

PARKING IN MOUNT ROAD

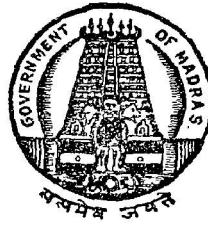
MADRAS

HIGHWAYS RESEARCH STATION

HIGHWAYS DE PARTMENT

226





RESEARCH NOTE 5

# PARKING IN MOUNT ROAD

U. D. C. No. 625.712.6 : 656.01

DECEMBER 1961  
HIGHWAYS RESEARCH STATION  
HIGHWAYS DEPARTMENT  
**MADRAS-25.**

THE HIGHWAYS RESEARCH STATION of the Department of Highways is a Government organisation for studying problems that arise in designing, building and maintaining roads and road structures of Madras State. The primary objectives of the work is to reduce overall costs of constructions and maintenance and to promote safety and comfort in travel through economical design based on research findings. The principal sections of study are (1) Soils, (2) Concrete and structures, (3) Bitumen and Aggregates, and (4) Traffic and Safety.

Advice on the conduct of the investigation is given by the Research Council, a committee of engineers from representative fields of study.

The facilities of the laboratory including a reference library, are available to road engineers and others who desire information. Visits can be arranged by prior appointment. Suggestions or correspondence regarding problems are welcome and may be addressed to the Director, Highways Research Station, Madras-25.

RESEARCH NOTE 5

# PARKING IN MOUNT ROAD

U. D. C. No. 625.712.6 : 656.01



DECEMBER 1961

HIGHWAYS RESEARCH STATION

HIGHWAYS DEPARTMENT

**MADRAS-25.**



This article was published as Paper 230  
of the Journal of Indian Roads  
Congress, Vol. XXVI-~~Part~~ 2.



## FOREWORD

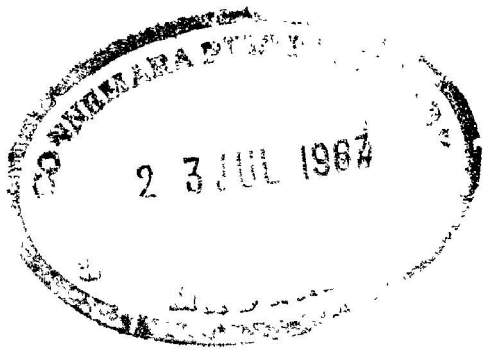
In Madras City, parking problem is acute on Mount Road which is situated in the heart of the city and is a fashionable shopping centre with show-houses, hotels and other recreational places. A portion of this road, is a heavily built-up area, is now proposed for improvement to provide 84 ft. wide carriageway, besides 8 ft. wide foot-paths on either side for pedestrians to accommodate the increased flow of traffic. In an effort to provide this width uniformly throughout the length, it has become necessary to prohibit curb parking in narrow portions and to provide off-street parking spaces. So a survey was conducted to evaluate parking requirements.

The survey was conducted to establish both quantity and character of potential demand of the parking facilities on this road and to meet that demand with economic justification. The survey also aimed at revealing the nature of parking habits. The survey revealed that about 72 per cent of the people park their cars for less than 20 minutes and only 5 per cent of the cars were parked for more than 60 minutes. Long time parking was generally adjacent to the area of important business. The parking facilities provided now by public and private buildings were generally found to be inadequate. The location of taxi stands, bus stops and cycle parking also needed a change.

Recommendations made include thirty minutes curb parking, restriction, marking of stalls and signing of regulations, relocation of taxi stands and bus stops, and enactment of zoning ordinance prescribing parking space provision for the various types of buildings besides amplification of the Motor Vehicles Act as regards method of parking and allied matters.

K. RAMASWAMY REDDY,  
*Director.*





## ACKNOWLEDGMENTS

The following persons of the Traffic Section of Highways Research Station participated in the investigation :—

1. Sri R. THILLAINAYAGAM,  
B.E., M.ASCE., A.M. INST. H.E., A.M.I.T.E., A.M.I.E.,  
Divisional Engineer (Traffic).
2. Sri R. SUBRAMANIAN, B.E., A.M.I.H.E.,  
Assistant Engineer (Traffic).
3. Sri P. S. SRIHARI, B.E.,  
Junior Engineer (Traffic).



## CONTENTS

	Page
FOREWORD	iii
1. Introduction	... 208
2. Growth of Madras City	... 208
3. Improvement of Major City Roads	... 209
4. Pilot scheme	... 209
5. Parking survey	... 210
6. Types of Parking Survey	... 210
7. Location	... 210
8. Time and Length of study	... 213
9. Personnel	... 213
10. Preliminary Training	... 213
11. Parking Inventory	... 214
12. Study of usage of Parking spaces	... 220
13. Cycle Parking	... 231
14. Analysis and Recommendations	... 232



## **“ PARKING IN MOUNT ROAD ”**

### **1. INTRODUCTION**

1.1. All roads are primarily dedicated to the purpose of public travel. Any other use must be considered of secondary importance. But mere movements do not accomplish the needs of transportation. Motor vehicles have no utility for their owners, unless it is possible to park them on reaching the destination.

1.2. Thus, while parking is not directly a part of the primary use to which streets are dedicated, it is nevertheless an important one. No reasonable private use of the road should be prohibited or restricted, unless public demands for more essential use become pressing. On this principle, parking should be permitted on all roads and streets for as long a period as it does not interfere with requirements of traffic movement.

1.3. Therefore, the curb parking problem involves primarily a study of the supply and demand for parking and for traffic movement and of the best possible balance between the two conflicting uses. Where curb parking is permitted, there is need for studying the most satisfactory regulation. Generally, the justifiable demand for additional parking must be provided by off-street lots or parking garages.

### **2. GROWTH OF MADRAS CITY**

2.1. Madras City, the capital of Madras State, is growing rapidly in area and population. During the recent years various industries have sprung up in and around Madras City. The Madras Harbour, the second largest port on the East Coast of India, is also

growing. Consequently, the traffic on the city roads have increased tremendously in recent years. But the improvements to roads have not kept pace with the increase in traffic. Although surface improvements were carried out, very little was done for the improvement of geometrics. A substantial mileage of city roads has thus become operationally unsafe. With the rapid increase of automobiles, the problem of accommodating and expediting the movement of fast moving vehicles along with the slow moving cycles, hand-drawn and animal-drawn vehicles has become more important. The existing narrow city roads have not met this demand satisfactorily.

### 3. IMPROVEMENT OF MAJOR CITY ROADS

3.1. Mount Road, Poonamallee High Road and Wall Tax Road are the three most important roads in Madras City, Plate I. These roads form link to National Highways within the city limits and connect the various industries located in and around Madras City. It is proposed to take up the improvements of these roads with a view to obtain smooth, safe and quick traffic movements. Mount Road, the fashionable shopping centre, is in the heart of the city. Improvement of a short length of Mount Road between Air India Office and Spencer & Co. has been taken up as a pilot scheme.

### 4. PILOT SCHEME

4.1. The existing width of the carriageway between Air India Office and Spencer & Co., excluding the footpaths, varies from 66 to 102 ft. The pilot scheme for the improvement of Mount Road envisages the widening of the carriageway beyond intersections to 84 ft uniformly to provide additional lanes for the movement of traffic. The 84 ft width of carriageway will consist of two lanes, 8 ft wide each, for cycle track, four lanes, 11 ft wide each, and two lanes, 12 ft wide, for fast moving traffic. Besides this, there will be 8 ft wide footpaths on either side of the carriageway. The traffic survey conducted on 27-7-1960 revealed that the cyclist traffic constituted nearly 50 per cent of the total traffic volume, Plate II. Hence it was decided to segregate the cyclists from the fast moving traffic and to keep them in separate lanes, all along the road and even at the intersections opposite to Wellington and Spencer & Co. At the intersections, the fast and slow moving vehicles are proposed to be sorted out separately into three lanes according to whether they want to turn left, right or go straight. The total width of the carriageway at the intersections will be 94 ft, 52 ft carriage width for the traffic entering the intersection and 42 ft carriage width for the traffic leaving the intersections, Figs. 1 and 2.



4.2. The principal function of streets and highways being the efficient movement of vehicles and pedestrians, curb parking in Mount Road will have to be prohibited in some narrow places to provide 84 ft wide carriageway to accommodate the increased volume of traffic, Plate III.

In order to assess the actual demand for parking in this area and to make necessary alternate provision for the curb spaces lost due to widening of the carriageway, a parking survey was conducted.

## 5. PARKING SURVEY

5.1. Parking survey is made to estimate accurately the extent of present parking at the curb and off the street, and to indicate where and how much additional parking space may be needed. Usually, curb parking is considered as reserved for the short time parker—one that requires an hour or less to conduct his business or shopping. Off-street parking is generally considered to be for the long time or all day parker.

## 6. TYPES OF PARKING SURVEY

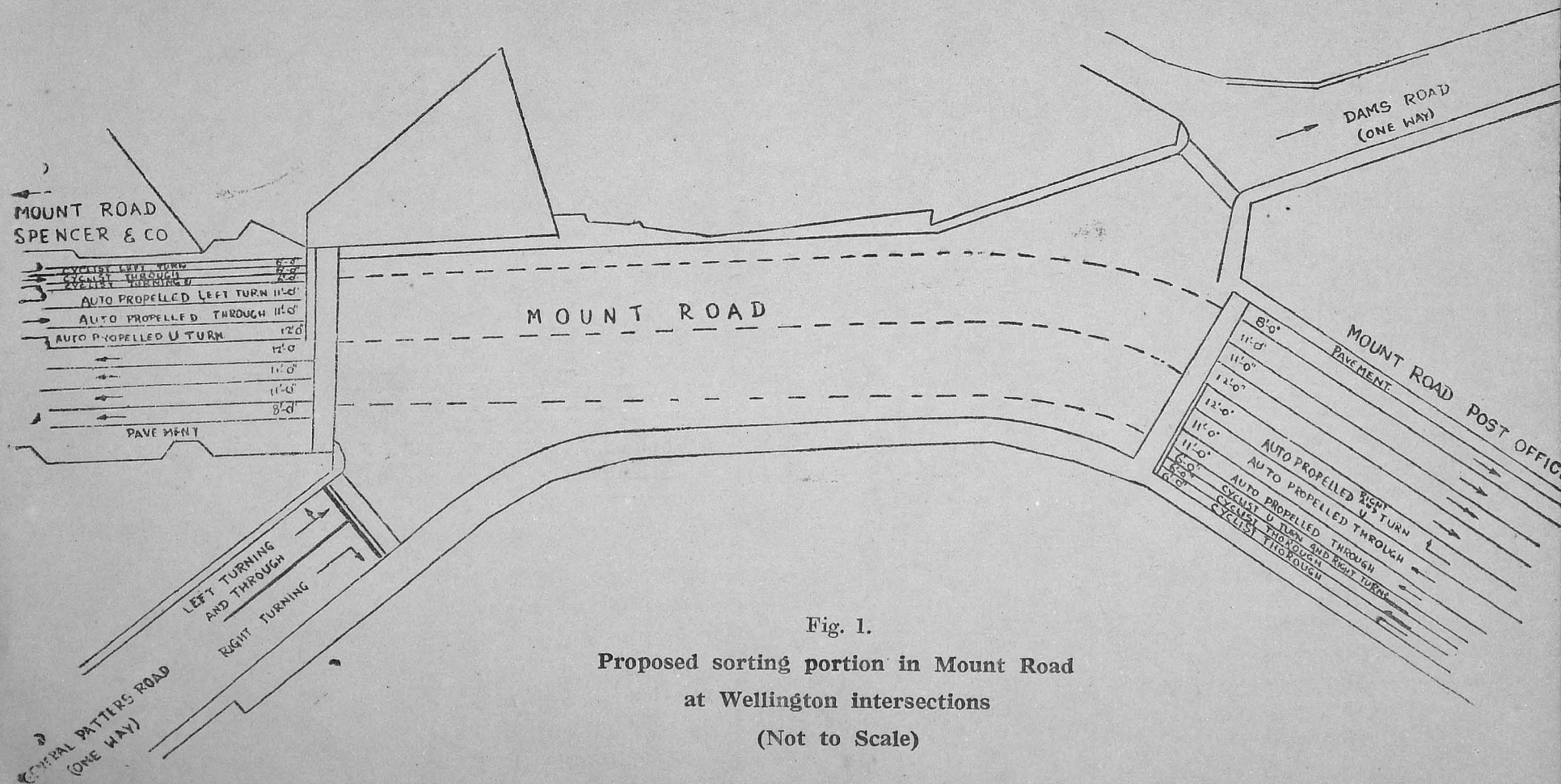
6.1. The following parking surveys were conducted :

- (a) Compilation of a parking inventory.
- (b) Study of usage of parking spaces.
- (c) Cycle parking.

