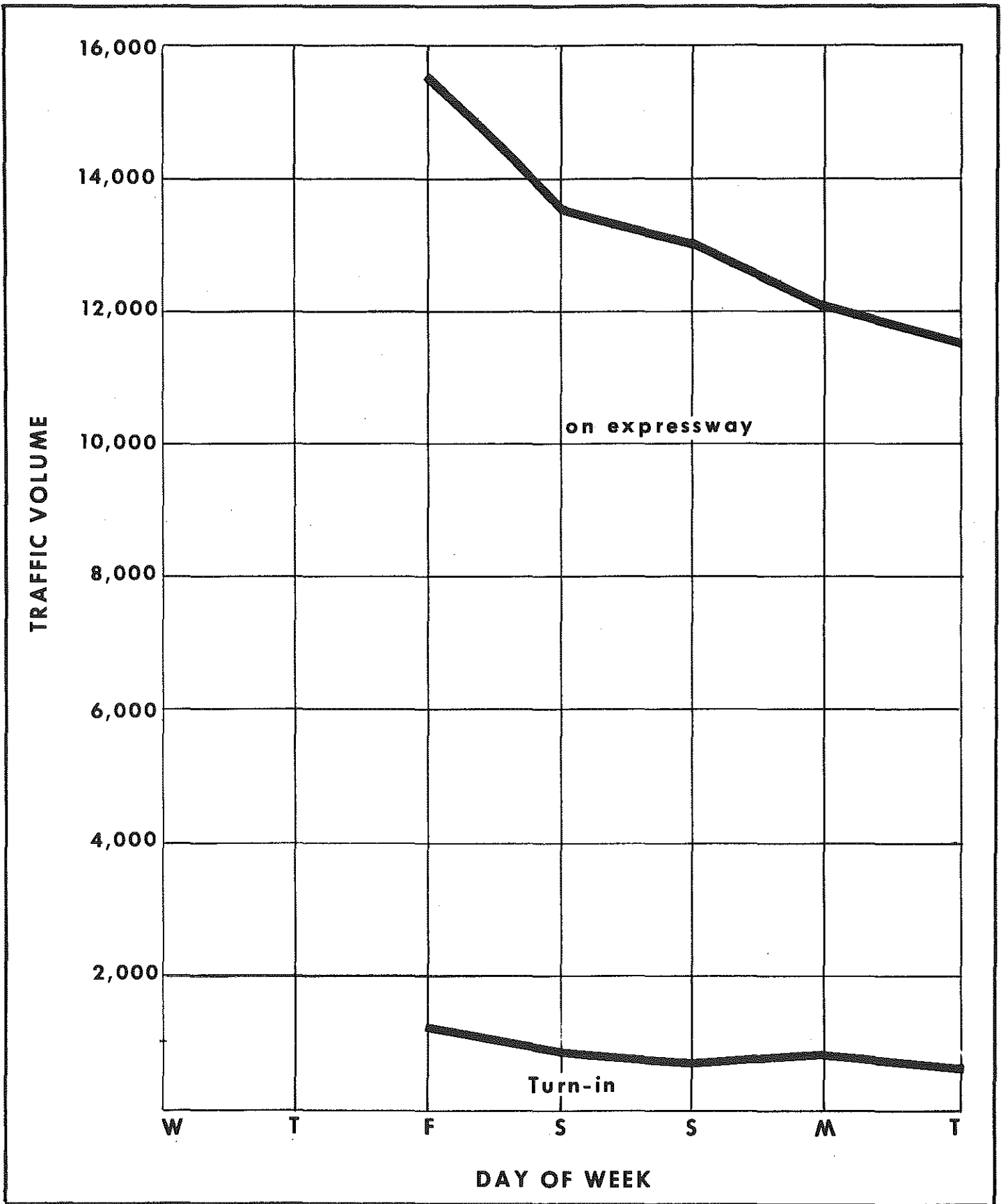
There were no adverse comments on the condition of the rest area and a large number of these comments were extremely favorable.



Graph I

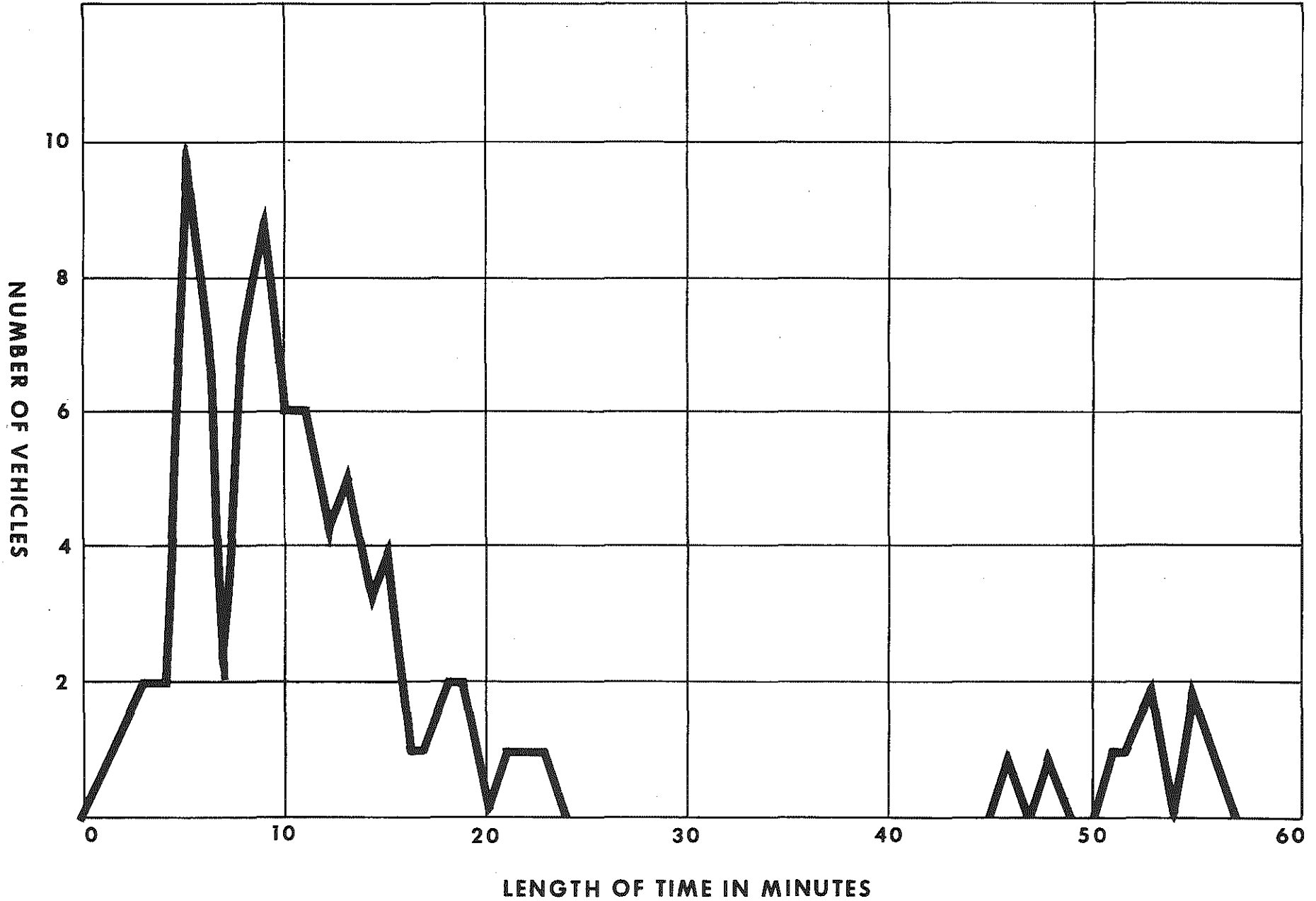


Graph II



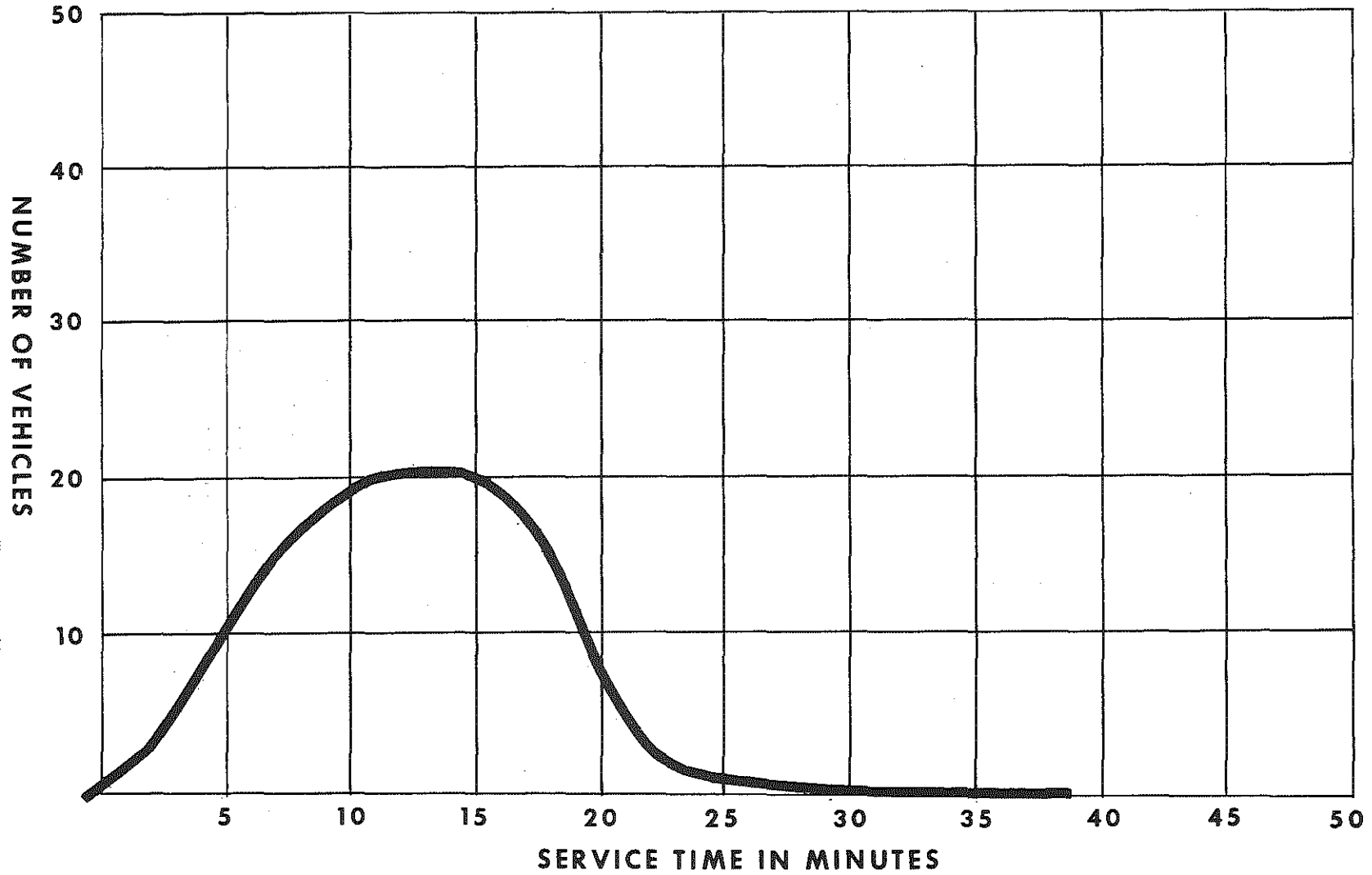
Graph III

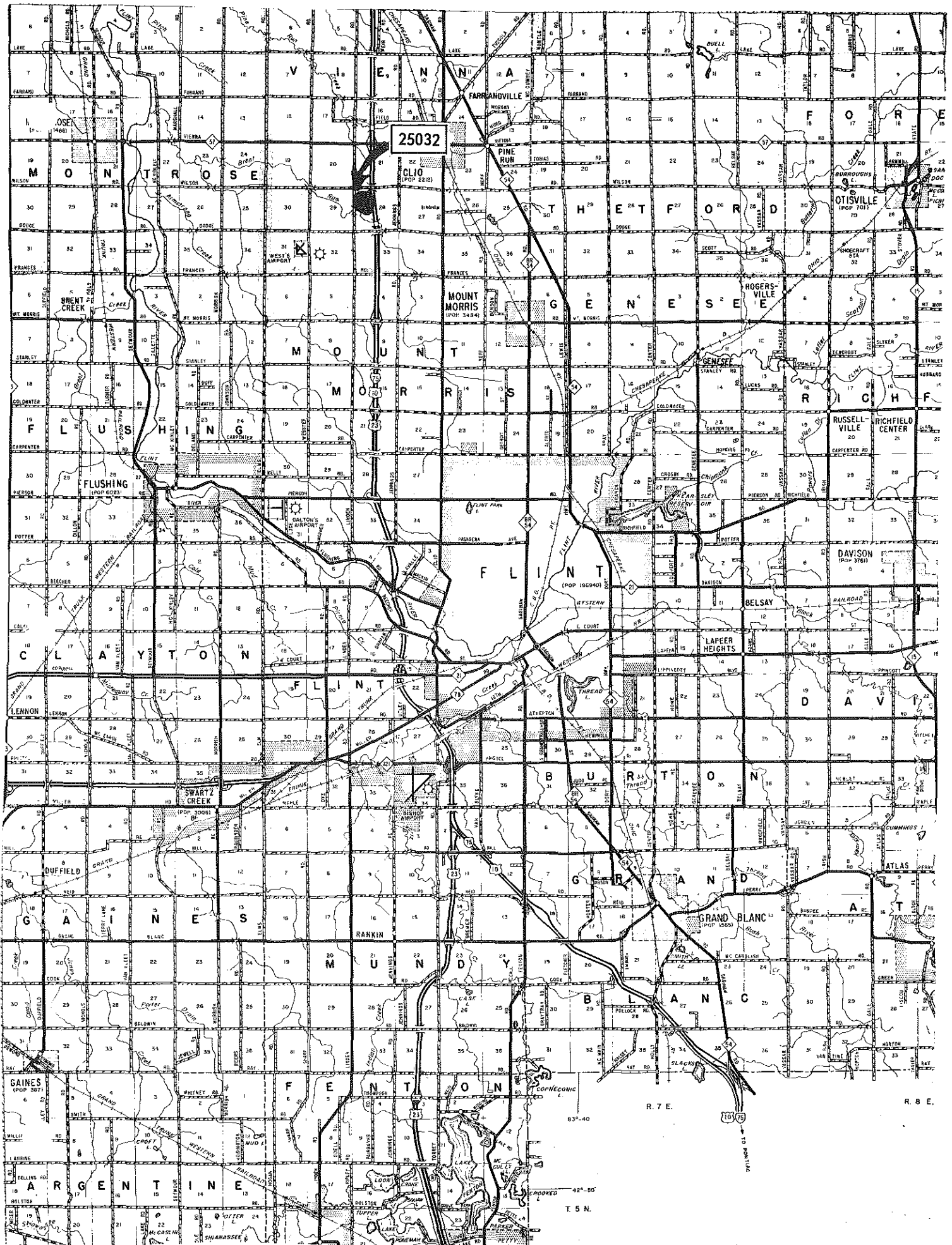
DISTRIBUTION OF LENGTH OF STAY



SERVICE TIME DISTRIBUTIONS (Vehicles in rest area)

CAR PARKING TIME





25032

CLIO (POP 2212)

NORTH OF FLINT

(2 5 0 3 2)

TRAFFIC VOLUMES BY DAY			
	From:	8/3/67	To: 8/10
	Expressway	Rest Area	%
SUNDAY	26,921	1,915	7.1
MONDAY (Except 2P-12P)	9,133	797	8.7
TUESDAY (Except 12P-12A)	8,260	969	9.3
WEDNESDAY	13,082	1,240	9.5
THURSDAY (Except 1P-2P)	12,528	1,079	8.6
FRIDAY	15,355	1,280	8.3
SATURDAY	16,655	1,304	7.8
TOTAL	101,934	8,384	8.2

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.	
12 PM-1	12.0		12 N-1	10.2
1-2	10.5		1-2	9.3
2-3	12.8		2-3	8.3
3-4	15.9		3-4	9.2
4-5	21.8		4-5	8.5
5-6	7.4		5-6	8.4
6-7	4.9		6-7	7.9
7-8	4.7		7-8	6.4
8-9	7.3		8-9	7.0
9-10	7.8		9-10	7.2
10-11	6.9		10-11	7.2
11-12	9.4		11-12	7.9

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	2329	85	13	1.4	1.4	0.1
2	215	7	20	1.0	0.0	0.0
3	20	3	23	1.3	1.6	0.3
6	9	3	14	1.3	1.3	0.6
7	110	7	13	1.1	0.4	0.2

CARDS REJECTED		32				
TOTALS	2683	137	14	1.3	1.2	0.1

Average Persons Per
Vehicle: 2.82

REST AREA VISITORS' COMMENTS

	<u>Total</u>
Unsanitary	3
Washing Facilities Required	2
More Rest Areas Needed	15
Flush Toilets Required	4
Rest Area Satisfactory	22
Rest Area Good	33
Refreshments Required	7
Facilities Unsatisfactory	1
No Comment	33
Larger Rest Rooms Required	4

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC VOLUME
AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.81
Tuesday	.90
Wednesday	.85
Thursday	.88
Friday	.94
Saturday	.93
Sunday	.97

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .98

Out-Of-State Vehicles

10 out-of-state vehicles stopped at the rest area during the 3-hour study.

The average length-of-stay in the rest area of these vehicles was 18 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 14 minutes.

Rest Room Usage by Sex

78 males out of a total of 148 used the rest rooms, giving a male's percentage usage of 52.7.

73 females out of a total of 144 used the rest rooms, giving a female's percentage usage of 50.6.

19 children under 5 years of age entered the rest area.

Sheet 1 of 2 Date 8-3-8/10 1967

Location I-75 Rest Area
(North of Flint)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	1 SB									
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.		
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10		
TIME										
12-1A.M.		208	239	357	522		191	179		
1-2		182	167	228	257		114	101		
2-3		119	135	184	148		98	102		
3-4		80	89	91	137		66	59		
4-5		113	93	62	185		90	94		
5-6		377	234	127	561		375	353		
6-7		368	303	129	668		421	510		
7-8		565	300	171	803		514	555		
8-9		452	435	268	765		499	510		
9-10		578	609	484	812		605	576		
10-11		767	781	786	1033		673	670		
11-12		886	970	1022	1138		714	778		
12-1P.M.		950	1156	1217	1271	759	771	899		
1-2		981	1333	1404	833	833	849			
2-3	929	1236	1463	1645	*	935	1020			
3-4	971	1149	1335	1985		920	981			
4-5	1034	1070	1231	2090		947	1003			
5-6	953	1278	1155	2173		786	1001			
6-7	776	1026	1085	2326		780	770			
7-8	668	893	958	2371		588	635			
8-9	577	735	846	2659		563	576			
9-10	497	575	663	1832		490	486			
10-11	437	420	583	2109		356	359			
11-12	300	347	492	1201		303	271			
TOTAL	7142	15355	16655	26921	9133	8260	13082	5386		

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Sta. No.	Direction	Road Type Width (ft.)		Route	Location	C.S. No.
1	S Bd	Conc.	24'	I-75	North of Flint	

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

(North of Flint)

STATION NO.	2 SB (Ramp)														
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.							
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10							
TIME															
12-1 A.M.		19	26	29	46	22	50	33							
1-2		21	25	10	25	12	19	10							
2-3		11	24	16	17	21	14	19							
3-4		15	24	12	4	29	10	18							
4-5		24	14	8	31	35	26	36							
5-6		20	10	15	39	17	51	14							
6-7		22	18	12	38	28	12	15							
7-8		18	20	11	27	27	29	31							
8-9		40	28	16	39	44	56	34							
9-10		32	42	32	70	36	48	60							
10-11		68	43	45	66	71	50	53							
11-12		87	88	76	136	59	73	57							
12-1 P.M.		83	128	109	132	89	81	93							
1-2		74	108	118	127	80	78								
2-3	71	101	122	117	106	76	113								
3-4	83	118	88	153	115	114	116								
4-5	89	82	119	159	111	96	84								
5-6	90	119	82	175	91	67	85								
6-7	61	82	80	188	61	64	58								
7-8	51	65	59	132	64	43	44								
8-9	60	55	57	155	63	35	33								
9-10	41	41	48	118	35	49	29								
10-11	30	54	25	115	34	31	54								
11-12	30	29	26	94	31	25	27								
TOTAL	606	1280	1304	1915	1508	1170	1240	473							

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Sta. No.	Direction	Road Type	Width (ft.)	Route	Location	C.S. No.
2	S. Bd.	Conc	15'	I-75 (Ramp)	Entrance to Rest Area (North of Flint)	

NOTES ON CHARACTERISTICS OF REST AREA
NORTH OF FLINT

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are seventy-five parking spaces for cars as well as twenty-five separate truck spaces. Likewise, twenty-one picnic tables and 8 separate cooking facilities can be found. As an added convenience, general tourist information is available. This is a shady rest area which has a dog run and a separate toilet for truckers.

This rest area has a reasonably constant percentage turn-in except for the weekend when the percentage turn-in is lower. In particular we note that the percentage turn-in is only 7.1 percent for Sunday. The reason for this is that the expressway volume is significantly higher on Sunday than the rest of the week.

The percentages for the hourly distribution will be fairly stable since the expressway volume was reasonably high even during the hours of darkness.

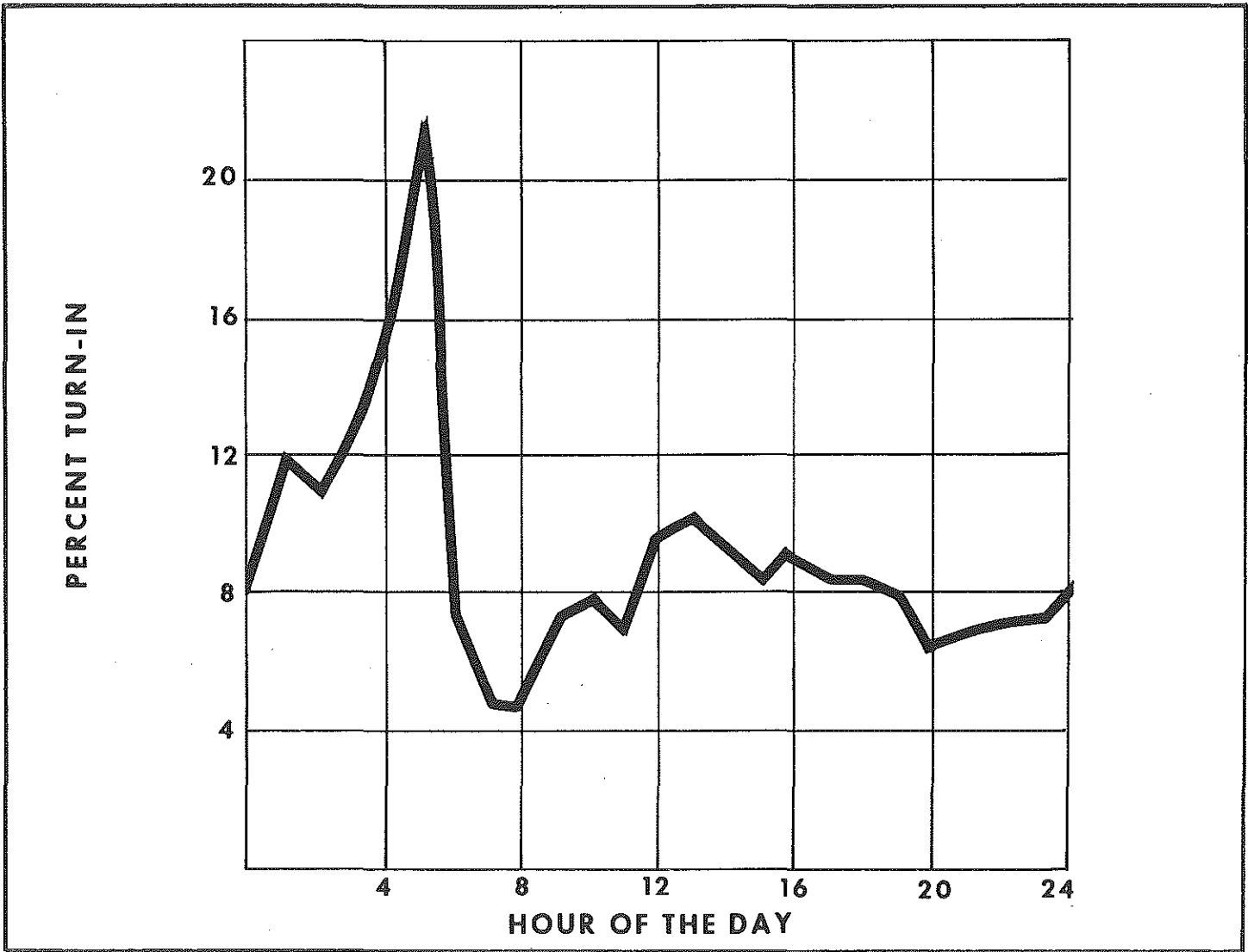
The number of persons per vehicle will be an accurate description of vehicle occupancy during a summer weekend, turning into the rest area. The average length-of-stay was considerably larger for trucks than for private cars.

The correlation between expressway volume and volume turn-in by hour of the day is high, especially for Sunday. The correlation between daily expressway volumes and daily expressway volumes and daily rest area turn-in is very high.

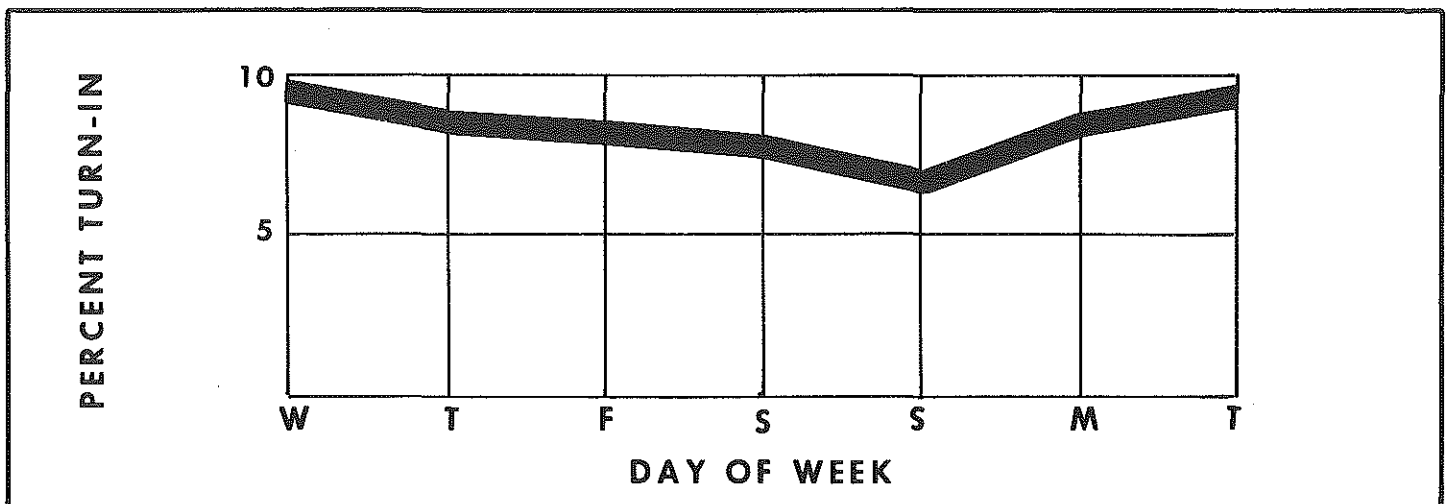
Only ten out-of-state vehicles stopped at the rest area during the survey. The average length-of-stay of out-of-state vehicles was slightly larger than the average length-of-stay for all vehicles.

The percentage rest room usage was high for females and fairly high for males.

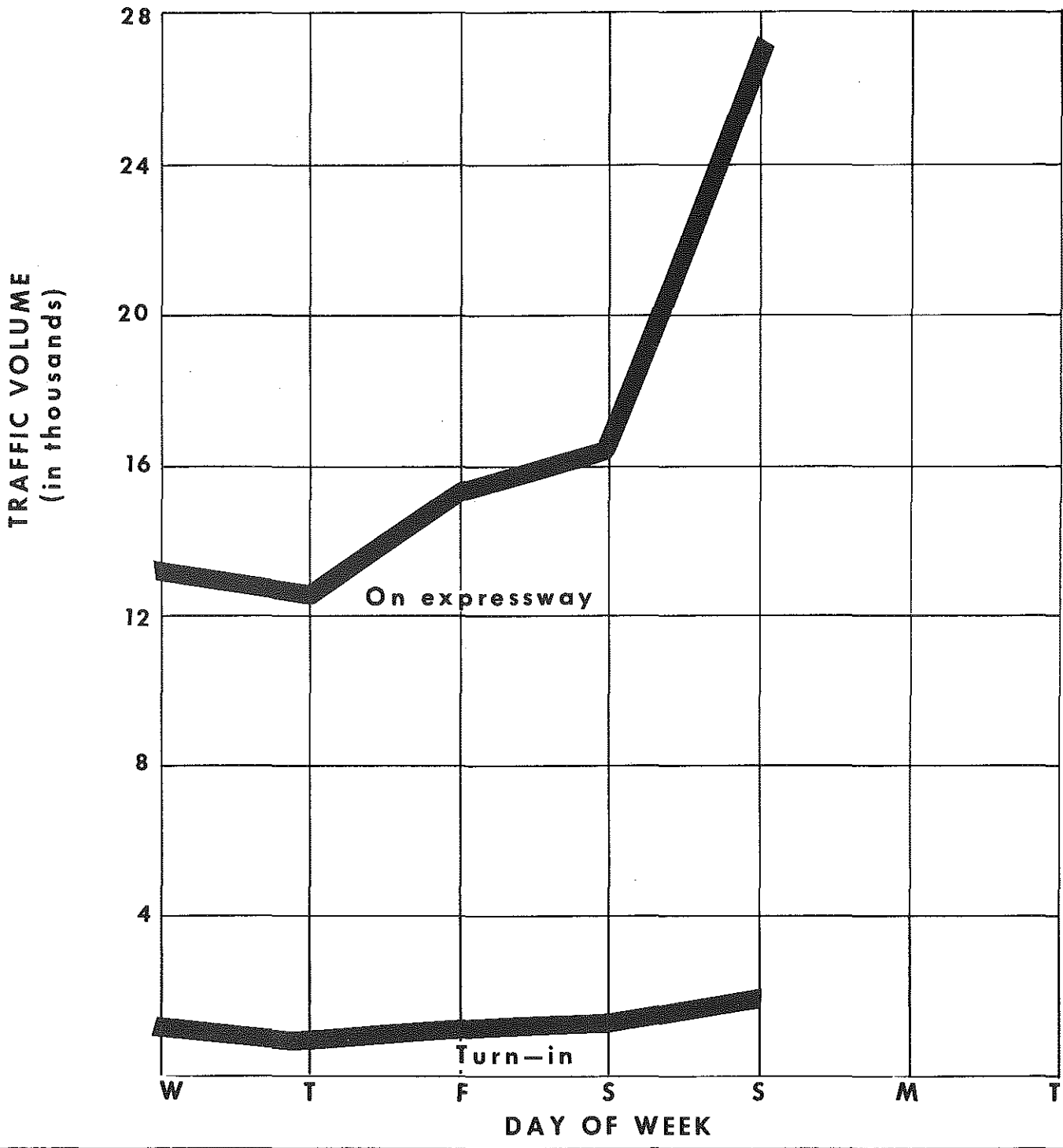
The visitors' comments were reasonably favorable except that a significant number of visitors required more rest areas on the roads of Michigan.



