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GOVERNMENT OF KERALA

ORIGIN DESTINATION SURVEY

DEPARTMENT OF STATISTICS

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ORIGINAL DISTRICT
SURVEY

SECTION 17, T. 10 N., R. 10 E.

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GOVERNMENT OF KERALA

**ORIGIN DESTINATION
SURVEY**

DEPARTMENT OF STATISTICS



GOVERNMENT OF INDIA

ORIGIN DESTINATION
SURVEY

DEPARTMENT OF STATISTICS

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ORIGIN DESTINATION SURVEY

SECTION I

INTRODUCTORY

1.1 In recent years there has been a steady movement of population towards towns and cities. This has raised serious problems regarding the availability of means of transport. Towards an efficient solution of traffic problems, it is necessary to obtain quantitative data on the "travel-modes" of the people in towns and cities. The Ministry of Transport-Roads Wing-Government of India conducted pilot surveys on origin destination of traffic in New Delhi and obtained useful information on travel-modes of the people. The Ministry requested the State Governments to conduct similar surveys to study the extent, purpose, timing, etc., of journeys undertaken by the urban population. This Government in G.P. No. A11-4704/55/Fd.D dated 16-9-1956 sanctioned the conduct of the survey. The present report embodies the findings from the survey.

1.2 The travel modes of the people have a norm typical of the conditions that remain more or less steady during the year. However, periods of greater intensity of travel crop up due to causes that are seasonal. Holidays in educational institutions, festivals and marriage seasons often dislocate the norm and raise difficulties in traffic movement. Thus the origin destination survey has to throw light on (a) the normal travel modes and (b) the seasonal disturbances. The seasonal disturbances in the State are mostly seen in March when summer holidays for educational institutions start, June when the educational institutions resume work, August—September season of marriages and Christmas in December. The remaining months are more or less steady in respect of travel habits. The origin destination survey has to be conducted during these four seasons of more intensive activity and also during two other periods of normal activity. These six rounds of surveys will bring out the pattern of traffic movements in the towns in the State.

1.3 The first round of the survey was conducted in December 1955. The towns selected were Trivandrum, the capital of the State and the seven Municipalities—Nagercoil, Quilon, Alleppey, Kottayam, Alwaye, Ernakulam and Trichur. A number of educational institutions are located in these towns; these towns have also commercial importance. One Investigator in each of the seven Municipalities and two in Trivandrum city were in charge of enumeration. Twelve households were enumerated in one day by each investigator. The households were selected at random from the electoral rolls. The questionnaire and instructions are given in the Appendix. The details of journeys performed by the inmates in the sample households on the previous day of visit have been collected. The field work took nearly two months.

SECTION II.

TRAVELLING PUBLIC IN TOWNS

2.1 The households have been classified into groups according to family income. The following table gives the number of households actually visited and the distribution according to annual family income.

TABLE I.

Family Income

Name of Town	No. of household	No. of families in Income Groups (%)			
		Below Rs. 600	Rs. 600-1500	Rs. 1500-3000	Over Rs. 3000
Nagercoil	758	53	37	7	3
Trivandrum	1232	30	59	7	4
Quilon	739	39	48	10	3
Kottayam	502	46	39	9	6
Alwaye	510	31	55	7	7
Alleppey	502	61	30	6	3
Ernakulam	519	41	29	18	12
Trichur	497	41	39	13	7

This table shows that in Nagercoil, Trivandrum and Alleppey almost 90 per cent of the families have incomes below Rs. 125 a month; the corresponding figure for Quilon, Kottayam and Alwaye is nearly 85 per cent while for Trichur it is 70 per cent. Since the households have been selected at random, it can be inferred that the families are generally earning low-incomes.

2.2 There have been several families without any entries indicating that none of the members in such households travelled on the previous day of the visit. The averages (per 100 households) of the number of persons who travel are given below:

Name of Towns	No. of persons who travel per 100 households
Nagercoil	75
Trivandrum	143
Quilon	96
Kottayam	145
Alwaye	91
Alleppey	121
Ernakulam	158
Trichur	184

Trichur shows the largest activity in respect of travel; Ernakulam comes second and Kottayam and Trivandrum stand third; Quilon, Alwaye and Nagercoil are least travel-minded.

2.3 The persons who travel have been classified into Earners including earning dependents and non-earning dependents. The following table gives the percentages of persons under these categories.

TABLE 2.

Economic status of persons who travel

Name of Town	No. per 100 persons who travel	
	Earners and Earning dependents	Non-earning dependents
Nagercoil	60	40
Trivandrum	72	28
Quilon	74	26
Kottayam	69	31
Alwaye	77	23
Alleppey	61	39
Ernakulam	52	48
Trichur	55	45

The economic status of the travelling public differs considerably from town to town. In Ernakulam and Trichur, the travelling public consists of 52 per cent and 55 per cent respectively of earners. In Nagercoil and Alleppey, this percentage is 60. In the remaining towns the percentages vary between 70 and 77. The journeys of non-earners are largely for their education.

SECTION III.

Purpose of Journeys

3.1 The purpose of journeys has been classified into:

- (i) Service-going (or returning) from offices
- (ii) Business or professional
- (iii) Social calls
- (iv) Education
- (v) Shopping
- (vi) Medical
- (vii) Religious
- (viii) Others

The trips under "services" relate to those that are performed for attending offices which are their normal places of work. Professional or Business trips are those that are performed by business men. The other categories are self-explanatory

The journeys under each head, have also been classified into regular and casual.

3.2 In Nagercoil, as shown in the accompanying table, 22 per cent of the trips is for "service", 23 for social purposes and 43 for education. Business trip form only 7 per cent, while shopping, medical and others cover 5 per cent. The 42 per cent of the trips on education is performed by non-earners and all these are regular showing that these relate to journeys to schools and back home. Under "service" 16 out of 22 are regular trips; in all other categories except education the trips are of a casual nature.

TABLE 3.1
Purpose of Travel--Nagercoil

Purpose	Number of trips (Percentage)					
	All		Earners		Non-earning dependents	
	Total	Regular	Total	Regular	Total	Regular
All	100	61	48	18	52	43
Service	22	16	20	15	2	1
Professional	7	3	6	3	1	..
Social etc.	23	..	18	..	5	..
Education	43	42	1	..	42	42
Shopping etc.	5	..	3	..	2	..
Hospital	..	..	..	..	..	..
Religion	..	..	..	..	..	..
Others	..	..	..	..	..	..

3.3 In Trivandrum (see table below) trips for 'service' account only for 17 per cent, business trips form 38 per cent, educational and social calls 15 per cent each and shopping 9 per cent. Taking all trips, 57 per cent are of a regular nature.