## 7. LOCATION

7.1. The portion of Mount Road taken up for parking survey runs south-west from Fort St. George and is between Air India Office and Victoria Technical Institute. The following roads join Mount Road in the direction indicated against them :

Name of road	Direction
Dams Road	... West
General Patters Road	... East
Nellukara Veera Mudali Street (one-way street)	... East
Woods Road (one-way street)	... East
Club House Road (dead-end road)	... East
Binny's Road	... West
Patullos Road	... East





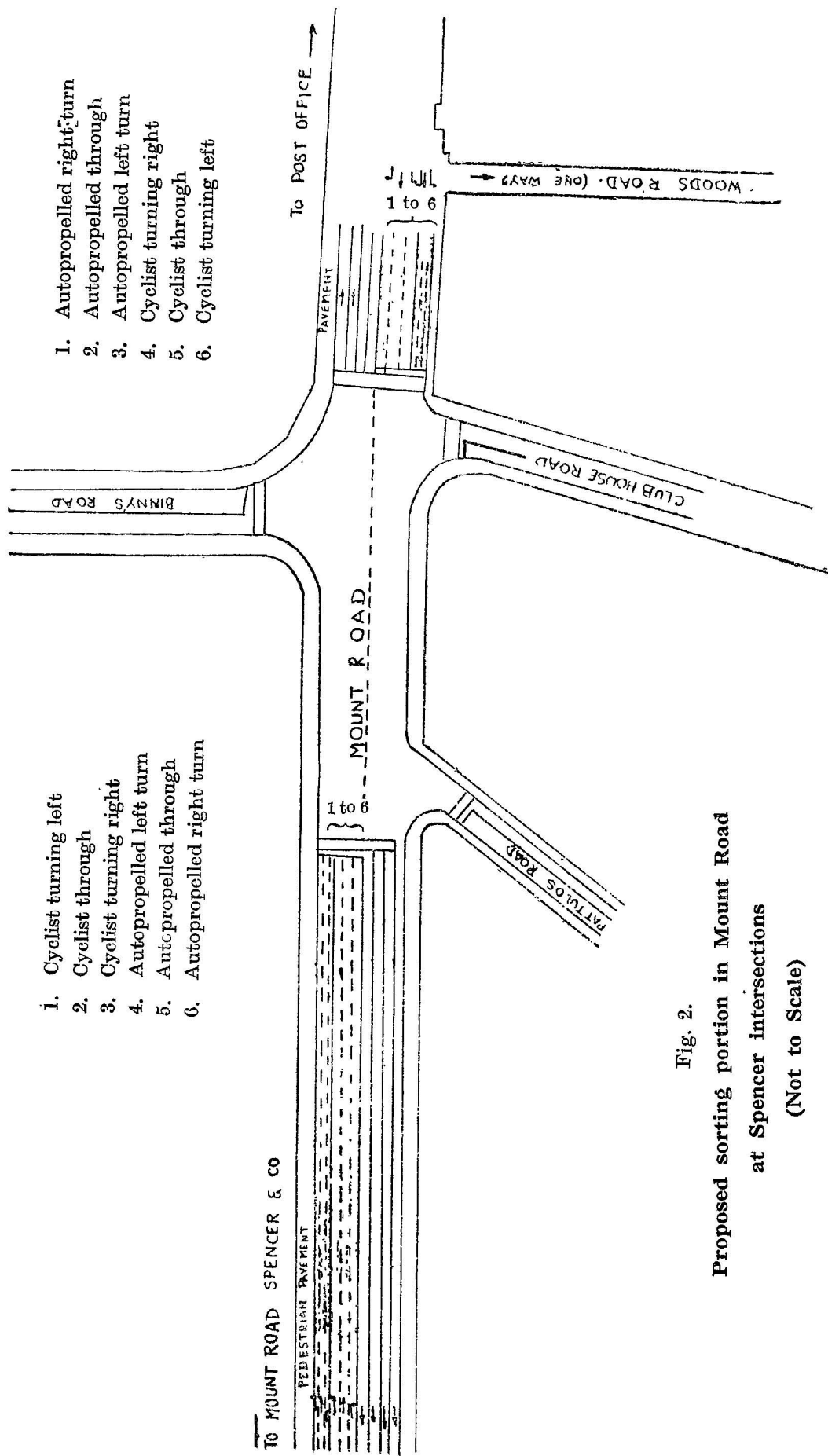


Fig. 2.

Proposed sorting portion in Mount Road  
at Spencer intersections  
(Not to Scale)

7.2. The parking survey also included portions of the above cross roads as far out as were commonly used for parking by the Mount Road traffic. For the purpose of the survey, Mount Road has been assumed to run north-south and all cross roads east-west.

## 8. TIME AND LENGTH OF STUDY

8.1. The normal practice is to take parking survey for a week. The parking survey taken for a week includes all the days in a week and any special days like Saturday—a half holiday and Sunday—a full holiday. Parking survey is taken for 12 hours between 7.00 a.m. to 7.00 p.m.

Such an elaborate survey was not considered necessary in the present case. Hence it was decided to conduct the survey during a normal working day when all the schools and colleges in the city were open. The parking survey was conducted on Tuesday, 11th October, 1960—a normal working day—from 8.00 a.m. to 12.00 noon and from 4.00 p.m. to 8.00 p.m. The hours of the survey were the same as those adopted for the traffic survey conducted on 27-7-1960.

8.2. The parking survey observations were done at every 10 minute interval. The cycle parking survey observations were done at every 30 minute interval.

## 9. PERSONNEL

9.1. The parking survey was planned, supervised and analysed by the Traffic section of the Highways Research Station, Madras, in co-operation with the Madras City Traffic Police and the Corporation of Madras.

9.2. The observers for the survey were Traffic Policemen, Photo 4. The traffic regulations on all the roads were also done by the Madras City Police.

## 10. PRELIMINARY TRAINING

10.1. Prior to the commencement of the parking survey, all the supervisory staff of the Madras City Police and the Highways Research Station were given detailed instructions as regards the

parking survey. The supervisory staff in turn gave detailed instructions to the Traffic Policemen.

## 11. PARKING INVENTORY

11.1. The parking inventory is the assembly of information about the location, extent, capacity, layout, type and operating characteristics of existing parking facilities, both at the curb and off-street.

### 11.2. Location

The parking inventory was taken in Mount Road between Air India Office and Victoria Technical Institute and all the cross roads branching from Mount Road between these limits as far out as commonly used for parking by the Mount Road traffic.

### 11.3. Procedure

Every curb face within the selected area was surveyed and inspected and using the curb inventory record form (Form 1), data was collected for every type of space indicated thereon. When the curb parking spaces were not marked, the number of spaces were determined by allowing 20 ft per space for parallel parking and from 8 ft to 16 ft per space for angle parking. In the case of centre street parking, such stalls were marked. All the parking stalls on the curb side and in the centre of the road were marked by means of white paint lines 4 inches wide. The parking spaces in the various roads were divided into 23 sections and each parking stall in a section was given a serial number for easy identification, Photo 1.

In addition to this, an inventory of the existing private parking lot and garages available in this area was also compiled using the off-street parking facility inventory form (Form 2).

### 11.4. Results

The total curb footage and its break-up for Mount Road between Air India Office and Victoria Technical Institute and other branch roads are shown in Table 1.

### 11.5. Parking Spaces

The curb side parking spaces available on Mount Road (from Air India Office to Victoria Technical Institute) and other branch

TABLE 1  
Showing the breakdown of the curb footage in various roads

	Mount Road		General Patters Road		Nellukara Mudali st.		Club House Road		Patullos Road		Binny's Road		Dams Road		Woods Road		Total	
	Feet	Per cent	Feet	Per cent	Feet	Per cent	Feet	Per cent	Feet	Per cent	Feet	Per cent	Feet	Per cent	Feet	Per cent	Feet	Per cent
Parking	2,581	30.8	1,810	46.7	228	35.3	573	55.6	—	—	—	—	—	—	—	—	5,192	24.5
Taxi stands	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bus stops	668	8.2	229	5.9	—	—	—	—	35	1.4	150	8.1	—	—	—	—	1,102	5.2
Petrol bunks	646	7.7	82	2.1	—	—	—	—	—	—	—	—	—	—	—	—	728	3.4
Alleys and driveways	927	11.1	312	8.0	22	3.4	94	9.1	338	13.1	90	4.9	100	6.6	82	6.0	1,965	9.2
Corner clearance	1,485	17.7	252	6.5	44	6.8	363	35.3	—	—	229	12.4	—	—	—	—	2,373	11.2
No parking	2,048	24.5	1,195	30.8	352	54.5	—	—	2,199	85.5	1,375	74.6	1,420	93.4	1,277	94	9,866	46.5
Total	8,355	—	3,880	—	646	—	1,030	—	2,572	—	1,844	—	1,520	—	1,359	—	21,226	—



roads are shown in Table 2.

**TABLE 2**  
**Showing curb side parking spaces available on various roads**

Sl. No.	Name of road	Side of curb	No. of parking spaces						Remarks
			Parallel Angle				Total		
			No.	Feet	No.	Feet	No.	Feet	
1.	Mount Road	East	34	612	124	889	158*	1,501	* 14 parking spaces opposite to L.I.C. are not on curb but on footpath
		West	54	1,080	—	—	54	1,080	
2.	General Patters Road	North	29	580	—	—	29	580	
		South	58	1,090	10	140	68	1,230	
3.	Nellukara Veera Mudali Street	North	10	180	—	—	10	180	
		South	—	—	6	48	6	48	
4.	Club House Road	North	20	359	—	—	20	359	
		South	12	214	—	—	12	214	

### 11.6. Taxi Stands

There are three taxi stands on Mount Road (from Air India Office to Victoria Technical Institute) as shown in Table 3.

**TABLE 3**  
**Showing the location of the taxi stands on Mount Road**

Sl. No.	Name of road	Side of curb	Location	Capacity		Remarks
				No.	Feet	
1.	Mount Road	West	Opposite to Mount Road Post Office	4	—	The taxi stands are located on the pedestrian footpaths
2.	Do.	East	Opposite to Cosmopolitan Club	12	—	Do.
3.	Do.	West	Opposite to Govt. Arts College	8	—	Do.

**11.7. Bus Stops**

There are ten bus stops on Mount Road (from Air India Office to Victoria Technical Institute) and seven in other branch roads as shown in Table 4.

**TABLE 4**  
**Showing the location of bus stops on various roads**

Serial No.	Name of road	Side	Location	City or mofussil	Curb length occupied in feet	Remarks
1.	Mount Road	East	Opposite to Kashmir Emporium	City or mofussil	129	
2.	Do.	„	Opposite to Bharat Insurance Co.,	„	10	
3.	Do.	„	Opposite to V.S.T. & Co.	„	50	
4.	Do.	„	Opposite to D-2 Police Station	City	44	
5.	Do.	West	Opposite to Spencers	„	39	
6.	Do.	„	Opposite to Government Arts College	City or mofussil	50	
7.	Do.	„	Opposite to Industries Emporium	„	56	
8.	Do.	„	Opposite to Tarapore & Co.	City	67	
9.	Do.	„	Opposite to Dhuns Building	Mofussil	40	
10.	Do.	„	Opposite to Old Post Office building	City	109	
11.	General Patters Road	North	Opposite to Globe Theatre (rear side)	„	69	
12.	Do.	„	Opposite to Midland Theatre	„	50	
13.	Do.	South	Opposite to Byranjung street	„	60	
14.	Do.	„	Opposite to Bharat Buildings	„	50	
15.	Patullos Road	South	Opposite to Good Year & Co.	„	35	
16.	Binny's Road	North	Opposite to Govt. Arts College	„	75	
17.	Do.	South	Opposite to Hotel Connemara	„	75	

**11.8. Petrol Bunks and Service Stations**

There are six petrol bunks and service stations on Mount Road (from Air India Office to Victoria Technical Institute) and one on

General Patters Road as shown in Table 5.

**TABLE 5**  
**Showing the location of petrol bunks and**  
**service stations on various roads**

Serial No.	Name of road	Side	Location	Name of company	Curb length in feet
1.	Mount Road	East	Adjoining Cosmopolitan Club	Caltex	86
2.	Do.	„	Adjoining Irani Hotel	Standard Vacuum	74
3.	Do.	„	Adjoining Globe Theatre	Burmah-Shell	98
4.	Do.	„	Adjoining George Oakes	Do.	138
5.	Do.	„	Adjoining the above bank	Stanvac	100
6.	Do.	„	Adjoining Victoria Technical Institute	Caltex	150
7.	General Patters Road	North	Adjoining Baba Arts near Woods Road	Do.	82

### 11.9. Corner Clearance

The corner clearance on Mount Road given at the various intersections by the posting of 'No Parking' sign is as shown in Table 6.

**TABLE 6**  
**Showing the corner clearance on Mount Road**

Serial No.	Name of intersection	Name of road	Side	Clearance in feet
1.	Intersection of Mount Road and General Patters Road	Mount Road	East	91
2.	Do.	„	„	154
3.	Intersection of Mount Road and Club House Road	„	„	86
4.	Intersection of Mount Road and Patullos Road	„	„	62
5.	Intersection of Mount Road and Binny's Road	„	West	150
6.	Do.	„	„	183
7.	Intersection of Mount Road and Dams Road	„	„	400
8.	Intersection of Mount Road and Blackers Road	„	„	359

**11.10. No Parking Zone**

In the following places, parking restrictions have been posted in addition to the prohibition at the corner of intersections on the various roads as given in Table 7 :

**TABLE 7**

**Showing the footage of the 'No parking zones' on various roads**

Sl. No.	Name of road	'No Parking' zone (feet)
1.	Mount Road	2,048
2.	General Patters Road	1,195
3.	Nellukara Veera Mudali Street	352
4.	Woods Road	1,277
5.	Club House Road	—
6.	Patullos Road	2,199
7.	Binny's Road	1,375
8.	Dams Road	1,420

**11.11. Centre Parking**

Centre parking is provided in Mount Road alone at two places as shown in Table 8. (Photos 2 and 3.)

**TABLE 8**

**Showing the location of centre parking on Mount Road**

Sl. No.	Name of road	Location of centre parking	No. of spaces			Particulars
			Angle	Parallel	Total	
1.	Mount Road	Opp. to Buhari	16	—	16	
2.	Do.	Opp. to Bata Shoe Co.	9	—	9	30-minute parking zone



### 11.12. Off-street Parking

No public 'off-street parking' is provided in this area. Only private parking to serve the employees and customers in the various public and private buildings has been provided. The details of the available garages and parking spaces in some buildings are given in Table 9.

TABLE 9

Showing the details of private parking in some buildings

Sl. No.	Name of road	Owner of building	No. of garages	No. of parking spaces with aisles	No. of parking space closely packed	Remarks
1.	Mount Road	L. I. C.	11	Nil	Nil	
2.	Do.	Tarapore & Co., Dhun Building	6	—	—	About 40 cars are found parked inside

## 12. STUDY OF USAGE OF PARKING SPACES

12.1. Perhaps the most valuable information is the supply of and demand for parking space in each block of the Central business zone. Presented both in map form and figures, these findings show clearly the areas of congestion and surplus space and permit a quantitative evaluation of deficiencies.