Graph I

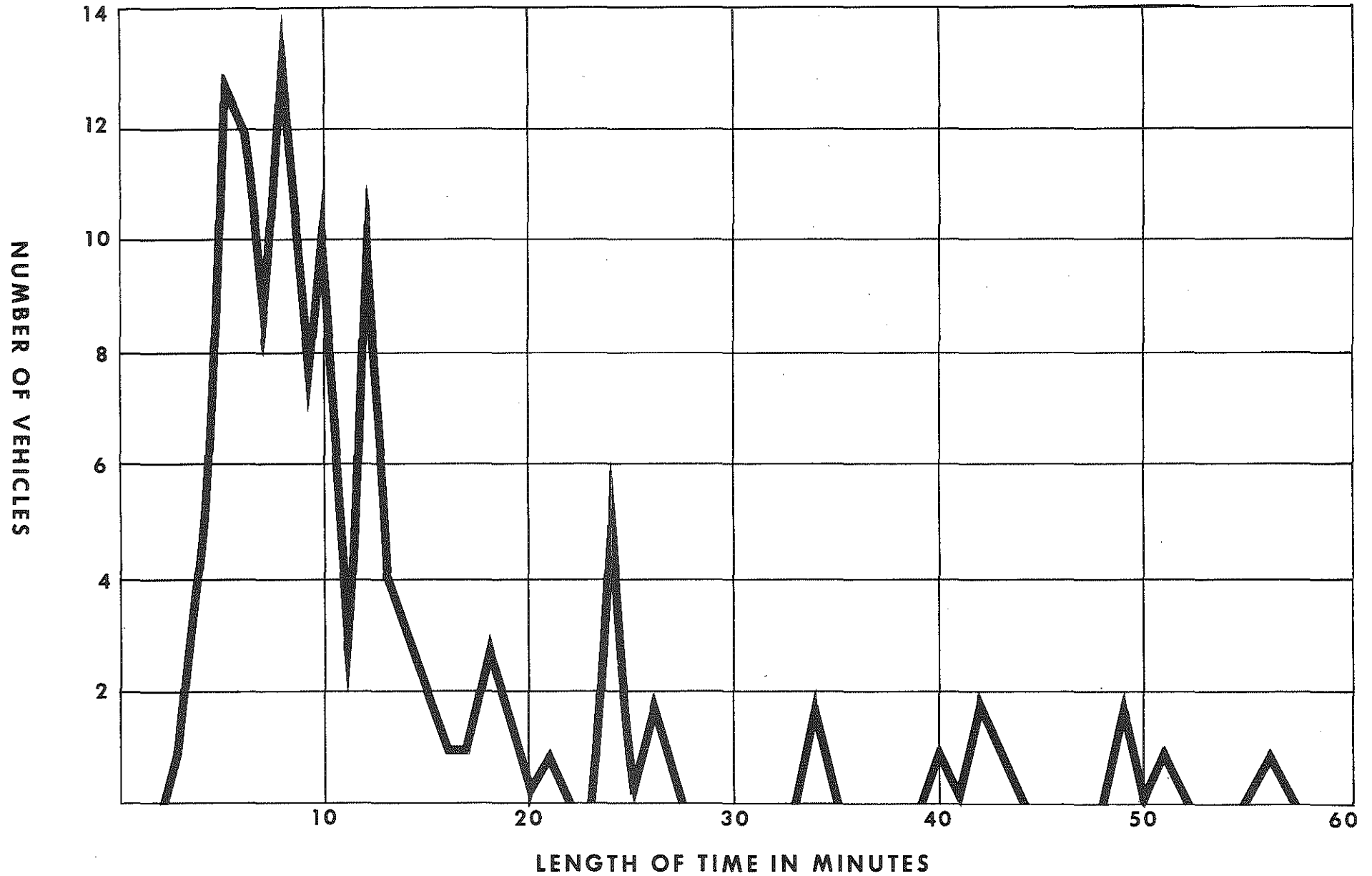


Graph II



Graph III

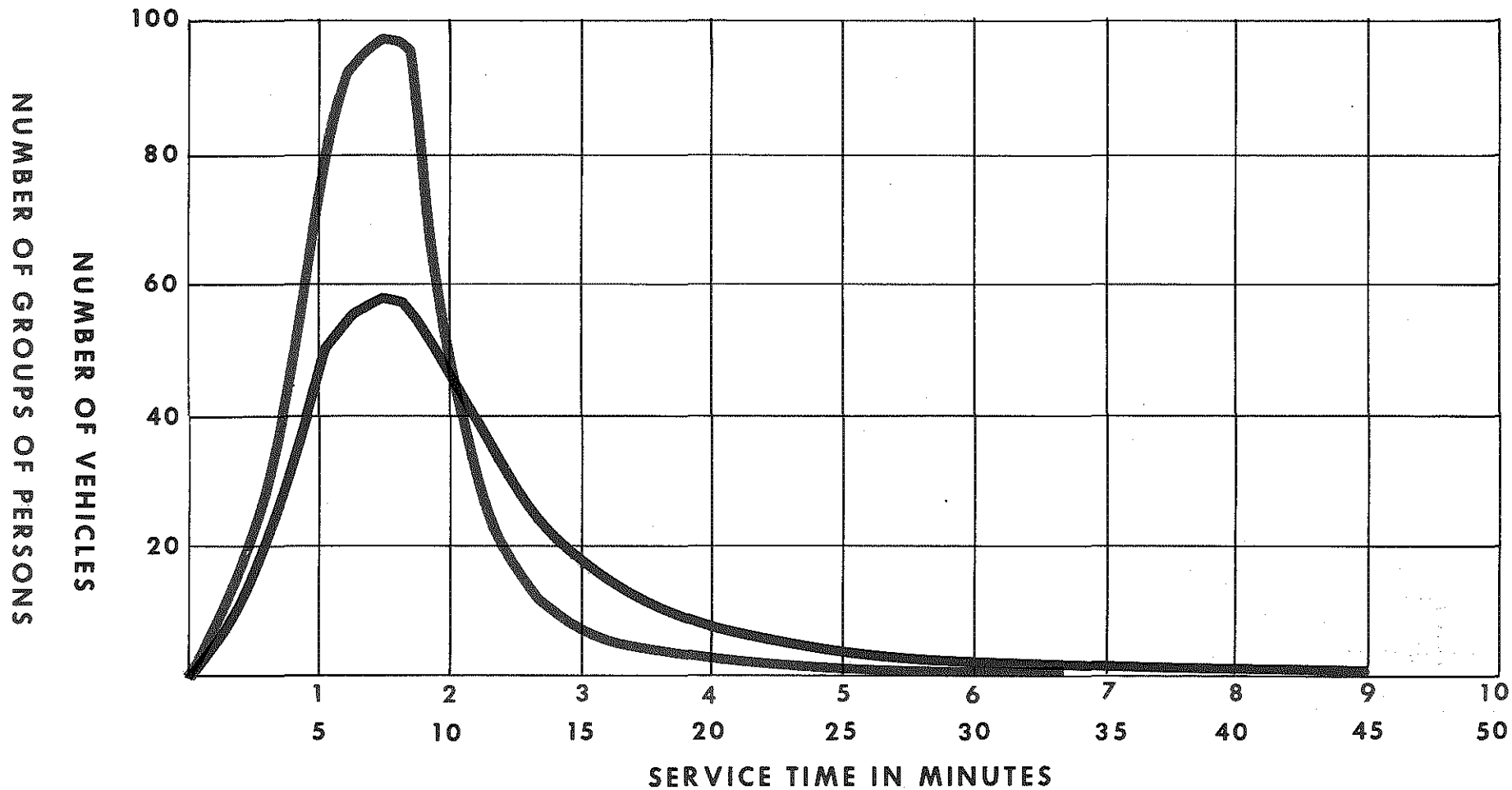
DISTRIBUTION OF LENGTH OF STAY



SERVICE TIME DISTRIBUTIONS

(Person—Groups in rest rooms)
(Vehicles in rest area)

REST ROOM USAGE TIME
CAR PARKING TIME





61075

NORTH OF MUSKEGON

(6 1 0 7 5)

TRAFFIC VOLUMES BY DAY			
		From: 8/2/67	To: 8/9
	Expressway	Rest Area	%
SUNDAY	7,497	578	7.7
MONDAY	4,882	300	6.1
TUESDAY	4,268	252	5.9
WEDNESDAY	4,796	282	5.9
THURSDAY	4,519	307	6.8
FRIDAY	4,879	314	6.4
SATURDAY	5,674	366	6.5
TOTAL	36,515	2,399	6.6

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	8.4	12 N-1	10.3
1-2	8.4	1-2	8.6
2-3	26.8	2-3	8.7
3-4	6.1	3-4	8.8
4-5	8.7	4-5	7.4
5-6	0.1	5-6	6.2
6-7	2.6	6-7	5.2
7-8	3.0	7-8	4.8
8-9	6.6	8-9	5.8
9-10	5.5	9-10	4.2
10-11	7.2	10-11	5.7
11-12	7.2	11-12	7.8

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	862	32	6	1.2	0.8	0.0
2	46	7	18	1.0	0.0	0.0
6	3	1	12	1.0	1.0	0.0
7	40	3	5	1.0	0.6	0.0

CARDS REJECTED		1				
TOTALS	951	44	8	1.1	0.6	0.0

Average Persons Per
Vehicle: 1.95

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	0
Washing Facilities Required	2
More Rest Areas Needed	1
Flush Toilets Required	0
Rest Area Satisfactory	12
Rest Area Good	15
Refreshments Required	0
Facilities Unsatisfactory	0
No Comment	15
Larger Rest Rooms Required	0

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.66
Tuesday	.64
Wednesday	.66
Thursday	.75
Friday	.85
Saturday	.87
Sunday	.90

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .98

Out-Of-State Vehicles

6 out-of-state vehicles stopped at the rest area during the 4-hour study.

The average length-of-stay in the rest area of these vehicles was 6 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 8 minutes.

Rest Room Usage by Sex

29 males out of a total of 51 used the rest rooms, giving a male's percentage usage of 56.9.

15 females out of a total of 30 used the rest rooms, giving a female's percentage usage of 50.0.

3 children under 5 years of age entered the rest area.

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village _____
or Twp. _____ County Muskegon

Sheet 1 of 2 Date 8/2-8/9 19 67

Location US-31 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(North of Muskegon)

STATION NO.	1 SB														
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.							
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9							
TIME															
12-1A.M.		47	50	54	80	34	24	33							
1-2		15	23	30	46	21	14	18							
2-3		17	9	24	27	23	12	15							
3-4		12	16	27	23	22	15	17							
4-5		24	17	19	17	41	33	45							
5-6		39	65	41	31	252	267	305							
6-7		238	248	122	41	336	274	302							
7-8		328	293	129	54	341	238	178							
8-9		167	199	183	85	225	189	171							
9-10		213	248	330	124	285	210	237							
10-11		237	259	418	208	309	211	248							
11-12		274	332	494	299	312	221	239							
12-1P.M.		262	272	393	343	280	266	239							
1-2		280	332	396	393	328	311	355							
2-3		328	375	424	461	369	340	379							
3-4		307	315	359	671	327	323	305							
4-5		342	375	312	765	308	286	287							
5-6	287	286	343	362	920	253	231	206							
6-7	267	298	254	346	985	218	187	188							
7-8	210	209	240	344	789	168	176	205							
8-9	175	230	197	333	491	144	144	180							
9-10	188	142	198	239	363	130	131								
10-11	191	147	135	174	193	79	77								
11-12	105	77	84	121	88	77	88								
TOTAL	1423	4519	4879	5674	7497	4882	4268	4152							

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	S Bd	Conc	24	US-31	North of Muskegon	

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Sheet 2 of 2 Date 8/2-8/9 19 67

Location US-31 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(North of Muskegan)

STATION NO.	2 SB (Ramp)																	
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.										
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9										
TIME																		
12-1 A.M.		8	2	3	2	6	3	3										
1-2		2	0	4	1	5	1	1										
2-3		3	1	4	8	5	9	4										
3-4		1	0	1	3	0	0	3										
4-5		3	4	2	3	5	0	0										
5-6		0	2	1	0	4	0	0										
6-7		7	2	12	9	3	4	3										
7-8		3	19	4	5	8	3	5										
8-9		11	11	2	16	11	17	12										
9-10		12	13	15	8	10	11	22										
10-11		18	20	27	19	20	10	22										
11-12		26	16	29	20	22	20	24										
12-1 P.M.		28	16	39	47	34	22	26										
1-2		25	34	40	31	24	28	25										
2-3		33	27	35	47	41	26	23										
3-4		28	28	33	64	32	23	22										
4-5		30	32	16	66	18	15	21										
5-6	19	16	13	21	67	15	9	25										
6-7	9	13	21	22	50	7	12	17										
7-8	12	9	15	15	32	12	8	7										
8-9	6	9	12	19	37	9	7	10										
9-10	5	10	9	8	21	2	4	6										
10-11	11	8	10	4	10	3	11	8										
11-12	4	4	7	10	12	4	9	11										
TOTAL	66	307	314	366	578	300	252	300										

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Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	Sbd	B. T.	12	US-31 Ramp	Entrance to Rest Area -- North of Muskegan	

NOTES ON CHARACTERISTICS OF REST AREA
NORTH OF MUSKEGON

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are fifty parking spaces for cars as well as twenty separate truck spaces. Likewise, nineteen picnic tables and 5 separate cooking facilities can be found. As an added convenience, general tourist information is available.

This rest area has a reasonably constant percentage turn-in by day of week, except for Sunday when a higher percentage turn-in is encountered. The expressway volume also increased on Sunday although percentage turn-in usually increases as expressway volume decreases. The reason for the somewhat abnormal pattern of usage of this rest area was that the type of traffic was very largely recreational.

The hourly percentage distribution is extremely unreliable for the hours of darkness since the amount of traffic on the expressway was low, thus leading to unstable information.

The average number of persons per vehicle during the survey was low. However, care must be taken in placing too much reliance on these figures as the number of vehicles using the rest area was very small. If more accurate vehicle occupancy data is required another survey would be advisable.

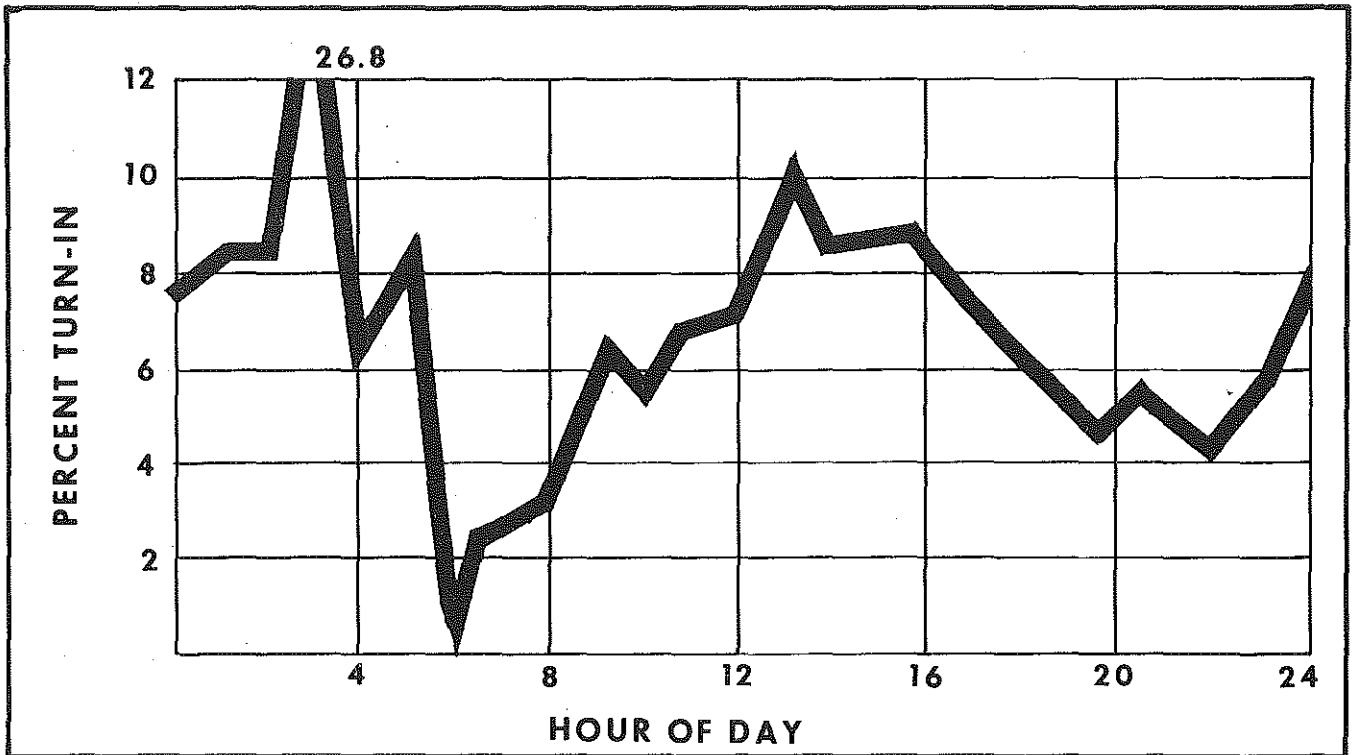
The correlation between expressway volume and volume turn-in by hour of the day is only good at the weekend.

The correlation between daily expressway volume and volume turn-in is, however, excellent.

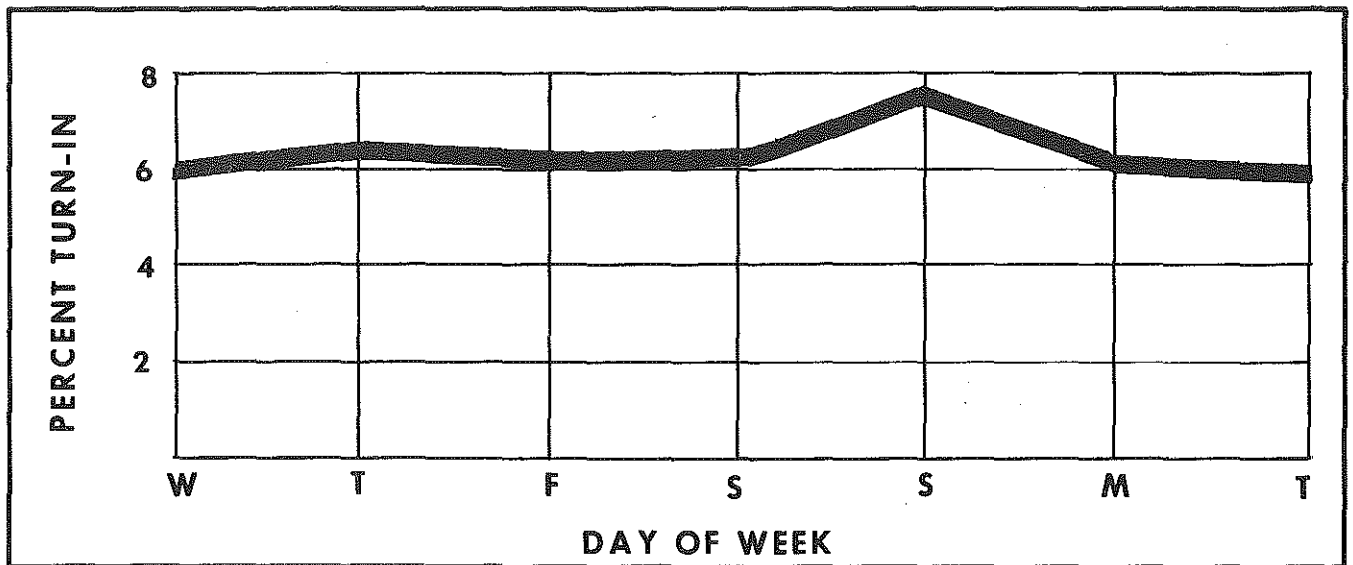
The information on length-of-stay of out-of-state vehicles should be viewed with extreme caution since only six of these vehicles stopped during the survey.

The percentage rest room usage is fairly high for both males and females.

The comments received about the rest area were overwhelmingly favorable.

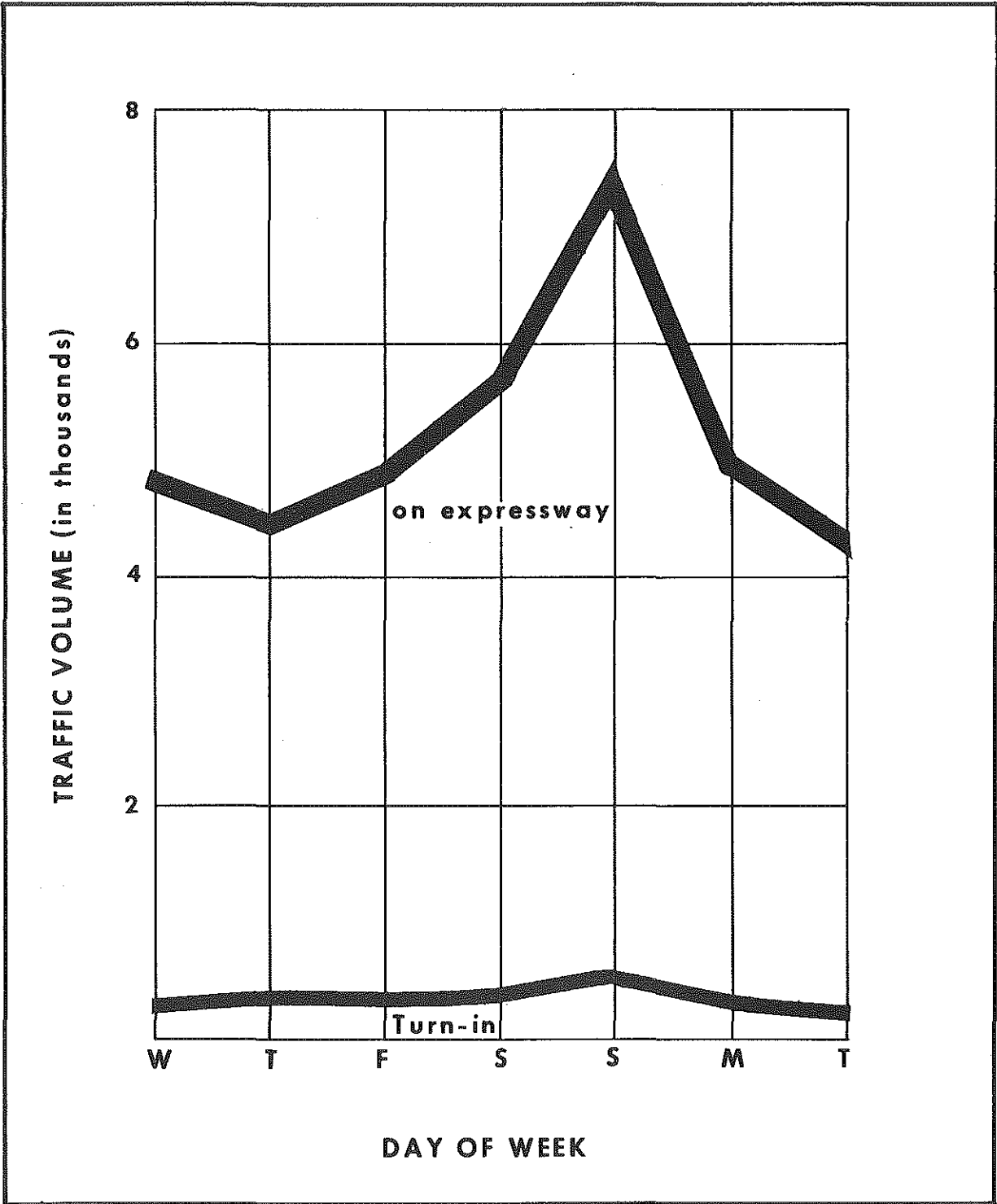


Graph I



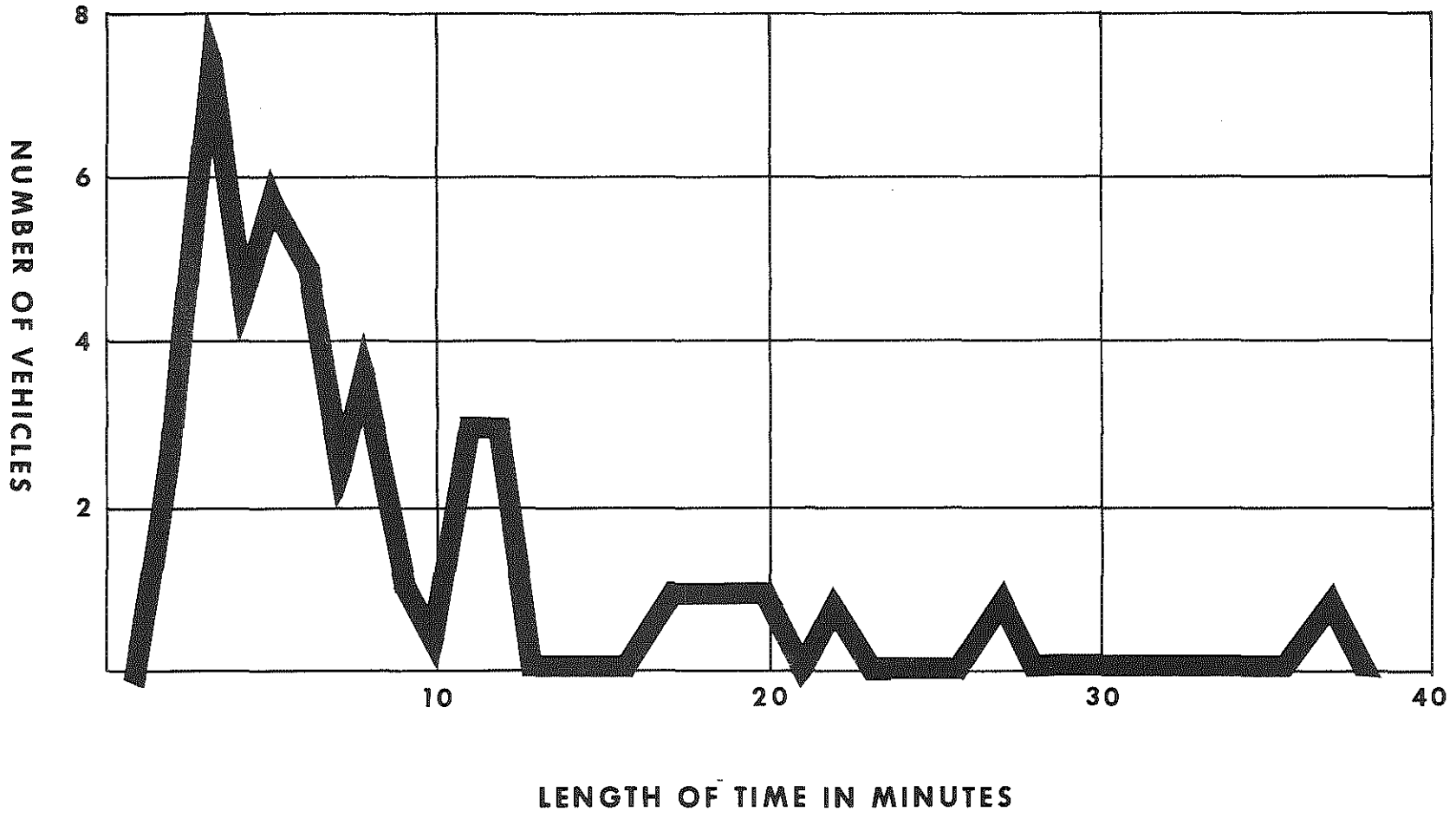
Graph II

LIBRARY
 michigan department of
 state highways
 LANSING



Graph III

DISTRIBUTION OF LENGTH OF STAY



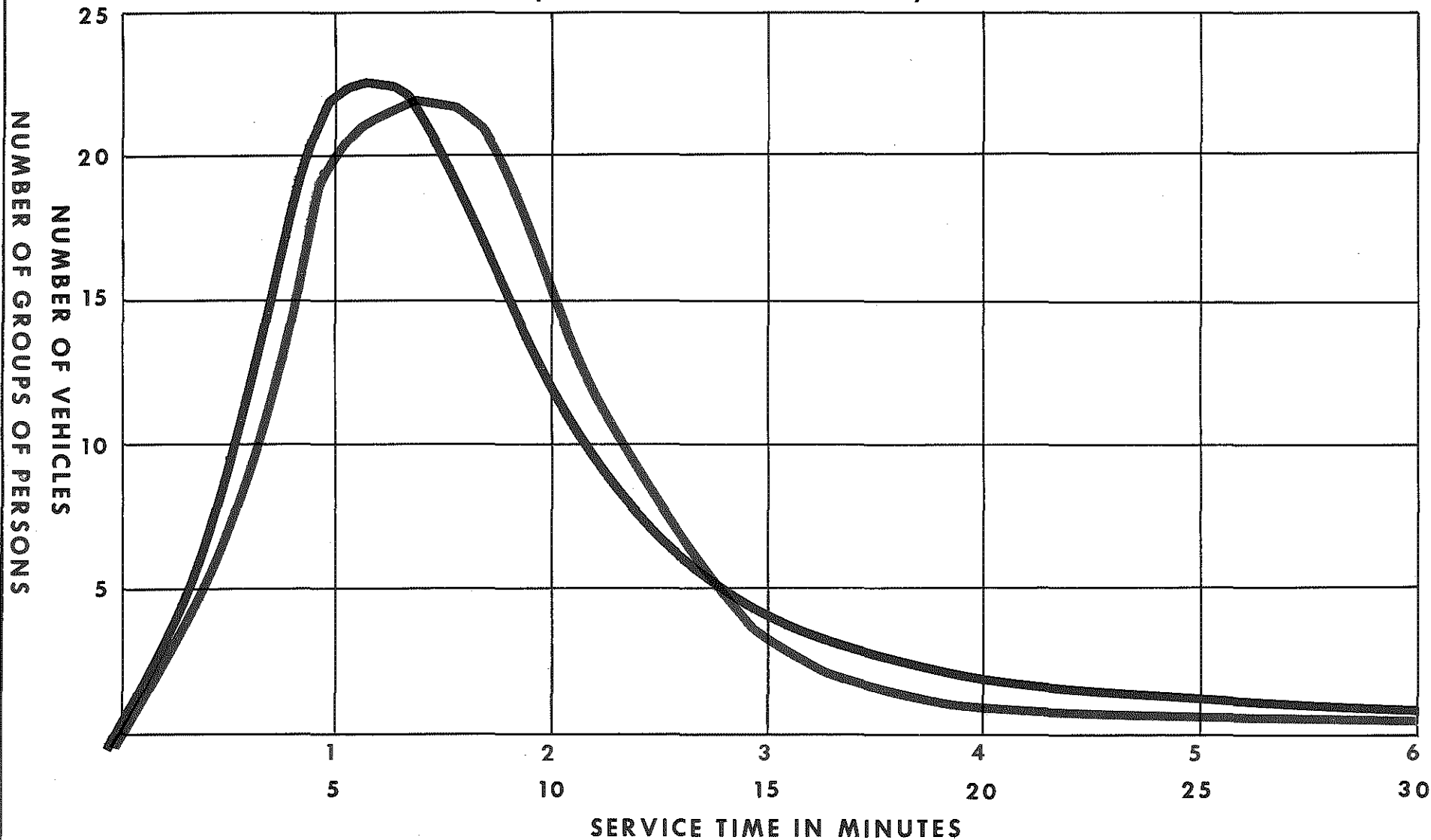
SERVICE TIME DISTRIBUTIONS

(Person—Groups in rest rooms)

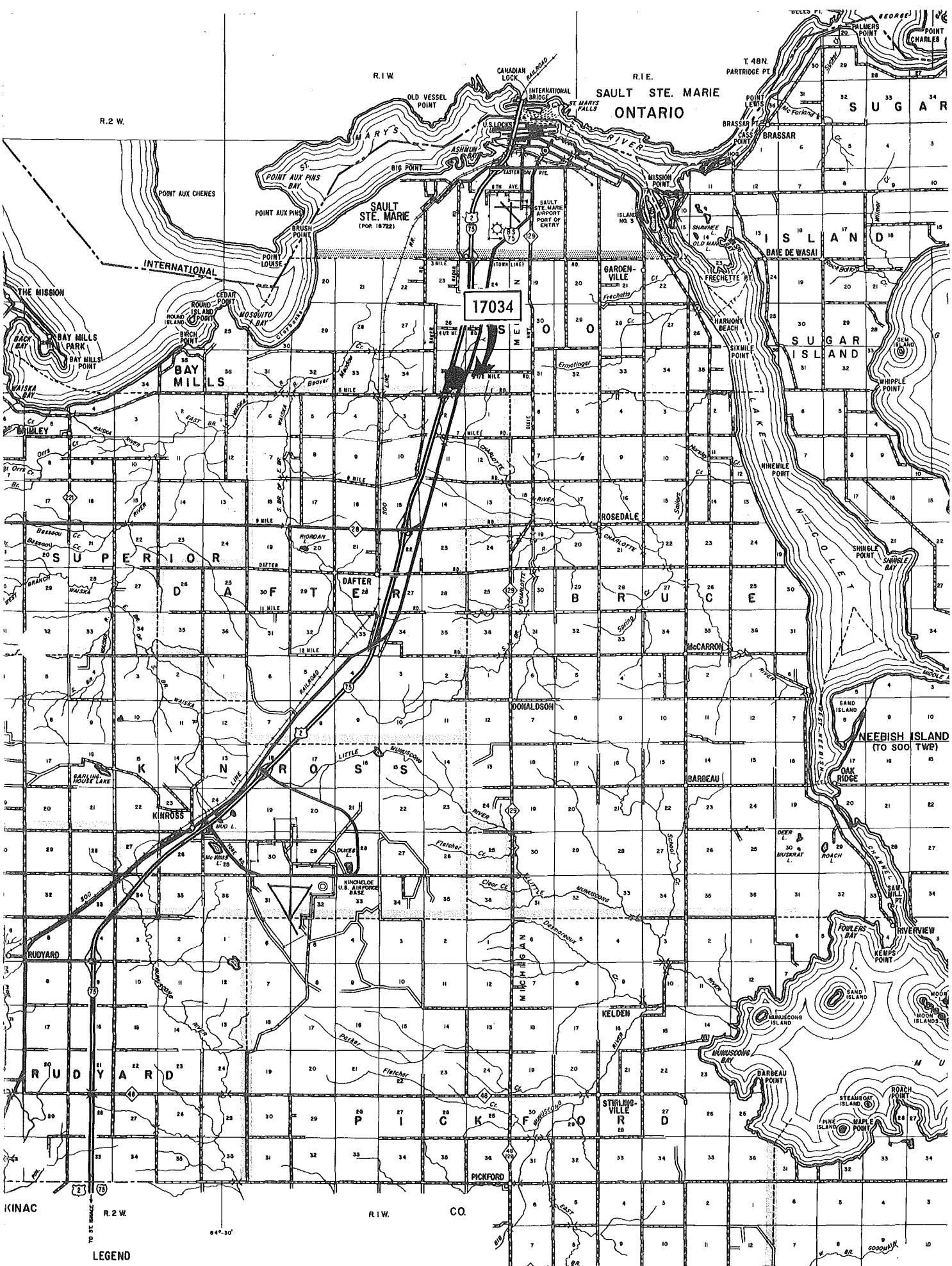
(Vehicles in rest area)

REST ROOM USAGE TIME

CAR PARKING TIME







17034

LEGEND

SOUTH OF SAULT STE. MARIE

/17034/

TRAFFIC VOLUMES BY DAY		FROM: 7/31	TO: 8/8
	EXPRESSWAY	REST AREA	PERCENT
SUNDAY	3,209	452	14.1
MONDAY	3,960	478	12.1
TUESDAY	3,423	429	12.5
WEDNESDAY	3,568	388	10.9
THURSDAY	3,000	323	10.8
FRIDAY	3,537	367	10.4
SATURDAY	3,948	573	14.5
TOTAL	24,645	3,010	12.2

HOURLY DISTRIBUTION

	% ENTERING R.A.		% ENTERING R.A.
12 PM - 1	7.3	12 Noon - 1	20.2
1 -- 2	15.5	1 -- 2	17.5
2 -- 3	15.7	2 -- 3	13.5
3 -- 4	18.9	3 -- 4	12.0
4 -- 5	12.1	4 -- 5	8.5
5 -- 6	17.1	5 -- 6	9.3
6 -- 7	15.1	6 -- 7	7.4
7 -- 8	5.0	7 -- 8	6.8
8 -- 9	10.2	8 -- 9	8.0
9 -- 10	15.1	9 -- 10	6.4
10 -- 11	13.7	10 -- 11	9.6
11 -- 12	16.3	11 -- 12	7.6

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	3
Washing Facilities Required	19
More Rest Areas Needed	16
Flush Toilets Required	9
Rest Area Satisfactory	105
Rest Area Good	37
Refreshments Required	2
Facilities Unsatisfactory	0
No Comment	13
Larger Rest Rooms Required	3

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.89
Tuesday	.89
Wednesday	.89
Thursday	.88
Friday	.79
Saturday	.89
Sunday	.83

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .73.

Out-Of-State Vehicles

75 out-of-state vehicles stopped at the rest area during the 3-hour study.

The average length-of-stay in the rest area of these vehicles was 20 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 21 minutes.

Rest Room Usage by Sex

84 males out of a total of 303 used the rest rooms, giving a male's percentage usage of 27.7.

88 females out of a total of 266 used the rest rooms, giving a female's percentage usage of 33.1.

24 children under 5 years of age entered the rest area.

Sheet 2 of 2 Date 7/31 - 8/8 19 67

Location I-75 Rest Area
(South of Sault Ste. Marie)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	2 NB	(Exit)																
DAY	Mon.	Tue.	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tue.									
DATE	7-31	8-1	8-2	8-3	8-4	8-5	8-6	8-7	8-8									
TIME																		
12-1 A.M.		0	2	1	3	4	6	1	2									
1-2		0	2	1	3	3	8	3	4									
2-3		3	0	4	1	1	2	3	1									
3-4		0	1	2	5	5	3	1	1									
4-5		0	0	3	1	4	4	0	2									
5-6		1	4	1	2	7	2	1	0									
6-7		3	3	3	3	18	3	4	3									
7-8		6	3	2	3	14	8	0	6									
8-9		11	6	5	8	15	16	15	15									
9-10		21	36	17	20	47	21	23	25									
10-11		46	41	34	15	50	36	44	32									
11-12		67	47	36	45	62	48	56	56									
12-1 P.M.	65	44	61	39	52	70	52	61	60									
1-2	50	55	45	32	41	59	46	57	50									
2-3	30	42	26	34	38	38	44	47	55									
3-4	41	30	24	29	24	50	34	48	49									
4-5	30	24	25	19	19	30	24	40	19									
5-6	12	31	14	21	27	34	32	13	38									
6-7	21	12	20	7	15	19	18	20										
7-8	14	11	6	12	14	13	8	15										
8-9	15	6	13	7	7	9	15	13										
9-10	3	5	3	6	1	7	10	8										
10-11	2	7	5	3	14	11	5	1										
11-12	6	4	1	5	6	3	7	4										
TOTAL	289	429	388	323	367	573	452	478	418									

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	NB	Bit.	18'	I-75 (Ramp)	Exit at Rest Area (South of Sault Ste. Marie)	

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STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village _____
or Twp. _____ County Chippewa

Sheet 1 of 2 Date 7/31 - 8/8 19 67

Location I-75 Rest Area

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

(South of Sault Ste. Marie)

STATION NO.	1 NB														
DAY	Mon.	Tue.	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tue.						
DATE	7-31	8-1	8-2	8-3	8-4	8-5	8-6	8-7	8-8						
TIME															
12-1 A.M.		24	28	23	40	44	42	33	38						
1-2		14	11	17	16	34	22	15	12						
2-3		10	4	8	12	28	22	5	8						
3-4		8	5	1	12	33	24	7	4						
4-5		8	9	12	12	30	17	11	8						
5-6		10	11	15	11	35	12	11	18						
6-7		48	38	40	39	40	15	25	38						
7-8		115	118	110	116	105	41	116	127						
8-9		119	108	101	144	112	57	101	117						
9-10		191	207	141	179	217	128	166	217						
10-11		296	370	235	215	286	243	295	272						
11-12		327	356	227	275	363	273	398	309						
12-1 P.M.	284	249	315	249	252	313	223	278	293						
1-2	258	263	316	242	244	300	224	327	262						
2-3	268	288	293	255	265	345	223	330	316						
3-4	334	267	249	219	276	321	279	384	339						
4-5	318	332	297	266	327	289	236	384	342						
5-6	275	274	266	227	255	285	255	293	284						
6-7	201	206	162	195	237	222	253	226							
7-8	153	129	131	141	214	148	205	189							
8-9	126	80	88	105	134	153	169	141							
9-10	69	70	76	76	94	110	112	90							
10-11	61	54	58	48	95	71	73	78							
11-12	50	41	52	47	73	62	61	57							
TOTAL	2397	3423	3568	3000	3537	3846	3209	3960	2998						

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Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	NB	Conc.	24'	I-75	South of Sault Ste. Marie	

NOTES ON CHARACTERISTICS OF REST AREA
SOUTH OF SAULT STE. MARIE

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are fifty-six parking spaces for cars as well as fourteen separate truck spaces. Likewise, twenty-one picnic tables and 9 separate cooking facilities can be found. As an added convenience, tourist information is available.