FIGURE 1

PURPOSE OF TRIPS

■ SOCIAL Etc
■ PROFESSIONAL
■ SERVICE

■ OTHERS
■ EDUCATION

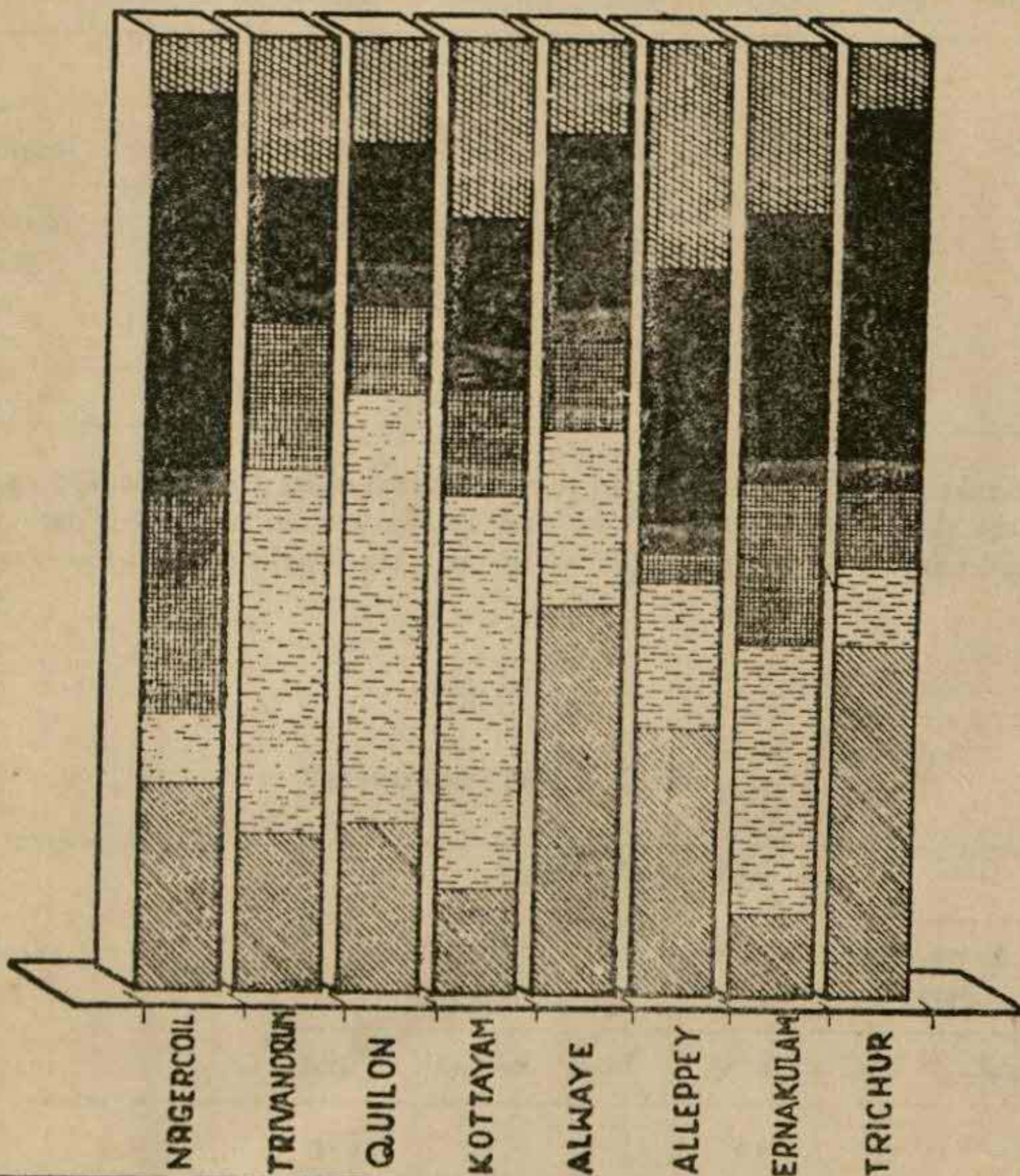


TABLE 3.2

Purpose of Travel—Trivandrum

Purpose	Number of trips (Percentage)					
	All		Easners		Non-earning dependents	
	Total	Regular	Total	Regular	Total	Regular
All	100	57	69	40	31	17
Service	17	14	17	14	..	..
Professional	38	25	35	24	3	1
Social	15	1	10	1	5	..
Educational	15	13	1	1	14	12
Shopping	9	3	3	..	6	3
Hospital	1	..	..	..	1	..
Religion	4	1	2	..	2	1
Others	1	..	1	..	..	..

3.4 In Quilon (*vide* table given below) 45 per cent of the trips is for business, 18 per cent is for 'service' and 17 per cent for education. Social calls account for 9 per cent and shopping 5 per cent of the trips. 73 per cent of the trips is regular.

TABLE 3.3

Purpose of Travel—Quilon

Purpose	Number of trips (Percentage)					
	All		Earners		Non-earning dependents	
	Total	Regular	Total	Regular	Total	Regular
All	100	63	67	44	33	19
Service	18	17	17	16	1	1
Professional	45	30	41	28	4	2
Social	9	..	6	..	3	..
Educational	17	16	..	..	17	16
Shopping	5	..	1	..	4	..
Hospital	..	..	..	..	..	..
Religion	3	..	1	..	2	..
Others	3	..	1	..	2	..

3.5 In Kottayam (*see* table below) 41 per cent of the trips is for business, 18 per cent for education, 11 per cent for each of service and social calls. Regular trips form 55 per cent of the total.

TABLE 3.4

Purpose of Travel—Kottayam

Purpose	Number of trips (Percentage)					
	All		Earners		Non-earning dependents	
	Total	Regular	Total	Regular	Total	Regular
All	100	55	70	35	30	20
Service	11	5	11	5	..	..
Professional	41	29	40	28	1	1
Social	..	2	7	1	4	1
Educational	18	18	1	1	17	17
Shopping	9	1	5	..	4	1
Hospital	1	..	1	..	..	..
Religion	9	..	5	..	4	..
Others	..	..	..	..	..	..

3.6 In Alwaye, 41 per cent of the trips is for 'service', 22 per cent for education 18 per cent for business and 9 per cent for social calls, the percentage of regular trips is 77.

TABLE 3.5

Purpose of Travel—Alwaye

Purpose	Number of trips (Percentage)					
	All		Earners		Non-earning dependents	
	Total	Regular	Total	Regular	Total	Regular
All	100	77	77	58	23	19
Service	41	40	41	40	..	..
Professional	18	15	18	15	..	..
Social	9	1	8	1	1	..
Educational	22	21	2	2	20	19
Shopping	3	..	3	..	..	..
Hospital	1	..	1	..	..	..
Religion	6	..	4	..	2	..
Others	..	..	..	..	..	..