### 12.2. Procedure

The curb face in Mount Road from Air India Office to Victoria Technical Institute and other branch roads was divided into 23 sections. The maximum number of parking stalls in a section was 35. Each curb face and each lot was toured by an observer every ten minutes from 8.00 a.m. to 12.00 noon and from 4.00 p.m. to 8.00 p.m. Each observer was assigned no more space than could be covered in ten minutes including his return to the starting point. The parking usage study form (Form 3) was used for this purpose. Depending upon the number of parking spaces, one or more sheets were used for each curb face. The parking usage form had previously added to it in the title space, the date, the day of the week, the time of observation to which the form related and a des-

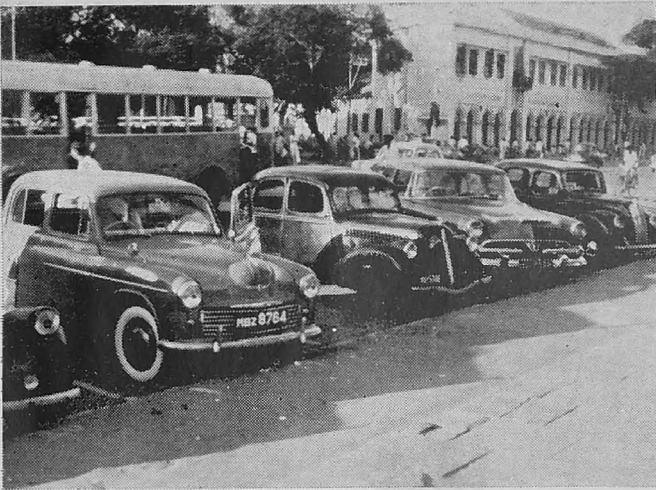


Photo 1

Parking stalls  
numbered for easy  
identification

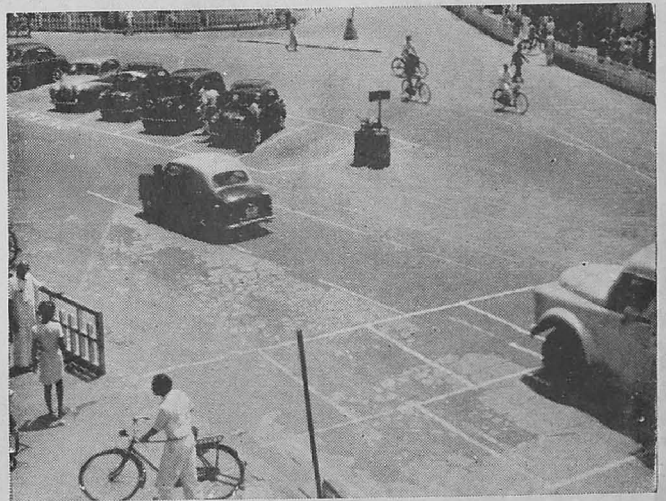


Photo 2

Centre parking in  
Mount Road opposite  
to Bata Shoe  
Company



Photo 3

Centre parking in  
Mount Road opposite  
to Buhari





Photo 4

**Observer (traffic policemen) recording  
the number of cars parked in stalls**



Photo 5

**Parallel parking interferes least with  
movement of traffic—parallel parking  
in General Patters Road**







Photo 6

**Vehicles parked on footpath  
in no parking zone**



Photo 7

**Cycles parked on the pedestrian footpath  
reducing the usable width of footpath  
and causing obstruction to the movement  
of pedestrians**





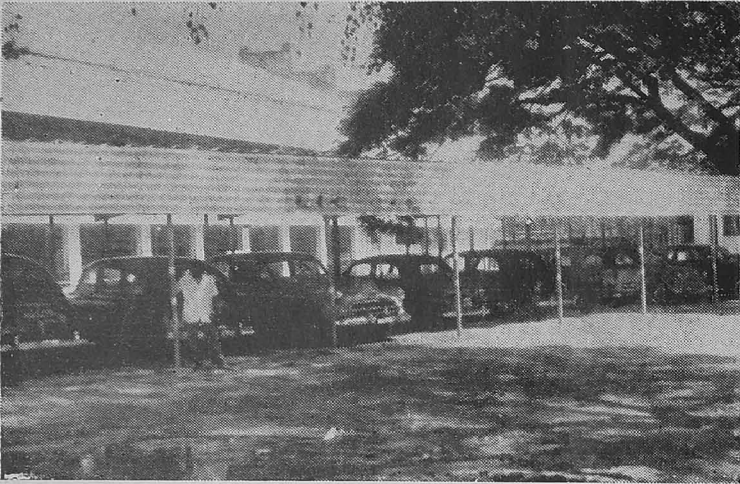


Photo 8

**Parking garages (11 Nos.) provided for  
the Life Insurance Corporation building at  
Mount Road with a floor area of  
89,000 sq. ft.**

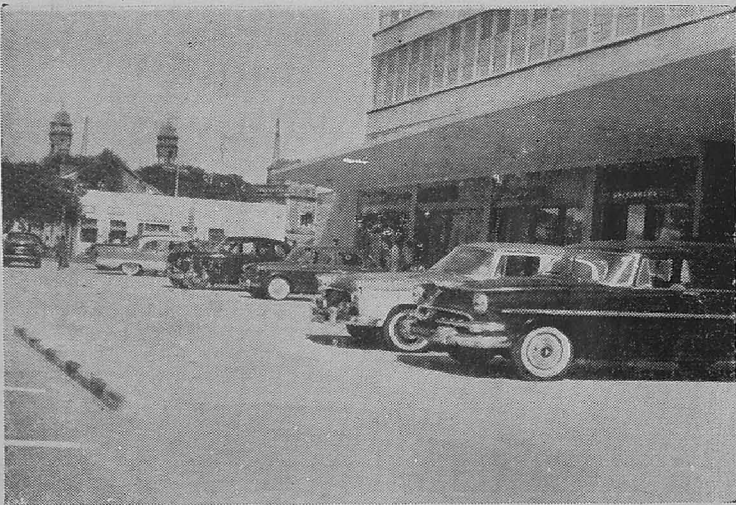


Photo 9

**Informal parking space (14 Nos.) opposite  
to Life Insurance Corporation building  
at Mount Road. The occupancy rate at  
this place is very high**

cription of the location. One form for each section of the curb face and for every hour was used. Before commencement of the survey, the prevailing weather condition and the name of the observer was also recorded in the form.

The first tour by the observer was started at about 7.50 a.m. since it involved gathering of more details and required upto 20 minutes. On the first tour, the observers recorded every car or truck parked at the curb, whether in a legal space or elsewhere. The form provides one line for each legal space and one or more lines for each of the various restricted spaces that may be present. The line opposite the point where each vehicle was found was used. An exception to this was when vehicles were parked double or in informal spaces. These were recorded in the extra lines provided in the page. An informal space is any space not at the curb and not in an established lot or garage or an irregular and temporary space such as on a sidewalk, lawn or front yard, etc.

On the first tour (beginning at 7.50 a.m.) the registered number of all the vehicles present were recorded in the first column (headed 8 a.m.). All the registration numbers of commercial vehicles were underlined (5349) to distinguish them from other vehicles. In the case of motor cycles and scooters, the letter 'S' was noted.

The first tour—requiring 20 minutes—was completed before 8.10 a.m. All the subsequent tours, one every ten minutes, were started from the same point and following the same path as the 7.50 a.m. tour.

On each subsequent tour using the appropriate column, a check mark (✓) was made for each vehicle found on the preceding tour and was still present; for each new vehicle, the registered number was recorded. The record concerning any vehicle or vacancy on each tour was as seen by the observer at the moment he passed the space. No allowance for what was seen just before or just after passing the space was made. Registered numbers were recorded only to permit an estimate of the demand in terms of time.

### 12.3. Results

The length of time parked by the vehicles in Mount Road is given in Fig. 3 and Table 10.

The accumulation of vehicles at the curb and centre of street parking in Mount Road, General Patters Road and all the other roads together in this area during the period between 8.00 a.m. and 12.00 noon and from 4.00 p.m. to 8.00 p.m. are given in Figs. 4, 5 and 6, and Tables 11 and 12.

TABLE 10

## Length of time vehicles parked on Mount Road

		No. of vehicles parking for								
		0-10 minutes	10-20 minutes	20-30 minutes	30-40 minutes	40-50 minutes	50-60 minutes	1-2 hours	2-3 hours	3-4 hours
V.T.I. to Binny's Road	A.M.	31	11	4	4	1	—	2	—	—
	P.M.	12	6	5	—	—	1	—	—	—
Binny's Road Junction to M.E.S. Road	A.M.	25	9	5	2	—	—	2	1	—
	P.M.	28	9	7	—	—	2	1	—	1
M.E.S. Road Junction to Industries Emporium	A.M.	34	30	6	7	4	4	5	2	1
	P.M.	28	23	8	4	2	4	7	5	—
Industries Emporium to Dams Road	A.M.	5	5	2	3	3	1	—	—	1
	P.M.	14	3	3	1	—	—	1	1	1
Dams Road to P.M.G.'s Office	A.M.	37	30	1	3	—	—	—	—	—
	P.M.	54	26	12	3	—	—	—	—	1
P.M.G.'s Office to Blackers Road Jn.	A.M.	8	10	3	7	—	4	3	1	—
	P.M.	23	12	10	9	4	1	1	—	—
Central Parking opp. to Buhari	A.M.	44	30	7	8	2	—	3	—	—
	P.M.	43	29	21	5	2	5	7	2	—
Central Parking opp. to Bata	A.M.	38	19	11	7	3	1	1	—	—
	P.M.	31	22	8	8	3	2	3	—	—
Air India Office to My Coffee Bar	A.M.	38	14	9	2	4	3	1	1	—
	P.M.	43	17	8	3	3	3	3	—	—
My Coffee Bar to General Patters Road Jn.	A.M.	27	15	6	1	2	2	2	—	—
	P.M.	45	23	7	4	—	3	3	1	—
General Patters Road to State Bank Road	A.M.	32	36	20	9	9	6	3	1	1
	P.M.	48	36	8	6	4	3	2	1	—
State Bank Road to Union Company	A.M.	29	15	3	5	1	—	2	1	—
	P.M.	32	11	4	2	2	—	4	—	—
Union Company to Woods Road	A.M.	40	12	10	4	1	1	5	2	—
	P.M.	41	16	9	3	2	1	2	3	1
Woods Road to Club House Road Jn.	A.M.	12	8	2	1	—	4	1	5	1
	P.M.	12	7	8	2	2	1	4	—	—
Club House Road to Patullos Road	A.M.	14	9	2	2	3	1	2	5	—
	P.M.	13	5	3	1	1	—	5	1	—
Patullos Road Junction to George Oakes	A.M.	25	14	3	2	1	2	1	1	—
	P.M.	14	16	4	3	1	—	2	2	—
Total	A.M.	439	277	94	67	34	29	33	20	4
	P.M.	481	261	125	54	26	26	45	16	4

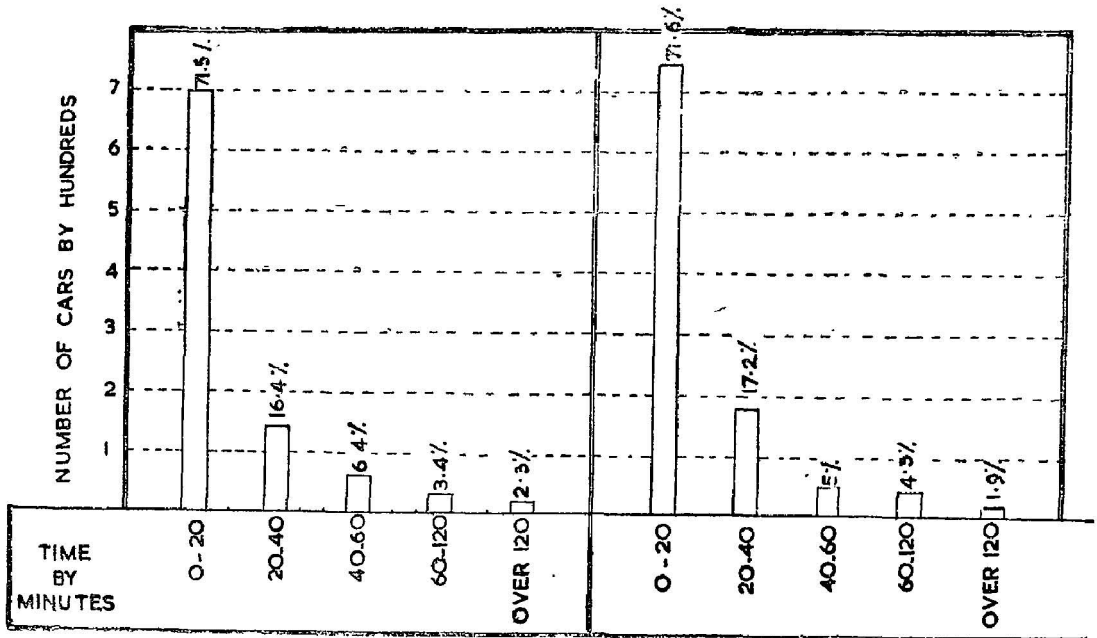


Fig. 3. Length of time parked on Mount Road normal week day  
8 a.m.—12 noon 11th October, 1960 4 p.m.—8 p.m.