This rest area has a reasonably constant percentage turn-in by day of the week for weekday traffic, but the weekend percentage turn-in is somewhat higher. This higher percentage is a result of the fact that there is a higher percentage of recreational traffic on the expressway on the weekend. Higher car occupancy tends to increase the percentage turn-in. The percentage turn-in by hour of day is at a peak around noon - even exceeding the nighttime percentage turn-in. The nighttime percentages will be very unstable, as the traffic volumes are extremely low. (If accurate turn-in percentage estimates are required for this rest area during the hours of darkness, a protracted study must be made over a period of about one month.)

The number of persons per vehicle is high. This is due to the high volume of recreational traffic. The average length-of-stay is also long for the same reason. (This rest area is extremely well landscaped and maintained, and a large number of visitors use the facilities for picnicing.)

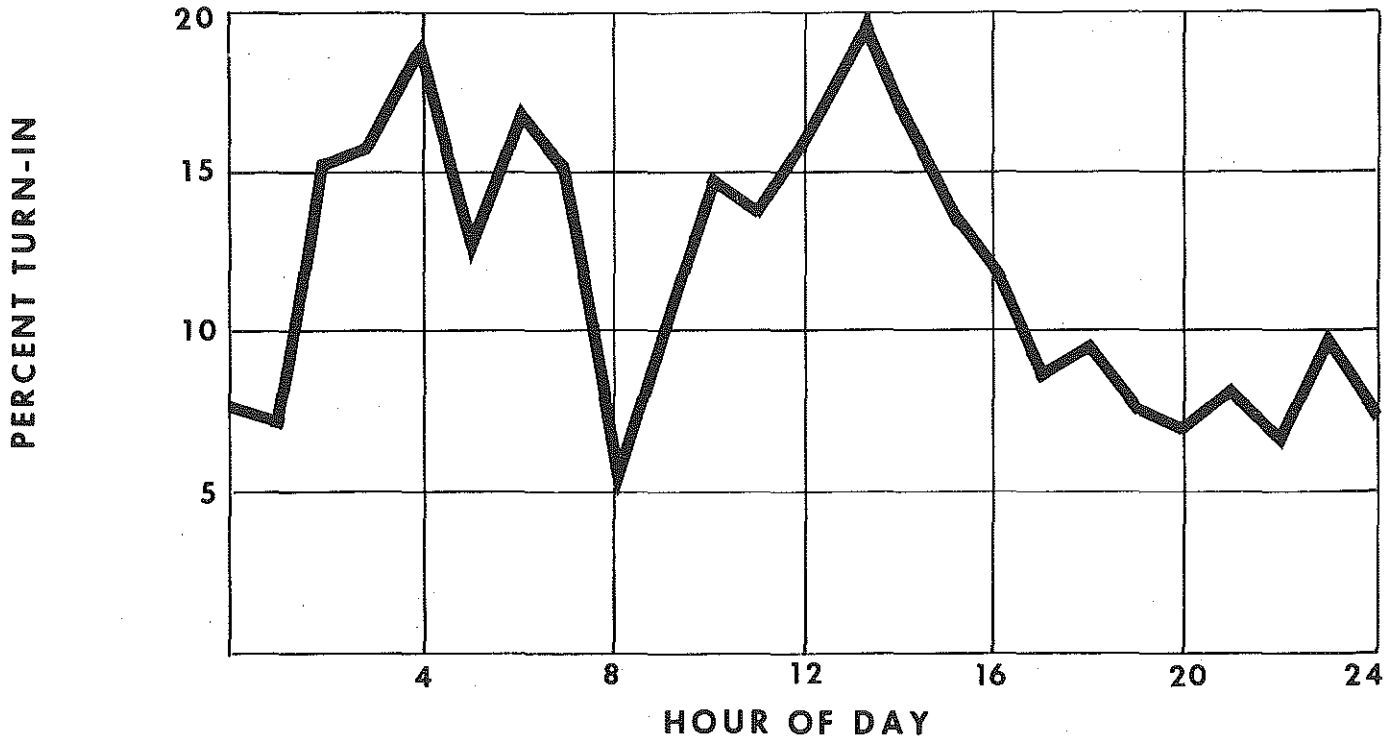
The correlation between expressway volumes by hour of day is fairly high, except for Friday.

The correlation between expressway volumes and daily rest area turn-in is, however, remarkably low. (If the data already obtained for this rest area is used for design purposes, great care must be exercised. I would suggest taking more traffic counts, since recreational traffic characteristics depend on many variables which cannot be controlled, e.g. weather.)

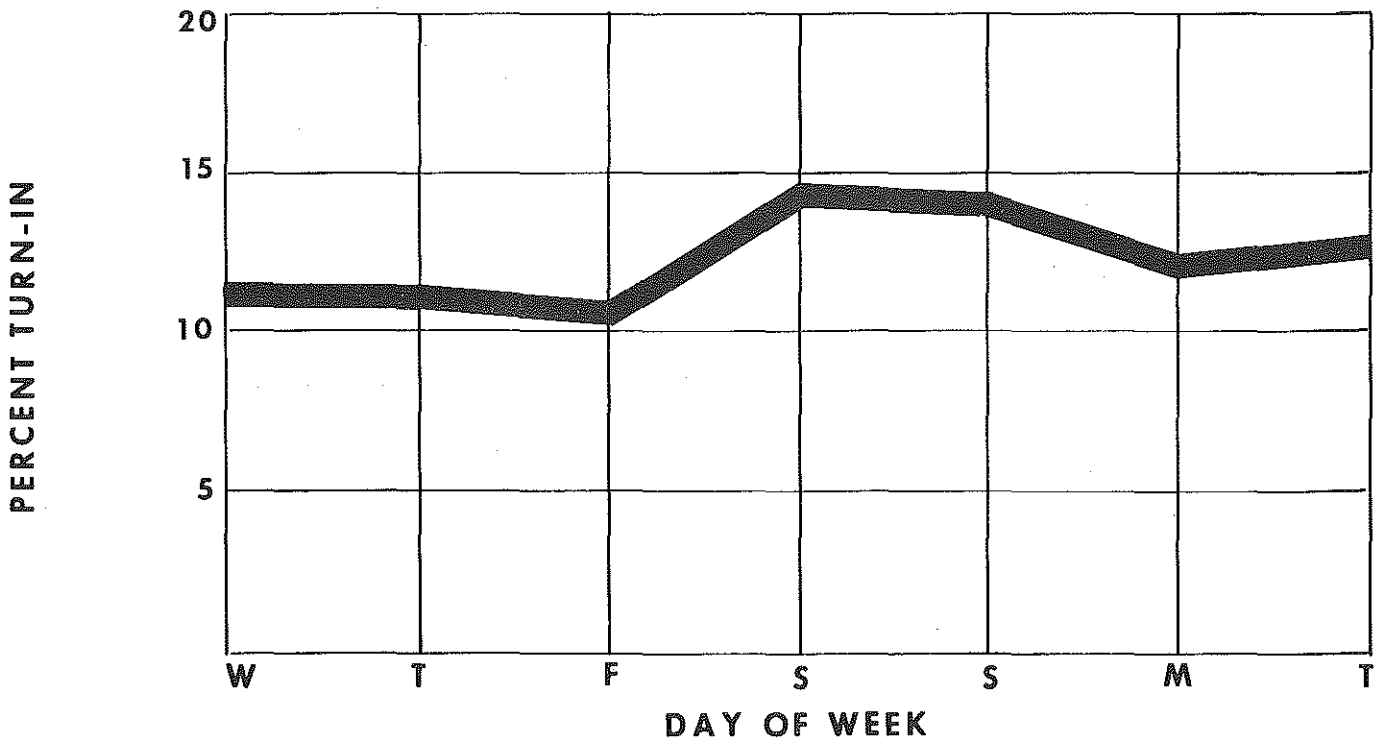
An extremely high number of out-of-state vehicles stopped at the rest area. (Nearly forty percent of the vehicles turning in were from out-of-state - many of these from Canada.) There was no significant difference between length-of-stay for all vehicles.

The percentage usage of the rest rooms was very low - again this was largely as a result of high vehicle occupancy. (It must be noted that difficulty was encountered in surveying this rest area since there are two separate sets of rest rooms in the rest area. However, the data obtained seems remarkably consistent since the survey was very carefully carried out.)

The comments obtained from rest area visitors were in general extremely favorable but some travelers would like to see modern toilets installed and more rest areas built.

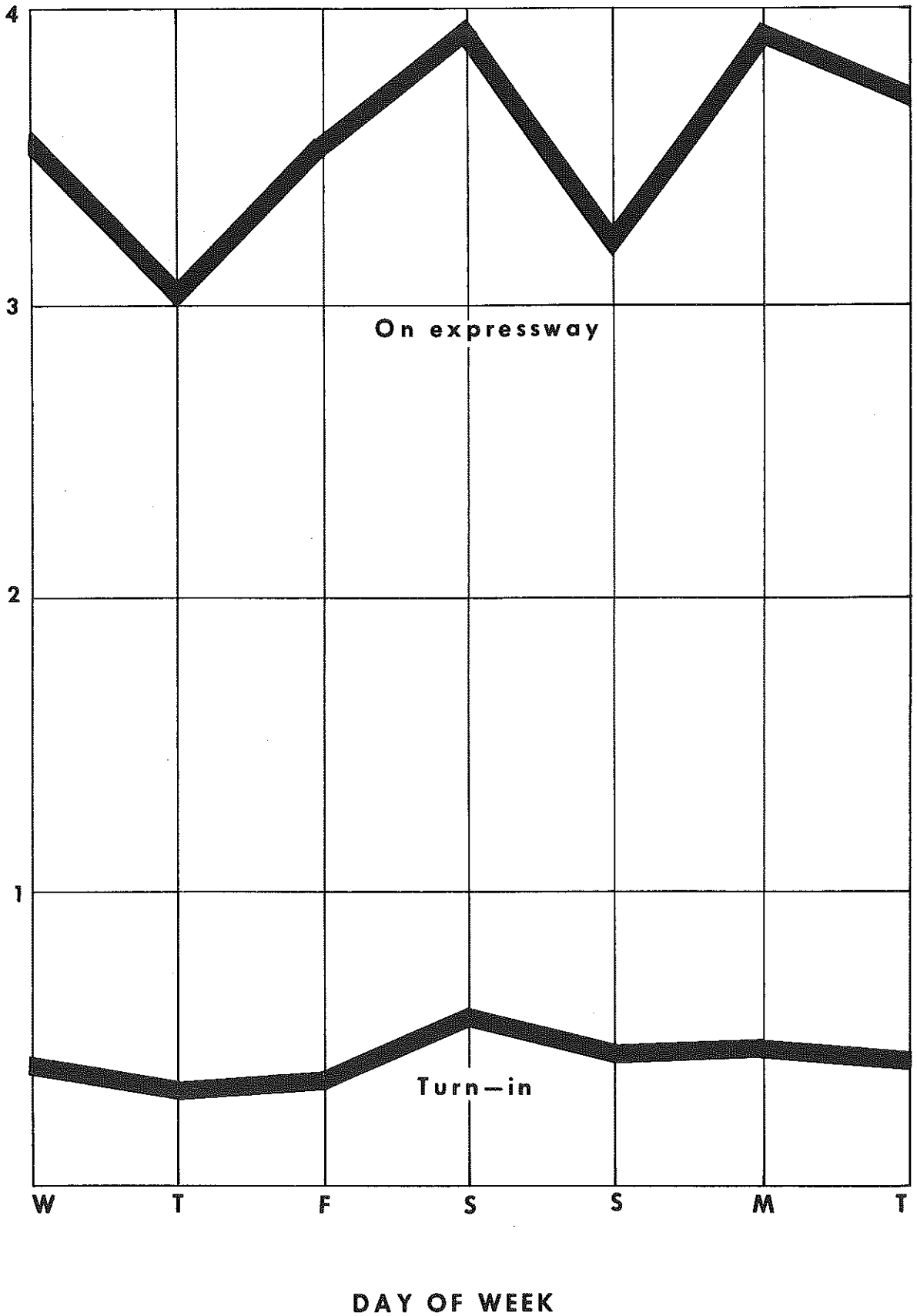


Graph I



Graph II

TRAFFIC VOLUME
(in thousands)



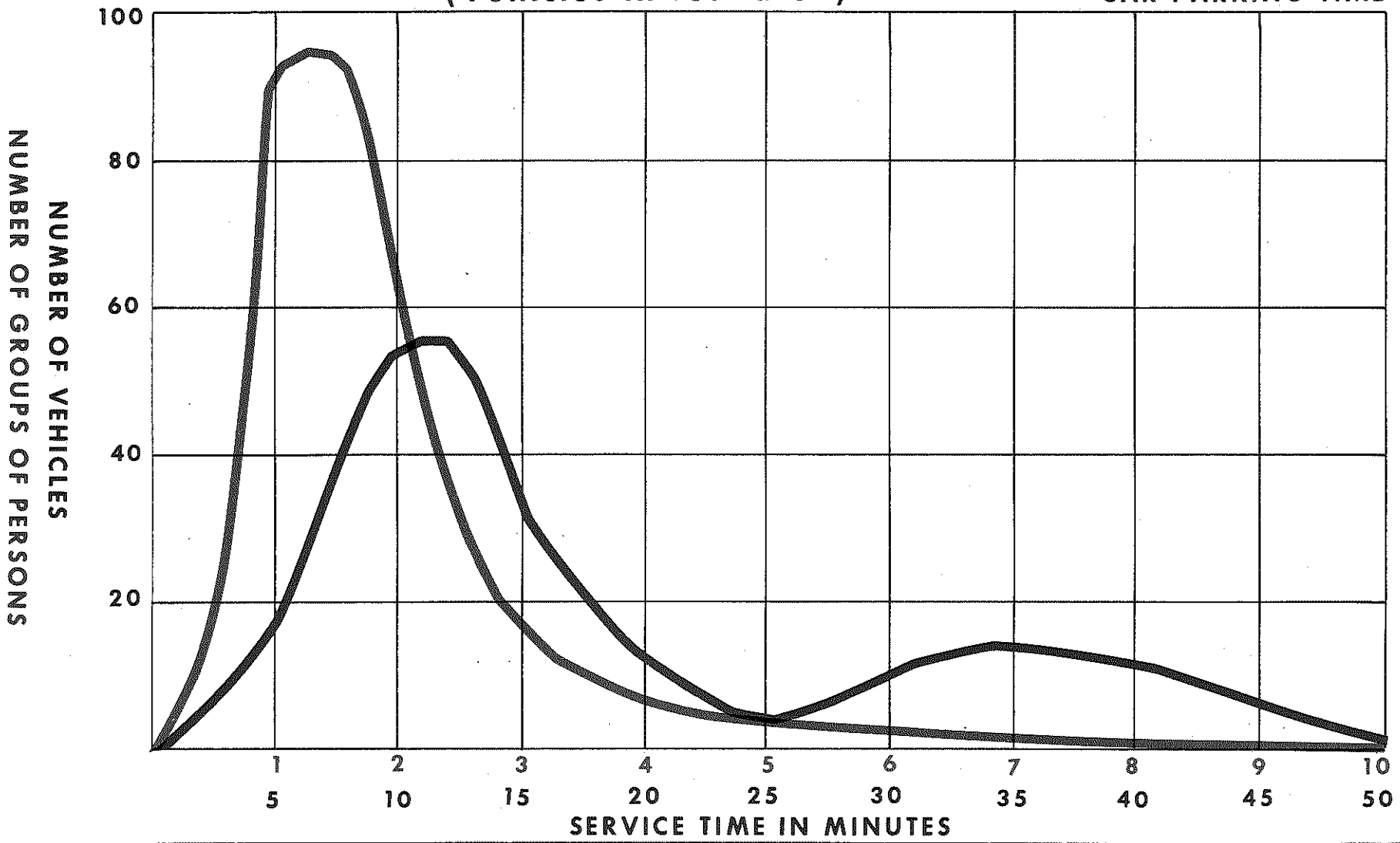
DISTRIBUTION OF LENGTH OF STAY

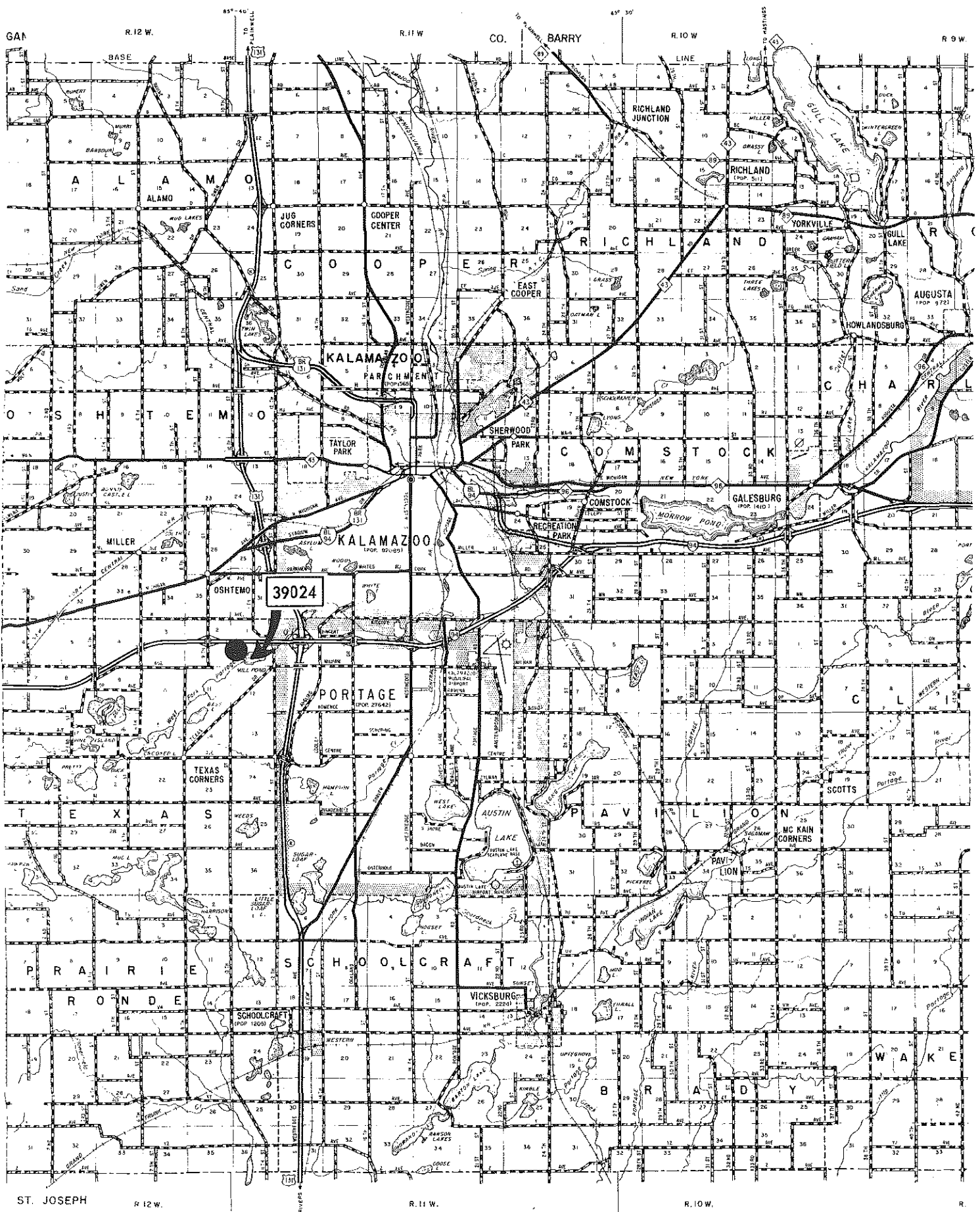


SERVICE TIME DISTRIBUTIONS

(Person—Groups in rest rooms)
(Vehicles in rest area)

REST ROOM USAGE TIME
CAR PARKING TIME





WEST OF KALAMAZOO

(3 9 0 2 4)

TRAFFIC VOLUMES BY DAY				From: 8/3/67	To: 8/9
	Expressway	Rest Area	%		
SUNDAY	9,933	1,511	15.2		
MONDAY	8,533	1,647	19.3		
TUESDAY	7,838	1,572	20.7		
WEDNESDAY	7,683	1,563	20.3		
THURSDAY	8,600	1,600	18.6		
FRIDAY	9,739	1,803	18.5		
SATURDAY	10,005	2,009	20.1		
TOTAL	62,331	11,705	18.8		

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.	
12 PM-1	22.5		12 N-1	17.0
1-2	23.7		1-2	18.7
2-3	30.5		2-3	16.4
3-4	25.9		3-4	15.7
4-5	28.1		4-5	14.5
5-6	28.0		5-6	12.3
6-7	11.3		6-7	11.5
7-8	12.5		7-8	13.1
8-9	15.7		8-9	12.5
9-10	17.3		9-10	13.8
10-11	16.5		10-11	14.4
11-12	15.1		11-12	18.2

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	4712	270	26	1.2	1.3	0.2
2	1712	153	31	1.0	0.0	0.0
3	54	7	24	1.1	0.8	0.0
6	4	1	66	1.0	1.0	0.0
7	46	6	20	1.0	0.6	0.8

CARDS REJECTED

TOTALS	6528	437	24	1.0	0.4	0.0
--------	------	-----	----	-----	-----	-----

Average Persons Per
Vehicle: 1.56

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	0
Washing Facilities Required	0
More Rest Areas Needed	35
Flush Toilets Required	3
Rest Area Satisfactory	56
Rest Area Good	94
Refreshments Required	12
Facilities Unsatisfactory	3
No Comment	79
Larger Rest Rooms Required	0

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.65
Tuesday	.47
Wednesday	.30
Thursday	.34
Friday	.77
Saturday	.84
Sunday	.91

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .92

Out-Of-State Vehicles

199 out-of-state vehicles stopped at the rest area during the 24-hour period.

The average length-of-stay in the rest area of these vehicles was 24 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 24 minutes.

Rest Room Usage by Sex

_____ males out of a total of 186 used the rest rooms, giving a male's percentage usage of _____. (Information Unavailable)

_____ females out of a total of 98 used the rest rooms, giving a female's percentage usage of _____. (Information Unavailable)

21 children under 5 years of age entered the rest area.

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village
or Twp. _____ County Kalamazoo

Sheet 1 of 2 Date 8/3-8/10 19 67

Location I-94 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(West of Kalamazoo)

STATION NO.	1 EB																	
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.										
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10										
TIME																		
12-1A.M.		163	248	198	203	167	165	162										
1-2		169	181	138	163	133	133	158										
2-3		145	134	89	139	116	133	130										
3-4		145	126	71	116	142	149	134										
4-5		105	125	49	137	140	145	157										
5-6		168	148	82	152	146	168	178										
6-7		361	294	132	391	390	412	374										
7-8		418	364	104	421	435	299	407										
8-9		320	457	158	366	330	310	308										
9-10		349	499	251	374	353	374	336										
10-11		464	585	411	460	399	372	394										
11-12	339	459	725	479	433	415	380	430										
12-1P.M.	317	452	694	520	459	440	405	428										
1-2	424	458	614	501	498	432	401	298										
2-3	469	566	643	612	629	512	490											
3-4	454	646	587	718	632	521	500											
4-5	548	674	670	799	612	508	560											
5-6	476	636	603	972	523	451	461											
6-7	418	629	564	882	420	426	427											
7-8	364	595	507	812	359	356	337											
8-9	311	509	414	669	343	267	288											
9-10	290	472	319	581	274	266	305											
10-11	211	467	292	436	223	276	273											
11-12	197	366	212	269	206	217	196											
TOTAL	4818	9736	10005	9933	8533	7838	7683	3894										

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Sta. No.	Direction	Road Type	Width (ft.)	Route	Location	C.S. No.
1	E Bd	conc	24	I-94	West of Kalamazoo	

Sheet 2 of 2 Date 8/3-8/10 19 67

Location I-94 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(West of Kalamazoo)

STATION NO.	2 EB																	
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.										
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10										
TIME																		
12-1 A.M.		48	76	34	56	58	46	62										
1-2		50	46	14	54	50	59	64										
2-3		32	56	31	55	76	86	55										
3-4		24	21	18	55	44	60	86										
4-5		51	29	11	57	38	63	87										
5-6		59	55	24	60	79	73	56										
6-7		40	41	26	53	55	52	21										
7-8		53	69	18	14	49	61	86										
8-9		78	90	22	62	54	65	49										
9-10		101	100	49	60	77	54	67										
10-11		105	123	71	73	91	67	59										
11-12	58	89	114	78	76	83	76	87										
12-1 P.M.	75	101	143	91	86	78	98	71										
1-2	96	106	183	107	102	87	84	52										
2-3	85	109	139	124	116	95	101											
3-4	91	111	109	117	131	99	97											
4-5	97	109	137	116	96	89	96											
5-6	81	105	94	118	88	58	36											
6-7	56	87	71	110	62	46	58											
7-8	78	76	69	118	63	38	58											
8-9	33	70	118	50	62	41	27											
9-10	64	64	62	76	30	78	27											
10-11	32	84	36	62	58	52	41											
11-12	53	51	28	26	78	57	78											
TOTAL	899	1803	2009	1511	1647	1572	1563	902										

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Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	E Bd	B.T.	16	I-94 Ramp	Entrance to Rest Area -- West of Kalamazoo	

NOTES ON CHARACTERISTICS OF REST AREA
WEST OF KALAMAZOO

This rest area is equipped with electricity and drinking water. Its rest rooms have lavatories and flush toilets. There are fifty-two parking spaces for cars as well as sixteen separate truck spaces. Likewise, sixteen picnic tables and 3 separate cooking facilities can be found. As an added convenience, tourist information is available. This rest area is about 8 acres in size.

This is the only rest area where a twenty-four-hour survey was carried out. As was expected, this rest area had a particularly high percentage of expressway traffic turning in. The main reason for this supposition was the fact that no rest area exists on I-94 eastbound all the way from Chicago. Another reason for the high turn-in is the fact that the rest area provides flush toilet facilities.

The average percentage turn-in was, in fact, 18.8. The highest percentage turn-in occurred on Tuesday and the lowest percentage turn-in occurred on Sunday. The special point of interest in this rest area is the high volume of commercial vehicles both on the expressway and turning into the rest area. This is reflected in the turn-in figures for the hours of darkness, the rest area being busy even during these hours.

The average length-of-stay for all vehicles is high, even the passenger vehicles stay considerably longer than is the case in most other rest areas.

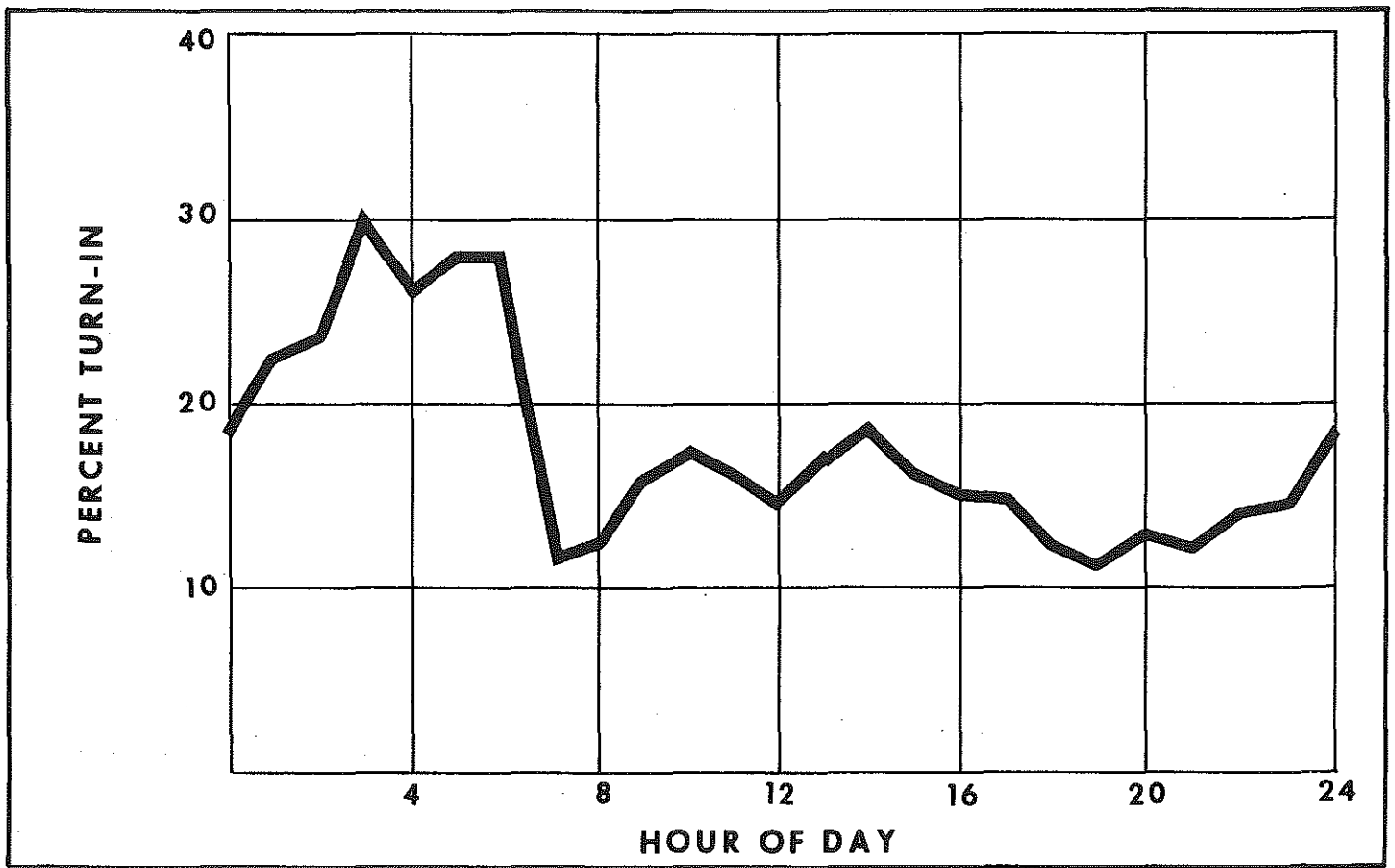
The average number of persons per vehicle is extremely low and there are more than twice as many males as there are females. This again is due to the high number of commercial vehicles which stop at the rest area.

The correlation between volume turn-in and expressway volume by hour of day is low except for Sunday.

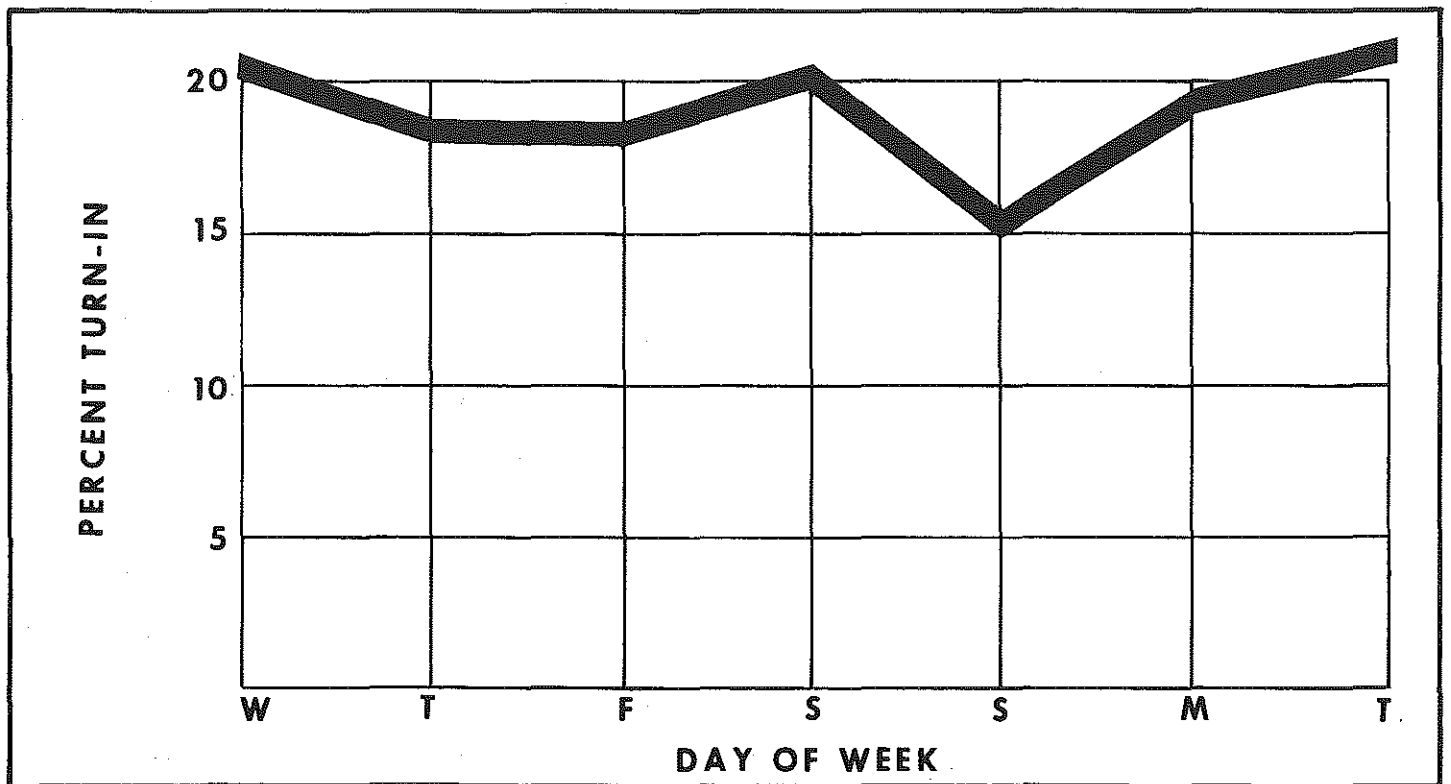
The correlation between daily expressway volumes and daily turn-in is, however, fairly high.

The average length-of-stay of out-of-state vehicles does not vary significantly from the average length-of-stay of all vehicles.

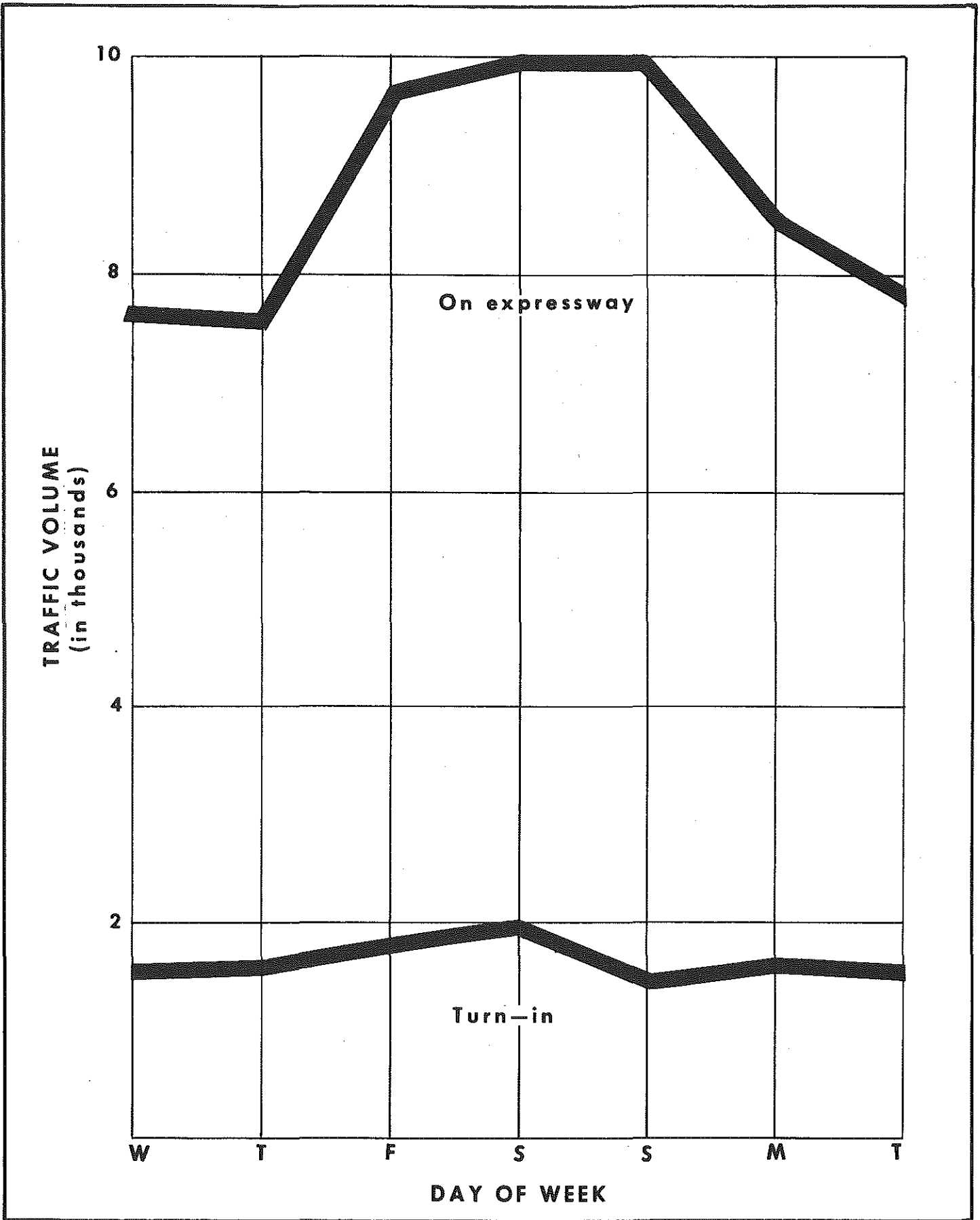
The comments obtained concerning the rest area were very favorable; however, a significant number of persons desired more rest areas.