3.7 In Alleppey (*vide* table given below) 30 per cent of the trips is for educational purposes, 28 per cent for 'services' and 15 per cent for business. The remaining 27 per cent consists of trips for social calls, shopping, visit to places of worships, etc. 70 per cent of the trips are regular.

TABLE 3.6
Purpose of Travel—Alleppey

Purpose	Number of trips (Percentage)					
	All		Earners		Non-earning dependents	
	Total	Regular	Total	Regular	Total	Regular
All	100	70	52	33	48	37
Service	28	27	24	23	4	4
Professional	15	11	13	10	2	1
Social	3	..	3	..	..	..
Educational	30	30	..	..	30	30
Shopping	5	2	3	..	2	2
Hospital	2	..	1	..	1	..
Religion	6	..	2	..	4	..
Others	11	..	6	..	5	..

3.8 In Ernakulam (See table below) the per centage of trips for each of educational and business purposes is 28. 17 per cent is for social calls, 15 per cent is for journeys to places of worship and 9 per cent is for 'services'. 58 per cent of the trips are of the regular type.

TABLE 3.7
Purpose of Travel—Ernakulam

Purpose	Number of trips (Percentage)					
	All		Earners		Non-earning dependents	
	Total	Regular	Total	Regular	Total	Regular
All	100	58	32	17	68	41
Service	9	7	5	4	4	3
Professional	28	23	17	13	11	10
Social	17	1	7	..	10	1
Educational	28	27	..	..	28	27
Shopping	2	..	..	..	2	..
Hospital	1	..	..	..	1	..
Religion	15	..	3	..	12	..
Others	..	..	..	..	..	..

3.9 In Trichur (Vide table below) 40 per cent of the trips is for education, 37 per cent for service and 8 per cent for business. Regular trips form 83 per cent of the total number.

TABLE 3.8

Purpose of Travel—Trichur

Purpose	Number of trips (Percentage)					
	All		Earners		Non-earning dependents	
	Total	Regular	Total	Regular	Total	Regular
All	100	83	49	41	51	42
Service	37	35	35	34	2	1
Professional	8	8	7	7	1	1
Social	8	..	4	..	4	..
Educational	40	40	..	..	40	40
Shopping	4	..	3	..	1	..
Hospital	..	..	..	..	..	..
Religion	3	..	..	..	3	..
Others	..	..	..	..	..	..

3.10 The diagram given below represents the relative proportions of trips for the various purposes in the eight towns.

3.11 Having described the purpose of the trips undertaken by the inhabitants of the important towns an attempt may be made to get the overall picture for the urban population in the State. The estimates for the State have been calculated by weighting the figures for each town by the corresponding population. The number of trips (expressed as a percentage of the total) according to the purpose of the trip is given below.

Service	22	Shopping	7
Business	2	Hospital	1
Social	12	Religion	5
Education	25	Others	2

3.12 The average distance travelled per trip for the various classifications according to purpose is given in the following table.

TABLE 4
Distances of Trip
Average distance in miles

Towns	Service	Business	Social	Education	Shopping	Hospital	Religious	Others
Nagercoil	2.06	6.24	4.40	0.92	2.77	1.67	6.00	..
Trivandrum	1.49	1.31	1.68	0.92	1.09	2.25	0.86	2.33
Quilon	1.49	1.22	3.58	0.69	0.64	1.67	0.46	2.45
Kottayam	2.61	2.51	3.99	1.24	1.61	3.52	1.67	..
Alwaye	3.12	1.57	5.30	1.23	1.93	0.88	0.40	..
Alleppey	1.78	3.07	1.55	1.11	2.38	3.46	1.50	7.12
Ernakulam	0.95	1.68	2.72	0.63	0.94	0.93	0.73	3.06
Trichur	1.69	0.71	1.42	0.71	1.49	2.56	0.70	..

The distance travelled for educational purpose is in most cases less than a mile; and in no town does it exceed this by more than a quarter of a mile. The trips for religious purpose are also short except in Nagercoil. In Nagercoil, Kottayam and Alwaye, trips for 'service' exceed two miles while in the remaining towns, these trips are below 2 miles. Business trips are also comparatively longer in Nagercoil and Alleppey. Trips on social calls are probably the longest.

3.13 The distribution of trips in the various towns according to the time of the day is now studied. The following table is in respect of Nagercoil town.

TABLE 5.1
Trips according to time and purpose, Nagercoil

Time	Number of trips (Percentage)								
	Total	For-ward	Re-turn	Ser-vice	Busi-ness	Soci-al	Edu-cation	Shop-ping	Oth-ers
All	1000	505	495	218	72	230	428	48	4
Before 9 A.M.	108	105	3	46	16	33	1	10	2
9 A.M.—11 A.M.	283	269	14	46	20	46	156	15	..
11 A.M.—3 P.M.	194	83	111	27	8	32	117	9	1
3 P.M.—5 P.M.	263	24	239	47	6	47	151	11	1
5 P.M.—7 P.M.	98	24	74	38	10	44	3	3	..
7 P.M.—9 P.M.	3	..	30	8	9	13	..	..	..
After 9 P.M.	24	..	24	6	3	15	..	..	..

In Nagercoil, the peak periods of bus journeys are 9 to 11 A.M. and 3 P.M. to 5 P.M. the former being for forward journeys and the latter for return journeys. However, in regard to trips on business, the intervals—before 9 A.M., 9 to 11 A.M. and 3 to 5 P.M.—are equally important. Next in importance is the interval 5 to 7 P.M. Business trips are most frequent between 9 A.M. and 11 A.M. In respect of social calls, the intervals 9 A.M. to 11 A.M. and 3 P.M. to 7 P.M. cover the largest percentage of trips. Journeys under education are between 9 to 11 A.M. and 3 to 5 P.M.

The figure 2.1 is a pictorial representation of the table for Nagercoil. It is seen that between 9 A.M. and 5 P.M. the largest proportion of trips is on education.

3.14. The figures for Trivandrum are as follows:—

TABLE 5.2
Time of the day and purpose of trips, Trivandrum

Time	Trips								
	Total	For-ward	Ret-urn	Ser-vice	Busi-ness	So-cial	Edu-cation	Shop-ping	Oth-ers
Before 9 A.M.	168	151	17	20	110	10	3	3	22
9 A.M.—11 A.M.	192	169	23	41	40	15	56	35	5
11 A.M.—3 P.M.	249	96	153	38	107	22	51	26	5
3 P.M.—5 P.M.	86	35	51	3	25	16	31	7	3
5 P.M.—7 P.M.	178	57	121	59	40	51	5	11	12
7 P.M.—9 P.M.	92	8	84	8	42	29	1	7	5
After 9 P.M.	35	2	33	2	19	14	..	..	..