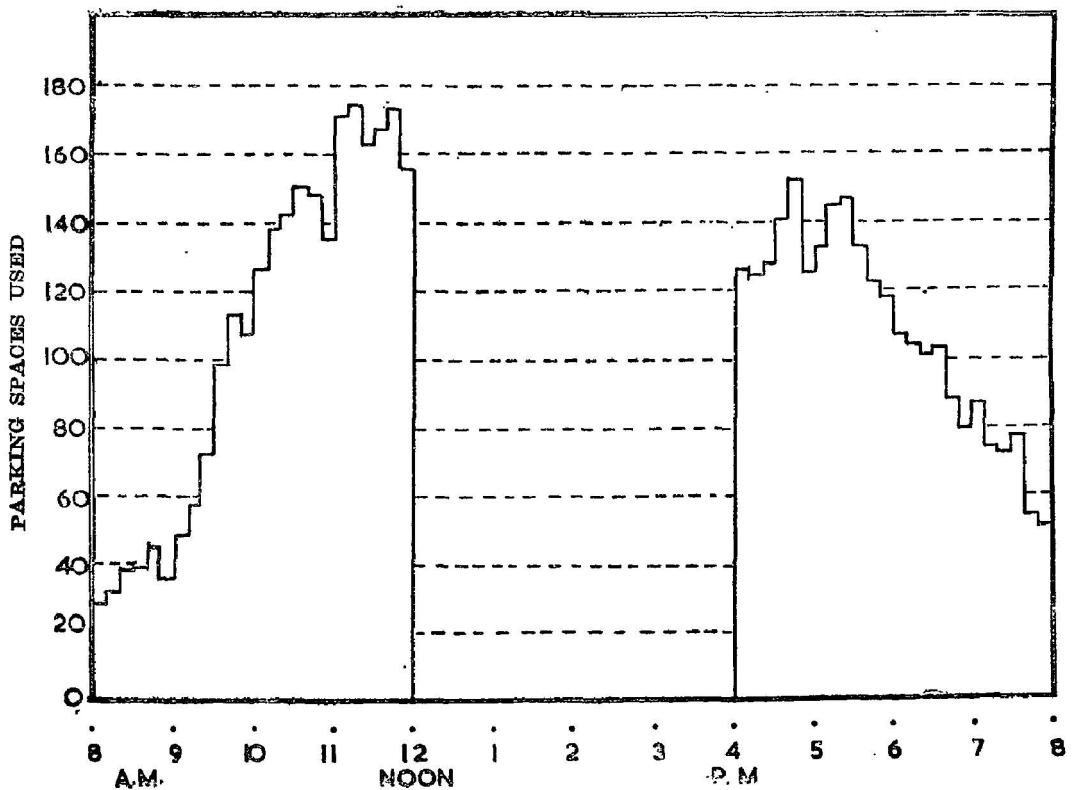


Fig. 4. Curbside parking on Mount Road  
Movements and Accumulation by 10 Minute Periods.  
Normal Week Day, 11th October, 1960. Total parking spaces  
available 237



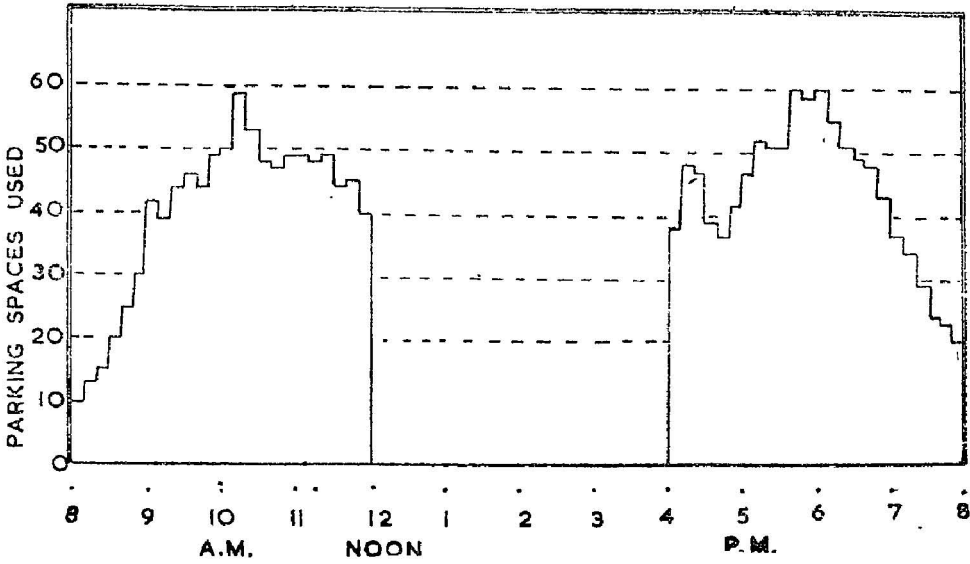


Fig. 5. Street parking in General Patters Road  
Movement and Accumulation by 10 Minute Periods  
Normal Week Day, 11th October, 1960.

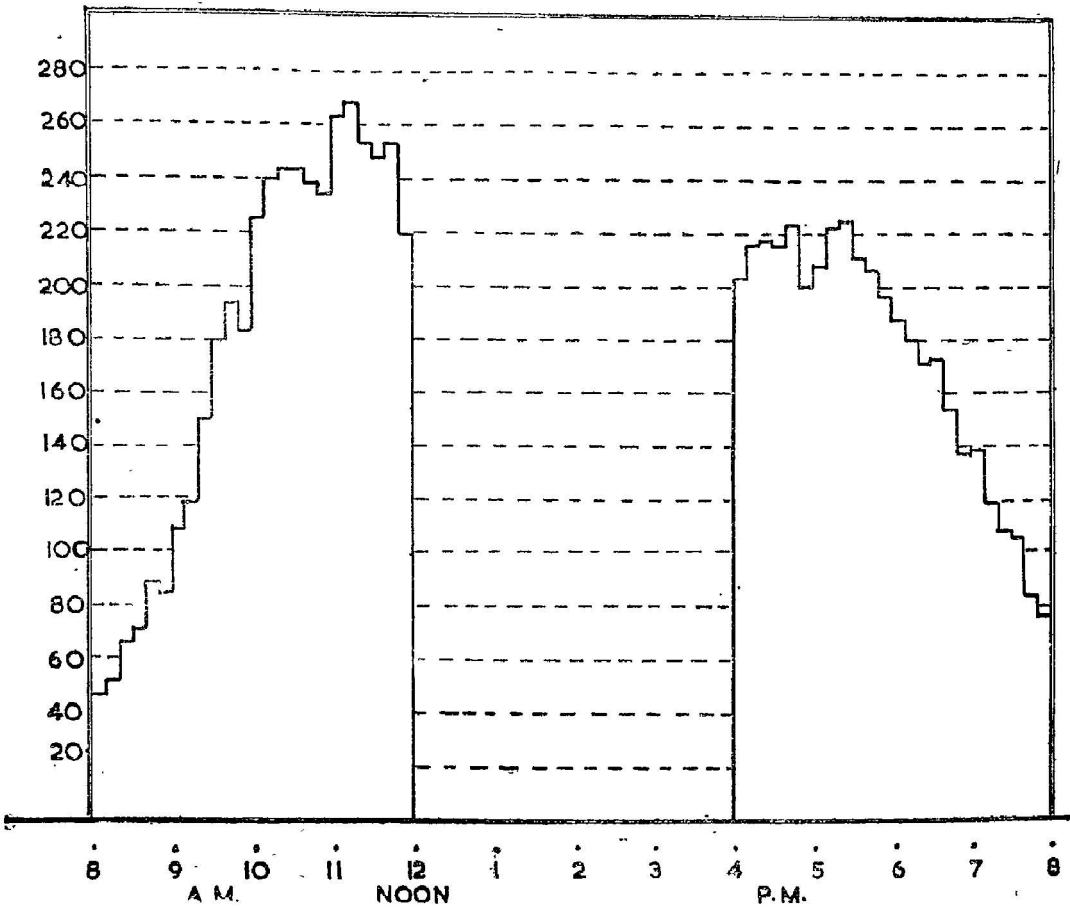


Fig. 6. Curb parking on Mount Road and Branch Roads



TABLE 11

Statement showing accumulation of vehicles on Mount Road

Mount Road	8.10	8.20	8.30	8.40	8.50	9.00	9.10	9.20	9.30	9.40	9.50	10.00	10.10	10.20	10.30	10.40	10.50	11.00	11.10	11.20	11.30	11.40	11.50	12.00	4.10	4.20	4.30	4.40	4.50	5.00	5.10	5.20	5.30	5.40	5.50	6.00	6.10	6.20	6.30	6.40	6.50	7.00	7.10	7.20	7.30	7.40	7.50	8.00	Total No. of parking stalls		
WESTERN SIDE :																																																			
From V.T.I. to Binny's Road	1	1	2	—	—	1	3	2	1	3	4	6	6	9	8	10	7	5	10	10	9	4	6	4	4	4	4	5	4	3	4	7	6	3	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	
Binny's Road Jn. to M.E.S. Road	—	—	2	2	2	1	2	4	5	4	4	4	5	6	6	5	6	4	5	5	5	6	8	5	4	3	3	3	5	4	6	6	8	6	4	7	4	4	5	3	3	1	3	5	5	4	4	3	13		
M.E.S. Road Jn. to Industries Emporium	4	3	4	2	4	3	3	3	5	8	13	15	15	18	19	17	19	17	17	20	16	14	17	14	12	14	14	15	15	19	21	17	17	17	17	13	14	14	10	12	11	8	2	2	3	4	3	3	35		
Industries Emp. to Dams Road	—	—	—	1	1	1	1	2	2	2	4	3	3	3	3	2	6	6	6	6	6	6	6	4	5	4	2	6	3	4	3	3	3	3	4	3	3	3	3	4	4	3	2	3	3	3	3	3	61		
Dams Road to P.M.G.'s Office	—	—	—	—	—	—	1	2	—	1	2	1	4	1	3	8	7	4	8	13	6	6	9	3	5	7	6	5	12	5	7	4	8	7	9	2	9	11	9	3	5	2	8	6	10	8	2	2	—		
P.M.G.'s Office to Blackers Road Junction	1	1	1	2	3	—	—	—	1	4	7	4	6	5	7	7	7	7	11	7	12	13	13	11	7	7	9	10	8	4	8	9	11	4	4	3	9	8	6	10	2	2	7	9	7	3	1	1	—		
Central Parking opp. to Buhari	4	4	5	5	3	4	5	4	6	10	8	6	5	6	8	7	10	10	14	14	11	14	14	14	11	14	12	12	15	14	15	14	14	15	14	14	14	13	12	14	14	13	14	15	14	13	12	12	16		
Central Parking opp. to Bata	4	6	6	5	4	6	7	7	8	8	8	6	6	6	6	7	9	8	9	8	8	8	7	8	9	8	9	9	8	8	8	9	9	8	7	7	7	8	8	8	8	8	8	8	7	7	8	4	6	9	
EASTERN SIDE :																																																			
Air India Office to My. Coffee Bar	2	2	3	3	7	2	4	6	5	9	8	6	6	8	9	11	11	6	9	10	10	11	11	10	9	7	8	10	7	5	4	6	10	7	8	11	8	8	7	10	7	7	6	7	4	7	6	7	14		
My Coffee Bar to General Patters Road	3	4	4	6	3	1	5	7	5	6	6	6	9	6	5	6	5	2	6	5	6	5	5	5	3	5	7	9	11	9	7	8	7	12	9	14	8	5	6	9	10	12	10	6	4	8	5	8	20		
General Patters Road to State Bank Road	1	1	1	1	1	1	2	2	5	10	10	11	17	22	24	23	22	18	24	28	29	26	29	26	18	18	18	19	19	13	10	11	9	10	8	11	10	7	12	11	8	8	6	4	3	7	5	1	14*		
State Bank Road to Union & Co.	1	—	1	1	2	2	5	3	6	6	9	8	6	9	6	7	4	5	5	7	7	9	9	7	5	5	4	10	6	6	8	6	7	9	6	6	3	3	4	6	3	3	6	3	2	1	3	3	28		
Union & Co. to Woods Road	—	1	2	2	6	5	4	5	6	7	6	8	14	14	14	11	11	15	19	17	13	13	13	15	9	7	8	6	10	11	7	17	16	19	15	13	11	12	13	7	6	6	6	2	3	3	3	1	35		
Woods Road to Club House Road Junction	4	6	4	4	3	4	4	6	10	11	13	12	14	12	11	8	9	11	10	9	8	9	9	7	9	6	9	10	11	8	10	10	8	7	8	7	3	1	—	—	1	1	2	—	—	2	—	—	15		
Club House Road Junction to Patullos Road	—	—	1	2	2	1	1	1	3	4	5	7	7	8	10	10	9	10	12	11	10	14	12	11	11	9	9	7	12	8	7	7	4	—	1	1	—	—	—	1	2	1	2	1	2	2	2	1	—		
Patullos Road Junction to George Oakes	3	2	2	3	4	3	1	3	4	5	6	6	3	3	3	11	6	7	6	4	7	10	5	5	5	6	6	5	6	4	8	11	9	6	7	6	4	6	6	5	4	4	4	4	5	4	1	—	32		
Total	28	31	38	39	45	35	48	57	72	98	111	109	124	136	142	150	148	135	171	174	163	168	173	148	126	124	128	141	152	125	133	145	144	133	122	118	107	104	101	103	88	79	87	74	72	77	54	51	237		

\*Informal parking





THILLAIKAYAGAM AND SRIHARI ON PARKING IN MOUNT ROAD

TABLE 12  
Accumulation of vehicles on various branch roads

Name of road	8.10	8.20	8.30	8.40	8.50	9.00	9.10	9.20	9.30	9.40	9.50	10.00	10.10	10.20	10.30	10.40	10.50	11.00	11.10	11.20	11.30	11.40	11.50	12.00	4.10	4.20	4.30	4.40	4.50	5.00	5.10	5.20	5.30	5.40	5.50	6.00	6.10	6.20	6.30	6.40	6.50	7.00	7.10	7.20	7.30	7.40	7.50	8.00	Total No. of parking stalls	
Patullos Road on both sides	1	1	4	3	3	6	7	9	12	12	16	9	16	16	17	15	14	13	12	10	11	8	10	9	11	13	13	15	16	13	9	8	9	10	7	7	6	6	7	5	6	6	2	2	1	1	2	2	—	
Binny's Road on both sides	1	1	2	2	6	5	1	1	4	—	2	—	4	—	2	1	1	1	—	5	3	1	1	1	1	6	5	2	4	3	5	3	2	3	1	—	—	2	—	—	—	—	—	—	—	—	—	—		
Club House Road on both sides	3	2	2	2	3	2	2	5	8	8	7	9	13	16	16	14	13	14	16	16	16	14	15	10	11	9	10	8	7	9	9	8	8	4	4	5	8	7	7	7	7	5	3	5	3	3	1	1	1	32
State Bank Road south side	4	4	6	5	6	6	9	7	10	15	12	9	11	11	14	16	16	16	16	15	11	13	10	11	16	16	14	11	8	8	5	7	9	11	13	7	7	6	5	9	7	6	8	5	3	3	4	2	16	
Irani Hotel north side to Woods Road	2	4	6	6	7	9	8	9	10	7	8	12	11	10	10	10	9	7	8	9	9	7	10	6	7	7	5	5	6	5	5	9	11	10	9	13	14	14	14	12	11	11	10	9	9	9	8	8	29	
Woods Road Jn. to Irani Hotel	2	—	—	6	7	3	13	6	10	10	9	9	10	14	13	8	9	12	12	9	9	10	9	9	14	18	15	13	11	13	17	18	14	18	24	19	24	20	18	18	19	17	13	13	10	10	12	10	35	
Irani Hotel to Mount Road	6	9	9	8	11	18	21	24	24	29	27	28	29	30	30	30	29	30	29	30	31	27	26	25	17	23	27	21	20	24	25	25	26	23	27	27	22	21	19	19	18	15	14	12	10	5	3	2	33	
Total	19	21	29	32	43	49	61	61	78	81	81	76	94	97	102	94	91	93	93	94	90	80	81	72	77	89	89	75	72	75	75	78	79	79	85	78	81	76	70	70	67	58	52	45	36	29	30	25	145	

### 13. CYCLE PARKING

13.1. The accumulation of cycle parking on footpaths opposite to various buildings was noted.

#### 13.2. Location

This study was restricted to Mount Road between Air India Office and Victoria Technical Institute and General Patters Road.