Graph I



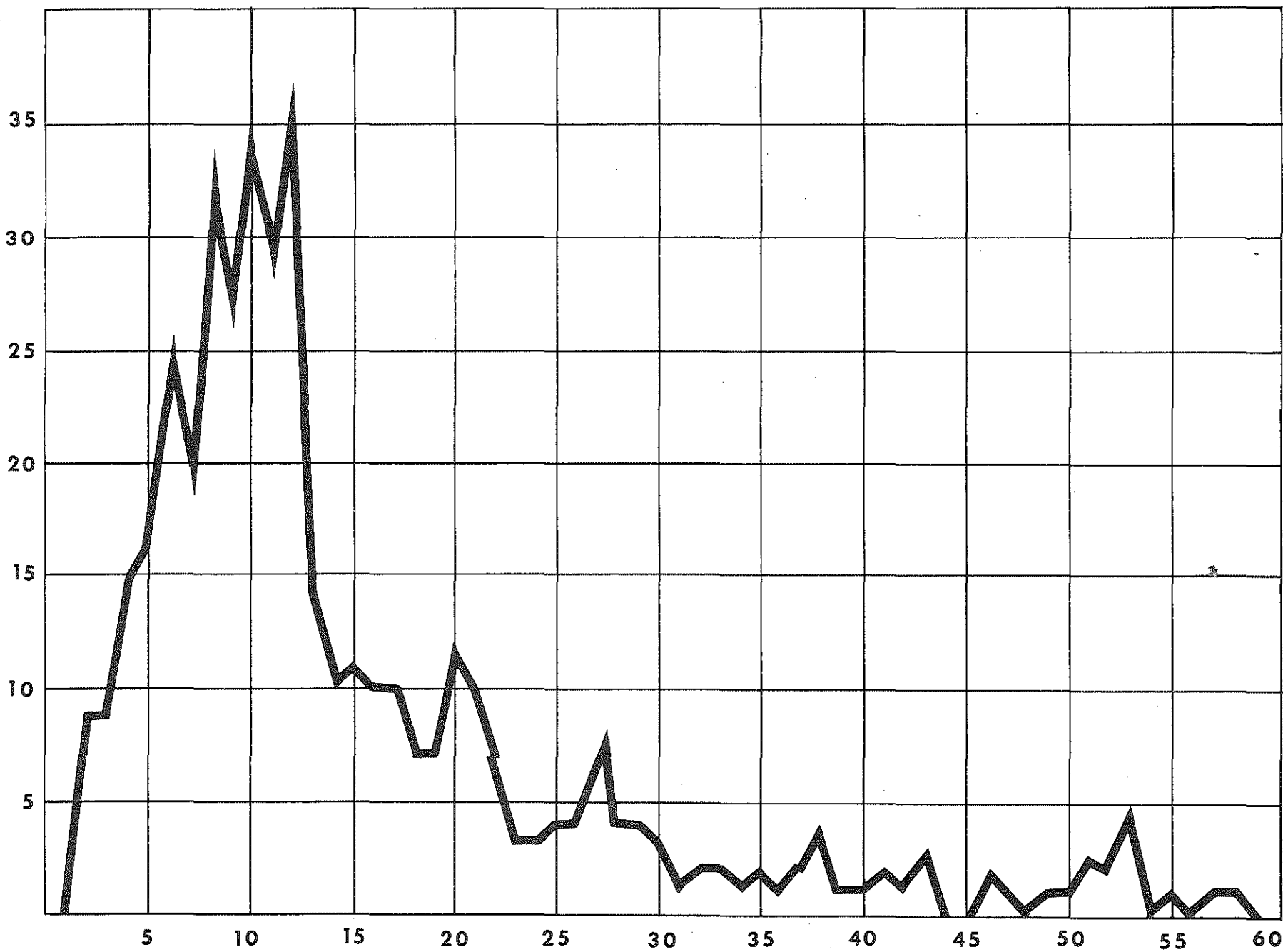
Graph II



Graph III

DISTRIBUTION OF LENGTH OF STAY

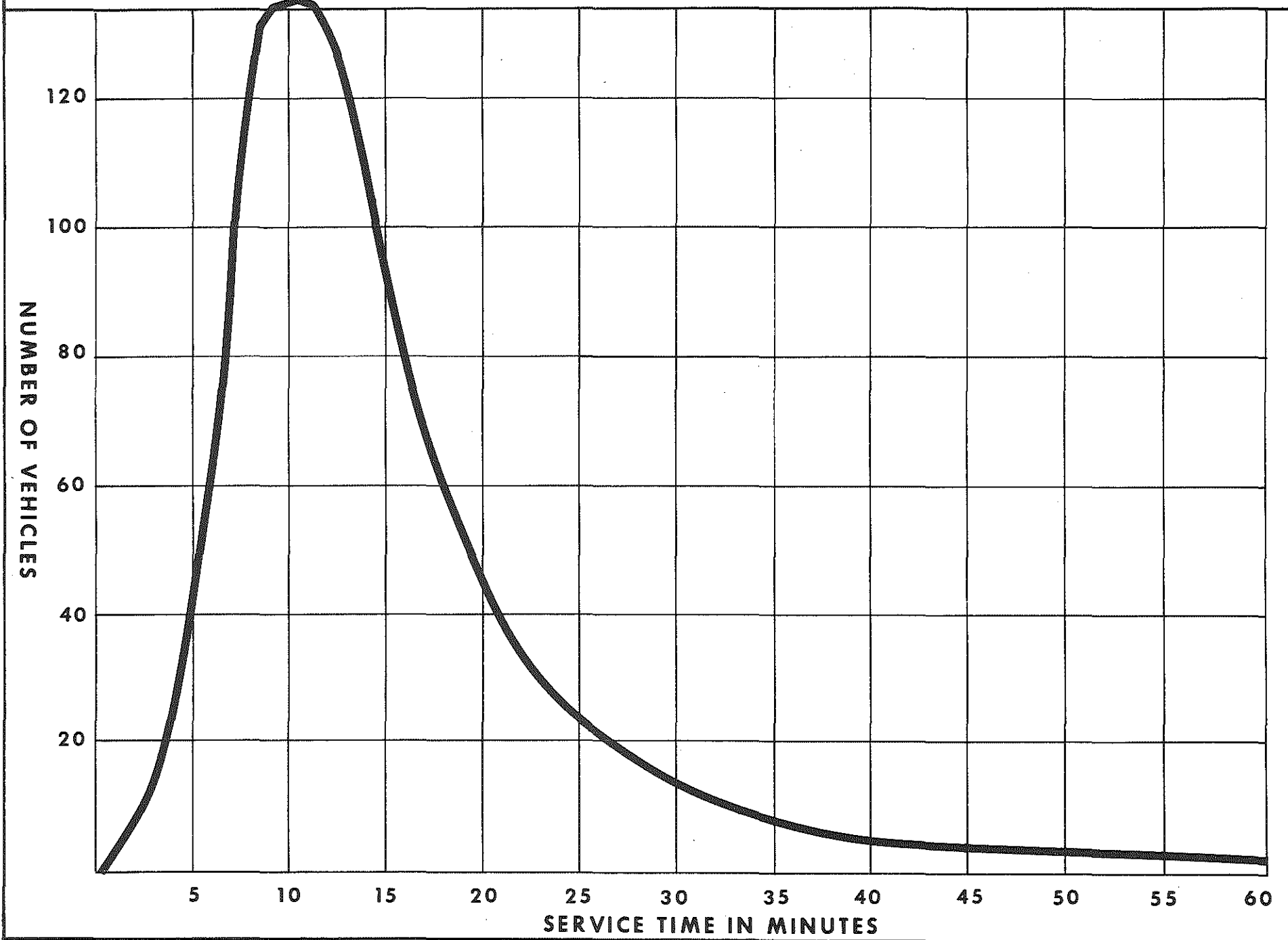
NUMBER OF VEHICLES

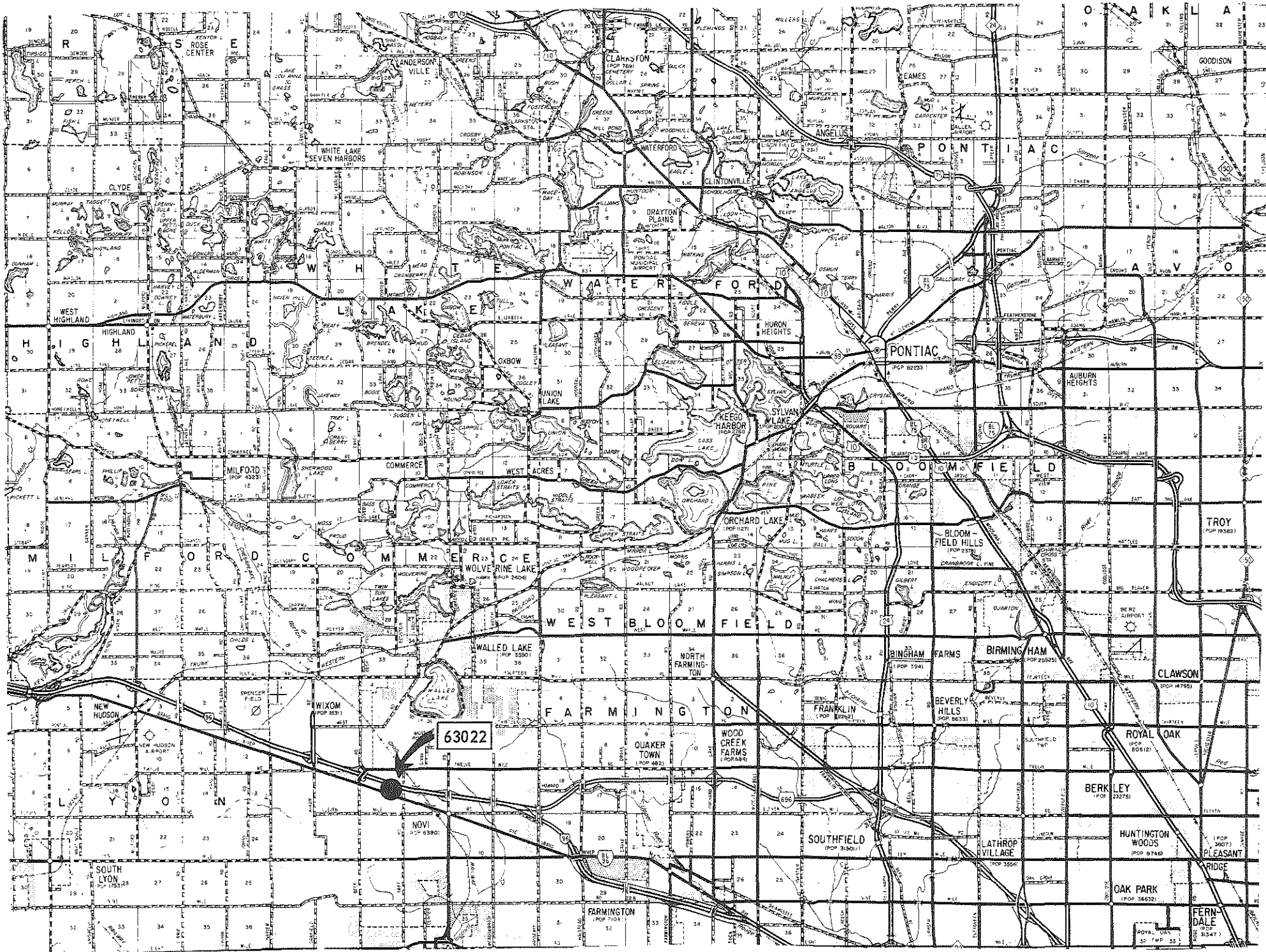


LENGTH OF TIME IN MINUTES

SERVICE TIME DISTRIBUTIONS (Vehicles in rest area)

CAR PARKING TIME





WEST OF NOVI

(6 3 0 2 2)

TRAFFIC VOLUMES BY DAY			
		From: 8/3/67	To: 8/10
	Expressway	Rest Area	%
SUNDAY	27,631	827	3.0
MONDAY	20,339	950	4.7
TUESDAY (Except 7A-2P)	13,296	631	4.7
WEDNESDAY	20,285	946	4.7
THURSDAY (Except 3P-6P)	18,987	832	4.4
FRIDAY	20,608	1027	5.0
SATURDAY	18,592	684	3.7
TOTAL	139,738	5897	4.2

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	2.8	12 N-1	6.1
1-2	7.5	1-2	6.0
2-3	15.0	2-3	6.9
3-4	11.2	3-4	3.4
4-5	9.4	4-5	3.7
5-6	6.8	5-6	3.6
6-7	3.4	6-7	3.4
7-8	3.0	7-8	3.4
8-9	3.6	8-9	3.1
9-10	5.5	9-10	2.8
10-11	5.2	10-11	2.8
11-12	6.4	11-12	4.9

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN= IN	AVERAGE LENGTH OF STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	4213	215	14	2.3	1.3	0.2
2	361	22	15	1.3	0.6	0.0
3	14	1	11	4.0	4.0	0.0
5	40	10	34	30.9	4.5	0.0
6	5	2	13	3.0	0.5	0.5
7	102	5	23	2.0	2.0	0.6

CARDS REJECTED

TOTALS	4735	255	15	3.3	1.4	0.2
--------	------	-----	----	-----	-----	-----

Average Persons Per
Vehicle: 5.00

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	8
Washing Facilities Required	12
More Rest Areas Needed	26
Flush Toilets Required	14
Rest Area Satisfactory	38
Rest Area Good	76
Refreshments Required	7
Facilities Unsatisfactory	3
No Comment	83
Larger Rest Rooms Required	21

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.72
Tuesday	.79
Wednesday	.89
Thursday	.81
Friday	.87
Saturday	.70
Sunday	.80

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .81

Out-Of-State Vehicles

11 out-of-state vehicles stopped at the rest area during the 4-hour study.

The average length-of-stay in the rest area of these vehicles was 8 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 15 minutes.

Rest Room Usage by Sex

113 males out of a total of 856 used the rest rooms, giving a male's percentage usage of 13.2.

120 females out of a total of 368 used the rest rooms, giving a female's percentage usage of 32.6.

51 children under 5 years of age entered the rest area.

LIBRARY
michigan department of
state highways
LANSING

Sheet 1 of 1 Date 7/26-7/27 19 67

Location I-96 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(West of Novi)

STATION NO.	1 EB			2 EB (Ramp)											
DAY	Wed.	Thurs.		Wed.	Thurs.										
DATE	7-26	7-27		7-26	7-27										
TIME															
12-1 A.M.		216			15										
1-2		74			23										
2-3		53			9										
3-4		62			12										
4-5		111			35										
5-6		354			50										
6-7		956			24										
7-8		1270			41										
8-9		911			41										
9-10	620	742		48	42										
10-11	752	794		32	63										
11-12	750	851		54	72										
12-1 P.M.	854	949		52	80										
1-2	1029	921		73	65										
2-3	1771			76											
3-4	1641			99											
4-5	1419			72											
5-6	1492			75											
6-7	1161			42											
7-8	1203			39											
8-9	917			29											
9-10	470			12											
10-11	338			18											
11-12	268			15											
TOTAL	14676	8264		739	572										

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	E Bd	Conc.	36	I-96	West of Novi.	
2	E Bd	B. T.	15	I-96 Ramp	Entrance to Rest Area -- West of Novi.	

194

Sheet 1 of 2 Date 8/3-8/10 19 67

Location I-96 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(West of Novi)

STATION NO.	1 EB																	
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.										
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10										
TIME																		
12-1A.M.		609	612	518	564	734	757	649										
1-2		172	283	289	286	252	217	310										
2-3		124	157	204	123	152	119	114										
3-4		66	105	92	84	127	124	101										
4-5		141	109	78	155	112	96	114										
5-6		289	160	50	305	276	271	255										
6-7		803	417	85	909	518	743	764										
7-8		1148	520	104	1350	*	1187	1234										
8-9		867	483	194	1172		862	909										
9-10		853	614	248	1009		866	931										
10-11		909	789	378	998		1022	904										
11-12		1048	1002	576	1183		908	984										
12-1P.M.		1090	1071	781	1134		941	991										
1-2		1070	1005	836	1073		1172	1102										
2-3		1307	1121	1041	1333	1208	1105	1147										
3-4		1802	1337	1393	1816	1882	1681											
4-5	1798	1616	1366	2085	1436	1623	1585											
5-6	1414	1652	1347	2798	1346	1711	1534											
6-7	1102	1267	1432	3045	1071	1158	1222											
7-8	993	1123	1177	3453	796	874	983											
8-9	766	812	1056	3239	641	827	788											
9-10	864	767	953	2989	583	787	787											
10-11	683	573	885	1936	533	618	760											
11-12	558	500	591	1219	439	437	555											
TOTAL	8178	20608	18592	27631	20339	13296	20285	10809										

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	E Bd	Conc	38	I-96 (3 lanes)	West of Novi.	
					* Hose up.	

Sheet 2 of 2 Date 8/3-8/10 19 67

Location I-96 Rest Area
(West of Novi)

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

STATION NO.	2 EB	(Ramp)																
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.										
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10										
TIME																		
12-1 A.M.		17	22	12	26	11	15	23										
1-2		26	15	13	26	24	16	15										
2-3		31	19	13	13	29	25	19										
3-4		19	11	12	6	11	12	7										
4-5		11	15	4	9	15	7	15										
5-6		8	13	1	13	29	19	27										
6-7		17	18	4	32	35	22	17										
7-8		41	12	2	42	24	31	41										
8-9		31	22	5	42	35	30	31										
9-10		54	33	22	48	54	41	50										
10-11		43	28	29	62	76	48	48										
11-12		77	40	35	85	86	73	56										
12-1 P.M.		56	57	35	59	78	95	67										
1-2		75	51	44	73	98	72	61										
2-3		96	32	42	54	63	74	60										
3-4		48	35	64	60	80	54											
4-5	57	83	34	51	50	73	80											
5-6	51	54	50	85	49	70	67											
6-7	47	54	43	71	48	42	43											
7-8	32	48	38	80	49	38	32											
8-9	33	42	36	63	29	26	25											
9-10	25	34	20	51	35	23	30											
10-11	23	27	19	37	23	23	15											
11-12	27	35	21	52	17	39	20											
TOTAL	295	1027	684	827	950	1082	946	537										

- 96T -

Sta. No.	Direction	Road Type		Width (ft.)	Route	Location	C.S. No.
2	E Bd	B.T.		18	I-96	Entrance to Rest Area (West of Novi)	

NOTES ON CHARACTERISTICS OF REST AREA
WEST OF NOVI

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are fifty parking spaces for cars as well as twenty separate truck spaces. Likewise, twenty picnic tables and 5 separate cooking facilities can be found. As an added convenience, tourist information is available. This rest area is located in a pleasant rural community near the Village of Novi in Oakland County.

This rest area has a very low percentage turn-in. The reason for this fact is that the expressway volumes are so high that any greater percentage turn-in would result in the rest area being overcrowded, especially on a summer Sunday.

The percentage turn-in by hour of the day reaches a peak, as in the case with other rest areas, in the small hours of the morning. There is also another peak between 11 AM and 3 PM.

The average number of persons per vehicle is extremely high, largely as a result of ten busses turning in during the survey period.

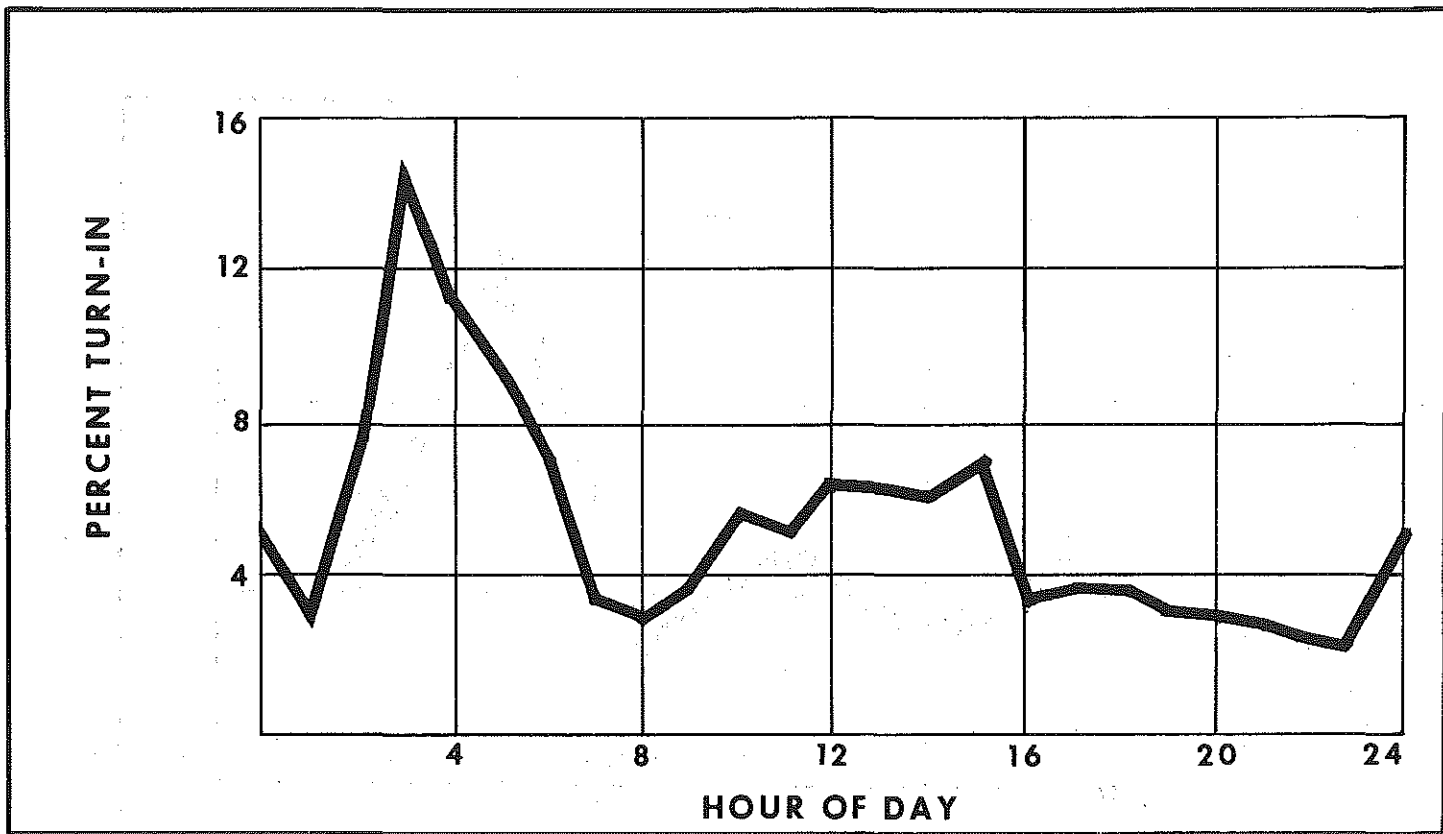
The correlation between expressway volume and volume turn-in by hour of the day is reasonably good except for Saturday and Monday, when it is somewhat low.

The correlation between expressway volume and volume turn-in is fairly high.

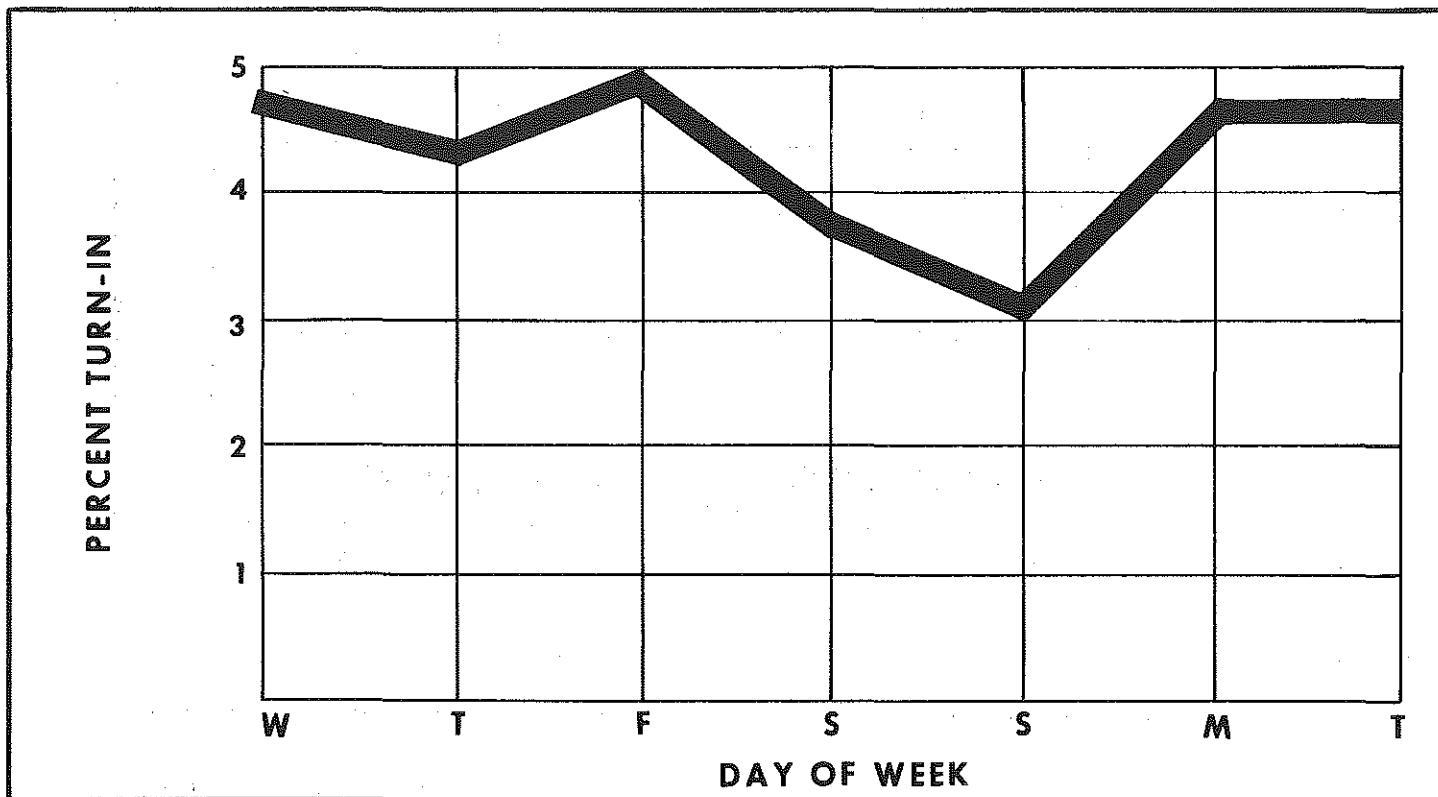
Only eleven out-of-state vehicles stopped at the rest area during the 4-hour study. The average length-of-stay of these vehicles was considerably less than the overall average length-of-stay. However, the statistics for out-of-state vehicles will not be very reliable for such a small number of vehicles.

The percentage rest room usage is extremely low for males, and reasonably low for females. The reason for the male percentage rest room use being so low is that a very large number of males entered the rest area and only a limited number of these will be able to use the rest room in any given time.

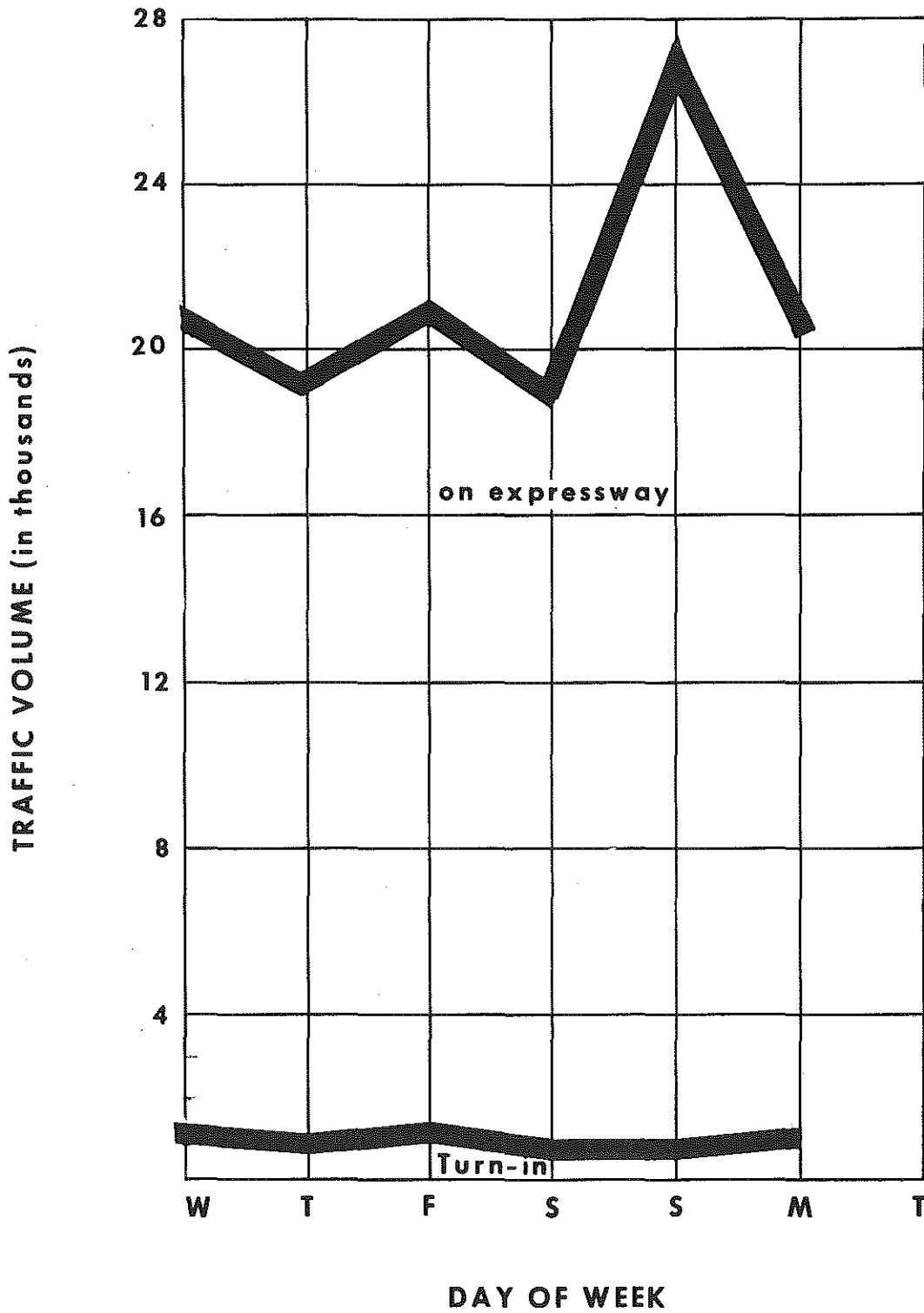
Although the comments were favorable concerning the rest area, a significant number of persons required flush toilets or more toilet facilities.