The busiest period happens to be between 11 A.M. and 3 P.M. The intervals 9 A.M. to 11 A.M. and 5 P.M. to 7 P.M. are next in importance. The peak period for service is 5 P.M. to 7 P.M.; for business, the periods are before 9 A.M. and 11 A.M. to 3 P.M.; for social calls, it is 5 P.M. to 7 P.M. and for shopping, the time is 9 A.M. to 11 A.M. Figure 2.2 shows these characteristics for Trivandrum.

3.15. The activity in Quilon is given below.

TABLE 5.3

Time of the day and purpose of the trips, Quilon

	Trips								
	Total	For-ward	Ret-urn	Ser-vice	Busi-ness	So-cial	Edu-cation	Shop-ping	Oth-ers
All	1000	581	419	179	448	95	166	50	62
Before 9 A.M.	247	236	11	62	142	17	3	4	19
9 A.M.—11 A.M.	140	130	10	10	42	11	59	13	5
11 A.M.—3 P.M.	236	154	82	40	83	27	57	14	15
3 P.M.—5 P.M.	117	35	82	10	39	11	46	6	5
5 P.M.—7 P.M.	134	22	112	38	60	14	1	9	12
7 P.M.—9 P.M.	88	3	85	15	54	11	..	4	4
After 9 P.M.	38	1	37	4	28	4	..	..	2

The peak periods are before 9 A.M. and 11 A.M. to 3 P.M. Service and business trips are most common before 9 A.M. Trips for educational purposes are between 9 A.M. to 3 P.M. Figure 2.3 shows these travel—modes for Quilon.

3.16. The figures for Kottayam are as follows.

TABLE 5.4

Time of the day and purpose of the trips, Kottayam

	Trips								
	Total	For-ward	Ret-urn	Ser-vice	Busi-ness	So-cial	Edu-cation	Shop-ping	Oth-ers
All	1000	520	480	145	463	108	177	92	99
Before 9 A.M.	197	178	19	34	103	10	11	11	28
9 A.M.—11 A.M.	158	129	29	15	52	15	47	15	14
11 A.M.—3 P.M.	215	101	114	17	93	17	57	17	14
3 P.M.—5 P.M.	163	68	95	9	39	28	59	18	10
5 P.M.—7 P.M.	137	31	106	22	52	18	2	27	16
7 P.M.—9 P.M.	82	9	73	11	45	12	1	4	9
After 9 P.M.	48	4	44	3	29	8	..	..	8

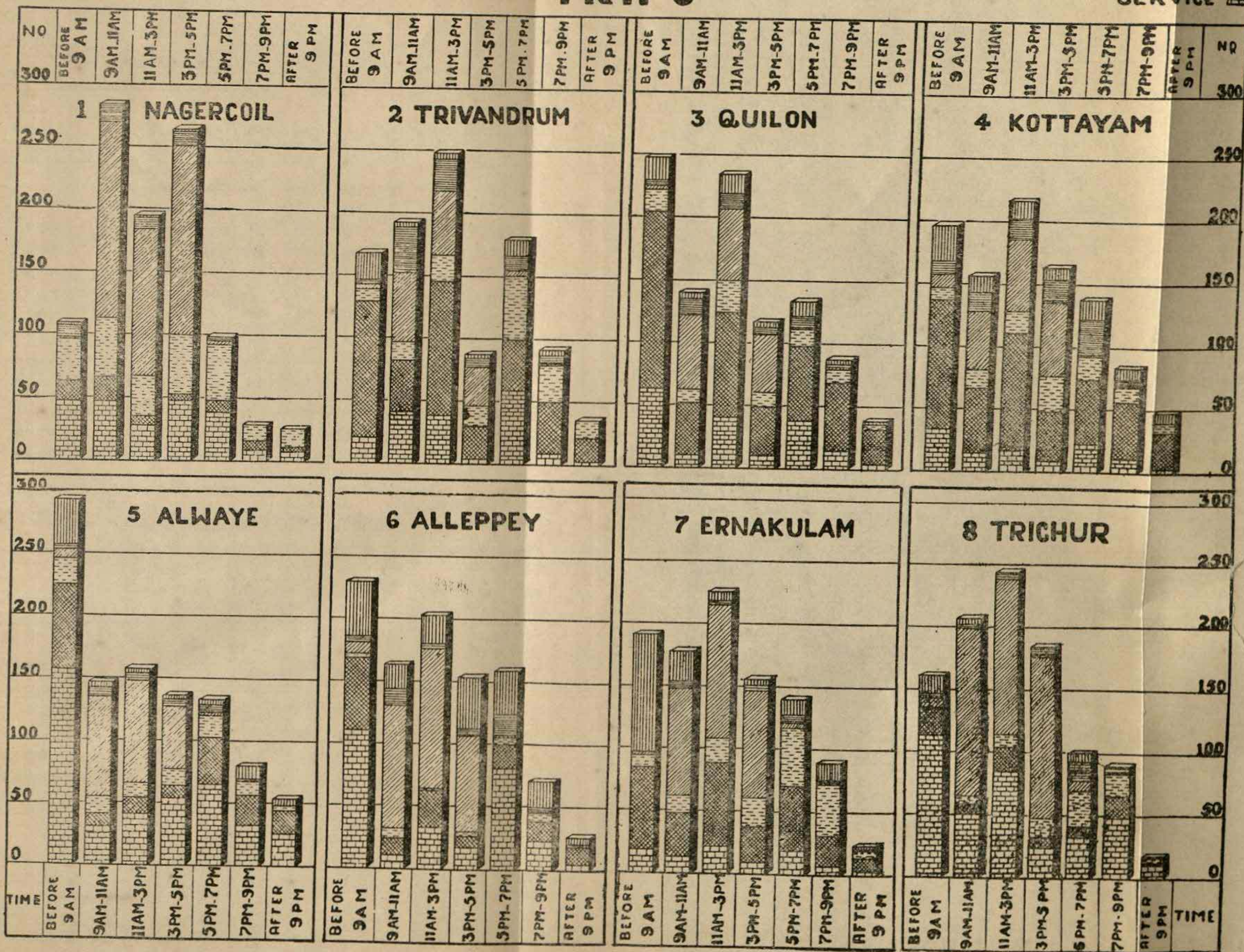
The peak period is 11 A.M. to 3 P.M. Service and business trips are most common before 9 A.M. Social calls are between 3 P.M. and 5 P.M. Trips for education are between 11 A.M. to 3 P.M. and 3 P.M. to 5 P.M. Figure 2.4 represents diagrammatically the distribution contained in the above table.