#### 13.3. Time and Length of Study

The cycle parking survey was conducted between 8.00 a.m. and 12.00 noon and from 4.00 p.m. to 8.00 p.m. The cycle accumulation during every 30 minutes was noted.

#### 13.4. Procedure

Mount Road between Air India Office and Victoria Technical Institute was divided into 5 sections and the General Patters Road into one section. The length of each section was such that an observer was able to cover it easily in 30 minutes including his return to the starting point. Each section of the road was toured by an observer every 30 minutes. The cycle parking accumulation study form provided had previously added to it in the title space, the date, the day of the week, the time of observation to which the form related and a description of the location. One form for each section of the road was used. Before commencement of the survey, the prevailing weather condition and the name of the observer was recorded in the form.

The first tour by the observer was started at about 7.50 a.m. since it involved gathering of more details and required 40 minutes. On the first tour, the observer noted the name of the building in column 1 (Form 4) and the number of cycles parked opposite to this building in column 2 (headed 8.00 a.m.). On each subsequent tour, the number of cycles parked opposite to these buildings was noted in columns 3 to 9 headed 8.30 a.m. etc., and so on. No allowance for what was seen just before or just after passing the building was made. The number of cycles was recorded only to permit an estimate of the demand of parking spaces for cycles.

#### 13.5. Results

The accumulation of cycles in Mount Road during the period between 8.00 a.m. and 12.00 noon and from 4.00 p.m. and 8.00 p.m. is given in Fig. 7.

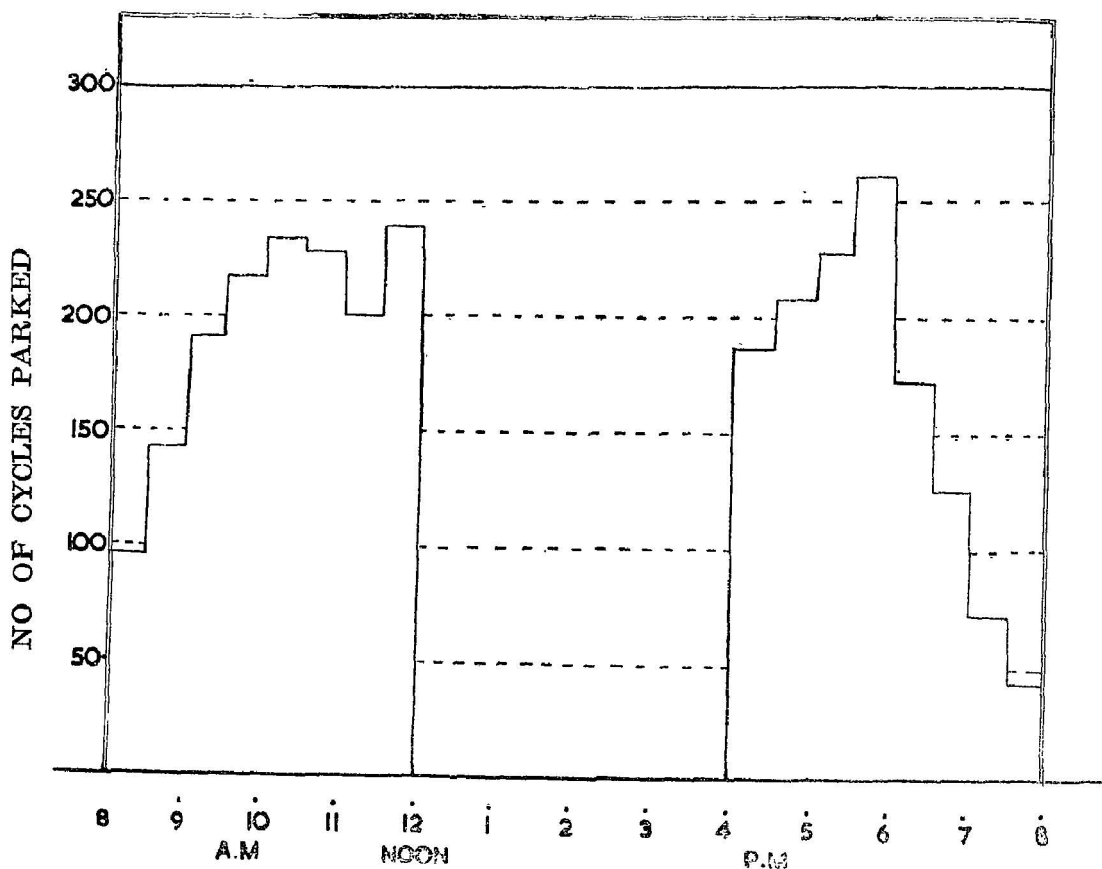


Fig. 7. Cycles Parked on Mount Road Movement and Accumulation by 30 Minute Periods Normal working Day 11th October, 1960.

## 14. ANALYSIS AND RECOMMENDATIONS

### 14.1. Curb Parking

14.1.1. In Mount Road, there are 237 spaces for parking. The maximum demand in Mount Road as observed during the survey was for 174 parking spaces, Table 11. By the proposed improvement to Mount Road as provided in the pilot scheme, the parking spaces will get reduced to 100 spaces, Plate IV. Hence alternate arrangements will have to be made for the provision of curb parking or off-street parking to the extent of 74 vehicle spaces. This provision can meet only the present needs. Considering the rapid rate at which the automobile traffic is increasing, the demand for parking may rise to 100 per cent within the next 5 years. Hence it is necessary even now to foresee the future requirements and make adequate provisions. Assuming a 100 per cent increase, the total parking demand will be about 348 vehicle spaces.

14.1.2. It is suggested that the parking demand may be met by :

- (a) Restricting the parking time on the curb side in Mount Road to 30 minutes. The traffic survey revealed, Fig. 3, that 72 per cent of the parkers required only about 20 minutes. The long time parkers were generally found opposite to business establishments. It is presumed that they may be employees working in such establishments. The restriction of 30 minutes is proposed to induce the establishments located along Mount Road to make adequate provision themselves for parking for their employees within their own premises.
- (b) Provision of curb side parking in the following branch roads :
  - (i) Club House Road 26 parking spaces
  - (ii) Binny's Road 20 parking spaces.
- (c) provision of off-street parking in the following places :
  - (i) Open space in front of Cosmopolitan Club, Mount Road 15 parking spaces
  - (ii) River margin adjoining the Coom river in Dams Road 40 parking spaces
  - (iii) Open space in Government Arts College, Mount Road 25 parking spaces.

14.1.3. In General Patters Road (between Mount Road junction to Woods Road junction), there are 29 spaces on the north side and 68 spaces on the south. The maximum demand in this street is for 60 spaces. In the pilot scheme, it is proposed to make General Patters Road a one-way road, allowing only entry of traffic from General Patters Road into Mount Road. This arrangement makes available two lanes of 11 ft each for fast moving traffic and two lanes of 8 ft each for cyclist traffic and one parking lane of 8 ft. It is proposed to allow parallel parking on the southern side of General Patters Road, besides accommodating the bus stops. This arrangement provides for 68 parking spaces as against the maximum demand for 60 parking spaces.

14.1.4. At present, the vehicles are parked in a disorderly manner along the curb, some vehicles parking parallel and some vehicles parking at an angle. The parallel parking, Photo 5, interferes the least with the movements of traffic as compared to angle parking, Figs. 8 and 9. Where there are 'No Parking' restrictions the vehicles are parked on the footpath, Photo 6, causing great inconvenience to the pedestrians. In some places, the vehicles are



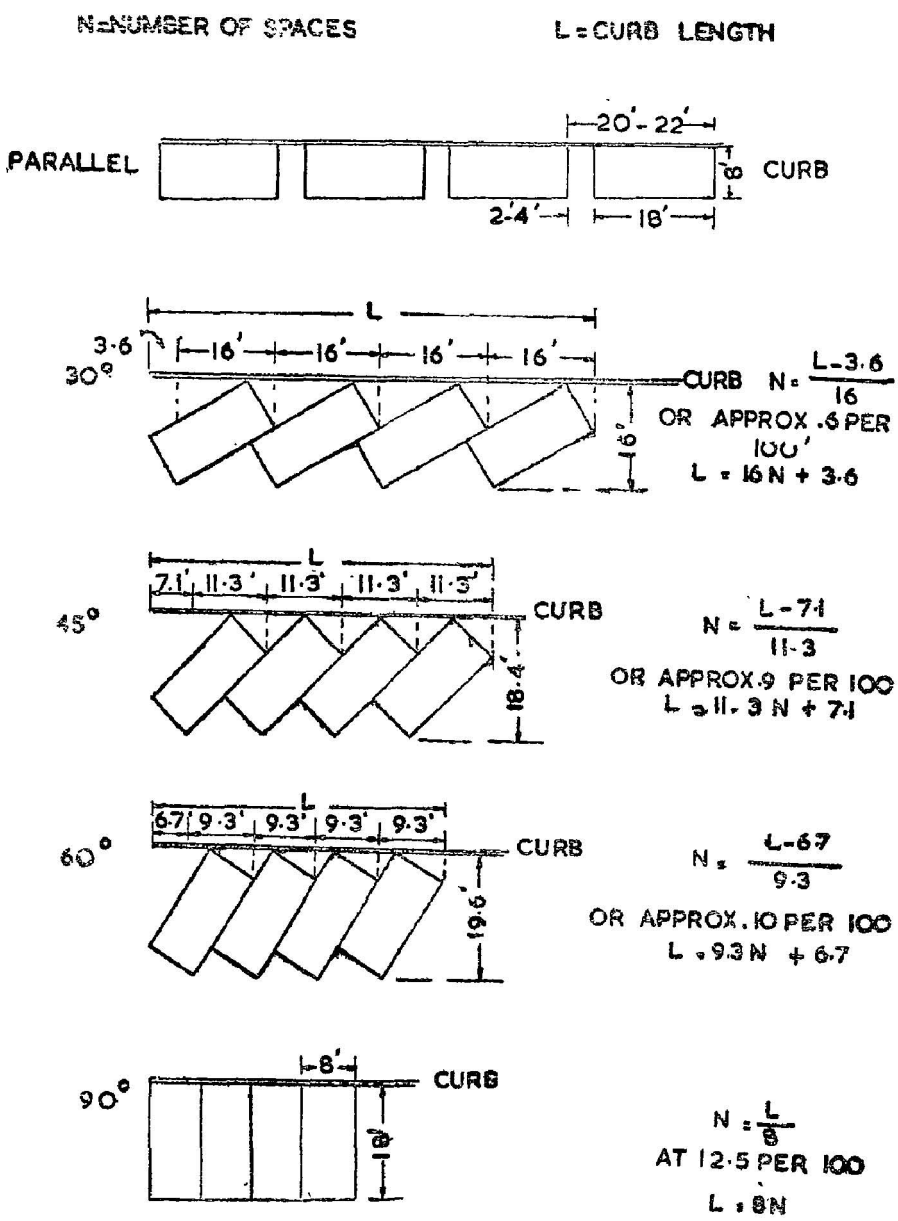


Fig. 8. Angle parking

parked across the pedestrian cross-walks also. Section 81 of the Motor Vehicles Act reads “No person in charge of a motor vehicle shall cause or allow the vehicle or any trailer to remain at rest on any road in such a position or in such a condition or in such circumstances as to cause or be likely to cause danger, obstruction or undue inconvenience to other users of the road”.

The above provision in the Motor Vehicles Act is not adequate and specific. Hence it is suggested that a law should be enacted prohibiting stopping, standing or parking of vehicles, on a sidewalk, within an intersection, on a cross-walk, or upon any bridge. Parking of any vehicle for the purpose of displaying such vehicles for

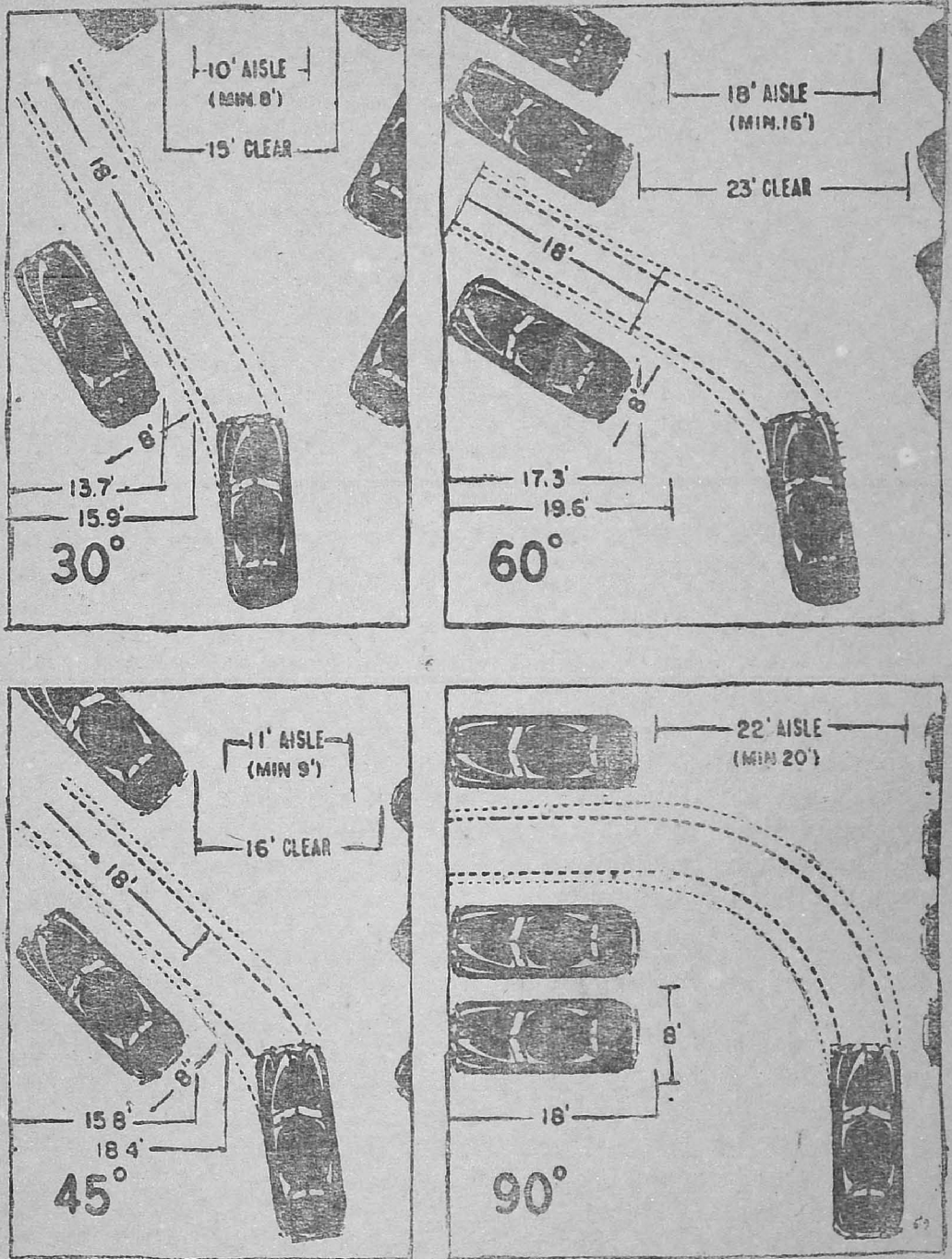


Fig. 9. Space and aisle requirements for parking at various angles

sale, or for washing, greasing and or repairing such vehicles, except for repairs necessitated by an emergency, should also be prohibited. No person should be allowed to park a vehicle on a roadway other than parallel with the edge of the roadway, headed in the direction of lawful traffic and with the left-hand wheels of the vehicle within 18 inches of the curb or the edge of the roadway except where angle parking has been indicated. In this connection, Articles XIII, XIV and XVI of Model Traffic Ordinance issued by the Public Roads

Administration, Federal Works Agency, U.S.A., as modified, Annexure I, are suggested for adoption.