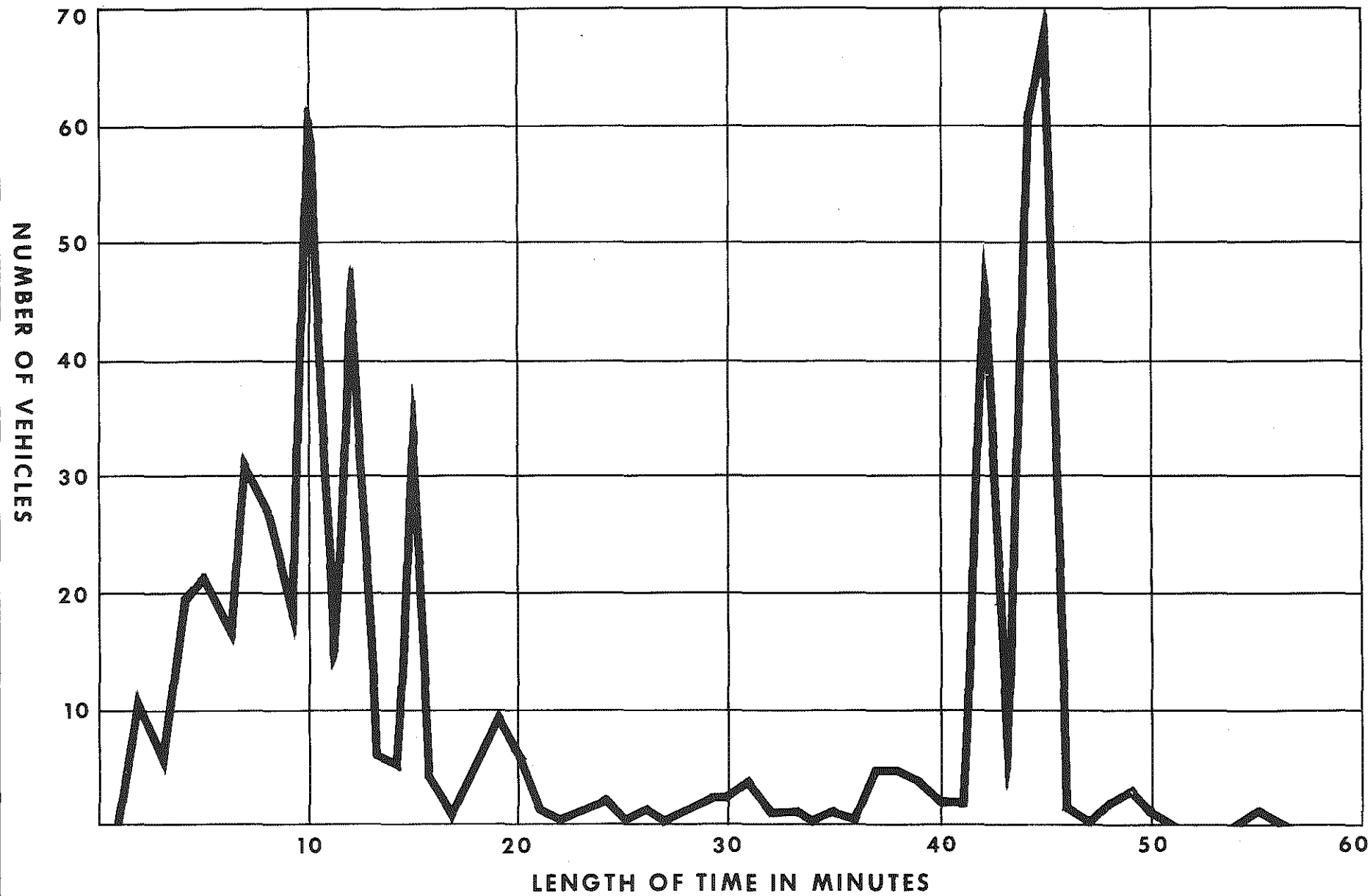
Graph I



Graph II

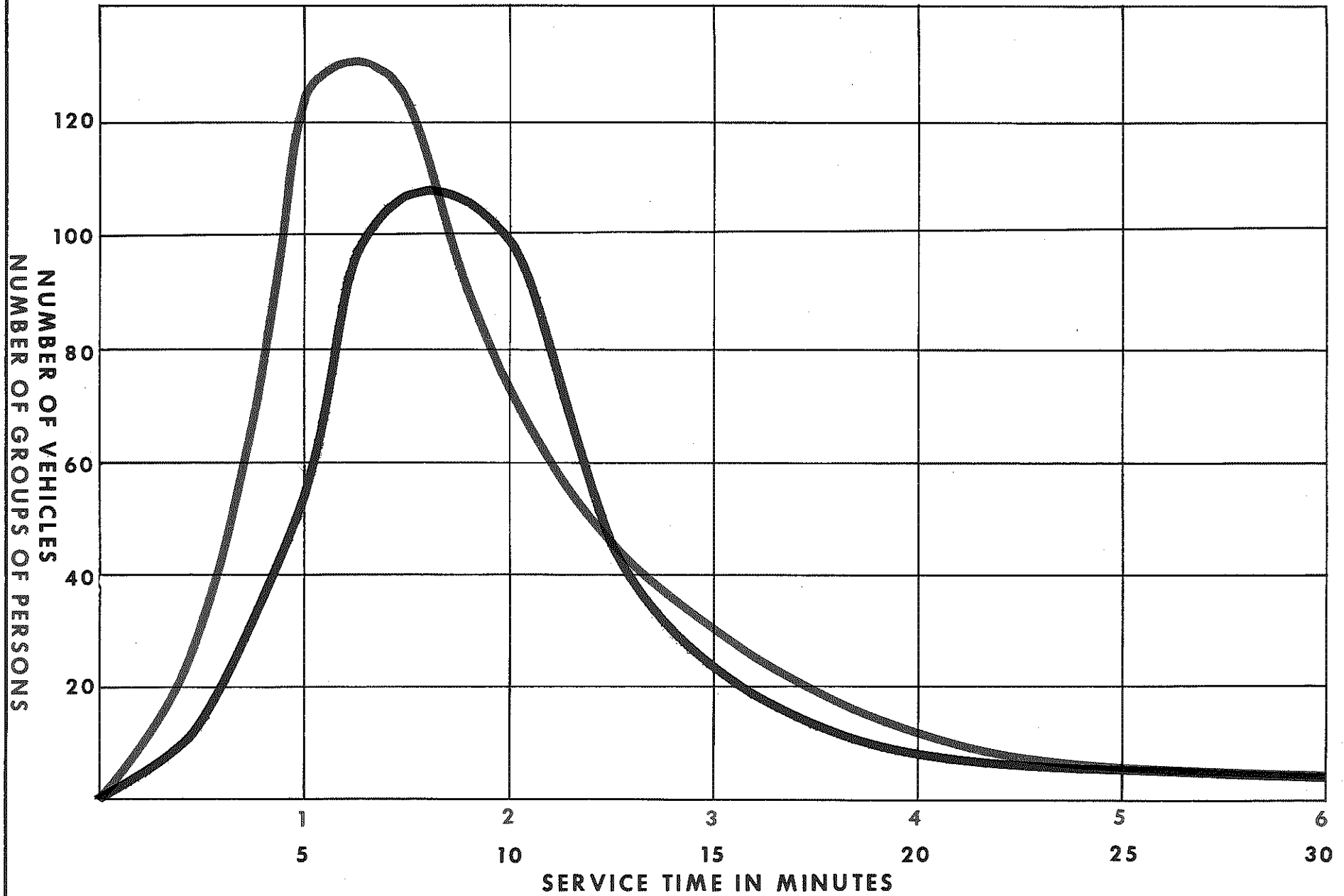


DISTRIBUTION OF LENGTH OF STAY

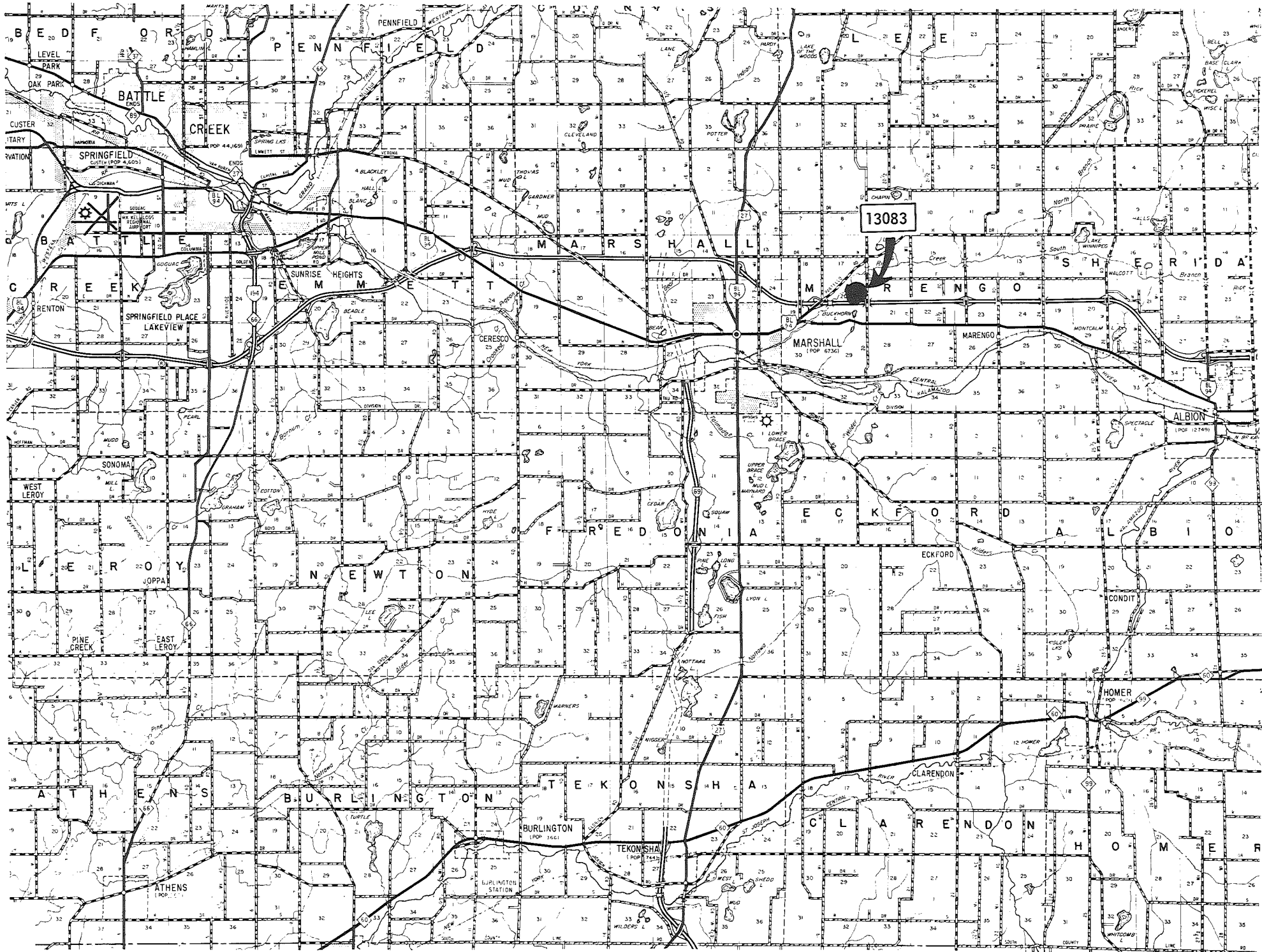


SERVICE TIME DISTRIBUTIONS
(Person—Groups in rest rooms)
(Vehicles in rest area)

REST ROOM USAGE TIME
CAR PARKING TIME







EAST OF MARSHALL

(1 3 0 8 3)

TRAFFIC VOLUMES BY DAY			
		From: 8/3/67	To: 8/9
	Expressway	Rest Area	%
SUNDAY	7,316	857	11.7
MONDAY	6,538	842	12.9
TUESDAY (Except 4A-12A)	3,922	466	11.9
WEDNESDAY (Except 5P-12A)	5,098	631	12.4
THURSDAY (Except 12P-9A)	5,293	572	10.8
FRIDAY	8,559	970	11.3
SATURDAY	7,252	895	12.3
TOTAL	43,978	5,233	11.9

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	11.5	12 N-1	11.9
1-2	19.7	1-2	10.7
2-3	24.0	2-3	11.5
3-4	27.6	3-4	10.4
4-5	22.9	4-5	8.1
5-6	23.3	5-6	9.8
6-7	14.6	6-7	9.1
7-8	13.6	7-8	8.7
8-9	14.6	8-9	7.9
9-10	13.3	9-10	8.7
10-11	13.4	10-11	10.5
11-12	13.2	11-12	13.8

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH OF STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	2798	211	13	1.2	1.3	0.2
2	111	6	10	1.1	0.3	0.0
3	31	6	18	1.2	1.6	0.5
7	116	16	13	1.5	1.3	0.5

CARDS REJECTED

TOTALS	3056	239	14	1.4	1.4	0.3
--------	------	-----	----	-----	-----	-----

Average Persons Per
Vehicle: 3.21

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	23
Washing Facilities Required	26
More Rest Areas Needed	16
Flush Toilets Required	27
Rest Area Satisfactory	78
Rest Area Good	31
Refreshments Required	10
Facilities Unsatisfactory	8
No Comment	53
Larger Rest Rooms Required	12

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
VOLUME AND TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.74
Tuesday	.54
Wednesday	.78
Thursday	.57
Friday	.80
Saturday	.83
Sunday	.89

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .97

Out-Of-State Vehicles

97 out-of-state vehicles stopped at the rest area during the 4-hour study.

The average length-of-stay in the rest area of these vehicles was 17 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 14 minutes.

Rest Room Usage by Sex

124 males out of a total of 348 used the rest rooms, giving a male's percentage usage of 35.6.

133 females out of a total of 358 used the rest rooms, giving a female's percentage usage of 37.2.

65 children under 5 years of age entered the rest area.

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village _____
or Twp. _____ County Calhoun

Sheet 1 of 2 Date 8/3-8/9 19 67

Location I-94 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(East of Marshall)

STATION NO.	1 WB														
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.								
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9								
TIME															
12-1 A.M.		159	148	115	139	147	137								
1-2		132	158	79	110	108	150								
2-3		98	134	84	80	93	128								
3-4		86	108	69	94	68	137								
4-5		129	105	43	64	74	113								
5-6		110	120	61	119	98	114								
6-7		157	203	83	183	163	162								
7-8		233	315	116	243	250	209								
8-9		308	306	177	312	298	279								
9-10	345	337	430	247	378	313	395								
10-11	438	517	525	395	500	408	441								
11-12	489	528	536	516	526	403	485								
12-1 P.M.	459	497	543	533	503	389	452								
1-2	461	538	443	461	473	366	468								
2-3	440	539	477	486	442	347	434								
3-4	424	593	495	480	373	400	482								
4-5	452	647	412	538	407	407	512								
5-6	399	605	377	513	371	329									
6-7	313	594	329	511	291	266									
7-8	268	522	287	471	220	249									
8-9	243	448	253	442	195	173									
9-10	209	349	214	381	173	213									
10-11	195	248	162	285	173	180									
11-12	158	185	172	230	170	187									
TOTAL	5293	8559	7252	7316	6538	5929	5098								

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	W Bd	Conc	24	I-94	East of Marshall	

Sheet 2 of 2 Date 8/3 - 8/10 19 67

Location I-94 Rest Area

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

(East of Marshall)

STATION NO.	2 WB																			
DAY	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thurs.												
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10												
TIME																				
12-1 A.M.		23	24	15	9	13	13	15												
1-2		34	10	10	39	27	25	24												
2-3		22	31	24	16	32	23	17												
3-4		23	33	13	34	35	17	18												
4-5		21	10	10	29	*	34	13												
5-6		36	35	6	26		19	24												
6-7		21	22	10	37		25	36												
7-8		14	43	26	31		38	29												
8-9		26	55	34	43		44	46												
9-10	49	30	61	34	54		55	60												
10-11	66	59	76	62	63		51	68												
11-12	55	71	78	65	80	**	59	38												
12-1 P.M.	47	79	65	57	54	40	60													
1-2	37	46	61	56	49	47	48													
2-3	48	45	58	58	61	43	51													
3-4	37	57	50	68	48	47	31													
4-5	22	65	36	54	31	29	38													
5-6	42	62	41	55	28	25	36													
6-7	35	60	20	43	15	37	20													
7-8	31	34	22	49	11	28	20													
8-9	26	37	25	31	10	19	25													
9-10	20	40	10	24	26	14	18													
10-11	16	30	15	31	23	15	28													
11-12	41	35	14	22	25	15	26													
TOTAL	572	970	895	857	842	466	804	388												

Sta. No.	Direction	Road Type	Width (ft.)	Route	Location	C.S. No.
2	W Bd	B.T.	13	I-94 Ramp	Entrance to Rest Area -- East of Marshall	
					* Count wrong	
					** Machine reset	

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NOTES ON CHARACTERISTICS OF REST AREA
EAST OF MARSHALL

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are seventy-four parking spaces for cars as well as twenty-two separate truck spaces. Likewise, 8 picnic tables and 3 separate cooking facilities can be found. As an added convenience, tourist information is available.

This rest area has a fairly constant turn-in by day of week, the weekly average being 11.9 percent. The highest percentage turn-in occurs on a Monday.

The percentage turn-in by hour of the day will be reasonably stable even during the hours of darkness as we have reasonably high volumes on the expressway. As usual, the percentage turn-in increases to a peak during the small hours of the morning.

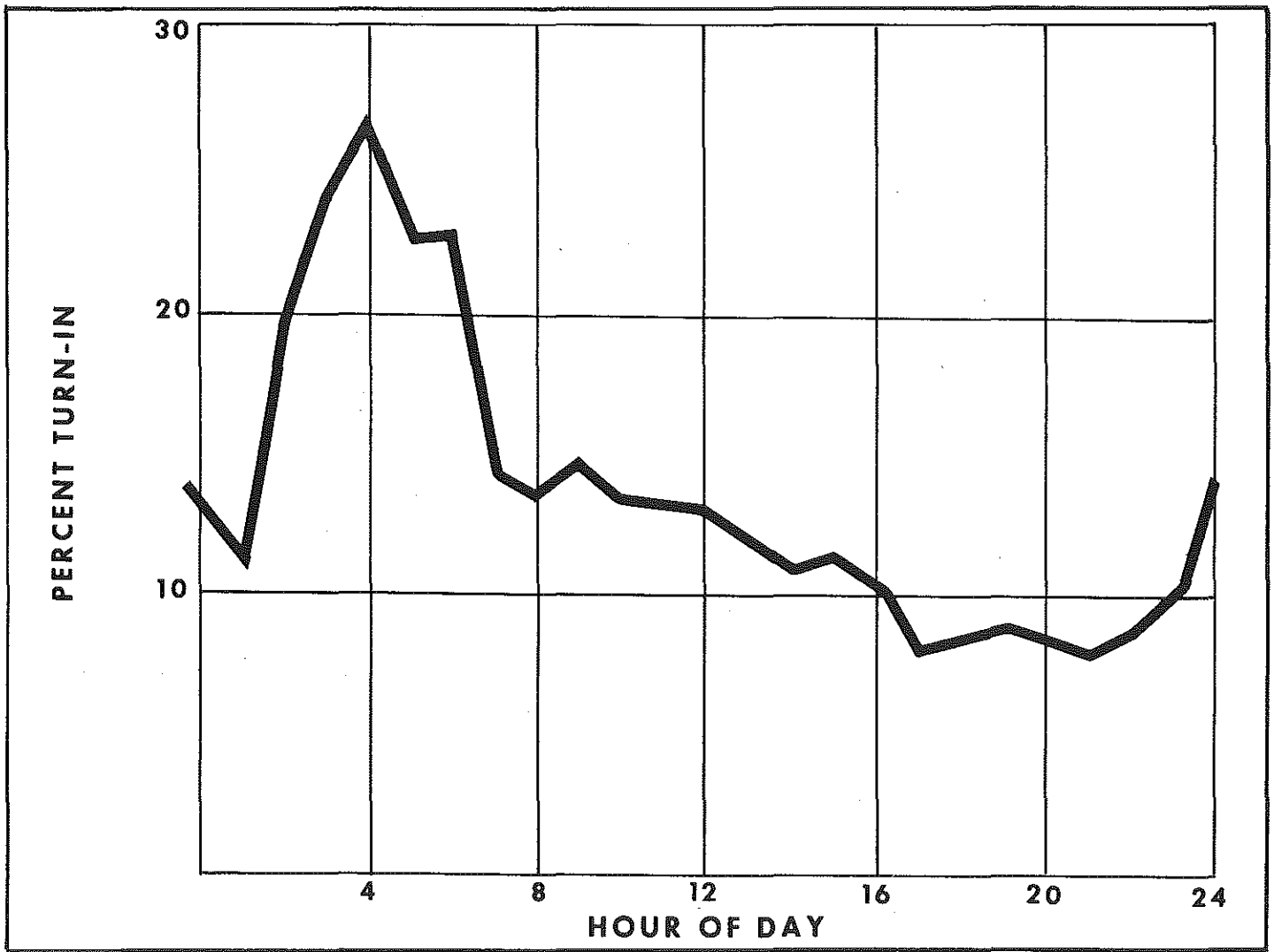
From the vehicle occupancy table, we see that rest area visitors are distributed equally between males and females.

The correlation between expressway volume and volume turn-in is extremely good.

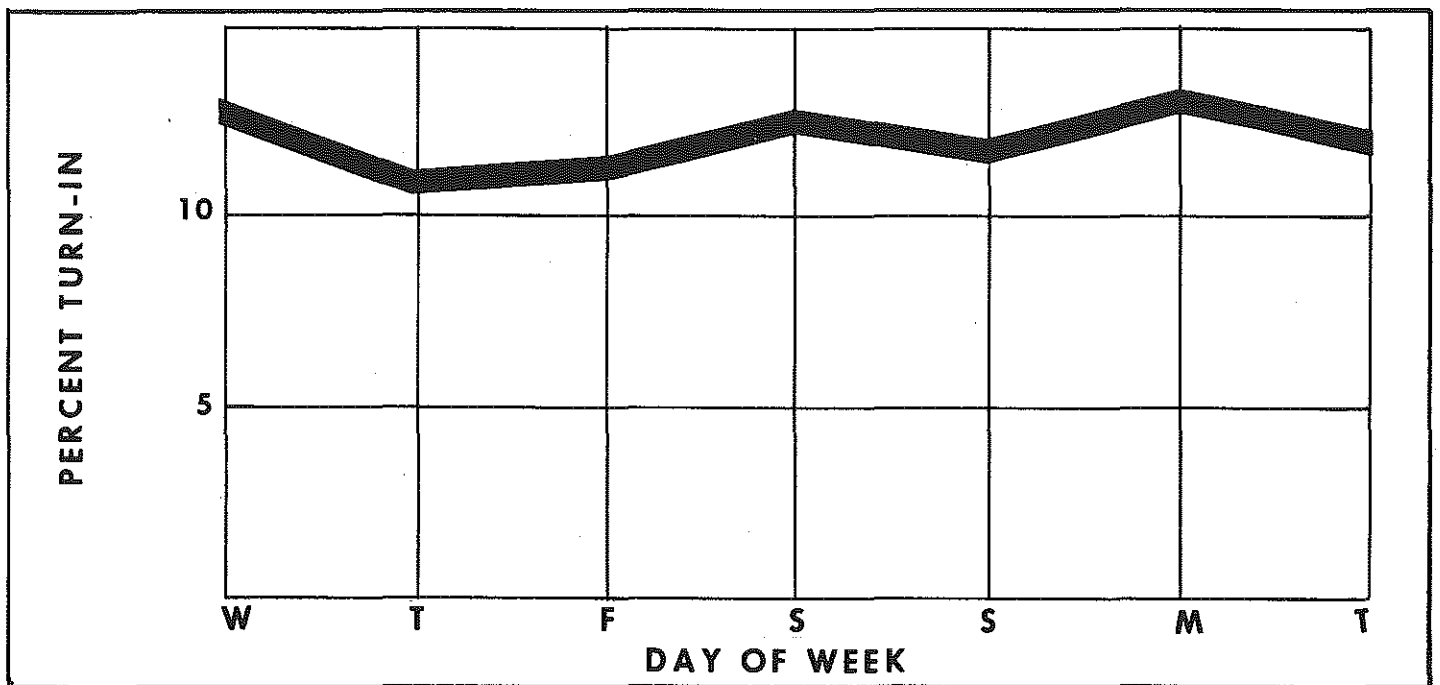
The average length-of-stay of out-of-state vehicles is slightly longer than the average length-of-stay of all vehicles.

The percentage of visitors using the rest room facilities is slightly above average for the state, the male and female percentages being virtually the same.

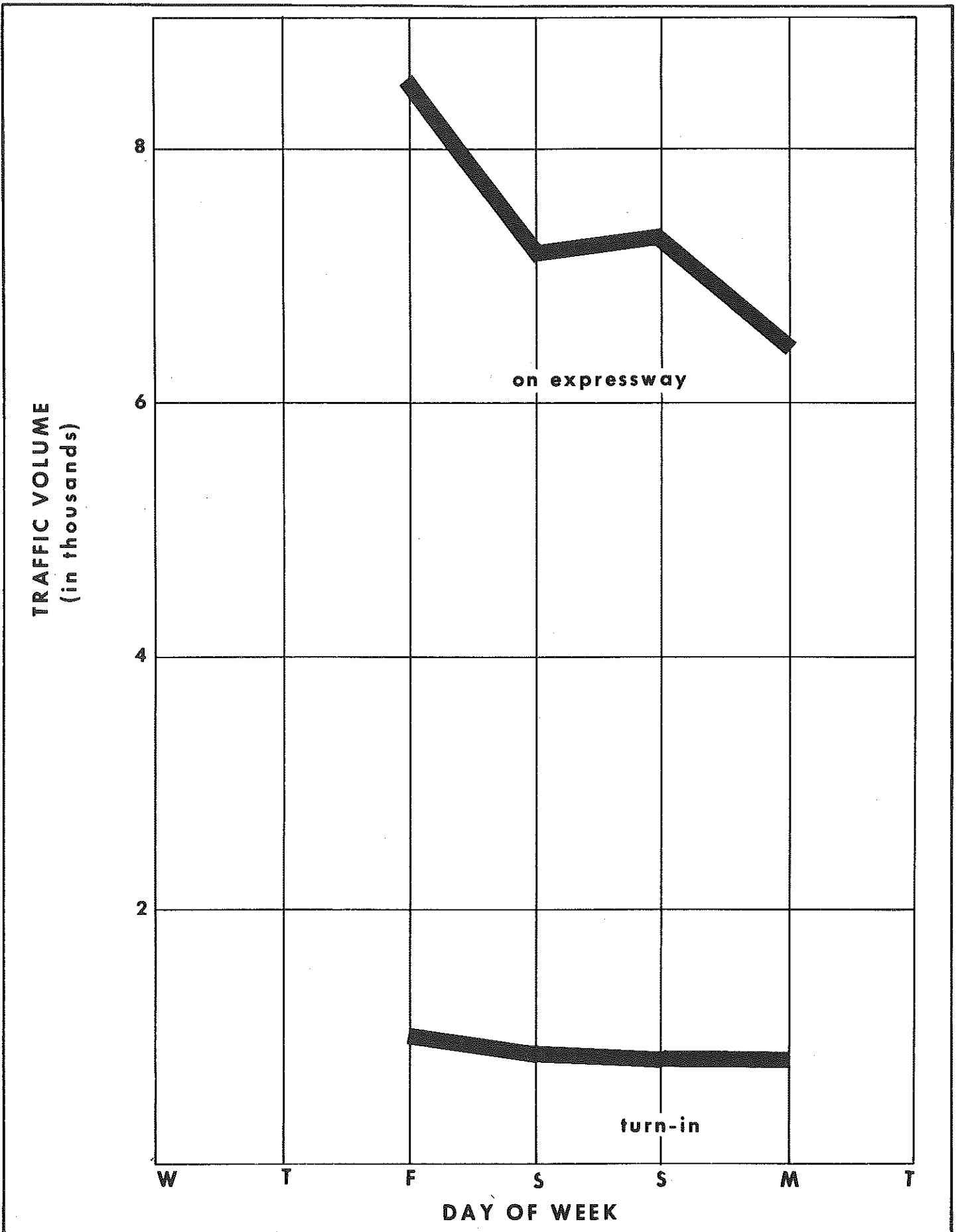
A significant number of adverse comments were obtained; persons requiring more facilities and a large number of complaints regarding the unsanitary condition of the rest rooms were also forthcoming.



Graph I

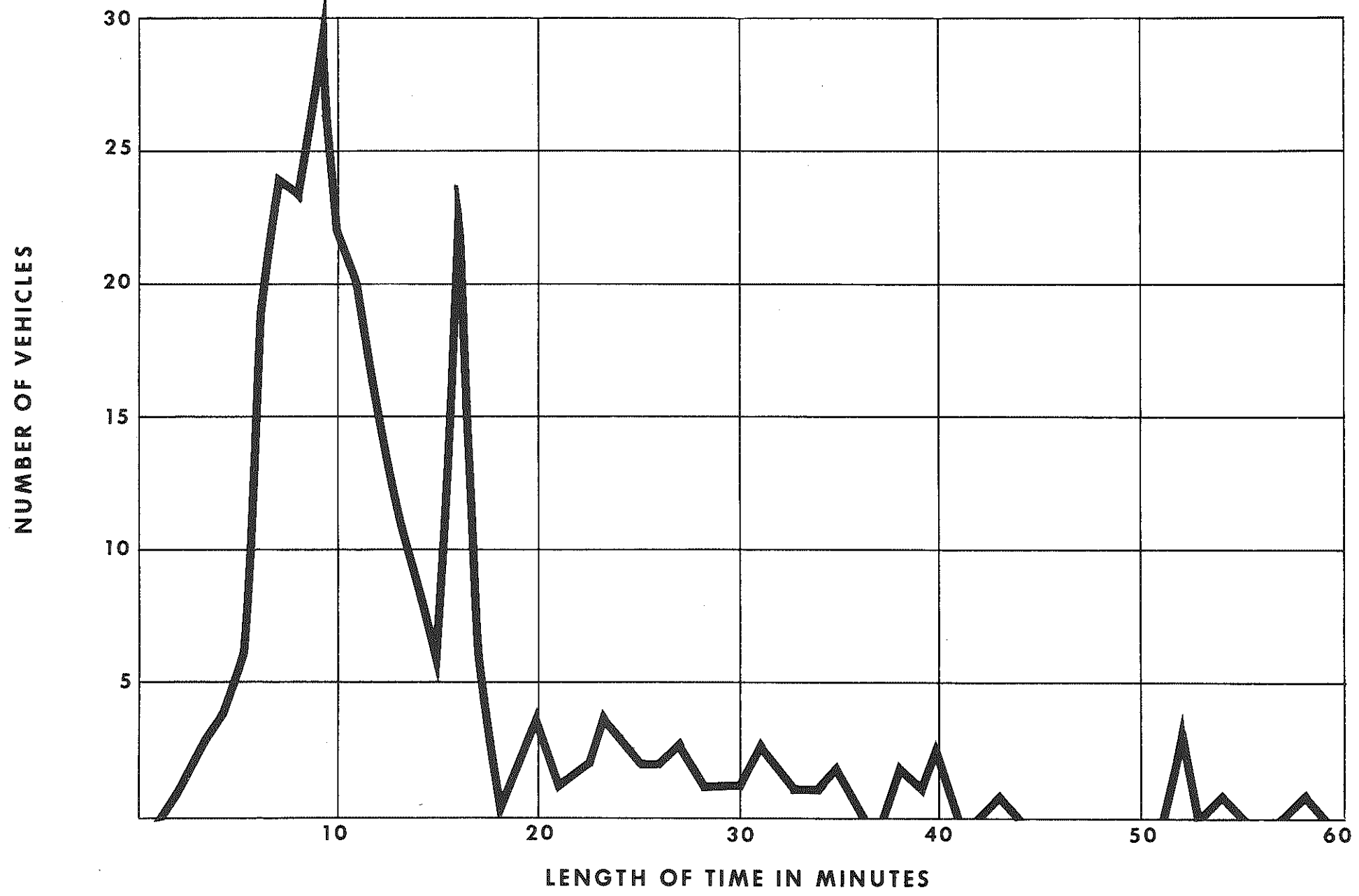


Graph II



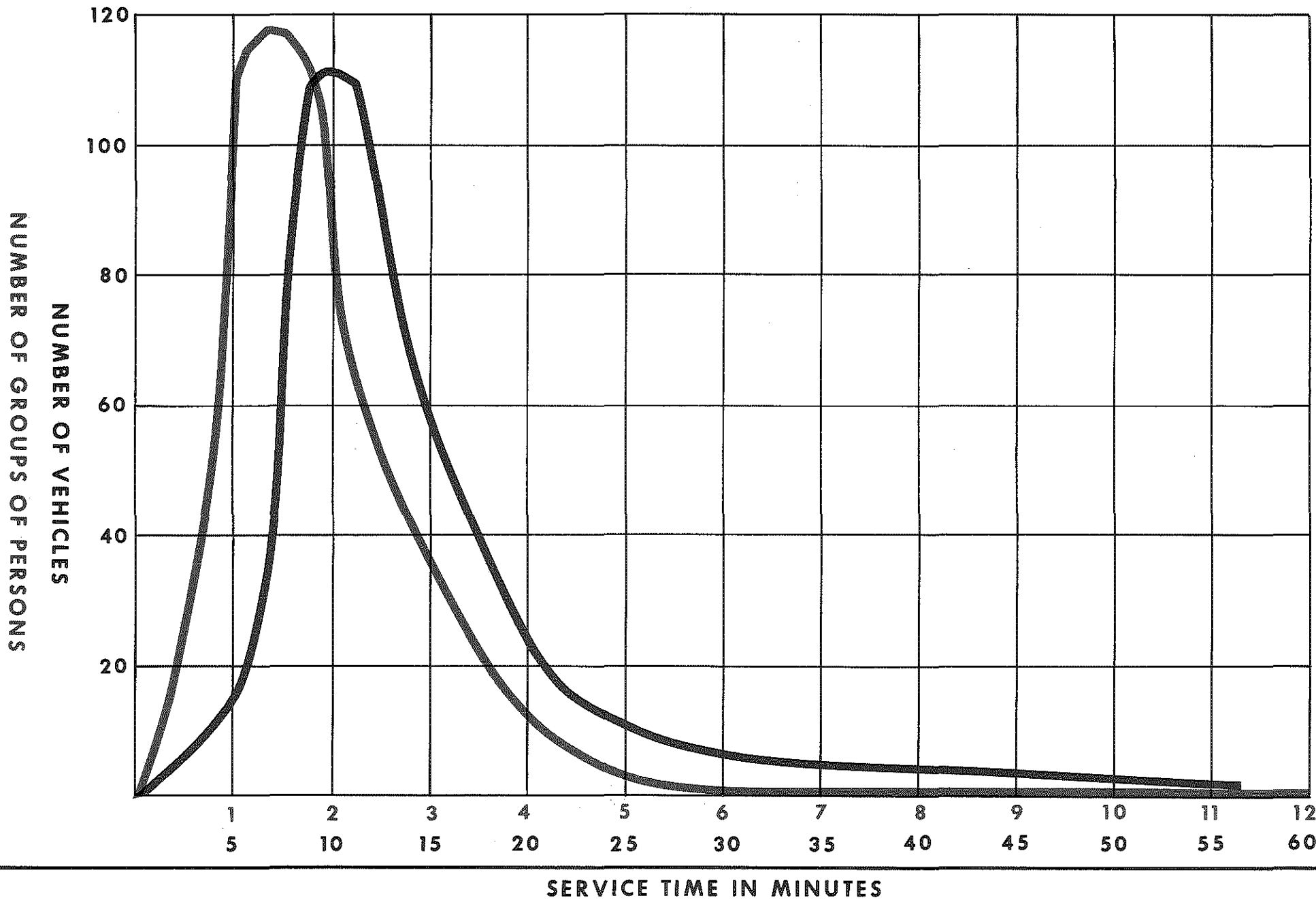
Graph III

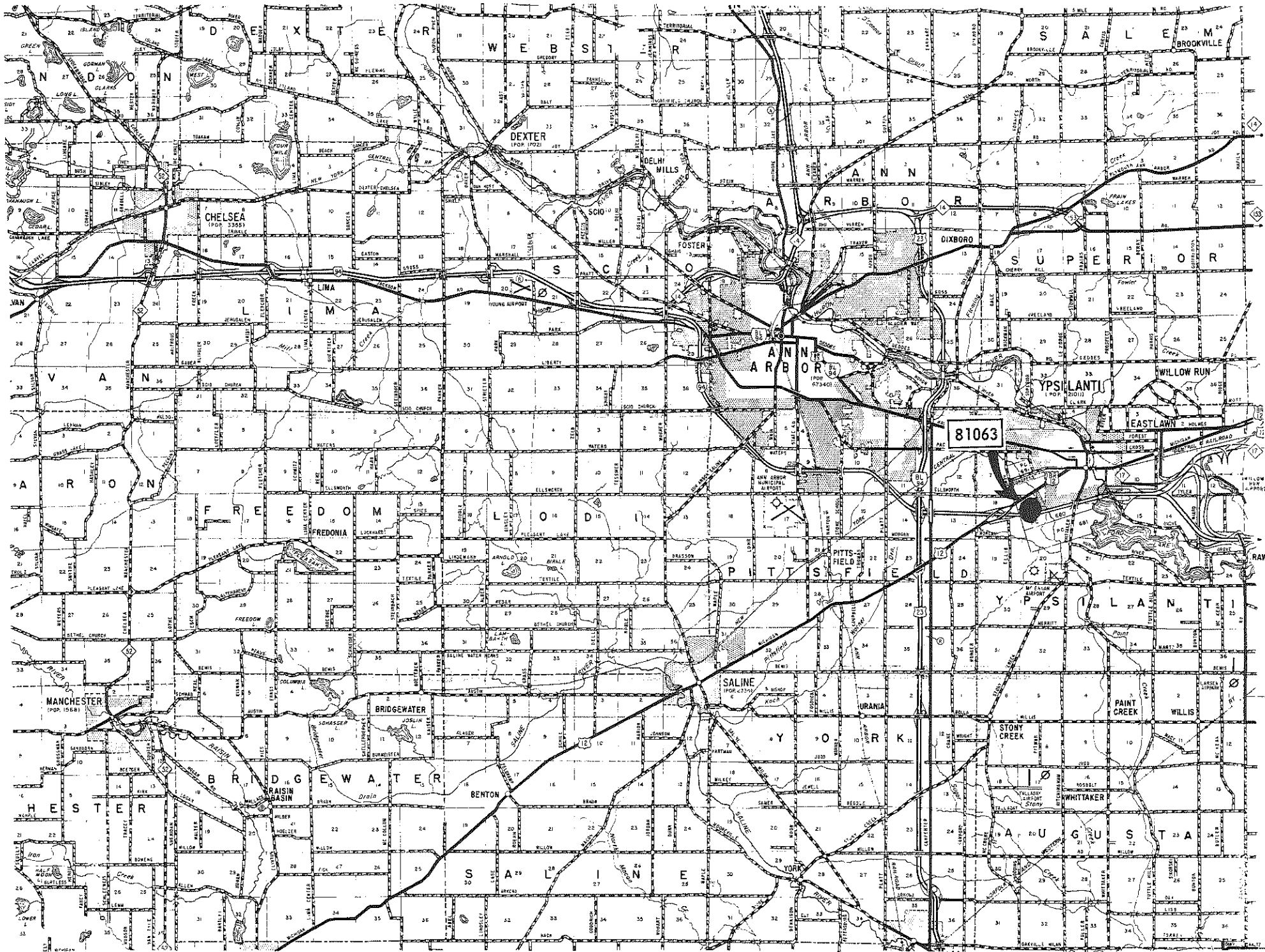
DISTRIBUTION OF LENGTH OF STAY



SERVICE TIME DISTRIBUTIONS
 (Person—Groups in rest rooms)
 (Vehicles in rest area)

REST ROOM USAGE TIME
 CAR PARKING TIME





EAST OF ANN ARBOR

(8 1 0 6 3)

TRAFFIC VOLUMES BY DAY From: 8/4/67 To: 8/10

	Expressway	Rest Area	%
SUNDAY	20,117	933	4.6
MONDAY	19,745	1,053	5.3
TUESDAY	20,216	1,006	5.0
WEDNESDAY	20,878	1,160	5.6
THURSDAY	21,321	1,235	5.8
FRIDAY	23,939	1,273	5.3
SATURDAY	20,426	1,091	5.3
TOTAL	146,642	7,751	5.3

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	5.4	12 N-1	6.7
1-2	8.3	1-2	6.4
2-3	7.9	2-3	6.7
3-4	8.9	3-4	5.5
4-5	9.1	4-5	5.0
5-6	9.3	5-6	4.7
6-7	4.5	6-7	4.3
7-8	2.7	7-8	4.2
8-9	4.0	8-9	4.6
9-10	4.8	9-10	4.4
10-11	5.2	10-11	5.1
11-12	5.7	11-12	7.4

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	3370	130	10	1.9	1.3	0.1
2	183	5	7	1.4	0.0	0.0
5	16	6	20	30.6	6.1	0.0
6	6	1	6	3.0	2.0	0.0
7	113	12	8	2.6	2.0	0.2

CARDS REJECTED

TOTALS	3688	154	10	3.0	1.5	0.1
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Average Persons Per
Vehicle: 4.77

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	16
Washing Facilities Required	6
More Rest Areas Needed	16
Flush Toilets Required	10
Rest Area Satisfactory	28
Rest Area Good	41
Refreshments Required	3
Facilities Unsatisfactory	15
No Comment	30
Larger Rest Rooms Required	5

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.80
Tuesday	.73
Wednesday	.69
Thursday	.63
Friday	.73
Saturday	.77
Sunday	.89

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .98

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	3370	130	10	1.9	1.3	0.1
2	183	5	7	1.4	0.0	0.0
5	16	6	20	30.6	6.1	0.0
6	6	1	6	3.0	2.0	0.0
7	113	12	8	2.6	2.0	0.2

CARDS REJECTED

TOTALS	3688	154	10	3.0	1.5	0.1
--------	------	-----	----	-----	-----	-----

Average Persons Per
Vehicle: 4.77

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
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CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.80
Tuesday	.73
Wednesday	.69
Thursday	.63
Friday	.73
Saturday	.77
Sunday	.89

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .98

Out-Of-State Vehicles

32 out-of-state vehicles stopped at the rest area during the 3-hour study.