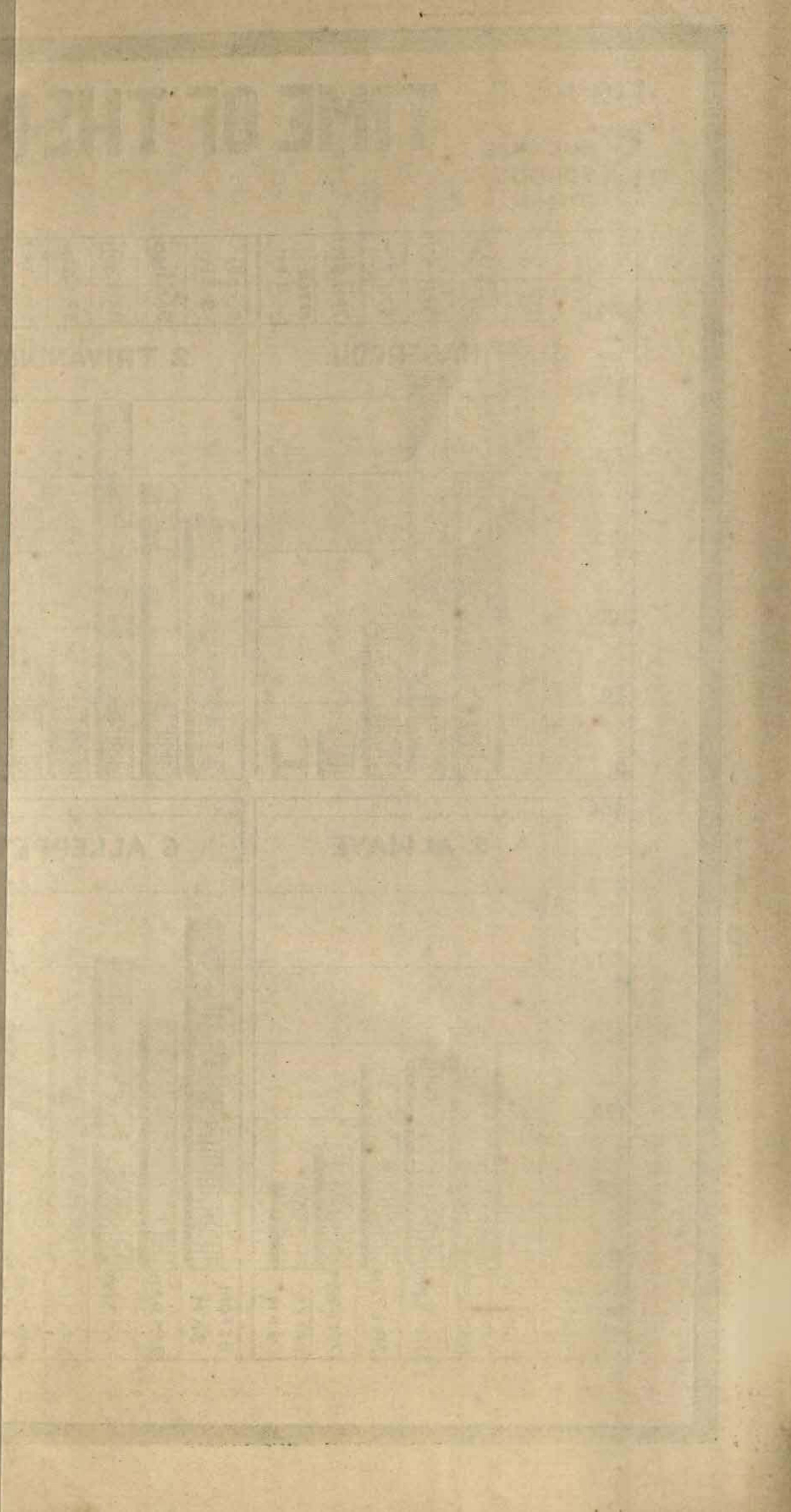
FIGURE II

TIME OF THE DAY AND PURPOSE OF TRIPS

SHIPPING
SCHOOL
SOCIAL

OTHERS
BUSINESS
SERVICE





3.17 In Alwaye (vide figures given below) trips for service, business and social calls are most common in the interval before 9 A.M. The trips for educational purposes are between 9 A.M. to 3 P.M.

TABLE 5.5
Time of the day and purpose of trips, Alwaye

Time	Trips									
	Total	For-ward	Ret-urn	Ser-vice	Busi-ness	So-cial	Edu-cation	Shop-ping	Oth-ers	
All	1000	505	495	407	185	93	220	29	66	
Before 9 A.M.	294	273	21	157	68	21	8	3	37	
9 A.M.—11 A.M.	148	133	15	31	11	15	80	7	4	
11 A.M.— 3 P.M.	157	52	105	42	13	12	81	6	3	
3 P.M.— 5 P.M.	136	24	112	54	11	14	49	5	3	
5 P.M.— 7 P.M.	133	15	118	65	39	17	2	6	4	
7 P.M.— 9 P.M.	79	7	72	32	24	11	..	2	10	
After 9 P.M.,	53	1	52	26	19	3	..	..	5

This table is diagrammatically shown in figure 2.5.

3.18 For Alleppey (vide table given below) the period of greatest travel activity is before 9 A.M. Service and business trips are mostly before 9 A.M. The trips for education are between 11 and 3 P.M.

TABLE 5.6
Time of the day and purpose of trips, Alleppey

Time	Trips									
	Total	For-ward	Ret-urn	Ser-vice	Busi-ness	So-cial	Edu-cation	Shop-ping	Oth-ers	
All	1000	497	503	276	156	30	298	51	189	
Before 9 A.M.	226	222	4	111	54	4	9	5	43	
9 A.M.—11 A.M.	164	139	25	10	14	8	99	14	19	
11 A.M.— 3 P.M.	203	72	131	33	29	1	113	4	23	
3 P.M.— 5 P.M.	153	24	129	16	9	4	76	6	42	
5 P.M.— 7 P.M.	158	35	123	79	20	6	1	17	35	
7 P.M.— 9 P.M.	71	5	66	23	16	7	..	4	21	
After 9 P.M.	25	..	25	4	14	..	..	1	6

Figure 2.6 represents the above table.

3.19 In Ernakulam as will be seen from the table given below 11 A.M. to 3 P.M. has the largest percentage of trips. Journeys performed on business or education are also most frequent during this interval. Trips for service are between 11 A.M. and 3 P.M. With an almost equal frequency before 9 A.M. and between 5 P.M. to 7 P.M. Figure 2.7 shows these characteristic diagrammatically.