### 14.2. Cycle Parking

At present cycles are being parked at 90° to the direction of curb on the pedestrian footpath, Photo 7, causing great inconvenience to the pedestrian movement. Consequent on the widening of the roadway to provide for additional traffic lanes, the footpath widths in many of the places have been reduced to 8 ft. On account of the presence of window displays, etc., attracting pedestrians, a footpath width of 3 to 4 ft is also lost for the movement of pedestrians. Hence it is necessary that the pavement parking of cycles on the footpath should be prohibited. In this connection it is also suggested that betel shops and other petty transactions causing obstruction to pedestrians should be located away so as to cause least obstruction to pedestrian movement.

Sufficient attention has not been given to the provision of parking places for pedal cycles while their riders go about their business. Cycles left stationary, often precariously, at the curb side or against a wall or fence, obstruct vehicular and pedestrian traffic and may be a source of danger. For this reason, as also to minimise risk of theft or damages, consideration should be given to the allocation of site equipped with stands or racks, preferably protected from the weather. Such sites may be found in open spaces adjoining shops and other business premises.

### 14.3. Private Parking

The analysis showed that the parking arrangements provided for the employees and to customers in public buildings, private buildings and theatres located in Mount Road, are woefully inadequate. The newly constructed Postmaster-General's Office is an instance where no parking facilities are provided for the public coming to transact business. So much so vehicles are forced to park on the footpath (where curb parking is prohibited, Photo 6).

The recently constructed L.I.C. Building with a floor area of 89,000 sq. ft. makes provision for only 11 garages for the employee parking, Photo 8. No provision has been made for the parking of customers. At present there are 14 informal vehicle spaces opposite to L.I.C. (Photo 9) and the present occupancy rate is very high. The above instances show that it is necessary to enact zoning ordinances enforcing the provision of off-street parking facilities whenever a new or substantially altered building is provided. In this connection, the parking spaces prescribed for the various buildings in other countries

are given in Annexure 2. Similar zoning regulations are worthy of adoption in big cities like Madras.

#### 14.4. Taxi Stands

The taxi stands are at present located on the pedestrian foot-paths. Consequent upon the widening of Mount Road these have to be located away from the road. It is suggested that the taxi stands may be located in the following places in Mount Road by acquiring the required land, Table 13.

TABLE 13

Showing the proposed location of taxi stands

Sl. No.	Location of taxi stand	No. of taxis that can be accommodated	Approximate area required sq. ft.	Remarks
1.	Opposite to Kashmir Arts Emporium	19	3,800	
2.	Corner of Tarapore & Co.	10	2,000	
3.	Opposite to Arts College	22	4,400	

#### 14.5. Bus Stops

The bus loading zone lengths recommended by the American Transit Association are given in Table 14. These standard lengths have been adopted in Mount Road.

TABLE 14

Showing the standard bus loading zones specified by American Transit Association

Approximate bus seating capacity	One-bus stop			Two-bus stop		
	Near side	Far side	Mid block	Near side	Far side	Mid block
25 & less	60	50	85	90	80	115
30	70	50	95	100	80	125
35	75	55	100	110	90	135
40 — 45	80	60	105	120	100	145

It is recommended that the bus stops may be located in the places shown in Table 15 on Mount Road.

**TABLE 15**  
**Showing the proposed location of bus stops**

Sl. No.	Name of street	Side	Location	City or mofussil	Length of zone (ft)
1.	Mount Road	East	Opp. to Kashmir Arts Emperium	City or mofussil	135
2.	"	"	Opp. to Bharat Buildings	"	145
3.	"	"	Opp. to V.S.T. & Co.	City	145
4.	"	West	Opp. to Govt. Arts College	"	145
5.	"	"	Opp. to Reliance Motor Company	City or mofussil	145
6.	"	"	Opp. to Tarapore & Co.	"	125

At present there are four bus stops on General Patters Road as shown in Table 4. By the conversion of General Patters Road into one-way road, the existing two bus stops on the northern side will cease to function. Hence provision has to be made for the bus stops on the southern side only, opposite to Byranjung street and opposite to Bharat Buildings. It is proposed to provide one bus stop to accommodate two buses opposite to Byranjung street. The bus stop opposite to Bharat Buildings will be removed as it is close to the intersection.

#### 14.6. Petrol Bunks and Service Stations

There are six petrol bunks and service stations on Mount Road (between Blackers Road junction to Victoria Technical Institute) causing interruption to traffic by the vehicles entering and leaving the petrol bunks and service stations. The number of bunks and service stations may be gradually reduced by the stoppage of renewal of licences and by prohibiting the opening of new bunks and service stations.

#### 14.7. Driveways

Driveways and alleys constitute about 11 per cent of the curb spaces. Entrances and exits from Mount Road to adjoining properties

are allowed indiscriminately adding to the traffic hazard. The entrances and exits have not also been properly designed to suit the vehicles using them with the result these vehicles have to cut across other traffic lanes to make an entry into or exit from the adjoining properties. Hence it is recommended that the entries and exits from Mount Road should be limited and properly designed.

#### 14.8. Parking Signs

'No Parking Zone' has to be indicated by means of 'No Parking' signs as specified in the IXth Schedule (item No. 3) under Mandatory signs, Fig. 10, of the Motor Vehicles Act. To this sign, a plate is added indicating the time during which parking is

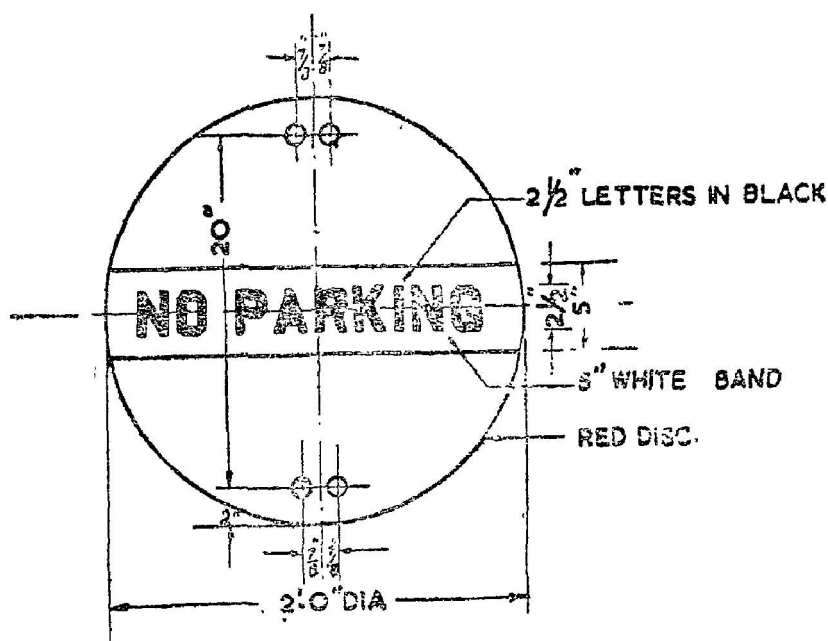
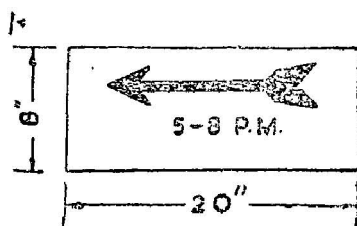


Fig. 10. Parking sign



BACKGROUND WHITE—ARROW BLACK

*Note:* Arrow may point in either direction. Space below arrow to indicate times during which parking is prohibited if necessary. Letters and figures to be 2 in. high.

To be used in conjunction with Sign No. A-5.

Fig. 10-A. Special parking sign



prohibited. In addition, there is also a single or double headed arrow to indicate the direction in which the regulation is in effect, Fig. 10-A. The arrows are also added to the main sign (Photo 6). The period during which parking is prohibited is, however, not indicated.

It is suggested that the time during which parking is prohibited may also be noted and parking sign, Fig. 11, standardised for uniform adoption. Where parking is permitted for a restricted time or during certain hours, special signs as shown in Fig. 12 may be posted.

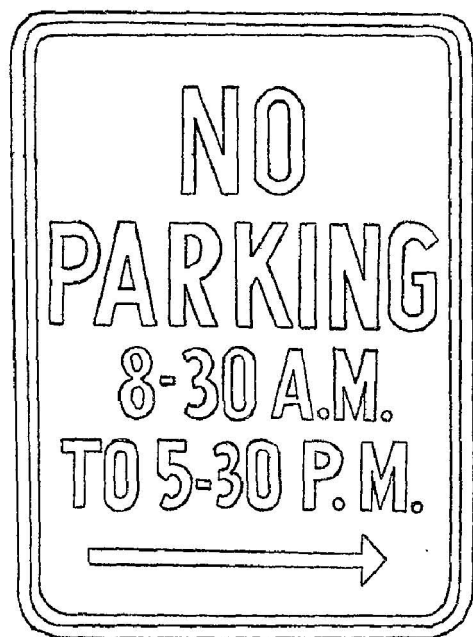


Fig. 11.

Size 12 in.  $\times$  18 in.  
Background white letters  
red

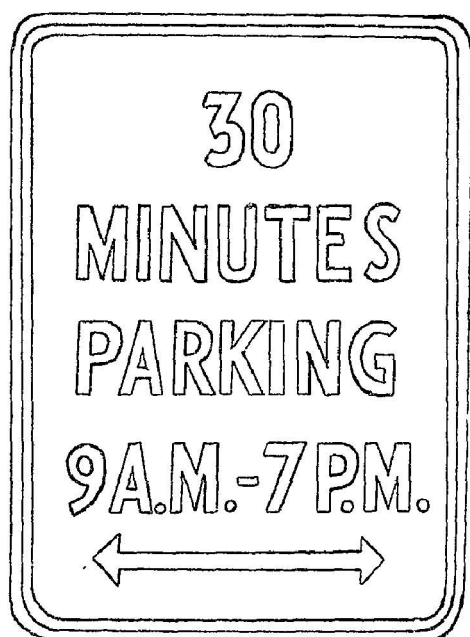


Fig. 12.

Size 12 in.  $\times$  18 in.  
Background white letters  
red

Parking sign in residence and business districts may be mounted not less than 7 ft nor more than 10 ft above the top of the curb, and with no part of the sign less than 1 foot away from the face of the curb. They may be set at an angle of not less than  $30^\circ$  nor more than  $45^\circ$  with a line parallel to the flow of traffic so as to be visible to approaching traffic, Fig. 13. Where the zone is longer than 200 ft, signs showing a double arrow will be needed at intermediate points within the zone at intervals not exceeding 200 ft.

#### 14.9. Curb Markings for Parking Restrictions

Curb marking may be used to show where parking is prohibited at all times. The curb marking may be of solid yellow colour covering the face and top of the curb. Curb markings are recom-

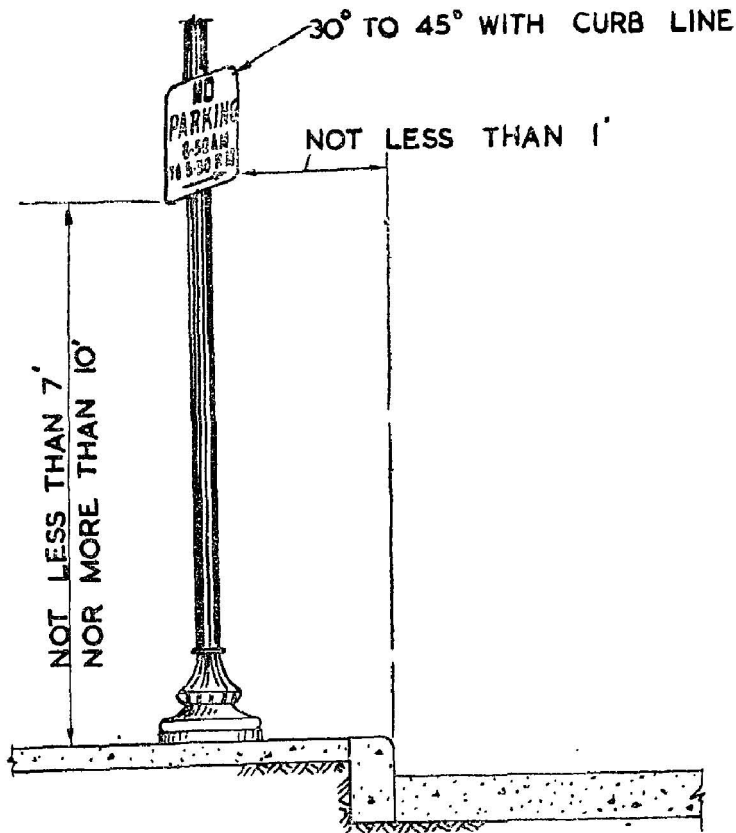


Fig. 13.