The average length-of-stay in the rest area of these vehicles was 8 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 10 minutes.

Rest Room Usage by Sex

72 males out of a total of 471 used the rest rooms, giving a male's percentage usage of 15.3.

64 females out of a total of 238 used the rest rooms, giving a female's percentage usage of 26.9.

24 children under 5 years of age entered the rest area.

LIBRARY
michigan department of
state highways
LANSING

Sheet 2 of 2 Date 8/3 - 8/10 19 67

TRAFFIC DIVISION

Location I-94 Rest Area

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

(East of Ann Arbor)

STATION NO.	2 WB														
DAY	Thur.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thur.							
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10							
TIME															
12-1 A.M.		16	26	13	39	25	42	28							
1-2		30	40	23	17	17	30	38							
2-3		11	27	24	13	11	32	34							
3-4		19	15	16	15	18	16	29							
4-5		25	39	10	8	6	11	29							
5-6		29	25	5	14	25	26	51							
6-7		78	25	24	34	25	32	28							
7-8		20	50	24	38	42	30	35							
8-9		53	27	43	49	63	31	52							
9-10		67	52	41	70	50	48	84							
10-11		70	70	54	71	83	61	63							
11-12		94	73	52	83	76	71	54							
12-1 P.M.		89	96	97	77	61	70	66							
1-2		72	67	73	69	69	85	66							
2-3		76	72	72	69	65	89	98							
3-4		66	80	49	70	56	89	92							
4-5		67	56	47	59	84	100	60							
5-6	50	94	68	64	66	43	62	65							
6-7	70	84	39	41	43	36	49								
7-8	35	61	44	37	39	35	35								
8-9	54	38	33	38	28	19	29								
9-10	26	37	18	33	19	34	27								
10-11	38	32	24	21	30	29	34								
11-12	40	45	25	32	33	34	61								
TOTAL	313	1273	1091	933	1053	1006	1160	972							

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Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	WB	Bit.	14'	I-94 (Ramp)	Entrance to Rest Area - East of Ann Arbor	

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village _____
or Twp. _____ County Washtenaw

Sheet 1 of 2 Date 8/3 - 8/10 19 67

Location I-94 Rest Area (East of Ann Arbor)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	1 WB															
DAY	Thur.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thur.								
DATE	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10								
TIME																
12-1 A.M.		494	611	427	324	447	542	647								
1-2		436	450	292	229	236	368	329								
2-3		286	304	189	184	240	471	244								
3-4		194	287	156	169	183	242	207								
4-5		244	275	103	155	203	208	222								
5-6		267	331	131	286	325	294	364								
6-7		920	777	251	886	918	863	090								
7-8		1475	1044	474	1475	1461	1392	1480								
8-9		1236	1158	711	1145	1262	1095	1268								
9-10		1134	1313	972	1678	1104	1169	1269								
10-11		1257	1442	1592	1164	1240	1242	1156								
11-12		1214	1352	1646	1125	1086	1214	1230								
12-1 P.M.		1140	1248	1676	1048	989	1043	1111								
1-2		1092	1141	1682	975	979	970	983								
2-3		1222	1134	1495	958	1059	1080	1160								
3-4		1539	1153	1243	1241	1271	1319	1371								
4-5		1730	1128	1138	1273	1303	1444	1479								
5-6	1449	1833	1093	1104	1352	1676	1394	1472								
6-7	1168	1674	965	1004	1108	1245	1182									
7-8	903	1487	931	985	817	811	867									
8-9	678	1011	779	889	630	599	631									
9-10	609	828	574	732	553	532	605									
10-11	557	615	497	737	510	552	596									
11-12	505	611	439	488	460	495	647									
TOTAL	5869	23939	20426	20117	19745	20216	20878	16901								

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Sta. No.	Direction	Road Type	Width (ft.)	Route	Location	C.S. No.
1	WB	Bit.	24'	I-94	East of Ann Arbor	

NOTES ON CHARACTERISTICS OF REST AREA
EAST OF ANN ARBOR

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are seventy parking spaces for cars as well as twenty separate truck spaces. Likewise, twenty picnic tables and 4 separate cooking facilities can be found. As an added convenience, tourist information is available.

This rest area has a reasonably constant percentage turn-in both by day of week and hour of day. The percentage turn-in is small because the expressway volumes are high.

The percentages for the hourly distribution will be fairly stable since the expressway volume was reasonably large even through the hours of darkness.

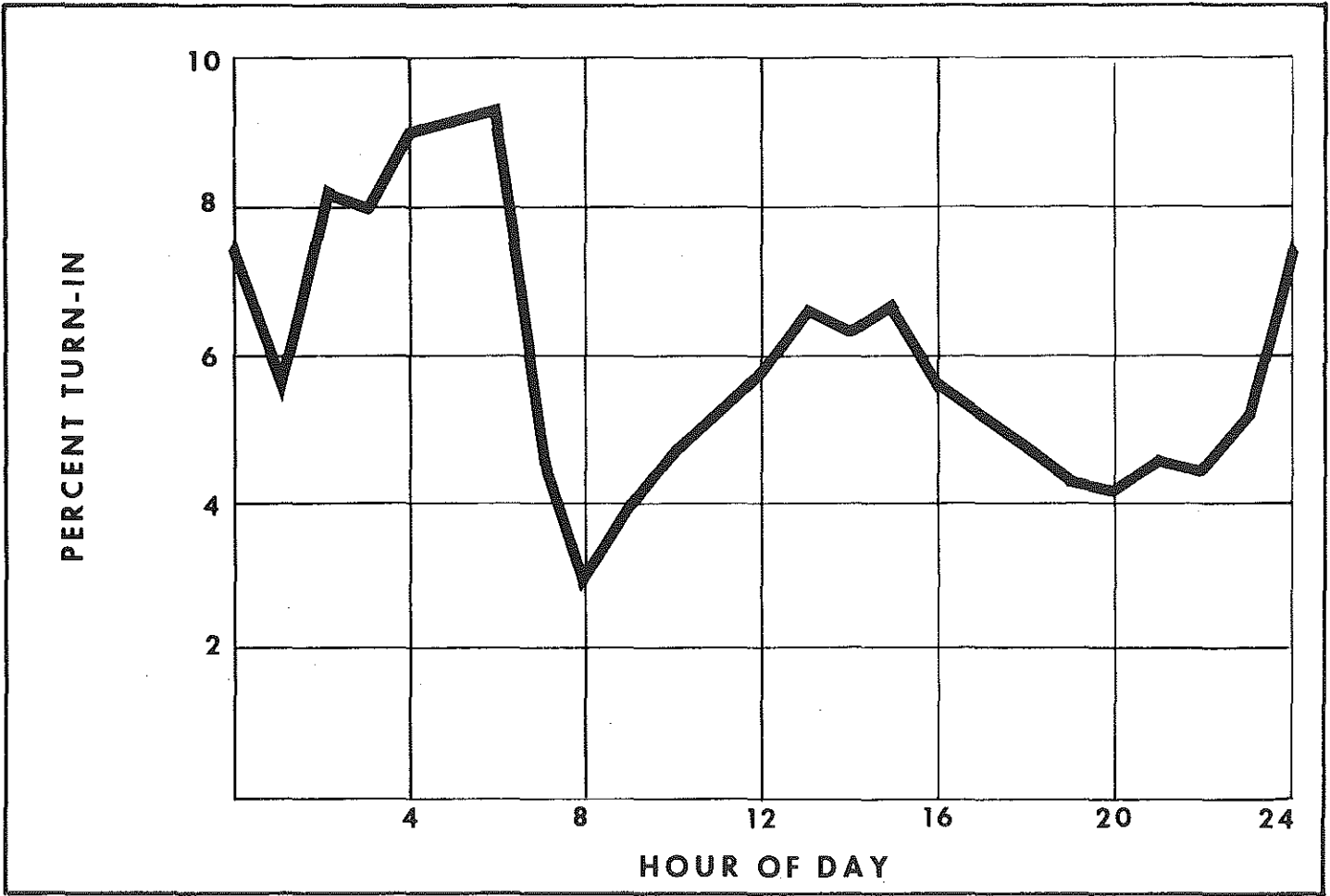
The number of persons per vehicle is high, purely as a result of the fact that 6 busses stopped at the rest area during the survey (a study of busses stopping at the rest areas should be conducted in a different way, e.g. by interviewing bus companies and drivers - or survey over a much longer period of time).

The correlation between expressway volumes and volume turn-in by hour of the day is not very high.

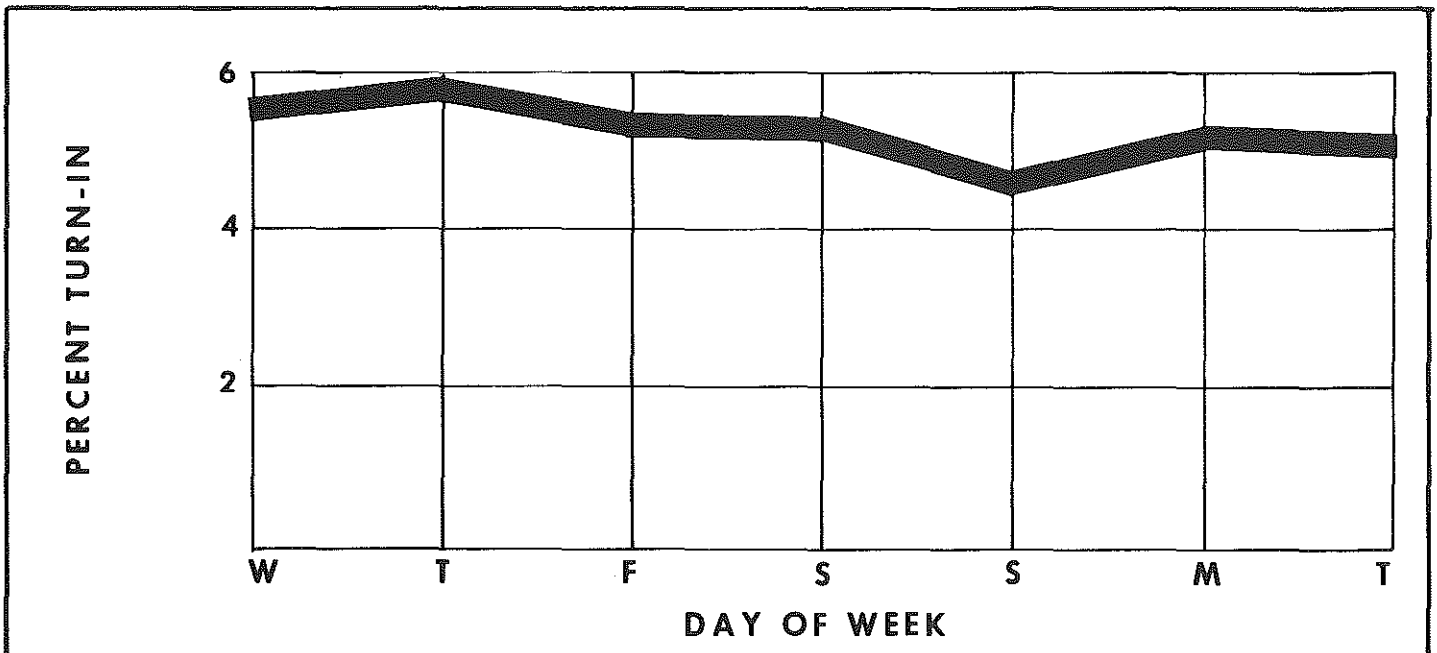
The large number of out-of-state vehicles stopping is accounted for mainly by commercial vehicles. This is reflected in the fact that the average length-of-stay for out-of-state vehicles is less than the average length-of-stay for all vehicles.

The percentage rest room use is extremely low for males and reasonably low for females.

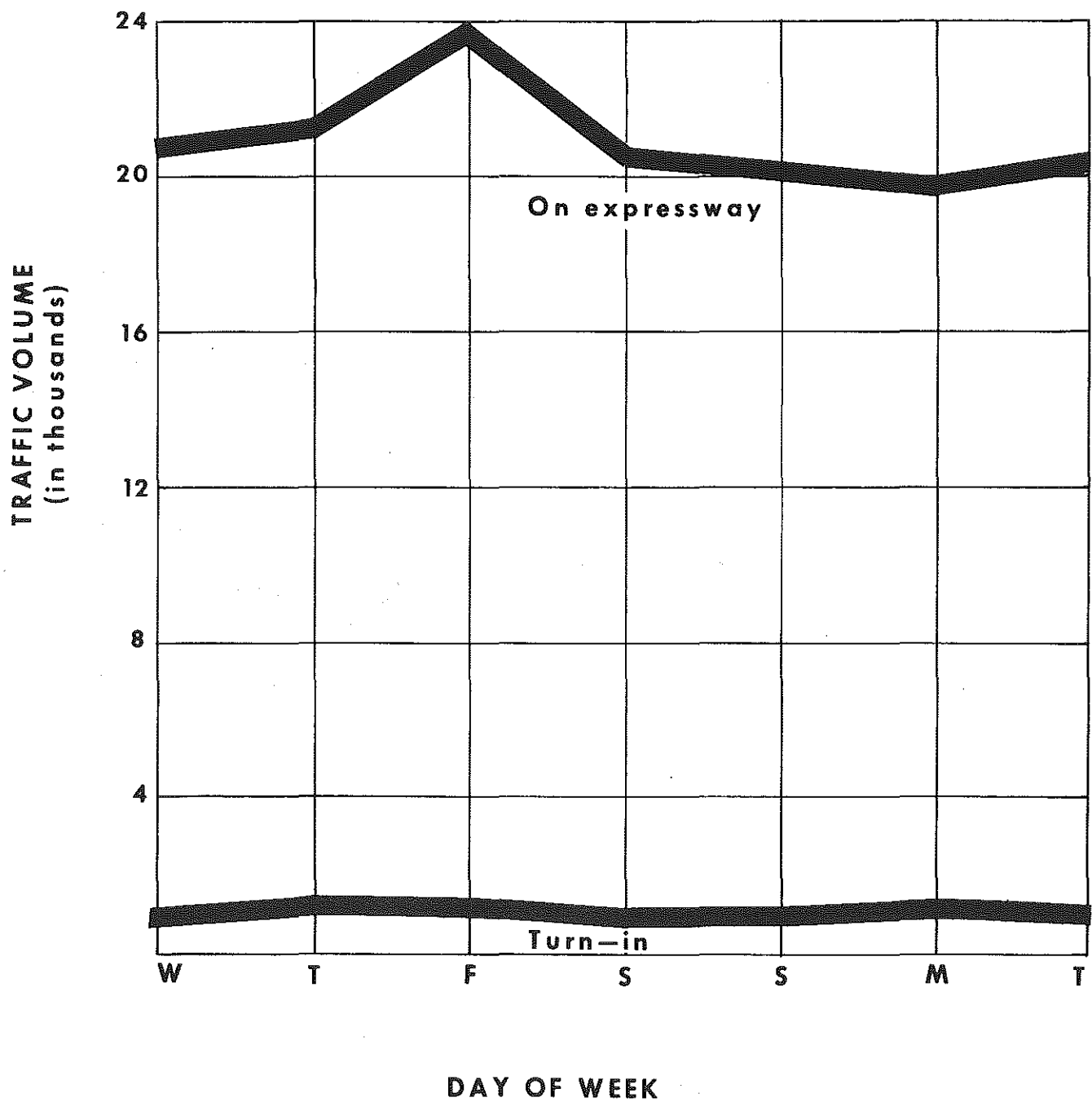
A significant number of comments were adverse (i.e., unsatisfactory or unsanitary). The condition of the rest rooms, therefore, may have partially accounted for the low percentage usage.



Graph I

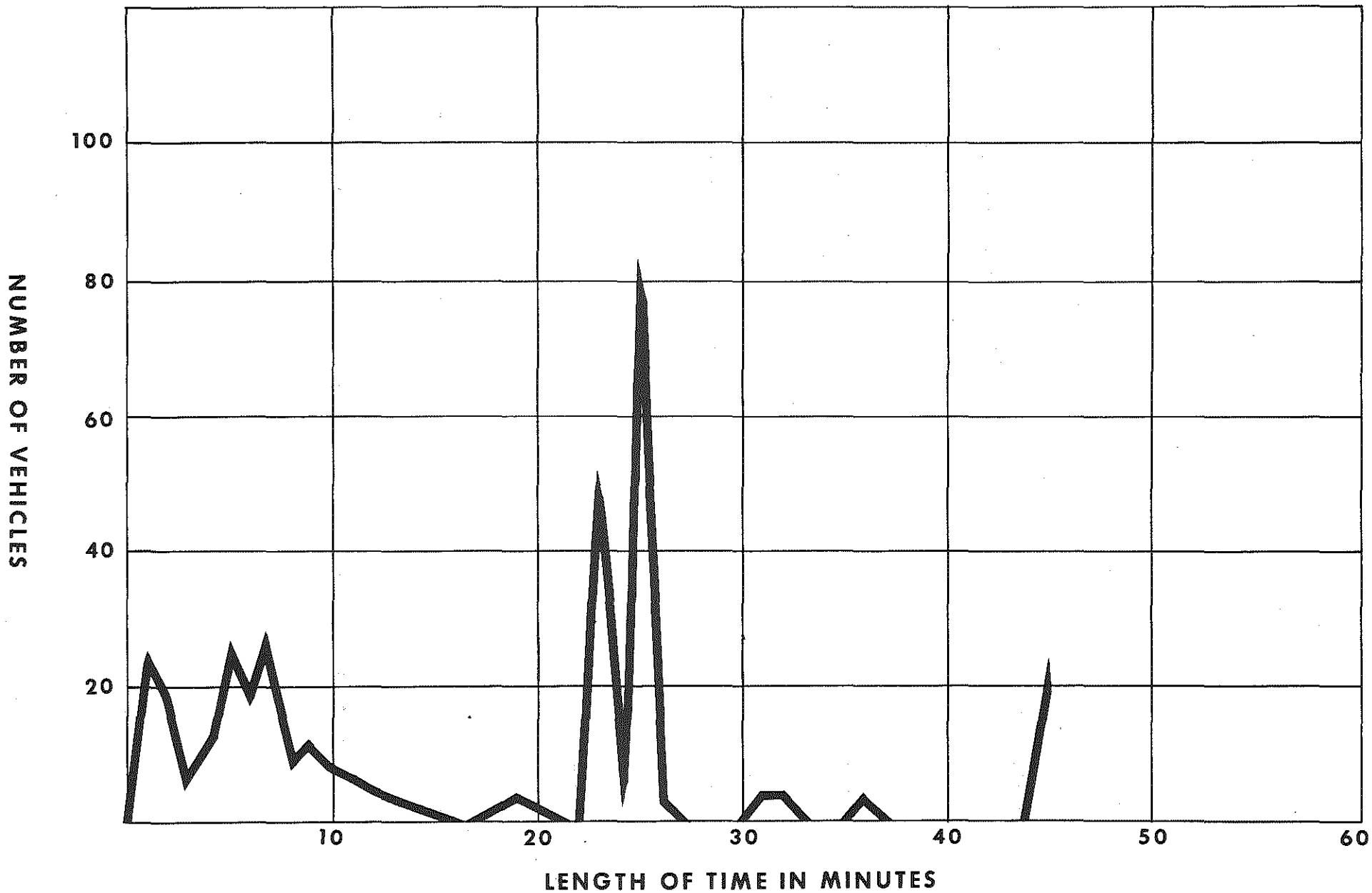


Graph II



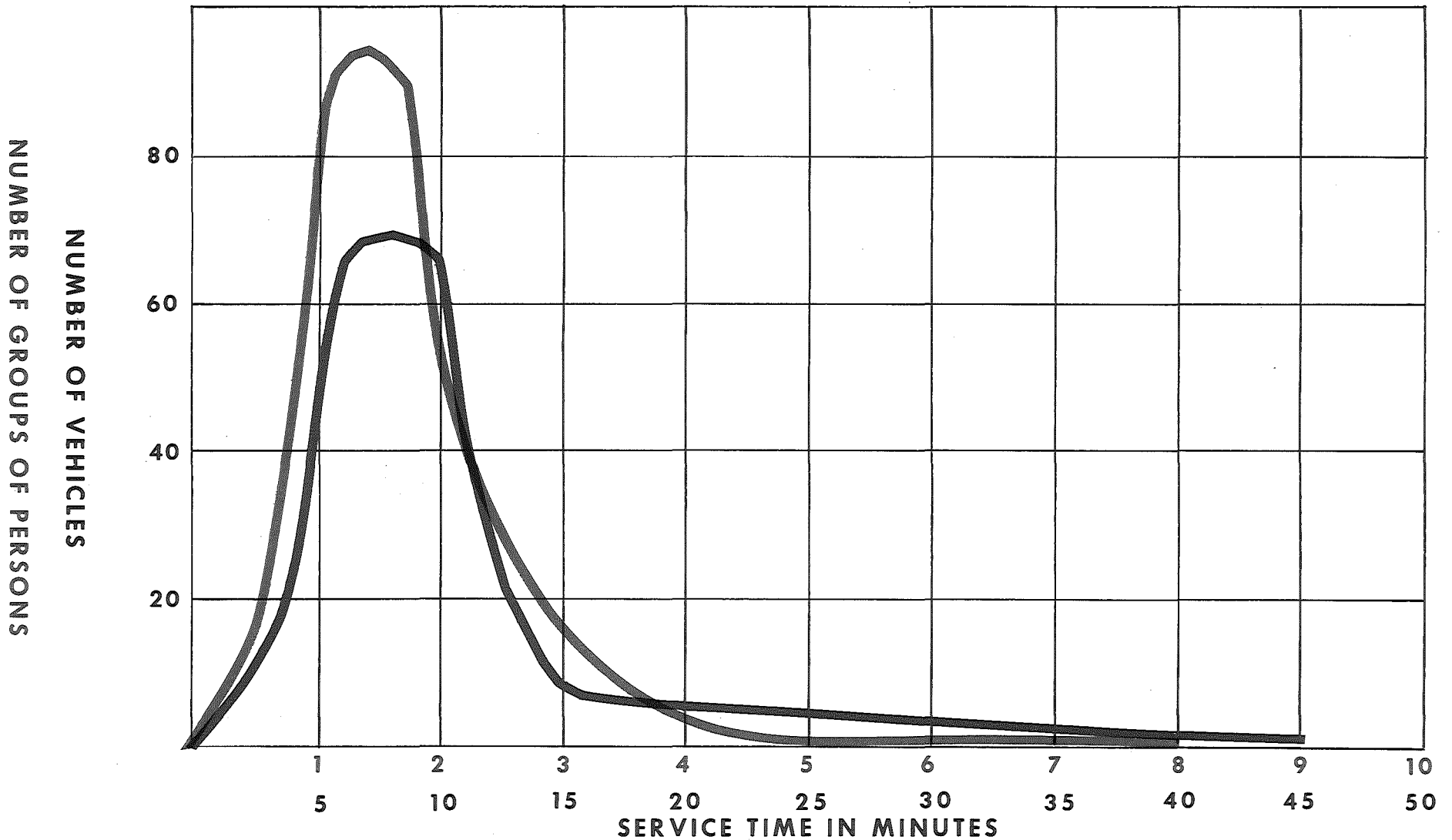
Graph III

DISTRIBUTION OF LENGTH OF STAY

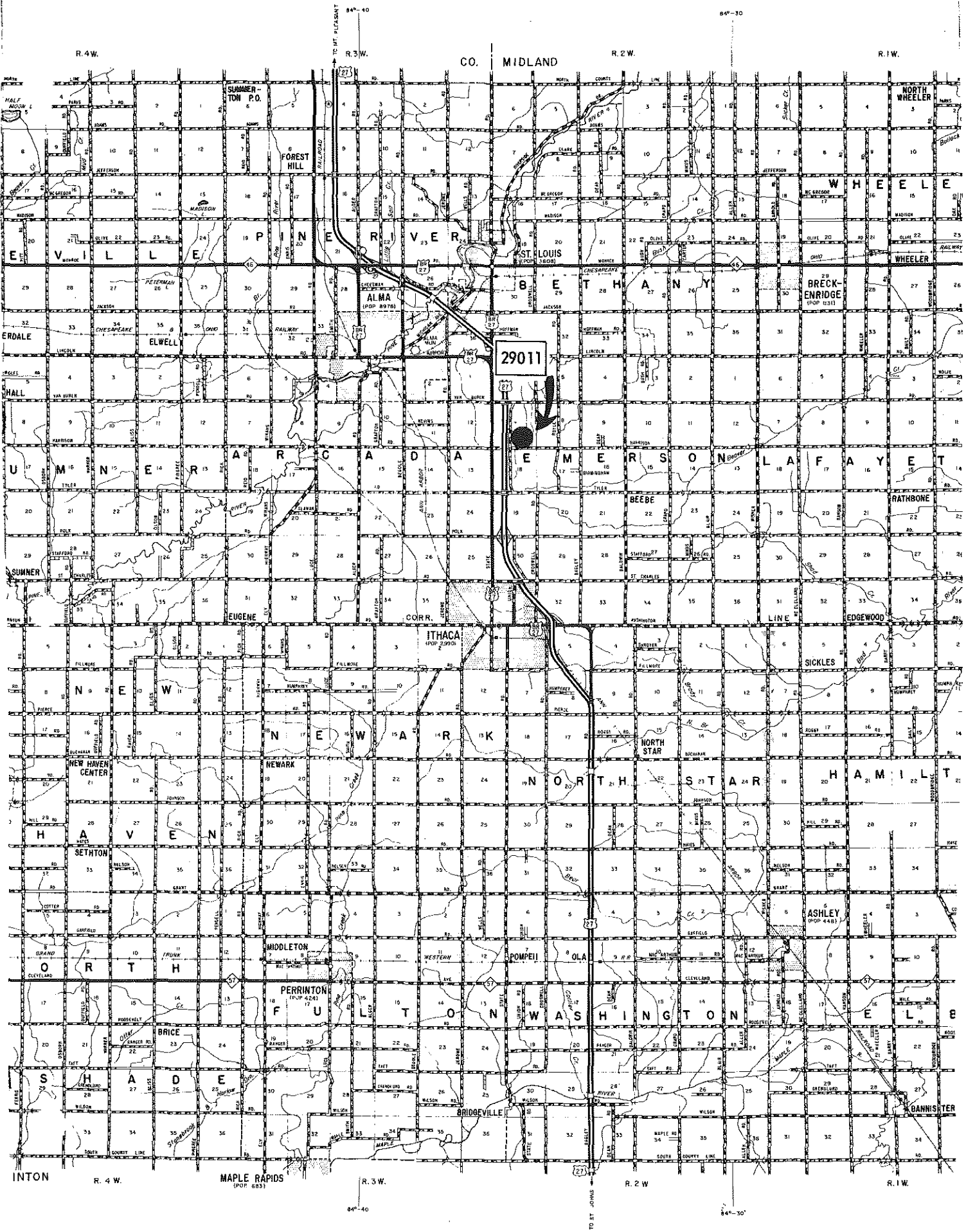


SERVICE TIME DISTRIBUTIONS
(Person—Groups in rest rooms)
(Vehicles in rest area)

REST ROOM USAGE TIME
CAR PARKING TIME







29011

NORTH OF ITHACA

(2 9 0 1 1)

TRAFFIC VOLUMES BY DAY			
		From: 8/2/67	To: 8/9
	Expressway	Rest Area	%
SUNDAY	5,105	628	12.3
MONDAY	4,273	557	13.0
TUESDAY	3,708	431	11.6
WEDNESDAY	3,737	379	10.1
THURSDAY	3,971	494	12.4
FRIDAY	8,139	978	12.0
SATURDAY	8,050	1,121	13.9
TOTAL	36,983	4,588	12.4

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	12.0	12 N-1	16.2
1-2	15.4	1-2	13.3
2-3	12.8	2-3	12.8
3-4	20.4	3-4	12.7
4-5	16.5	4-5	11.4
5-6	12.8	5-6	10.6
6-7	10.4	6-7	9.3
7-8	8.7	7-8	10.2
8-9	14.0	8-9	11.0
9-10	14.2	9-10	8.8
10-11	10.5	10-11	10.4
11-12	14.8	11-12	11.0

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN-IN	AVERAGE LENGTH-OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	3060	210	11	1.1	1.1	0.2
2	124	1	35	1.0	0.0	0.0
3	47	6	18	1.5	0.7	0.0
5	4	1	69	2.0	0.0	0.0
6	36	4	35	2.0	1.0	0.0
7	346	34	12	1.3	1.1	0.6

CARDS REJECTED

131

121 cars without occupancy information.

TOTALS	3617	387	12	1.2	1.1	0.2
--------	------	-----	----	-----	-----	-----

Average Persons Per Vehicle: 2.69

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.92
Tuesday	.92
Wednesday	.90
Thursday	.88
Friday	.97
Saturday	.97
Sunday	.94

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .99

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

City -
Village
or Twp.

County Gratiot

Sheet 1 of 2 Date 8/2-8/9 19 67

Location US-27 Rest Area
(North of Ithaca)

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

STATION NO.	1 NB														
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.							
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9							
TIME															
12-1 A.M.		65	57	120	71	64	56	52							
1-2		41	30	114	47	30	20	49							
2-3		13	36	106	31	31	42	46							
3-4		16	31	67	24	33	26	24							
4-5		41	45	80	30	28	27	21							
5-6		45	49	108	24	46	47	33							
6-7		88	124	178	70	96	77	72							
7-8		153	185	297	124	183	120	147							
8-9		161	140	501	194	219	192	170							
9-10		227	236	605	383	301	250	246							
10-11		277	306	738	486	313	285	309							
11-12		292	340	707	465	370	294	316							
12-1 P.M.	250	253	347	516	481	319	283								
1-2	256	298	352	555	379	327	262								
2-3	266	295	488	579	355	320	256								
3-4	242	243	507	531	285	309	257								
4-5	262	274	657	468	278	279	265								
5-6	234	285	790	412	294	251	242								
6-7	209	256	1056	379	282	208	225								
7-8	173	207	872	341	200	158	156								
8-9	123	150	664	233	197	124	95								
9-10	89	143	386	170	183	101	92								
10-11	83	87	261	137	130	92	78								
11-12	65	61	180	108	92	71	61								
TOTAL	2252	3971	8139	8050	5105	4273	3708	1485							

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	N Bd	Conc	26	US-27	North of Ithaca	

Sheet 2 of 2 Date 8/2-8/9 19

Location US-27 Rest Area
(North of Ithaca)

Remarks Machine Counts.

HOURLY TRAFFIC VOLUMES

STATION NO.	2 NB																	
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.										
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9										
TIME																		
12-1 A.M.		11	10	19	6	4	4	4										
1-2		5	3	21	15	2	1	4										
2-3		2	3	16	4	2	6	6										
3-4		10	2	20	3	7	1	2										
4-5		2	2	22	5	7	1	5										
5-6		6	4	22	3	4	3	3										
6-7		2	4	28	10	19	5	5										
7-8		8	12	38	10	24	3	10										
8-9		34	29	64	36	25	25	8										
9-10		28	37	85	52	40	44	34										
10-11		38	53	98	76	56	35	28										
11-12		52	43	110	70	42	42	53										
12-1 P.M.	30	45	40	87	76	67	52											
1-2	31	30	45	78	58	46	35											
2-3	26	37	60	78	42	50	35											
3-4	34	28	59	68	37	41	35											
4-5	32	32	68	59	27	30	23											
5-6	16	32	86	50	26	29	27											
6-7	15	27	108	37	21	17	17											
7-8	10	25	112	46	11	11	10											
8-9	9	11	83	29	14	14	15											
9-10	6	11	46	13	14	8	4											
10-11	5	4	39	20	5	12	5											
11-12	3	14	30	13	7	0	3											
TOTAL	217	494	978	1121	628	557	431	162										

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Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	N Bd	B.T.		US-27 Ramp	Entrance to Rest Area -- North of Ithaca	

NOTES ON CHARACTERISTICS OF REST AREA
NORTH OF ITHACA

This rest area is equipped with electricity and drinking water. Its rest rooms have lavatories and flush toilets. There are fifty parking spaces for cars as well as fifteen separate truck spaces. Likewise, twenty picnic tables and 3 separate cooking facilities can be found. As an added convenience, tourist information is available.

This rest area has a reasonably constant percentage turn-in by day of week, the peak being attained on a Saturday.

The percentages for the hourly distribution are fairly stable, the rest area being subjected to peak percentage turn-in during the small hours of the morning and during the afternoon.