TABLE 5.7

Time of the day and purpose of trips, Ernakulam

	Trips									
	Total	For-ward	Ret-urn	Ser-vice	Busi-ness	So-cial	Edu-cation	Shop-ping	Oth-ers	
All	1000	520	480	89	284	162	286	21	158	
Before 9 A.M.	190	149	41	19	65	10	3	..	93	
9 A.M.—11 A.M.	178	152	26	13	35	15	85	6	24	
11 A.M.—3 P.M.	225	104	121	21	67	20	106	3	8	
3 P.M.—5 P.M.	154	42	112	8	29	23	86	4	4	
5 P.M.—7 P.M.	141	55	86	19	52	47	5	6	12	
7 P.M.—9 P.M.	88	15	73	6	25	41	1	1	14	
After 9 P.M.	24	3	21	3	11	6	..	1	3	

3.20 In Trichur (vide table below) 11 A.M. to 3 P.M. is the peak period. Most of the trips for service purposes are before 9 A.M. Journeys for education are between 9 A.M. and 11 A.M.

TABLE 5.8

Time of the day and purpose of trips, Trichur




Time	Trips									
	Total	For-ward	Ret-urn	Ser-vice	Busi-ness	So-cial	Edu-cation	Shop-ping	Oth-ers	
All	1000	525	475	365	83	83	401	37	31	
Before 9 A.M.	158	149	9	113	20	1	6	3	15	
9 A.M.—11 A.M.	208	193	15	51	8	6	134	4	5	
11 A.M.—3 P.M.	244	120	124	85	20	10	124	4	1	
3 P.M.—5 P.M.	184	23	161	24	8	16	128	8	..	
5 P.M.—7 P.M.	100	37	63	32	9	28	8	15	8	
7 P.M.—9 P.M.	89	3	86	49	17	18	1	3	1	
After 9 P.M.	17	..	17	11	1	4	..	..	1

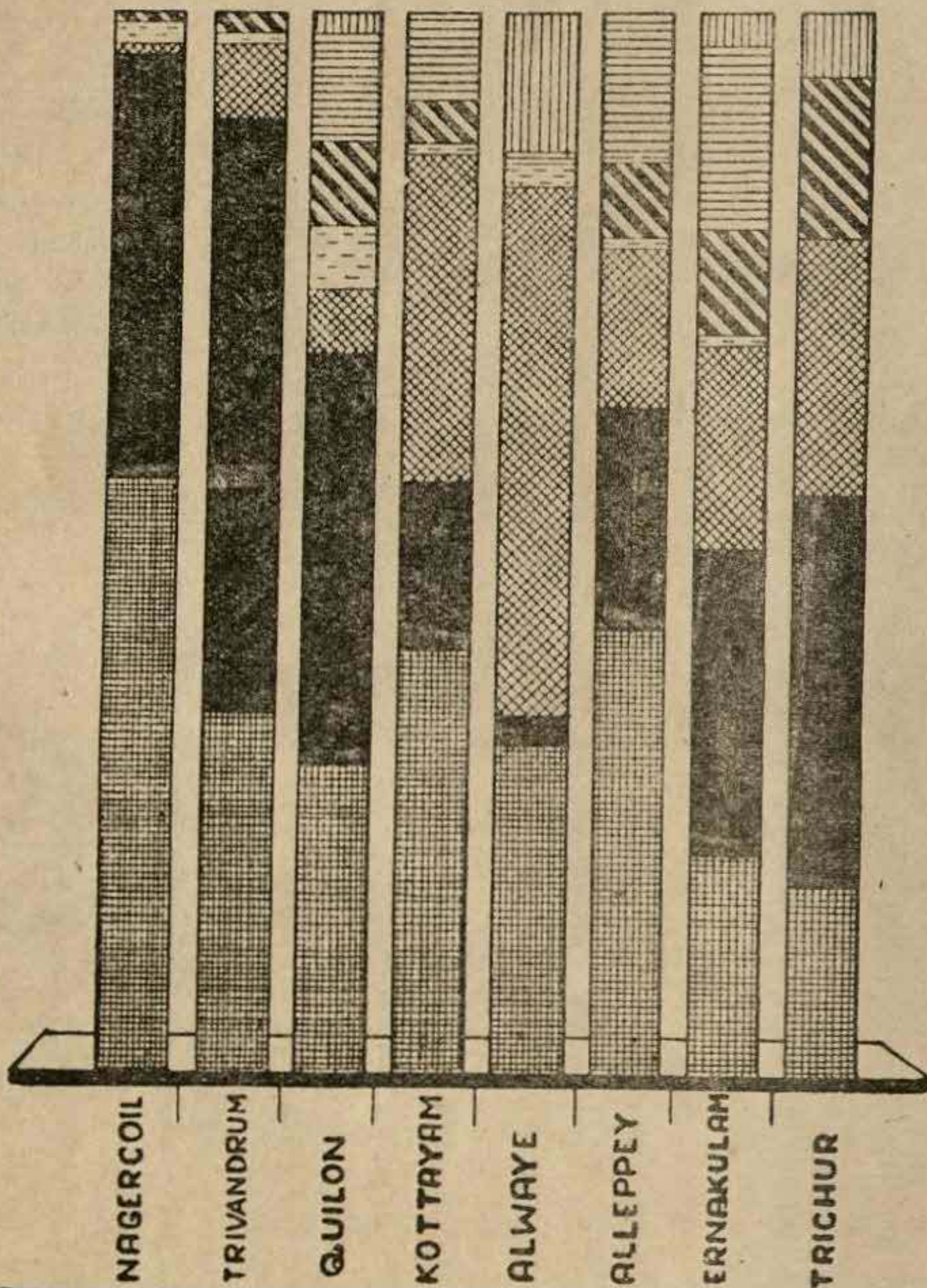
Figure 2.8 is a representation of the table given above.

DISTRIBUTION OF TRIPS USING CONVEYANCE

FIGURE III

 TRAIN
 BOAT
 RICKSHAW
 TAXI

 OWNED CAR
 CYCLE
 BUS



SECTION IV

Mode of Conveyance

Mode of conveyance has been classified under the following:—

- | | |
|------------------|-------------------------|
| (1) by foot | (5) by taxi |
| (2) by bus | (6) by rikshaw or jutka |
| (3) by cycle | (7) by boat |
| (4) by owned car | (8) by train |

Most of the journeys are performed on foot. In Trichur 94 per cent of the trips are on foot; in Nagercoil, Quilon, Kottayam and Alleppey this percentage is between 85 and 87. In Ernakulam it is 80 per cent, in Alwaye 78 per cent and in Trivandrum it is 76 per cent. Thus in almost all the town journeys on vehicles are more or less uncommon. This is to be expected as the persons belong to families earning low income.