#### Height and lateral location of parking sign

mended only to show that parking is prohibited at all times. Other restrictions should be shown by standard parking signs.

#### 14.10. Marking Parking Stalls

Parking stalls outlined or indicated on the pavement or curb are valuable in promoting orderly parking.

Parallel parking limits may be indicated on the pavement by lines marked perpendicular to the curb and extending into the roadway. The width required by a parked vehicle is usually 8 ft. The zone may be divided into stalls by the use of lines perpendicular to the curb and so spaced that each stall is long enough to accommodate one parked vehicle (usually 20 to 22 ft). In this case, a short line (4 ft long) parallel to the curb may be placed at the end of each stall line indicating the outside boundary of the parking zone, Fig. 14.

Angle parking is generally not desirable though occasionally it may be justified, as for example, on an unusually wide pave-

ment. Where angle parking is permitted, the marking of lines to indicate the limits of the stall enables all drivers to park at the same angle with a minimum of waste space, Fig. 14.

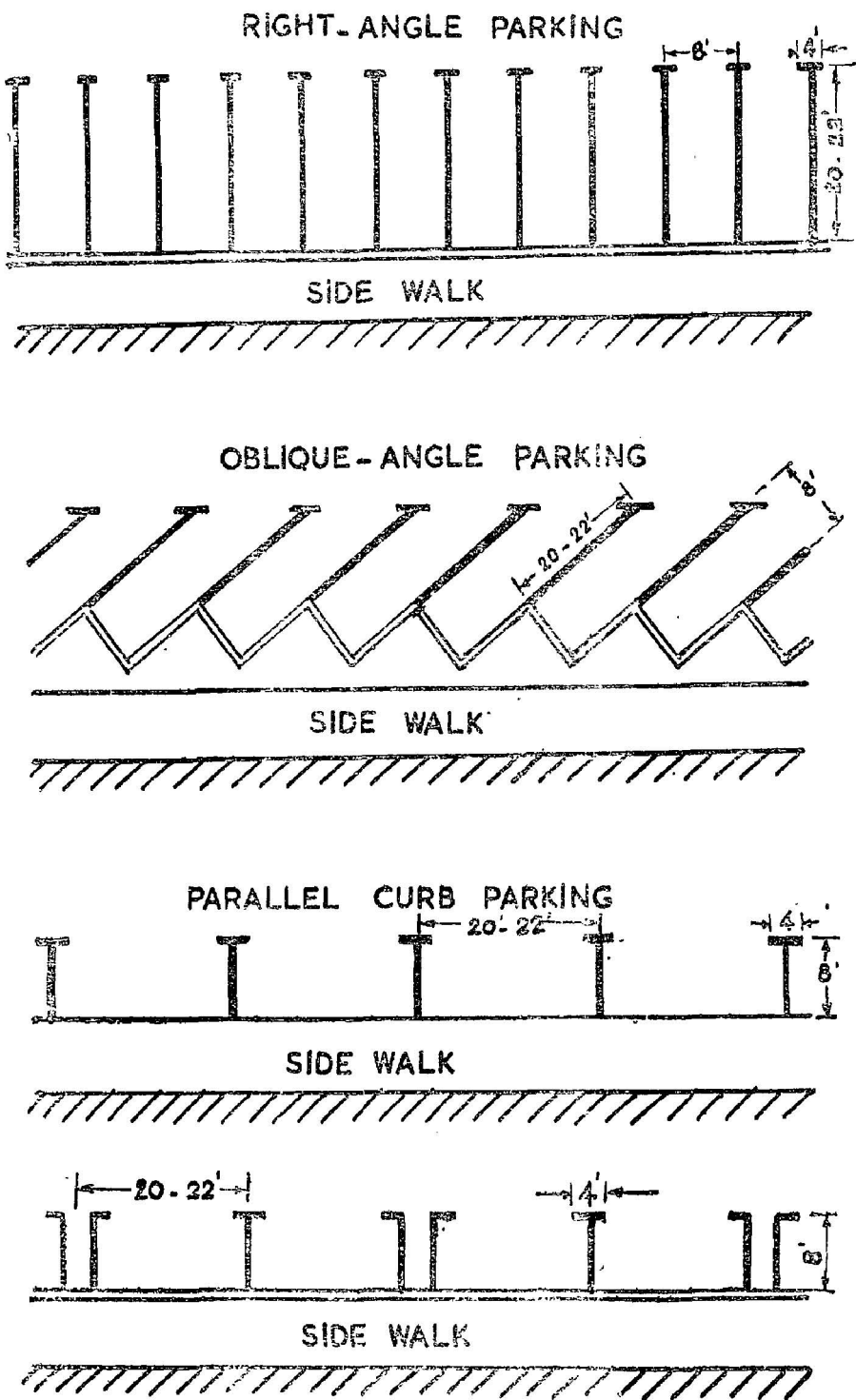


Fig. 14.  
Lines indicating parking space limits

All lines for parking spaces may be solid white lines 4 in. wide. The parking stall dimension given is between the centre of the width of the white lines.

14.11. The parking problem is not new. It has been with us and grown in many localities since the rapid rise in automobile use. Faced with rising vehicular traffic and unprecedented needs for off-street parking, merchants and business organizations together with local authorities have in many cities been intensively surveying the situation and studying possible remedies. A limit must be set to the time a vehicle is allowed to wait on the carriage-way while its occupants do business in adjacent premises. Generally the length of this period will not be less than ten or more than thirty minutes. It is, therefore, recommended that curb side parking may be limited to 30 minutes and cars which are required to remain stationary for a longer period should be left in car parks.

14.12. The Corporation should make available in the public car parks sufficient space to meet the whole of the probable demand. This is especially so in Mount Road, where the nature of the development prevents the majority of private enterprises from making provisions within boundaries of their sites. The distribution of car parks should be carefully considered. Motor car owners wish to park their cars as near their destinations as is possible. For this reason, a greater number of small parks is preferable to a few large ones. Car parks may conveniently be combined with service stations and public conveniences. The shape of the site has an obvious bearing on the layout of a car park. It is found that in general the *aisles* take up rather more than one-third of the space available for parking and together with approach roads, account for approximately 45 per cent of the site. Some savings can be made if big cars are segregated, but it will be found that with the open access system, a gross area approaching 200 sq. ft. should be allowed for each car, if due allowance is made for access roads, irregularities in manoeuvring and opening of doors. Four alternate layouts for surface car parks are suggested in Fig. 15.

14.13. A distinction should be made between short time parkers, like shoppers, visitors to offices, etc., and long time parkers. Short time parkers generally need to be closer to their destinations and they can afford to pay the high cost of parking facilities in business areas where the use of high-priced land is involved. Therefore, small parking units for short time parkers may be scattered throughout the business areas or immediately adjacent to them. All-day parking facilities, on the other hand, may be located on less expensive land on the fringe of the business area and since proximity to destination is less important, the units may be of much greater capacity.

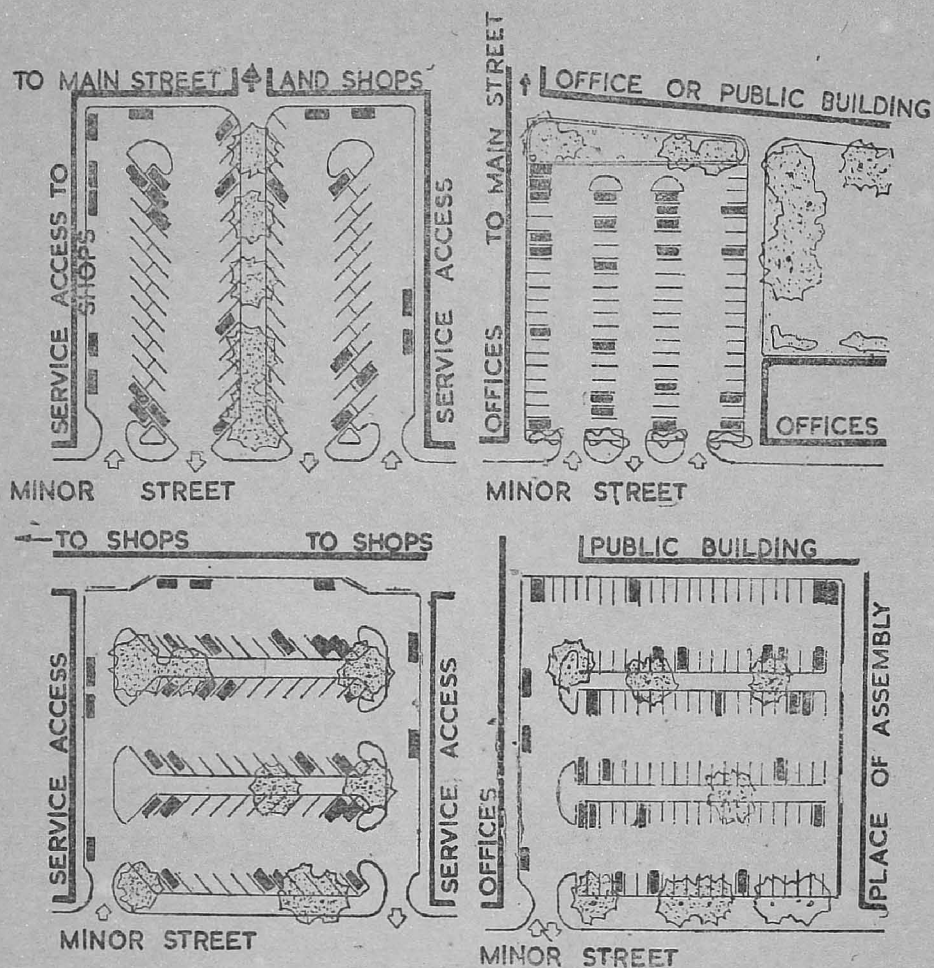


Fig. 15.

## Layout of car parks

14.14. Lastly, parking restrictions are only as effective as the efforts to enforce them. Regulations carefully related to parking needs and impartially enforced help to achieve the best use of the existing facility.

## ACKNOWLEDGMENTS

The Authors acknowledge with thanks the valuable information furnished by the Madras City Police Department and Corporation of Madras for preparing this Paper. Their grateful thanks are also due to the Director, Highways Research Station, Madras, for his valuable guidance.

The Paper is published with the permission of the Chief Engineer (Highways and Rural Works), Madras.



## REFERENCES

1. Parking—The Eno Foundation for Highways Traffic Control, Saugatuck, Connecticut, 1957.
  2. Parking Manual—American Automobile Association, Washington 6, D.C., March, 1948.
  3. Manual of Traffic Engineering Studies—Association of Casualty and Surety Companies, 60 John Street, New York City, 1945.
  4. Factual Guide on Automobile Parking for the Smaller Cities—Public Roads Administration, Washington, D.C., September, 1947.
  5. The Madras Road Traffic Codes, 1940, Volume I, Motor Vehicles Act, 1939—Government of Madras, 1959.
  6. Model Traffic Ordinance—Public Roads Administration, Federal Works Agency, Washington, 1946.
  7. Manual of Uniform Traffic Control Devices for Streets and Highways—Public Roads Administration, Federal Works Agency, Washington, D.C., August, 1948.
  8. Report of the Seminar on Engineering and Traffic Aspects of Highway Safety—United Nations Economic Commission for Asia and the Far East, Bangkok, 1958.
  9. The Redevelopment of Central Areas—Her Majesty's Stationery Office, London, 1947.
-

FORM 1  
MADRAS STATE HIGHWAYS AND RURAL WORKS DEPARTMENT  
Curb Inventory Records

Location				Special spaces								Restricted				Remarks.
Street	Side	Bounding	Streets	Angle or parallel	No. of spaces	Curb length (feet)	Taxi stand (feet)	Bus stop (feet)	Petrol bunks & service stations (feet)	Intersections, alleys, drive-ways (feet)	Corner clearance (feet)	No Parking (feet)	Total length (feet)			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
Mount Road	East	Wallajah Road	General Patters Road	Parallel	34	612	—	129	160	189	91	82	1,263			
		General Patters Road	Nellukara Veera Mudali Street	—	14*	—	—	104	98	148	154	445	949*	Parking is allowed on the footpath.		
		Nellukara Veera Mudali Street	Woods Road	90°	63	504	—	50	—	55	—	67	676			
		Woods Road	Club House Road	90°	15	120	—	—	—	—	86	—	206			
		Club House Road	Patullos Road	—	—	—	—	—	—	—	—	250	250			
		Patullos Road	Opposite to Victoria Institute	—	—	265	—	44	238	89	62	16	714			

West	Victoria Technical Institute	Binny's Road	—	—	—	39	150	203	150	440	982
	Binny's Road	M.E.C. Street	Parallel	13	260	50	—	53	183	118	664
	M.E.S. Street	Dams Road	"	41	820	56	—	88	400	259	1,623
	Dams Road	Blackers Road	—	—	—	216	—	102	359	371	1,048
North	Mount Road	Irani Hotel	—	—	—	69	—	103	—	928	1,109
General Patters Road	Irani Hotel	Woods Road	Parallel	29	580	50	82	81	77	—	870
South	Woods Road	Byranjung Bahadur I Street	"	35	630	—	—	60	50	—	740
	Byranjung Bahadur I Street	Mount Road	60° Parallel	10 23	140 460	—	—	68	125	267	1,170
North	Mount Road	General Patters Road	Parallel	10	180	—	—	—	44	99	323
South	General Patters Road	Mount Road	90°	6	48	—	—	22	—	253	323
South	"	"	—	—	—	—	—	15	—	657	672
North	Mount Road	General Patters Road	—	—	—	—	—	67	—	620	687

FORM I—(Contd.)