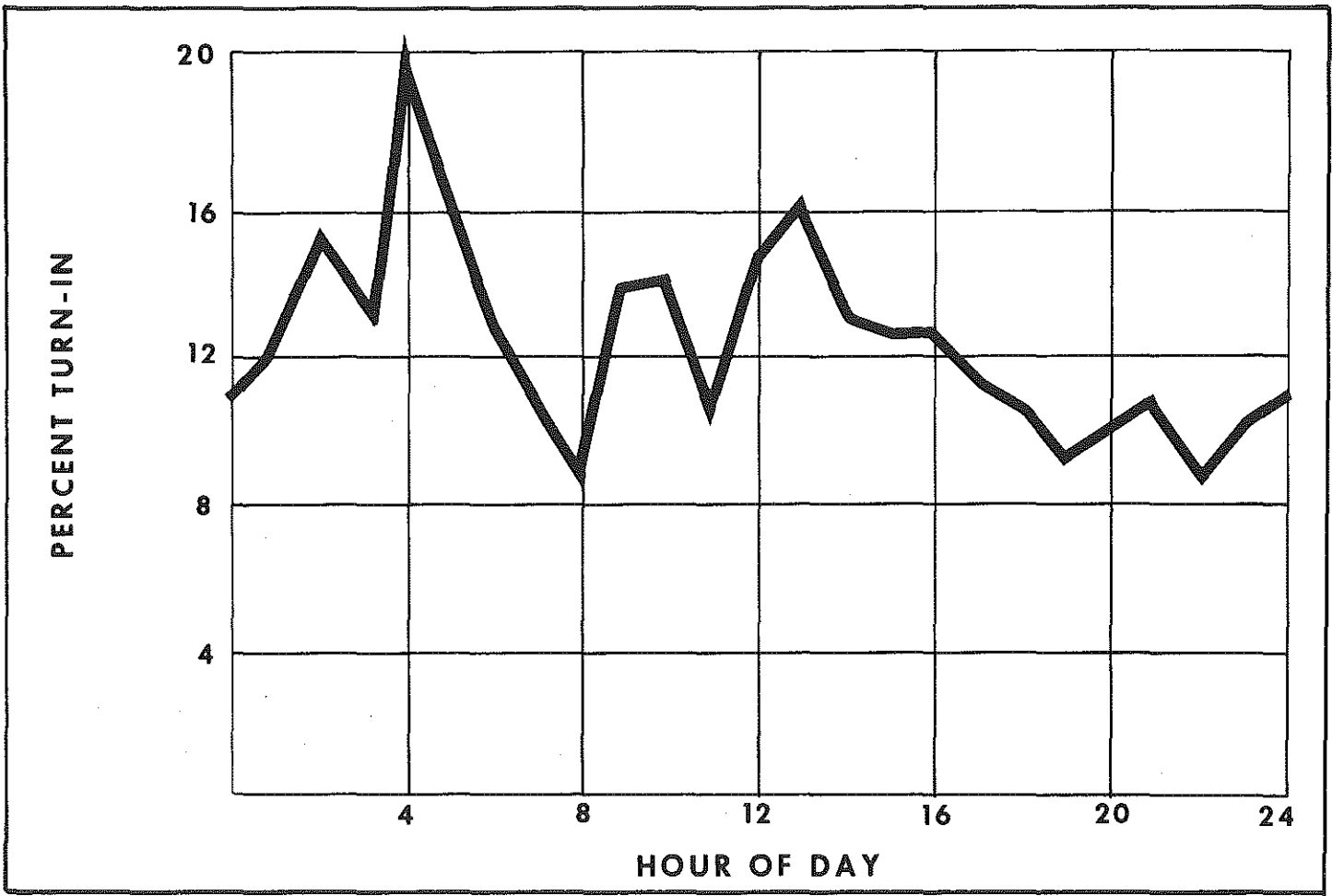
The average number of persons per vehicle will be in error on the low side. This is because this rest area was one of the first surveyed and the questionnaire was not handed to the driver. The vehicle occupancy was obtained by observation, as also was the vehicle length-of-stay. This method resulted in a number of errors due to difficulty in maintaining observation on any particular vehicle, reducing effective sample to approximately fifty percent.

The average length-of-stay computed could also possibly be slightly low.

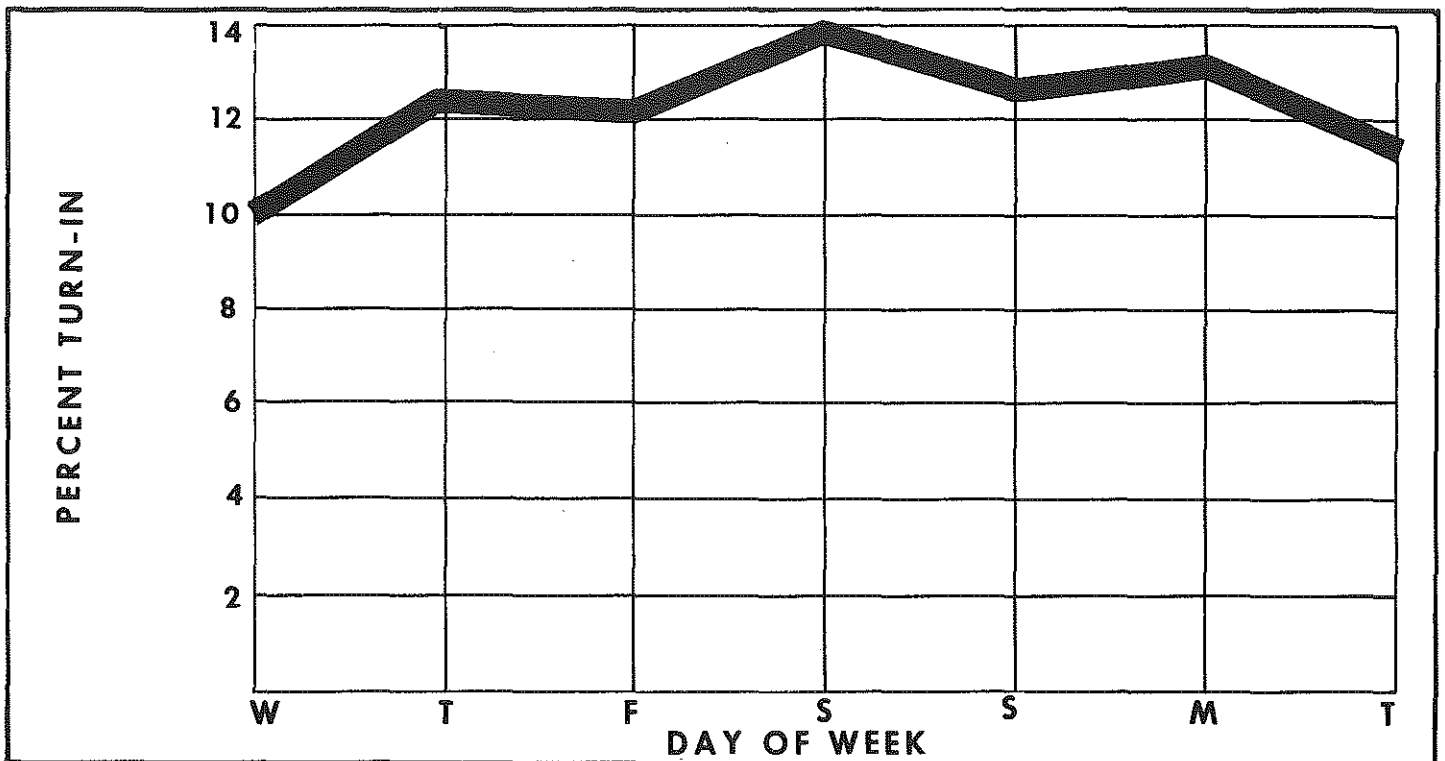
The correlation between expressway volume and volume turn-in by hour of day are very high.

The correlation between daily expressway volume and daily turn-in is also extremely high.

The percentage rest room usage is fairly high both for males and females.

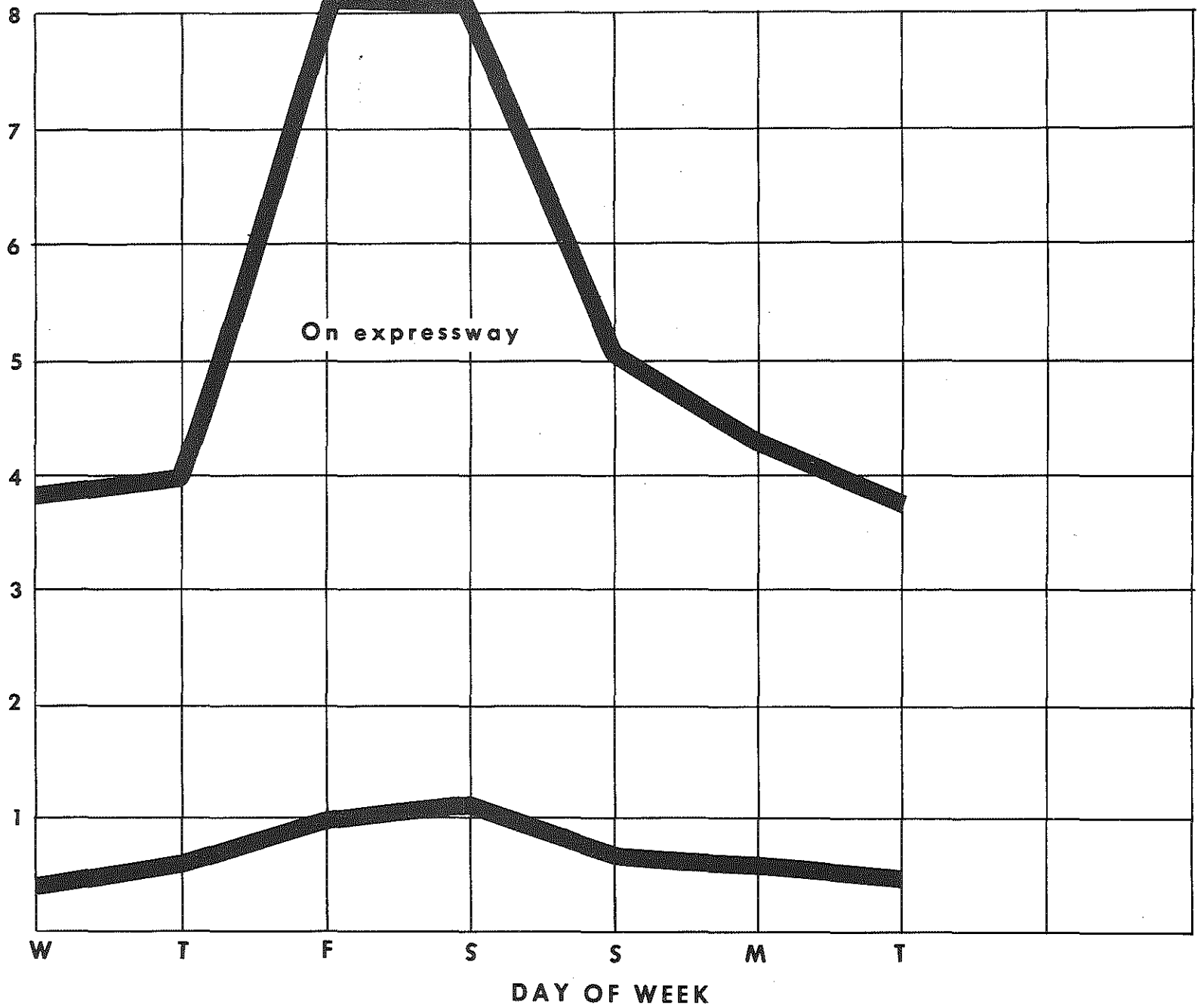


Graph I



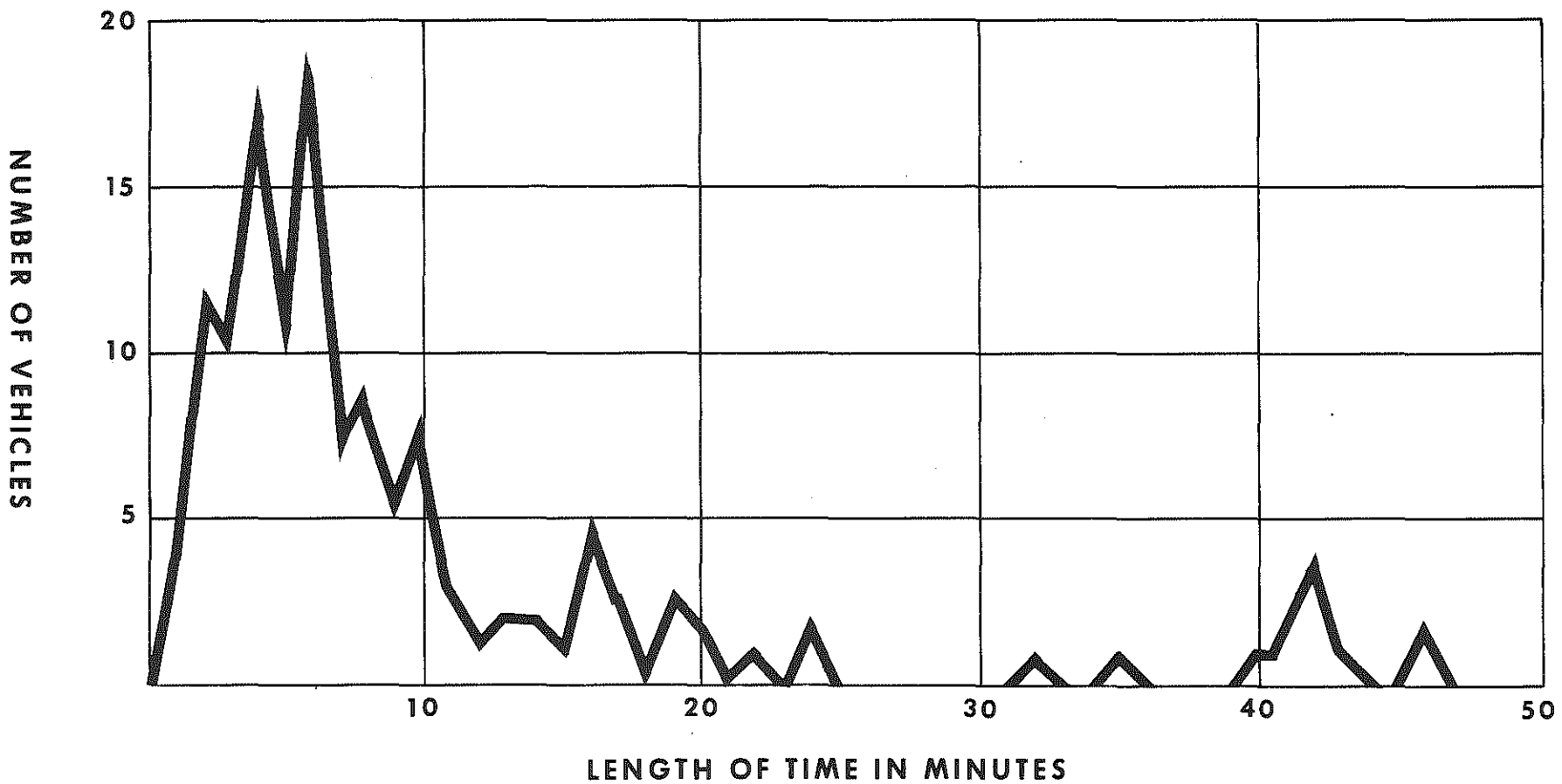
Graph II

TRAFFIC VOLUME
(in thousands)



Graph III

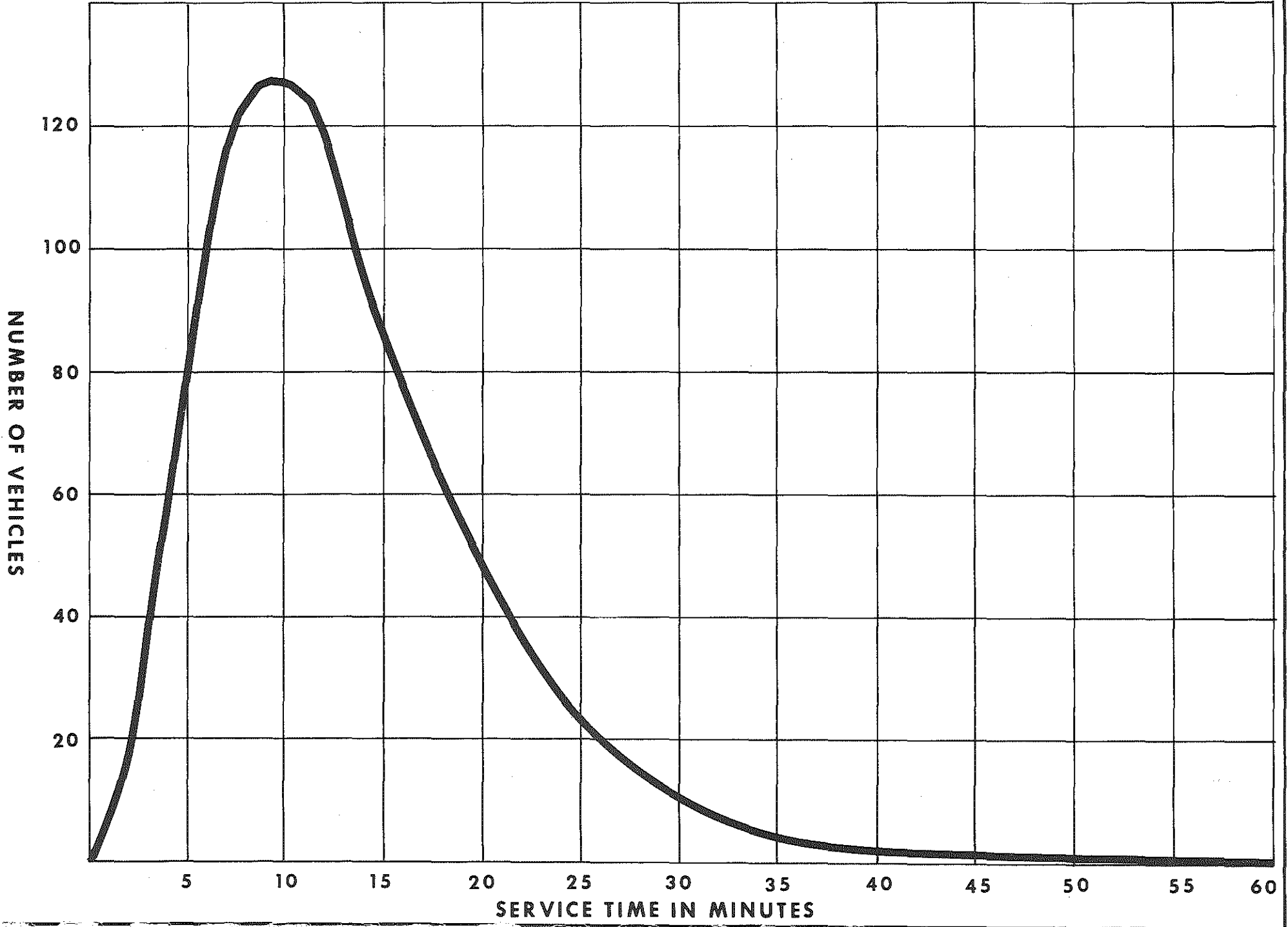
DISTRIBUTION OF LENGTH OF STAY

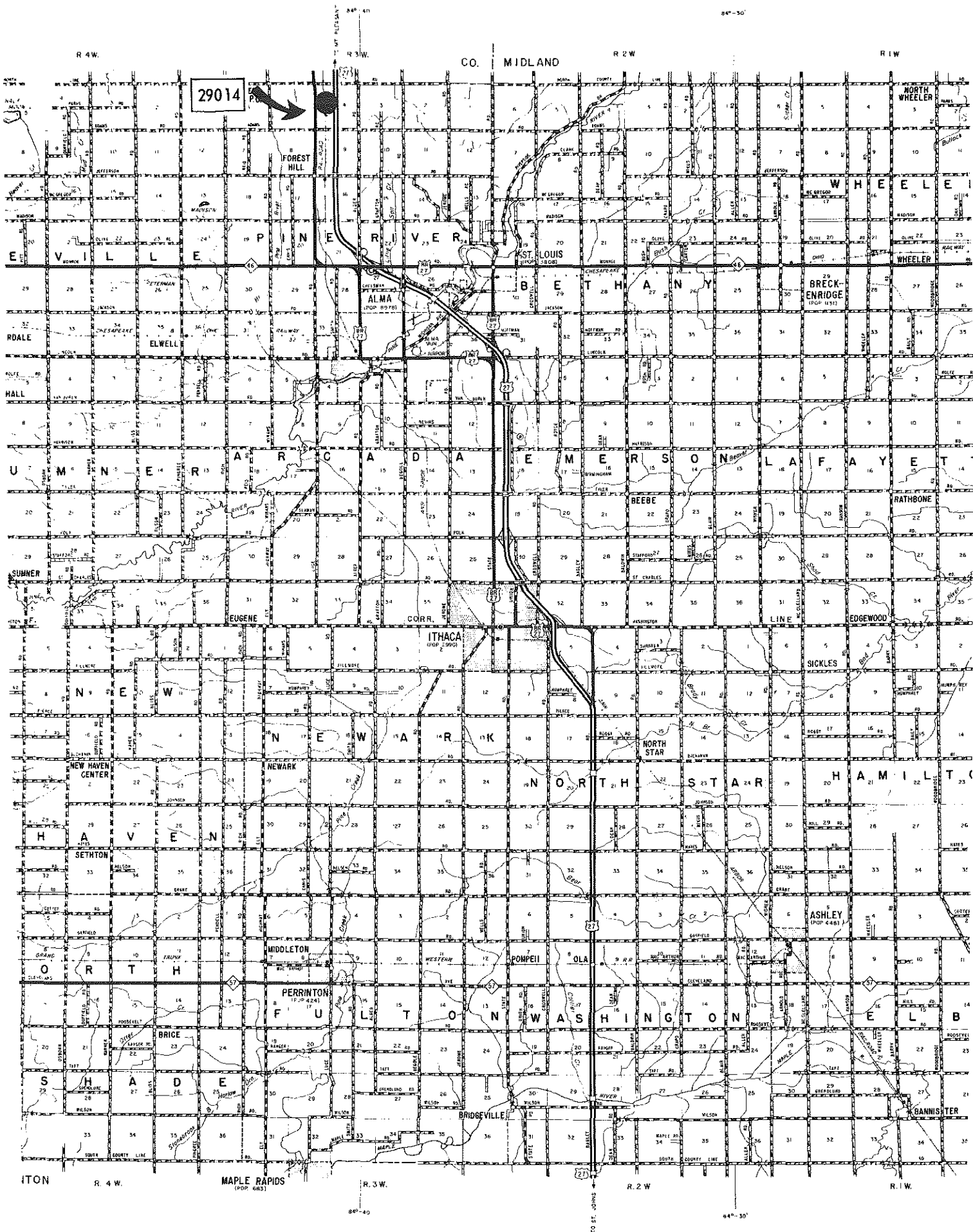


SERVICE TIME DISTRIBUTIONS

(Vehicles in rest area)

CAR PARKING TIME





NORTH OF ALMA

(2 9 0 1 4)

TRAFFIC VOLUMES BY DAY			
		From: 8/2/67	To: 8/9
	Expressway	Rest Area	%
SUNDAY	11,456	1,566	13.7
MONDAY	5,469	687	12.6
TUESDAY	3,988	521	13.1
WEDNESDAY	4,207	462	11.0
THURSDAY	4,397	638	14.5
FRIDAY	5,256	719	13.7
SATURDAY	5,586	763	13.7
TOTAL	40,369	5,356	13.3

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	18.6	12 N-1	13.5
1-2	13.4	1-2	15.3
2-3	17.7	2-3	14.6
3-4	22.4	3-4	14.4
4-5	22.9	4-5	12.4
5-6	14.7	5-6	10.2
6-7	12.0	6-7	11.6
7-8	13.4	7-8	11.3
8-9	11.6	8-9	14.1
9-10	16.7	9-10	8.6
10-11	17.1	10-11	10.4
11-12	15.1	11-12	12.4

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	4624	381	11	1.1	1.0	0.3
3	104	19	20	1.1	1.0	0.1
4	14	3	13	1.0	0.6	2.3
5	8	1	57			
6	41	5	25	1.4	0.8	0.0
7	470	68	16	1.4	1.1	0.2
CARDS REJECTED		55	82 cars without occupancy information.			
TOTAL	5261	532	13	1.2	1.1	0.3
				Average Persons Per Vehicle: <u>2.72</u>		

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	5
Washing Facilities Required	17
More Rest Areas Needed	26
Flush Toilets Required	14
Rest Area Satisfactory	60
Rest Area Good	21
Refreshments Required	7
Facilities Unsatisfactory	6
No Comment	47
Larger Rest Rooms Required	5
	<u>208</u>

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.86
Tuesday	.87
Wednesday	.83
Thursday	.93
Friday	.82
Saturday	.84
Sunday	.93

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .99

Out-Of-State Vehicles

33 out-of-state vehicles stopped at the rest area during the 5-hour study.

The average length-of-stay in the rest area of these vehicles was 19 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 13 minutes.

Rest Room Usage by Sex

311 males out of a total of 501 used the rest rooms, giving a male's percentage usage of 63.2.

369 females out of a total of 444 used the rest rooms, giving a female's percentage usage of 83.1.

130 children under 5 years of age entered the rest area.

Sheet 1 of 2 Date 8/2-8/9 19 67

Location US-27 Rest Area

Remarks _____

HOURLY TRAFFIC VOLUMES

(North of Alma)

STATION NO.	1 SB																	
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.										
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9										
TIME																		
12-1A.M.		41	52	71	126	89	41	58										
1-2		27	38	59	71	55	25	30										
2-3		30	18	51	67	39	20	18										
3-4		29	32	28	39	32	9	27										
4-5		17	22	20	24	39	27	26										
5-6		54	44	36	26	78	44	57										
6-7		107	98	51	26	166	108	110										
7-8		173	182	95	72	265	169	155										
8-9		136	157	150	79	264	203	167										
9-10		181	247	231	159	282	196	200										
10-11		240	313	321	268	341	245	244										
11-12		331	382	423	366	429	284	280										
12-1P.M.		254	384	418	454	460	233	270										
1-2	309	329	388	445	449	443	270	312										
2-3	319	301	411	468	585	422	273	375										
3-4	290	341	387	435	747	378	299	371										
4-5	310	382	410	460	956	396	308	354										
5-6	283	343	389	323	1404	332	302	299										
6-7	233	262	337	317	1408	247	233											
7-8	222	226	310	305	1355	190	206											
8-9	184	183	213	284	1166	171	182											
9-10	155	160	195	239	850	152	134											
10-11	174	157	157	198	511	118	112											
11-12	86	93	90	158	248	81	65											
TOTAL	2565	4397	5256	5586	11456	5469	3988	3353										

Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	SBd.	Conc	26	US-27	North of Alma	

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HOURLY TRAFFIC VOLUMES

STATION NO.	2 SB														
DAY	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.							
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9							
TIME															
12-1 A.M.		3	20	5	23	21	6	11							
1-2		1	2	9	10	11	3	5							
2-3		7	5	6	7	11	5	2							
3-4		7	6	6	9	3	13	0							
4-5		1	12	5	6	9	5	2							
5-6		6	3	3	3	13	12	10							
6-7		12	12	10	6	25	7	8							
7-8		30	51	23	2	17	16	10							
8-9		20	41	21	7	17	21	7							
9-10		21	52	50	28	43	33	23							
10-11		47	51	67	57	61	16	38							
11-12		38	49	81	56	52	48	52							
12-1 P.M.	44	36	53	72	66	33	30	43							
1-2	43	57	50	70	87	56	40	58							
2-3	43	46	67	51	101	51	47	45							
3-4	45	38	50	48	124	63	47	48							
4-5	21	47	43	51	151	52	36	37							
5-6	19	41	34	36	141	35	39								
6-7	28	51	25	41	148	34	25								
7-8	20	31	28	31	155	31	22								
8-9	13	36	21	15	217	22	13								
9-10	4	19	14	20	83	8	15								
10-11	8	22	18	19	55	16	10								
11-12	7	21	12	23	24	3	12								
TOTAL	295	638	719	763	1566	687	521	399							

Sta. No.	Direction	Road Type	Width (ft.)	Route	Location	C.S. No.
2	SBd	B7	18	US-27 Ramp	Entrance to Rest Area -- North of Alma	

NOTES ON CHARACTERISTICS OF REST AREA
NORTH OF ALMA

This rest area is equipped with electricity and drinking water. Its rest rooms have lavatories and flush toilets. There are fifty parking spaces for cars as well as fifteen separate truck spaces. Likewise, eighteen picnic tables and 3 separate cooking facilities can be found. As an added convenience, tourist information is available.

This rest area has a reasonably constant percentage turn-in, the weekend figures being very consistent.

The hourly percentage turn-in by hour of the day is reasonably constant except for the usual peak in the small hours of the morning and a peak at about 9:00 AM.

The number of persons per vehicle obtained from this survey is almost certainly lower than the actual vehicle occupancy, since the vehicle occupancy was obtained by observation and not preprinted questionnaire. The average length-of-stay will also, in all probability, be underestimated.

The average length-of-stay for commercial vehicles is considerably longer than the overall average length-of-stay.

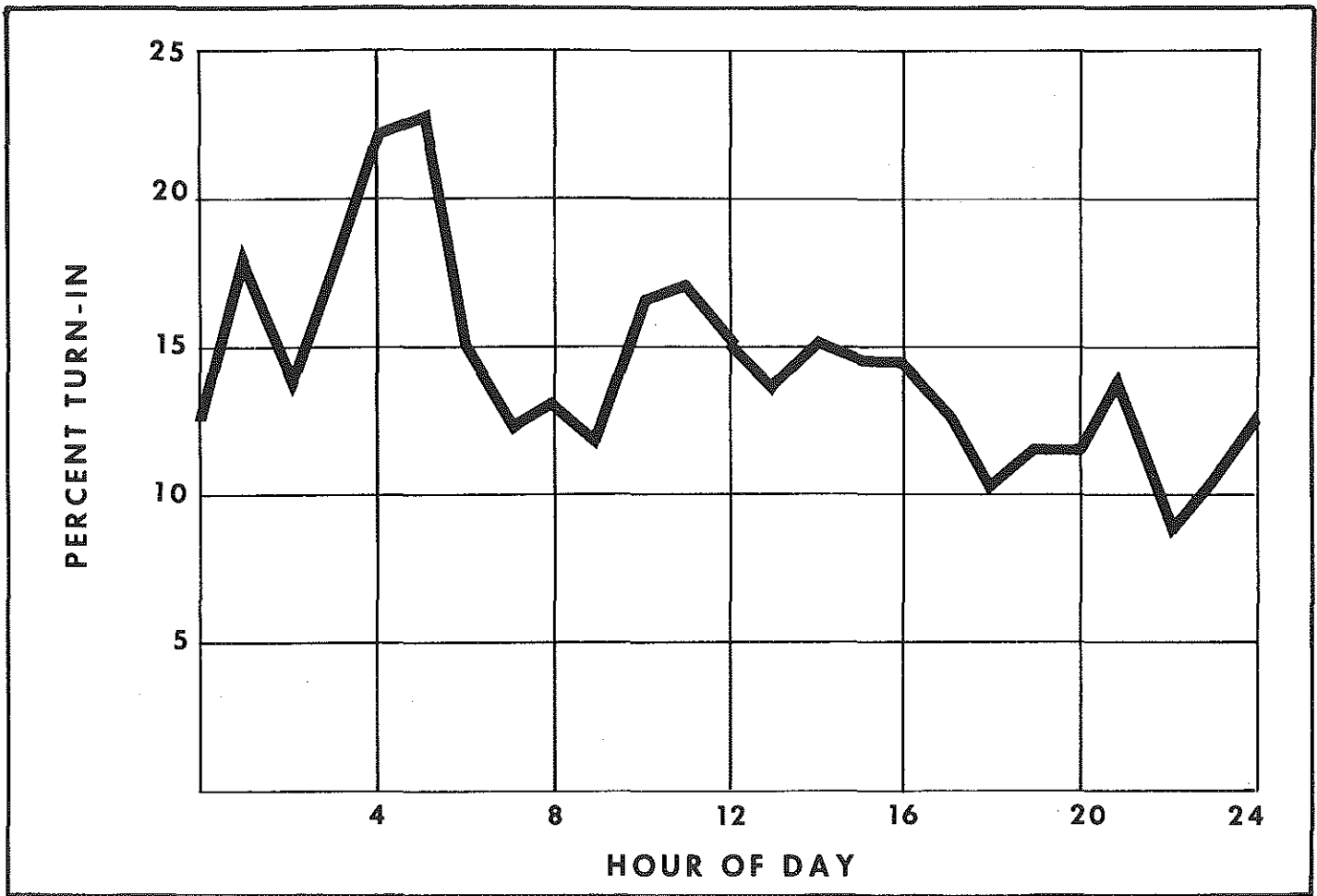
The correlation between expressway volume and volume turn-in by hour of the day is reasonably high.

The average length-of-stay of out-of-state vehicles was considerably longer than the overall average length-of-stay (this information was obtained from a sample - not a complete count of out-of-state vehicles).

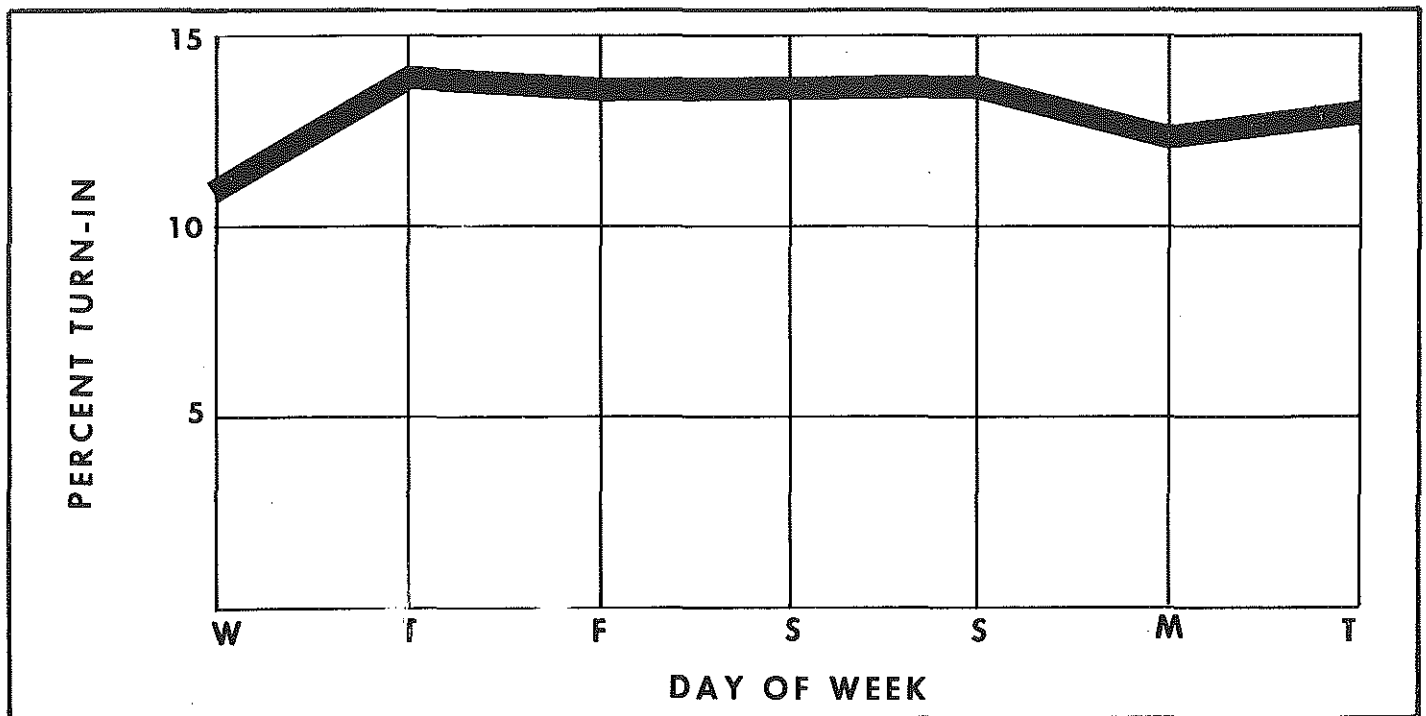
The percentage rest room use was high for females and fairly high for males.

The number of children entering the rest area was extremely high, indicating a high proportion of recreational traffic.