The following table gives fuller details.

Number of trips expressed as a percentage of the total.

Town	All	On foot	Bus	Cycle	Owned car	Taxi	Rikshaw	Boat	Train
Nagercoil	100	87	7	5	..	..	1	..	..
Trivandrum	100	76	8	13	2	..	1	..	..
Quilon	100	85	4	6	1	1	1	2	..
Kottayam	100	87	5	2	4	..	1	1	..
Alwaye	100	78	7	1	11	..	..	..	3
Alleppey	100	85	7	3	2	..	1	2	..
Ernakulam	100	80	4	6	4	..	2	3	1
Trichur	100	94	1	2	2	..	1	..	..
All towns	100	82	6	7	2	..	3	..	..

Nearly 7 to 8 per cent of the trips in Nagercoil, Trivandrum, Alwaye and Alleppey are on public buses. Alwaye has the largest percentage of trips in owned cars. Kottayam and Ernakulam come next.

An analysis of trips using conveyance gives the following percentages.

TABLE 7.

Trip by conveyance

Town	Bus	Cycle	Owned car	Taxi	Rikshaw	Boat	Train
Nagercoil	56	40	1	2	1	..	..
Trivandrum	34	56	7	1	2	..	..
Quilon	29	39	6	6	8	10	2
Kottayam	40	16	31	1	4	8	..
Alwaye	31	3	50	2	..	1	13
Alleppey	42	21	15	1	7	14	..
Ernakulam	21	29	19	1	10	17	3
Trichur	18	37	24	..	15	..	6

Bus in Nagercoil, Kottayam and Alleppey, Cycle in Trivandrum, Quilon, Ernakulam and Trichur and owned car in Alwaye appear to be the most common conveyance whenever used. The distribution of trips using conveyance is shown in figure 3.

TABLE 8

Average distance per trip

Town	Foot	Bus	Cycle	Owned car	Taxi or Rikshaw	Boat
Nagercoil	1.31	15.66	3.51	3.50	9.00	..
Trivandrum	0.95	3.06	2.01	2.93	2.33	..
Quilon	0.82	8.67	2.20	10.60	1.57	0.46
Kottayam	1.3	12.40	2.10	8.92	1.25	5.68
Alwaye	0.93	7.16	1.38	7.43	6.75	1.00
Alleppey	1.4	9.00	2.11	5.01	2.44	18.24
Ernakulam	0.73	5.51	1.88	5.71	1.55	2.15
Trichur	1.08	5.18	1.90	1.35	1.69	..

The average distance per trip on foot varies between 6 furlongs and 1 1/2 miles while that on cycle ranges between 2 and 3.5 miles, Alwaye being an exception. Trips in owned cars in Nagercoil, Trivandrum, Alleppey, Ernakulam and Trichur are within the municipal limits as the distances are small. In Quilon, Kottayam and Alwaye, trips in owned cars go probably beyond municipal limits. Taxis and rickshaws are being hired only for journeys within the municipal limits; as the distance covered in Kottayam is nearly 7 miles, it should be inferred that these trips go outside the municipal limits. The trips on boat in Alleppey are clearly to outside the municipality.

The trips by bus in Nagercoil are definitely to places beyond the municipal limits. In Trivandrum bus journeys are on an average 3 miles long. In the remaining town the distances covered are over 5 miles showing that these relate probably to journeys to out skirts.

SECTION V

Trips by bus

5.1 In this section, a fuller analysis of trips by bus is made. It will be remembered that in most of the towns the percentage of trips by bus varies between 6 and 8 though in Quilon and Trivandrum it is 4 percent and in Trichur it is 1 percent.

5.2 The cost of trips, average distance per trip and cost per mile for journey by bus are detailed below:

TABLE 9
Trips by bus

Town	Cost		Length	Cost per mile (in Ps.)
	As.	Ps.		
Nagercoil	11	10	15.66	9.07
Trivandrum	2	0	3.06	7.84
Quilon	7	2	8.67	9.91
Kottayam	8	11	12.40	8.63
Alwaye	4	5	7.16	7.40
Alleppey	4	6	9.00	6.00
Ernakulam	3	8	5.51	7.99
Trichur	4	5	5.18	10.23

In Nagercoil and Kottayam, the average lengths of a trip are 16 and 12 miles respectively showing that these are beyond municipal limits. Probably this is also true of Quilon, Alwaye and Alleppey. In the remaining towns—Trivandrum, Ernakulam and Trichur the bus journeys are within municipal limits.

5.3 In Trichur, closely followed by Quilon and Nagercoil, the trips on bus appear to be the costliest. The cheapest is Alleppey.

5.4 The waiting time for journeys by bus may now be examined. The following table gives the percentage of trips with waiting time and the average time before a bus could be boarded.

TABLE 10
Waiting time for bus journeys

Name of Town	Percentage of trips with waiting time	Average waiting time in minutes
Nagercoil	86	12
Trivandrum	72	8
Quilon	38	19
Kottayam	81	13
Alwaye	20	9
Alleppey	86	18
Ernakulam	16	10
Trichur	20	12

It is clear that in Nagercoil, Trivandrum, Kottayam and Alleppey passengers have invariably to wait to catch a bus while in the remaining four towns the pressure is not so great. The waiting time, except for Trivandrum, Alwaye and Ernakulam exceeds 10 minutes.

5.5 The following table gives the relation between waiting time and the duration of the trip.

TABLE 11
Duration of trips

Nam of town	Below half a hour		Half to 1 hour		1 to 2 hours		Over 2 hours	
	% of trip	waiting time	% of trips	waiting time	% of trips	waiting time	% of trips	waiting time
Nagercoil	16	8	23	10	31	15	30	14
Trivandrum	85	8	11	7	3	12	1	11
Quilon	60	12	28	33	6	23	6	16
Kottayam	64	12	12	9	14	16	10	19
Alwaye	14	31	77	5	9	11	..	..
Alleppey	52	16	14	8	5	19	29	27
Ernakulam	38	7	51	12	5	7	7	8
Trichur	41	11	41	8	18	28	..	..

Since trips within the towns are not likely to exceed one hour, it is seen that in all towns except Nagercoil, the percentages of journeys with waiting time within the towns are very high.—96 in Trivandrum, 88 in Quilon, 76 in Kottayam, 91 in Alwaye, 66 in Alleppey, 88 in Ernakulam and 82 in Trichur. Thus there is definite dearth of conveyance facilities for journeys within towns. This has to be viewed along with the very low percentage of trips on bus given in section IV. Even with only 4 to 8 per cent of the total trips using bus as conveyance, persons have to wait over 10 minutes before they could board a bus for trips within towns.