Location				Special spaces								Restricted			Total length (feet)	Remarks
Street	Side	Bounding	Streets	Angle or parallel	No. of spaces	Curb length (feet)	Taxi stand (feet)	Bus stop (feet)	Petrol bunks & service sta- tions (feet)	Intersections alleys, drive- ways (feet)	Corner clear- ance (feet)	No Parking (feet)				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
Club House Road	North	Mount Road	Express Estate	Parallel	20	359	—	—	—	29	131	—	519			
	South	Express Estate	Mount Road	"	12	214	—	—	—	65	232	—	511			
Patullos Road	North	Mount Road	Whites Road	—	—	—	—	—	—	106	—	1,180	1,286			
	South	Whites Road	Mount Road	—	—	—	—	35	—	232	—	1,019	1,286			
Binny's Road	North	Bridge	"	—	—	—	—	75	—	12	229	605	921			
	South	Mount Road	Bridge	—	—	—	—	75	—	75	—	770	920			
Dams Road	North	Blackers Road	Mount Road	—	—	—	—	—	—	50	—	700	750			
	South	Mount Road	Blackers Road	—	—	—	—	—	—	50	—	720	770			

## FORM 2

## MADRAS STATE HIGHWAYS AND RURAL WORKS DEPARTMENT

*Off-Street Parking Facility Inventory*

1. Lot	Garage	Located on	
side of	street between		
and	streets		
2. Public	Private	Free	Pay
3. Owner			
4. Lot dimensions	Area		
5. Entrance	ft	in. from	Street
Exit	ft	in. to	Street
6. (If lot) No. of spaces with aisles clear			
if packed			
(If garage)	Clear aisles		Packed
No. of spaces in			
Basement			
Ground floor			
7. No. of attendants	Open from	A.M. to	P.M.
8. Rates			
9. Approximate total No. of vehicles stored daily (est.)			
10. Parking area surface type	condition		
11. Lighting			
12. Sketch layout on back of this sheet, showing aisles, stall arrangements, en- trance and exits			
13. Field data obtained	196 — 196		





## Annexure 1

## METHOD OF PARKING

*(Extract from the Model Traffic Ordinance issued by Public Roads Administration, Federal Works Agency, U.S.A.)*

**Standing or parking close to curb :**

No person shall stand or park a vehicle in a roadway other than parallel with the edge of the roadway headed in the direction of lawful traffic movement and with the left-hand wheels of the vehicle within eighteen (18) inches of the curb or edge of the roadway except as otherwise provided in this article.

**Signs or markings indicating angle-parking :**

(a) The engineer shall determine upon what streets angle-parking shall be permitted and shall mark or signs such streets but such angle-parking shall not be indicated upon any National or State Highway within the city unless the State Highways Department has determined that the roadway is of sufficient width to permit angle-parking without interfering with the free movement of traffic.

(b) Angle-parking shall not be indicated or permitted at any place where passing traffic would thereby be caused or required to drive upon the right side of the street or upon any street car tracks.

**Obedience to angle-parking signs or markings :**

Upon those streets which have been signed or marked by the engineer for angle-parking, no person shall park or stand a vehicle other than at the angle to the curb or edge of the roadway indicated by such signs or markings.

**Permit for loading or unloading at an angle to the curb :**

(a) The engineer is authorised to issue special permits to permit the backing of a vehicle to the curb for the purpose of loading or unloading merchandise or materials subject to the terms and conditions of such permit. Such permits may be issued either to the owner or lessee of real property or to the owner of the vehicle and shall grant to such person the privilege as therein stated and authorised herein.

(b) It shall be unlawful for any permittee or other person to violate any of the special terms or conditions of any such permit.

**Lights on parked vehicles :**

(a) Whenever a vehicle is lawfully parked at night time upon any street within a business or residence district no lights need be displayed upon such parked vehicle.

(b) Whenever a vehicle is parked upon a street or highway outside of a business or residence district during the hours between one-half hour after sunset and one-half hour before sunrise, such vehicle shall be equipped with one or more lamps which shall exhibit a white light on the roadway side visible from a distance of 500 feet to the front of the vehicle and a red light visible from a distance of 500 feet to rear.

(c) Any lighted headlamps upon a parked vehicle shall be depressed or dimmed.

**Stopping, standing, or parking prohibited in specified places :**

Stopping, standing or parking prohibited. No signs required.

(a) No person shall stop, stand, or park a vehicle, except when necessary to avoid conflict with other traffic or in compliance with law or the directions of a police officer or traffic control device, in any of the following places:

1. On a sidewalk ;
2. In front of a public or private driveway ;
3. Within an intersection ;
4. Within 15 feet of a fire hydrant ;
5. On a cross walk ;
6. Within 20 feet of a cross walk at an intersection ;
7. Within 30 feet upon the approach to any flashing beacon, stop sign, or traffic-control signals located at the side of a roadway ;
8. Between a safety zone and the adjacent curb or within 30 feet of points on the curb immediately opposite to the ends of a safety zone, unless the city traffic engineer has indicated a different length by signs or markings ;
9. Within 50 feet of the nearest rail of a railroad crossing ;
10. Within 20 feet of the driveway entrance to any fire station and on the side of a street opposite the entrance to any fire station within 75 feet of said entrance (when properly sign posted).
11. Alongside or opposite any street excavation or obstruction when stopping, standing, or parking would obstruct traffic ;
12. On the roadway side of any vehicle stopped or parked at the edge or curb of a street ;
13. Upon any bridge or other elevated structure upon a highway or within a highway tunnel ;
14. At any place where official signs prohibit stopping.

(b) No person shall move a vehicle not lawfully under his control into any such prohibited area or away from a curb such distance as is unlawful.

**Parking not to obstruct traffic :**

No person shall park any vehicle upon a street, other than an alley, in such a manner or under such condition as to leave available less than 10 feet of the width of the roadway for free movement of vehicular traffic.

**Parking in alleys :**

No person shall park a vehicle within an alley in such a manner or under such conditions as to leave available less than 10 feet of the width of the roadway for the free movement of vehicular traffic, and no person shall stop, stand, or park a vehicle within an alley in such position as to block the driveway entrance to any abutting property.

**All-night parking prohibited :**

No person shall park a vehicle on any street for a period of time longer than 30 minutes between the hours of 2 a.m. and 5 a.m. of any day, except physicians on emergency calls.

**Parking for certain purposes prohibited :**

No person shall park a vehicle upon any roadway for the principal purpose of:

- (1) Displaying such vehicle for sale.
- (2) Washing, greasing, or repairing such vehicle except repairs necessitated by an emergency.

**Parking adjacent to schools :**

(a) The engineer is authorised to erect signs indicating no parking upon either or both sides of any street adjacent to any school property when such parking would, in his opinion, interfere with traffic or create a hazardous situation.

(b) When official signs are erected indicating no parking upon either side of a street adjacent to any school property as authorised herein, no person shall park a vehicle in any such designated place.

**Parking prohibited on narrow streets :**

(a) The engineer is hereby authorised to erect signs indicating no parking upon any street when the width of the roadway does not exceed 20 feet, or upon one side of a street as indicated by such signs when the width of the roadway does not exceed 30 feet.

(b) When official signs prohibiting parking are erected upon narrow streets as authorised herein, no person shall park a vehicle upon any such street in violation of any such sign.

**Standing or parking on one-way streets :**

The engineer is authorised to erect signs upon the right-hand side of any one-way street to prohibit the standing or parking of vehicles, and when such signs are in place, no person shall stand or park a vehicle upon such right hand side in violation of any such sign.

**Standing or parking on one-way roadways :**

In the event a highway includes two or more separate roadways and traffic is restricted to one direction upon any such roadway, no person shall stand or park a vehicle upon the right-hand side of such one-way roadway unless signs are erected to permit such standing or parking. The engineer is authorised to determine when standing or parking may be permitted upon the right-hand side of any such one-way roadway and to erect signs giving notice thereof.

**No stopping, standing, or parking near hazardous or congested places :**

(a) The engineer is hereby authorised to determine, designate by proper signs places not exceeding 100 feet in length in which the stopping, standing, or parking of vehicles would create an especially hazardous condition or would cause unusual delay to traffic.

(b) When official signs are erected at hazardous or congested places as authorised herein, no person shall stop, stand, or park a vehicle in any such designated place.

**Stopping, standing or parking restricted or prohibited on certain streets :**

**Application of articles :** The provisions of this article prohibiting the standing or parking of a vehicle shall apply at all times or at those times

herein specified or as indicated on official signs except when it is necessary to stop a vehicle to avoid conflict with other traffic or in compliance with the directions of a police officer or official traffic control device.

**Regulations not exclusive :**

The provisions of this article imposing a time limit on parking shall not relieve any person from the duty to observe other and more restrictive provisions prohibiting or limiting the stopping, standing, or parking of vehicles in specified places or at specified times.

**Parking prohibited at all times on certain streets :**

When signs are erected giving notice thereof, no person shall park a vehicle at any time upon any of the streets described.

**Parking prohibited during certain hours on certain streets :**

When signs are erected in each block giving notice thereof, no person shall stop, stand or park a vehicle between the hours specified of any day except Sundays and Public holidays within the district or upon any of the streets described. Stopping, standing, or parking is prohibited during certain hours on certain streets.

**Parking time limited on certain streets :**

When signs are erected in each block giving notice thereof, no person shall park a vehicle for longer than at any time between the hours of (    ) a.m. and (    ) p.m. of any day except Sundays and Public holidays within the district or upon any of the streets described.

**Parking signs required :**

Whenever by this or any other Ordinance of this city any parking time limit is imposed or parking is prohibited on designated streets it shall be the duty of the engineer to erect appropriate signs giving notice thereof and no such regulations shall be effective unless said signs are erected and in place at the time of alleged offence.

---

## Annexure 2

**Parking space prescribed for the various buildings in  
other countries**

Type of buildings	One parking space required for each		No. of cities represented
	Average	Range of middle 2/3	
Theatres, auditoriums, etc.	7 seats	4-10 seats	24
Retail business	400 sq. ft.	300-500 sq. ft. *	8
Office buildings	460 sq. ft.	400 sq. ft. ** 500 sq. ft. 500 sq. ft.	
Restaurants	(see notes)	50 sq. ft. *** 100 sq. ft. 5 seats	3
Hotels	4 guest rooms	3-4 guest rooms	14
Industrial buildings	3 employees	2-4 employees****	5
	750 sq. ft.	400-800 sq. ft.	4
Single dwellings	1 unit	1 unit	11
Multiple dwellings @	1½ units	1-3 units	33

**Notes:**

\* Usually square feet of space devoted to sales.

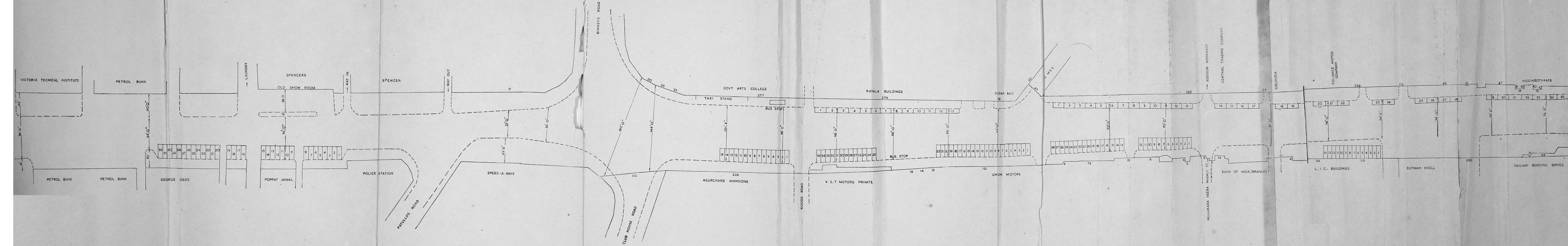
\*\* Represents all three having such requirements.

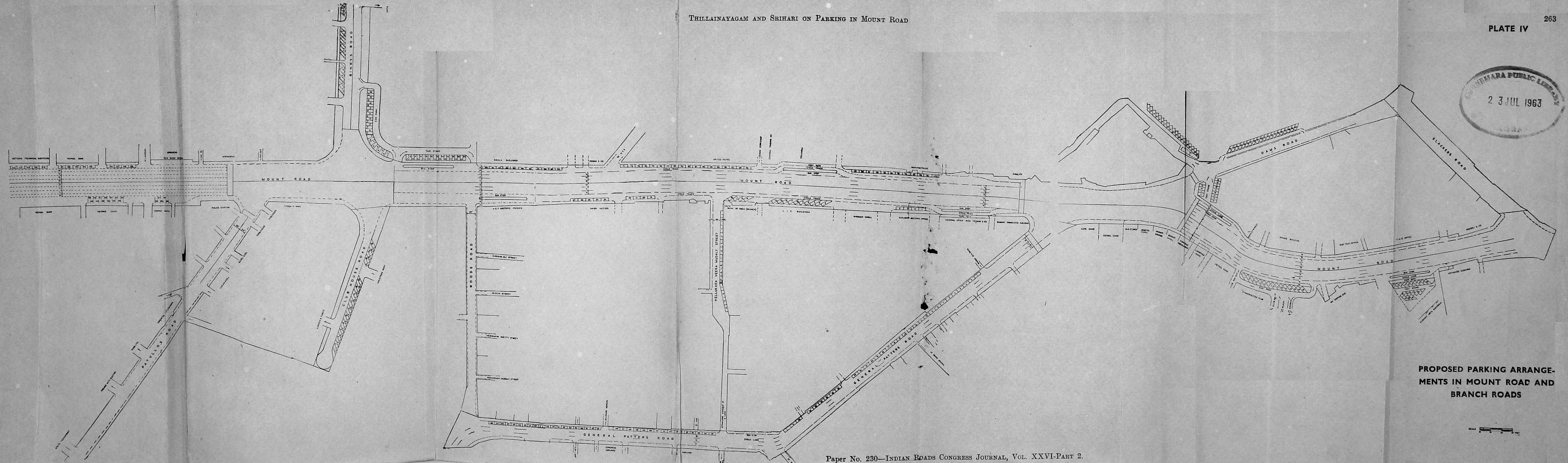
\*\*\* One per 50 square feet devoted to patron use, one per 100 square feet of total floor area.

\*\*\*\* Parking requirements based on number of employees and on gross floor area shown separately.

@ Represents grouping of all areas where multiple dwellings are permitted. Usually more parking space per dwelling unit is required in the higher class dwelling areas than in comparatively low grade areas.







PROPOSED PARKING ARRANGEMENTS IN MOUNT ROAD AND BRANCH ROADS



## HIGHWAYS RESEARCH STATION PUBLICATIONS

1. Annual Report 1956-57.
2. Annual Report 1957-58.
3. Annual Report 1958-59.
4. Annual Report 1959-60.
5. Annual Report 1960-61.
6. Research Note 1 :—Load Test conducted on Bridge at  
1/8 of ODDANCHATRAM-DHARA-  
PURAM ROAD.
7. Research Note 2 :—Mud plastering for Rural Houses.
8. Research Note 3 :—Design and construction of Highways  
Research Station.
9. Research Note 4 :—Load test on the masonry Arch Bridge  
across Uppodai.
10. Research Note 5 :—Parking in Mount Road.