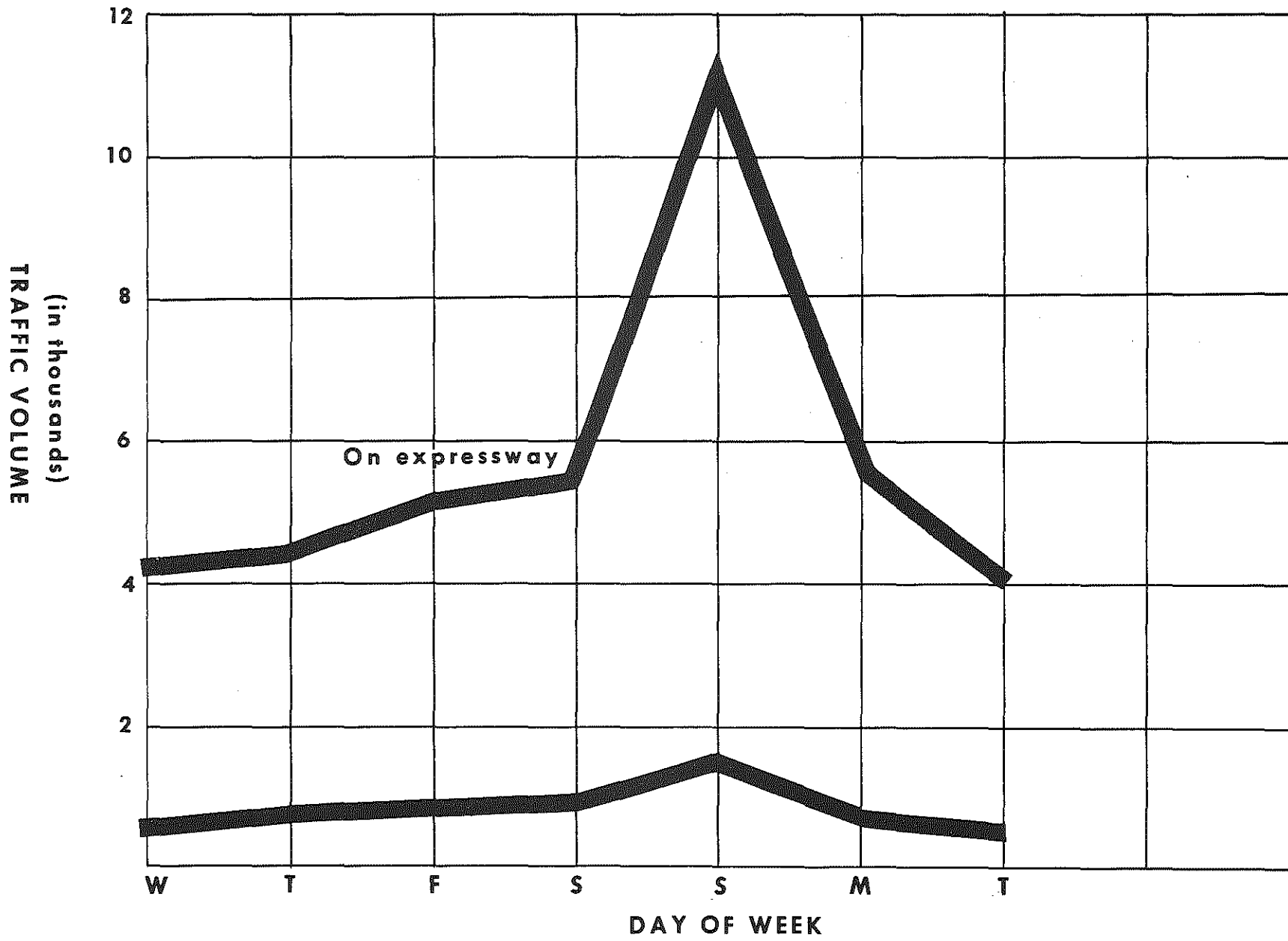
LIBRARY
michigan department of
state highways
LANSING



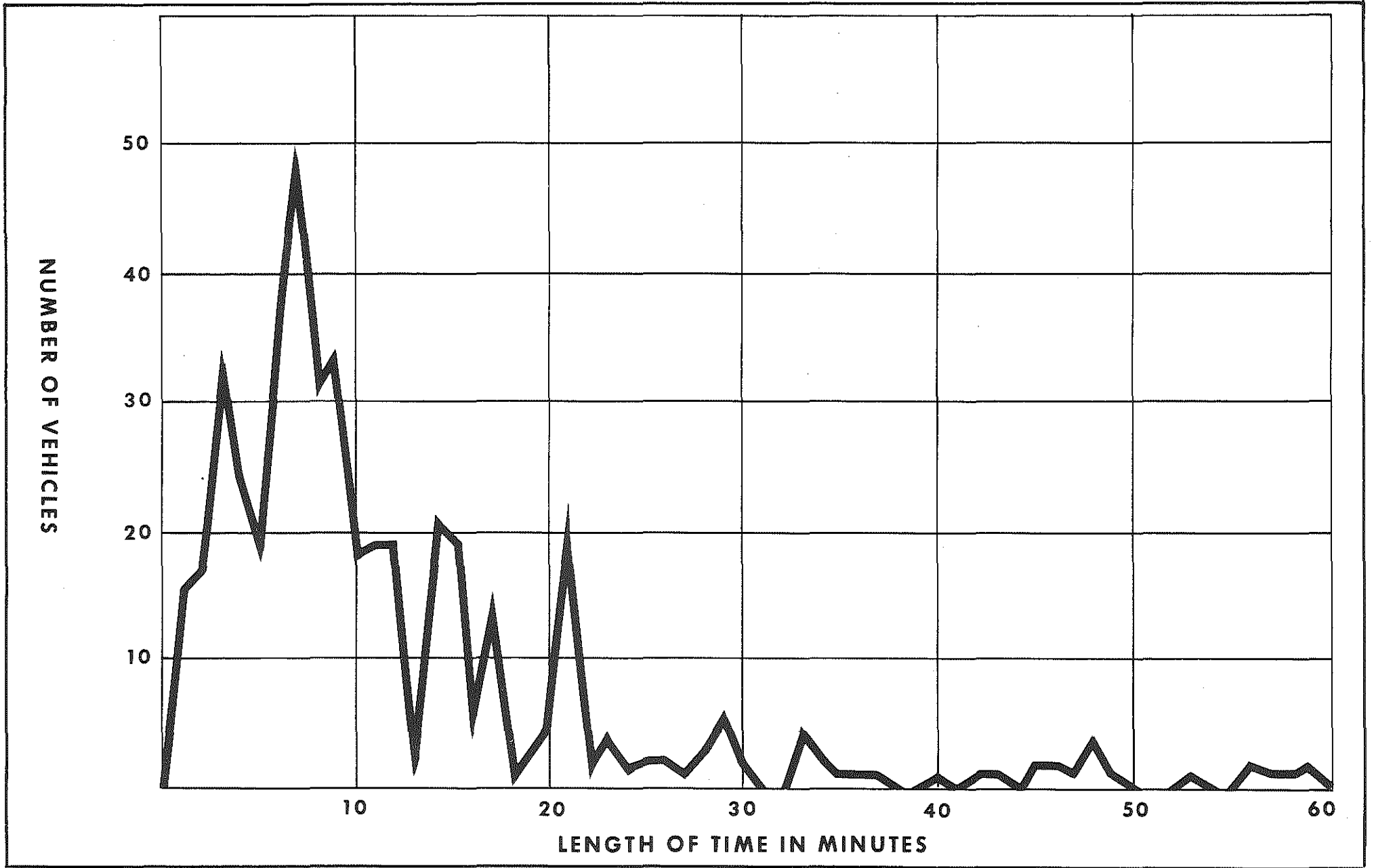
Graph I



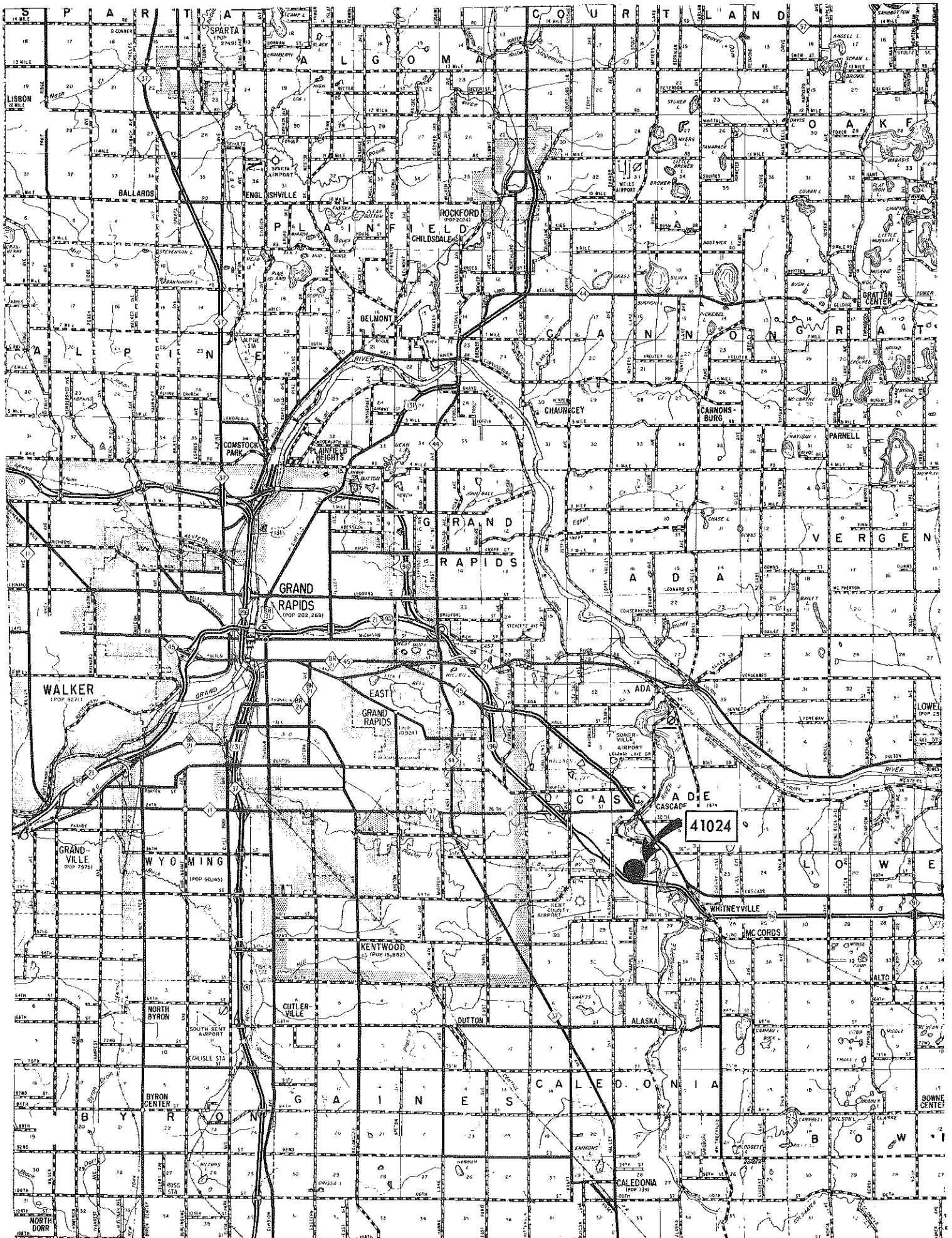
Graph II



DISTRIBUTION OF LENGTH OF STAY



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EAST OF GRAND RAPIDS

(4 1 0 2 4)

TRAFFIC VOLUMES BY DAY			
		From: 8/3	To: 8/9
	Expressway	Rest Area	%
SUNDAY	5,558	676	12.2
MONDAY	4,577	672	14.7
TUESDAY	4,911	736	15.0
WEDNESDAY	5,433	621	11.4
THURSDAY (Except 4P-12P)	1,812	202	11.1
FRIDAY	6,231	849	13.6
SATURDAY	5,589	794	14.2
TOTAL	34,111	4,550	13.3

HOURLY DISTRIBUTION

	% Entering R.A.		% Entering R.A.
12 PM-1	11.8	12 N-1	17.2
1-2	12.8	1-2	16.2
2-3	22.4	2-3	16.3
3-4	22.4	3-4	15.1
4-5	19.6	4-5	13.0
5-6	17.3	5-6	11.0
6-7	9.5	6-7	12.9
7-8	14.1	7-8	10.1
8-9	12.1	8-9	10.3
9-10	14.6	9-10	9.5
10-11	16.4	10-11	8.8
11-12	18.4	11-12	10.0

CLASS OF VEHICLE	VOLUME ON EX-WAY	VOLUME TURN- IN	AVERAGE LENGTH- OF-STAY	NUMBER OF PERSONS PER VEHICLE		
				MALE	FEMALE	CHILD
1	1258	162	18	1.5	1.5	0.3
2	29	3	14	1.3	1.0	0.0
3	4	1	13	4.0	3.0	0.0
4	6	1	16	1.0	0.0	0.0
5	2	0				
6	3	2	21	3.5	2.5	0.0
7	43	9	25	1.9	1.7	0.6
<u>CARDS REJECTED</u>		<u>27</u>				
TOTAL	1345	205	18	1.6	1.6	0.3
				Average Person Per Vehicle: <u>3.48</u>		

REST AREA VISITORS' COMMENTS

	<u>TOTAL</u>
Unsanitary	11
Washing Facilities Required	6
More Rest Areas Needed	33
Flush Toilets Required	5
Rest Area Satisfactory	25
Rest Area Good	22
Refreshments Required	1
Facilities Unsatisfactory	10
No Comment	45
Larger Rest Rooms Required	6

CORRELATION COEFFICIENTS BETWEEN EXPRESSWAY TRAFFIC
VOLUME AND VOLUME OF TRAFFIC ENTERING REST AREA:

<u>DAY OF WEEK</u>	<u>r</u>
Monday	.87
Tuesday	.77
Wednesday	.80
Thursday	.77
Friday	.92
Saturday	.90
Sunday	.74

The correlation coefficient given above was obtained from the hourly traffic volumes by day of week.

The correlation coefficient between total traffic per day and daily total entering rest area is: .94.

Out-Of-State Vehicles

51 out-of-state vehicles stopped at the rest area during the 3-hour study.

The average length-of-stay in the rest area of these vehicles was 10.4 minutes.

This is in comparison with the average length-of-stay for all vehicles, which was 18 minutes.

Rest Room Usage by Sex

170 males out of a total of 290 used the rest rooms, giving a male's percentage usage of 58.5.

111 females out of a total of 277 used the rest rooms, giving a female's percentage usage of 40.1.

54 children under 5 years of age entered the rest area.

Sheet 1 of 2 Date 8/2 - 8/10 19 67

Location I-96 Rest Area

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

(East of Grand Rapids)

STATION NO.	1 WB														
DAY	Wed.	Thur.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thur.						
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9	8-10						
TIME															
12-1A.M.		93	106	128	241	102	125	165	165						
1-2		52	75	67	121	70	59	76	121						
2-3		45	48	57	48	40	43	63	65						
3-4		47	36	40	21	31	30	101	36						
4-5		30	32	60	19	23	41	75	40						
5-6		71	64	55	12	68	71	71	81						
6-7		149	135	92	32	156	173	156	146						
7-8		183	168	134	35	241	203	216	199						
8-9		235	223	163	89	190	262	199	222						
9-10		320	232	303	208	253	318	252							
10-11		273	253	356	311	289	292	249							
11-12		282	290	452	336	241	271	281							
12-1P.M.		251	275	372	311	254	265	245							
1-2		265	314	327	266	295	255	256							
2-3	281	308	360	347	261	259	287	292							
3-4	267	278	413	366	276	274	299	332							
4-5	343	346	511	335	306	300	344	408							
5-6	326	344	520	313	383	320	314	391							
6-7	285	281	520	347	431	237	237	290							
7-8	199	222	464	293	433	183	204	213							
8-9	199	188	423	243	431	170	176	230							
9-10	177	158	348	192	425	170	167	242							
10-11	152	156	254	281	298	205	235	300							
11-12	101	117	167	266	264	206	240	330							
TOTAL	2330	4694	6231	5589	5558	4577	4911	5433	1075						

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Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
1	W Bd.	Conc	24'	I-96	East of Grand Rapids	

Sheet 2 of 2 Date 8/2 - 8/9 19 67

Location I-96 Rest Area
(East of Grand Rapids)

Remarks Machine Counts

HOURLY TRAFFIC VOLUMES

STATION NO.	2 WB	(Ramp)													
DAY	Wed.	Thur.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.							
DATE	8-2	8-3	8-4	8-5	8-6	8-7	8-8	8-9							
TIME															
12-1 A.M.			12	19	18	12	14	27							
1-2			8	8	19	11	10	4							
2-3			9	14	6	12	17	9							
3-4			14	8	9	10	9	8							
4-5			5	7	1	12	12	12							
5-6			16	11	4	6	18	4							
6-7			10	11	2	21	18	9							
7-8			28	20	7	33	35	18							
8-9			27	25	16	21	31	16							
9-10			32	51	26	39	48	32							
10-11			37	74	49	40	46	41							
11-12			40	67	63	55	59	60							
12-1 P.M.			49	64	51	50	52	31							
1-2			49	56	52	41	39	40							
2-3	*		61	47	46	36	69	35							
3-4			62	58	39	41	51	44							
4-5		46	55	43	47	45	43	52							
5-6		30	58	44	45	31	34	42							
6-7		44	91	37	47	33	24	26							
7-8		20	55	29	28	26	23	22							
8-9		6	59	30	27	27	23	19							
9-10		21	30	20	25	21	24	21							
10-11		22	25	20	22	24	24	16							
11-12		13	17	31	27	25	13	33							
TOTAL		202	849	794	676	672	736	621							

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Sta. No.	Direction	Road		Route	Location	C.S. No.
		Type	Width (ft.)			
2	W Bd	Bit.	16'	I-96 Ramp	Entrance to Rest Area - East of Grand Rapids	
*Hose up - Reset 8-3-67						

NOTES ON CHARACTERISTICS OF REST AREA
EAST OF GRAND RAPIDS

This rest area is equipped with electricity and drinking water but its rest rooms are without lavatories and flush toilets. There are fifty parking spaces for cars as well as twenty separate truck spaces. Likewise, twelve picnic tables and 3 separate cooking facilities can be found. As an added convenience, general tourist information is available.

The percentage turn-in by hour of day and by day of week are fairly consistent. The average percentage turn-in for the whole week is high.

The percentages for the hourly distribution will not be extremely stable during the hours of darkness since the expressway volumes were low and hence the estimate will have wide confidence limits.

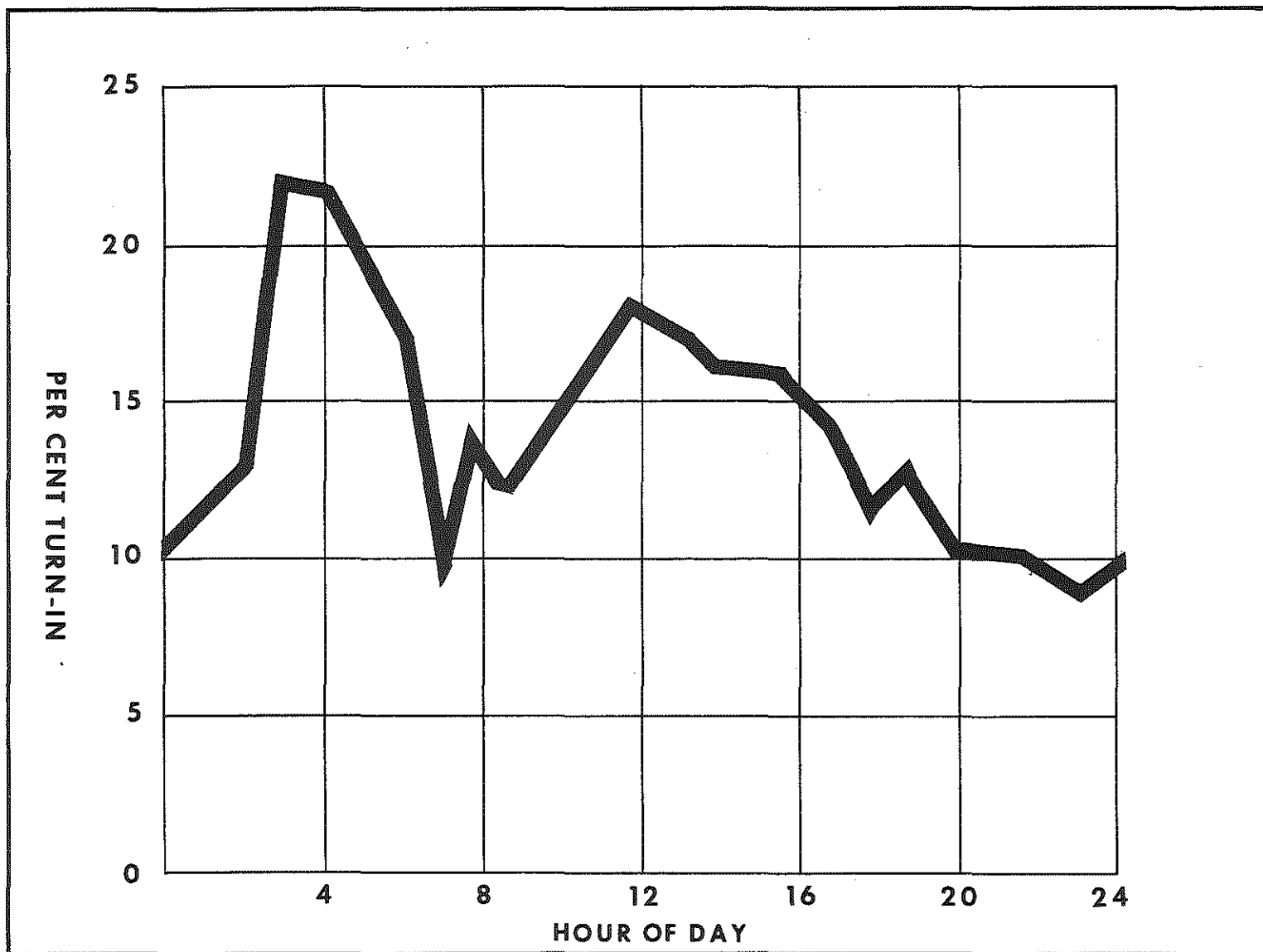
The average number of persons per vehicle is high. This is accounted for by passenger cars almost exclusively, implying a large percentage of recreational traffic (the survey having been taken from 10 AM to 2 PM on a Sunday.)

The correlation between daily expressway volumes and daily rest area turn-in is reasonably high.

A fairly high number of out-of-state vehicles stopped at the rest area. The average length-of-stay for these vehicles was somewhat greater than the average length-of-stay for all vehicles.

The percentage male rest room usage was fairly high while the percentage female rest room usage was considerably lower.

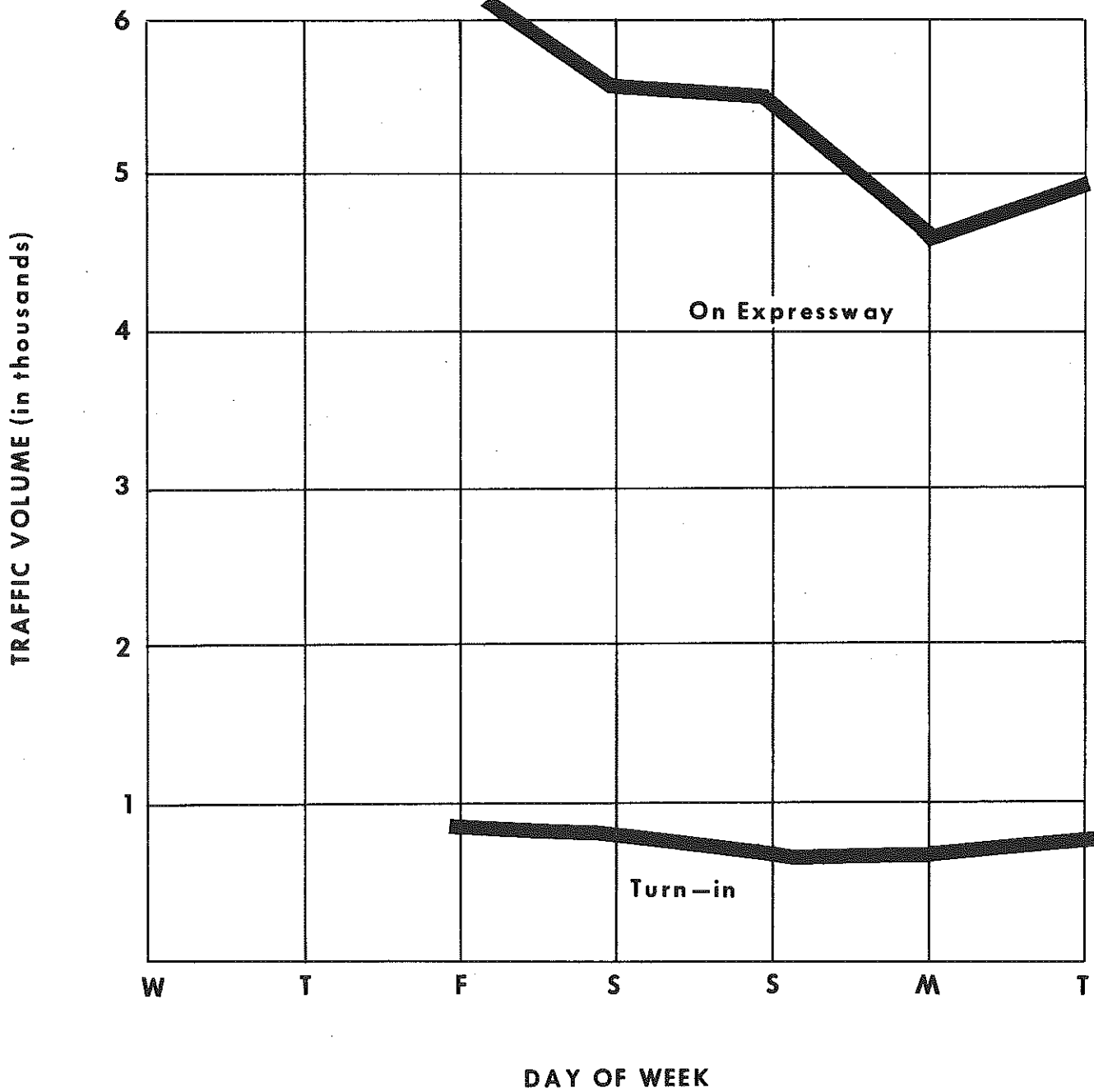
Very few adverse comments were received regarding the condition of the facilities but a significant number of visitors suggested flush toilets and washing facilities.



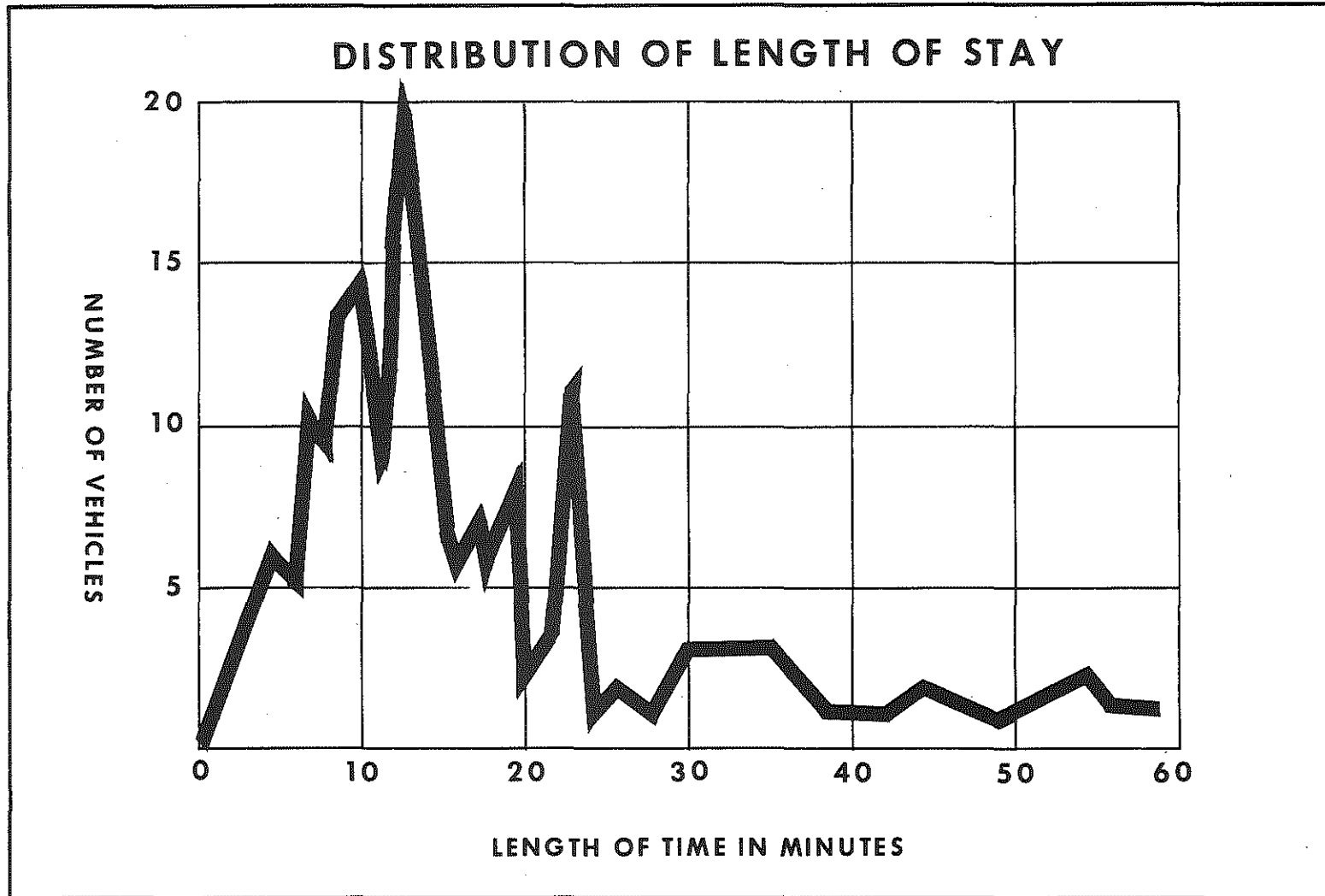
Graph I



Graph II



Graph III



Graph IV

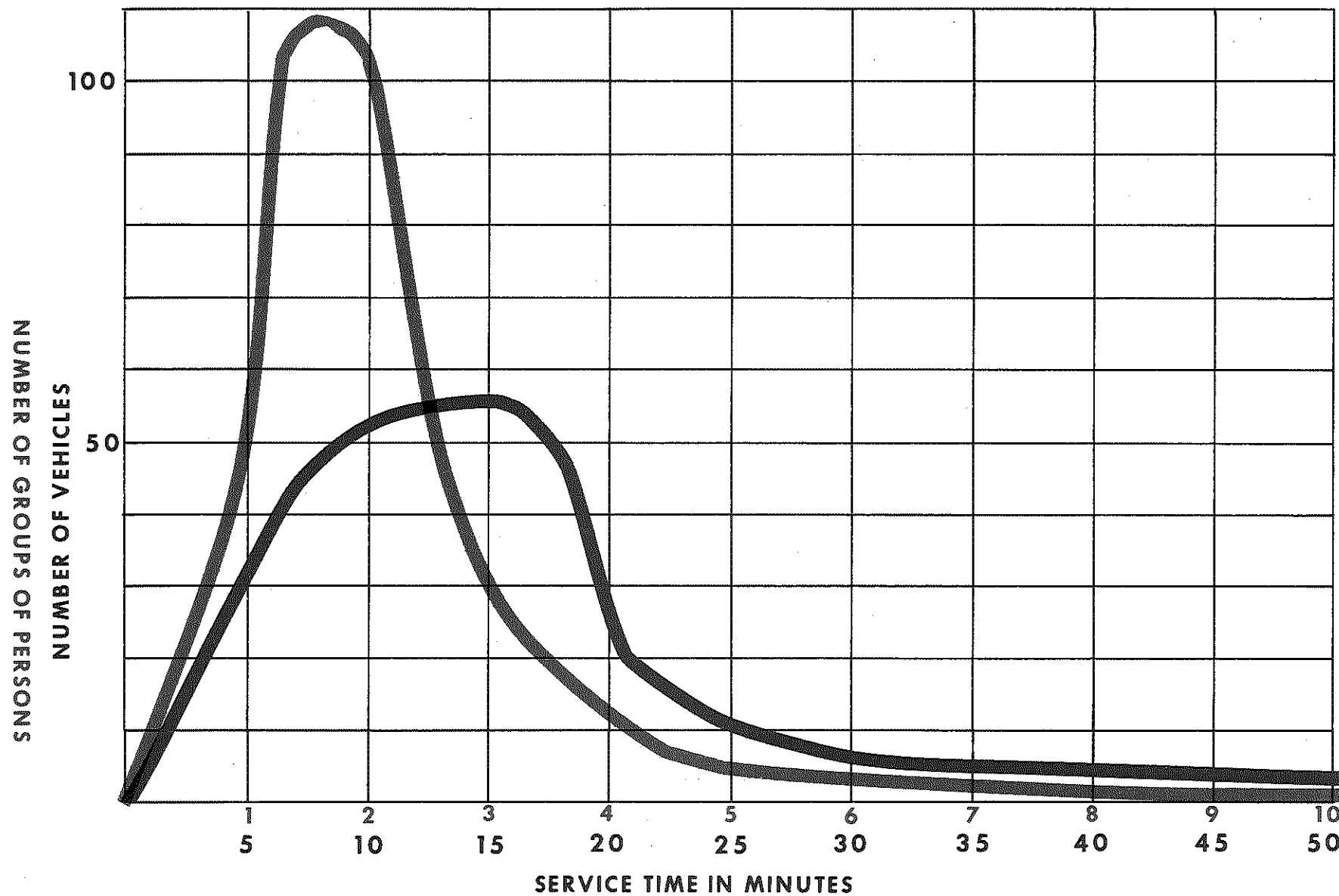
SERVICE TIME DISTRIBUTIONS

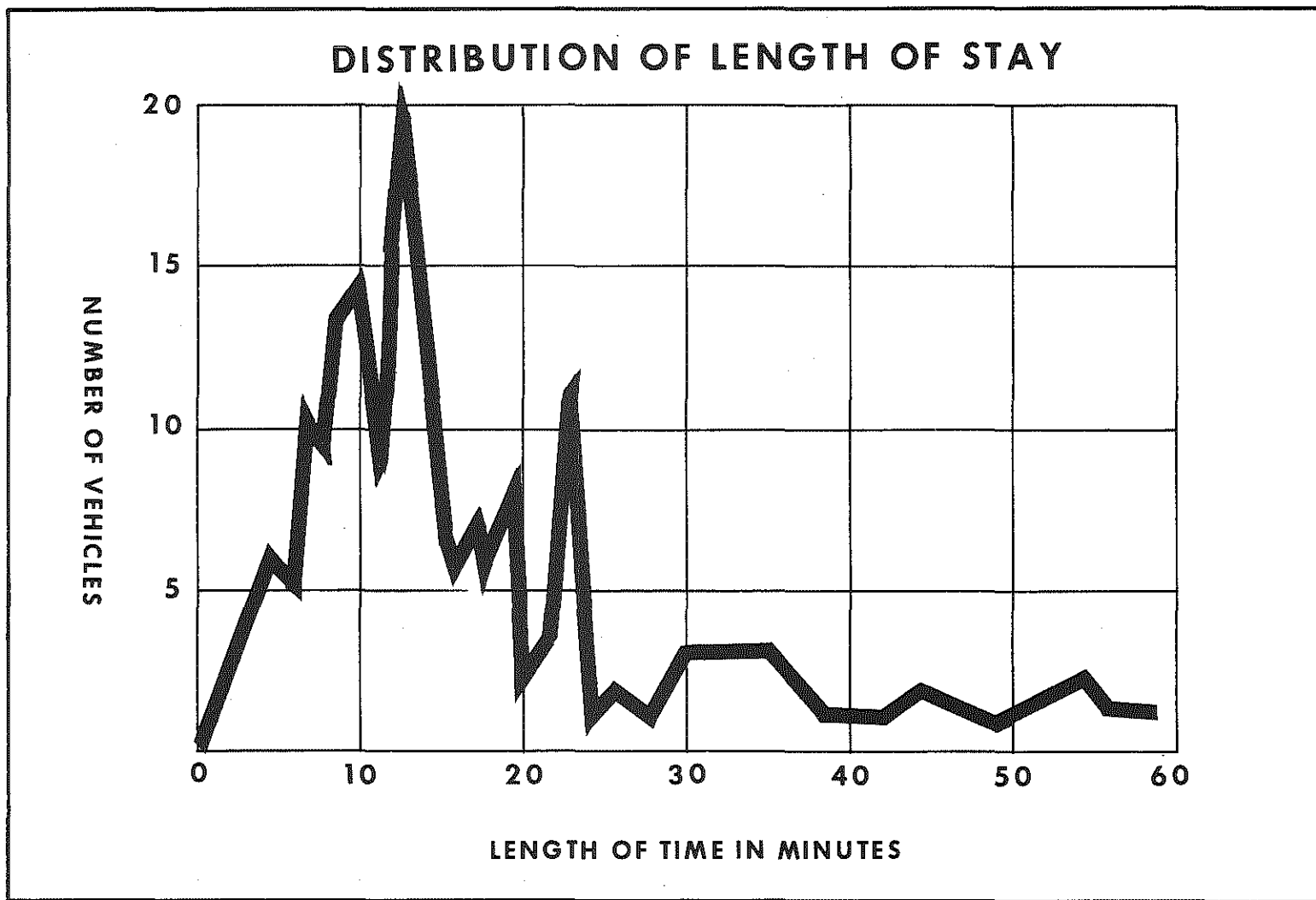
(Person—Groups in rest rooms)

(Vehicles in rest area)

REST ROOM USAGE TIME

CAR PARKING TIME





Graph IV

SERVICE TIME DISTRIBUTIONS

(Person—Groups in rest rooms)

(Vehicles in rest area)

REST ROOM USAGE TIME

CAR PARKING TIME