SECTION VI

Conclusion

6.1 The Origin-Destination Survey has shown that the economic conditions of the vast majority of persons in the towns is low as they (almost 85 per cent) belong to families with monthly income below Rs. 125 on an average only 125 persons per 100 households are in the habit of travelling daily-of the persons who travel, 65 percent are earners or earning dependents and the remaining 35 per cent are complete dependents. Fifty-seven percent of the trips are regularly undertaken by persons who travel.

6.2 In regard to purpose of journeys it is found that almost half the number of trips are on business and education in equal proportions, a little over one fifth on service and one tenth on social calls. Average length of trips on services is 2 miles; that on business is $2 \frac{1}{4}$ miles, while social calls take on an average 3 miles. Trips to schools are only $\frac{3}{4}$ of a mile long.

6.3 Almost 82 per cent of the trips are on foot. This should be expected as the persons came from families having low income. The remaining 18 per cent of the trips consist of 6 per cent by bus, 7 per cent by cycle, 2 per cent by owned cars and 3 per cent by rickshaw. Trips in foot cover on an average 1 mile while those on cycle exceed 2 miles. Trips in owned cars generally 5.5 miles long. Bus journeys in Nagercoil and Kottayam are beyond the municipal limits. In the other towns, the average length of trips on bus is nearly 6.4 miles. The cost of trips on bus cost 8 ps. per mile.

6.4 Though only 6 per cent of the trips are on bus over the passengers in most of the towns are put to considerable difficulty as over 80 percent are able to board a bus only after waiting for over 10 minutes. Thus there is a definite shortage of buses for traffic within municipal limits.

TRAVANCORE-COCHIN STATE

Department of Statistics

ORIGIN-DESTINATION SURVEY

Name of Town Ward No. House No.
 Name of Head Principal source of family income income

Journey No.	Economic status of the person	Starting time	Origin	Destination	Conveyance	Waiting time	Time taken for journey	Cost of journey	Distance	
									Purpose	Actual	Direct
.....
.....
.....
.....
.....
.....

Date.....
 Day of the week.....

Signature of Investigator.

ORIGIN-DESTINATION SURVEY

Instructions to Investigators

1. *Object of the Survey:*—

This survey is intended to study the travelling habits of people in some selected towns. The nature of travelling habits is to be studied so as to plan roads and road-transport in the most rational way. To obtain information about how people travel, it is necessary to meet them and ask them details about the various trips they make. In this enquiry, households in the town will be selected at random and the members of the household will be questioned about the various trips they made.

2. *Selecting the house-holds:*—

The following tentative number of households are to be enumerated in the various towns:—

Nagercoil	750	Kottayam	350
Trivandrum	1300	Alwaye	200
Quilon	750	Ernakulam	500
Alleppey	900	Trichur	700

To select the households randomly, choose as many random numbers as $1/5$ of the total number of households to be enumerated, thus for Nagercoil, select 150 random numbers. With each number form a cluster by tacing two numbers below and two numbers above the selected number. Thus, if the random number is 2531, the households to be enumerated will have numbers 2529, 2530, 2531, 2532 and 2533. If any one of these numbers corresponds to a non-residential house, select the next house. In this way you will be able to obtain the required number of houses. The municipal list of houses or electoral rolls should be made use of for purposes of choosing the houses.

3. *Filling up the schedule:*—

Details regarding the location of the house visited have to be filled in first. This includes, name of the town, ward number and house number. Additional information on the name of the head of the household, the principal source of family income and the approximate annual income of the family have also to be entered in the space provided.

The tabular block is to gather details of the journeys made by members of the household during the day previous to the day of visit to the household. Even if a member of the household is absent when you visit the household, information about his or her journey during the previous day has to be entered.

The meaning of 'journey' is as follows:—

Mr. X takes his child to the school—that is one journey (No. 1). From there Mr. X goes to his office—that is another journey (No. 2). Mr. X goes home from office—that is another journey (No. 3). He goes to visit his friend and have a chat—that is another journey (No. 4). He goes from there to the cinema, either alone or with others—that is another journey (No. 5). He comes back straight home from the cinema—that is another journey (No. 6). Thus Mr. X during the course of the day made 6 journeys. Details of these journeys are to be filled in the block provided. After entering the details of the journeys of a person, start collecting details of the journeys of the next person in the household, making use of the remaining

space. If the columns provided in one form is not sufficient to enumerate all the members of the household, use additional forms and pin these together.

In column 1, write the serial number of the journeys. For each new person, start the numbers serially. In column 2, note down the economic status of the person making the journey by using the following code letters:—

Earners	E
Earning dependent	E.D.
Non-earning Dependent	N.E.D.

A person is defined as an 'earner' if such a person is able to maintain the existing standard of living with his earnings even if he stays alone. An *earning dependent* would be a person who earns something, but will not be able to maintain his present standard of living with his earnings. This would mean that even though the person earns something, he is depending to some extent on the earnings of some other member of the household. *Non-earning dependents* are those who are completely dependent on the household for their existence.

Origin and destination have to be noted down as specific locations.

Eg. Origin and destination may be—

- (1) an address, such as 'Secretariat, Trivandrum',
- (2) a junction, such as 'Statue junction',
- (3) a place, such as 'Cantonment, Trivandrum'.

Against each journey, origin and destination have to be described as one of these. Do not write, 'home', 'office' 'cinema' etc.; specify the address.

In the column for 'conveyance', against each journey, write the conveyance used. If a single journey is made by two or more types of conveyance, treat it as two or more different journeys and list them separately.

'Waiting time' refers to the period of waiting without travelling during the journey, in order to avail of conveyance. It should be expressed in hours and minutes.

'Time taken for the journey' should be the time interval between starting from the origin and reaching the destination, inclusive of waiting time. This should be expressed in hours and minutes.

'Cost of the journey' should refer to the actual cost of the journey and should not include incidental expenses like refreshment, charity given, etc. If cost cannot be ascertained exactly, give the best estimate. If paid on monthly basis give the monthly figures and write 'monthly'.

'Purpose' of the journey may be indicated by remarks like 'professional' or 'business', 'school', 'marketing', 'social' etc. Mark those journeys which are made every day regularly by a cross (X) in this column.

'Distance' must be shown as actual distance between origin and destination, i.e. the distance travelled by the informant. If no trips were made, write 'none' across the face of the form.

The date as well as the day referring to the journeys should be written in the space provided.

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