

# Experimental Analysis of parking spaces of some selected areas in Rohtak city

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## ABSTRACT

**This experimental work attempts to identify the design performances and analysis of parking spaces in Rohtak city in the Haryana State. The rapid urbanization, rising economics status of people and vast distances in the sprawling cities have resulted into a phenomenal rise in the ownership of vehicles which in turn has affected the demand of space for parking in the urban areas. Especially in urban area parking is a serious problem, shortage of parking space, complaints about high parking tariffs and congestion due to visitors in search for parking places are some of the problems related to parking.**

**Keywords: parking, spaces, Rohtak, Haryana, vehicles.**

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## INTRODUCTION

Parking in cities of India is already pronounced to be one of the sources of mobility conflict and travel inefficiency and the parking policies established in the country significantly has widen the consequences. It calls for urgent action to address its own acute problems. There are sharp contrasts among the available approaches and the implications of motorization trends, traffic development, transport equity, urban development patterns, public space and emissions of the local air pollutants and greenhouse gases.

Although, the parking policy to be recognized as an essential component to overcome the challenges when implemented and thoroughly managed, it presents the dangers for its potential role in entrenching unsustainable pathways of development. In many growing cities it is common to see Commercial Street clogged with motor vehicles, cars parked along roadside, across curbs and footways and dusty verges and some cars double parked.

In many areas, parking is a serious problem. Shortages of parking space, complaints about high parking tariffs and congestion due to visitors in search for a parking place are only a few examples of everyday parking problems. Many cities and urban areas recognize these problems, but the solution proves to be very complicated.

Parking facilities are a major expense to society and parking conflicts are among the most common problems facing infrastructure planners. These problems can be most often described either in terms of supply or in terms of management. Parking management describes the process of optimizing the use of parking policies while making use of policies and programs that are applicable to parking. A well-thought out parking strategy often helps reduce the number of parking spots required in a particular situation and provides a variety of socio-economical and environmental benefits. When all factors are taken into consideration, improved management is often the best solution to parking problems. Management solutions tend to be significantly more optimum than increasing supply as they tend to support more strategic objectives. Some of these objectives are listed below:

- Improved user options and quality of service
- Facility cost savings.

In most countries where cars are the dominant mode of transportation, car parks are a feature of every city and suburban area. Shopping centers, sports stadiums, mega churches and similar venues often feature car parks of immense area. The right of way of the average city street is utilized not only for the movement of vehicles, but as a terminal for them as well ,the ever increasing vehicle owners in the cities wants to travel in their own vehicle from origin to destination which causes congestion as well as pollution.

### DEFINITION OF VARIOUS TERMINOLOGIES

- a) **Parking Accumulation:** The total number of vehicles parked in an area at a specified time is called parking accumulation.
- b) **Parking Load:** The area under the parking accumulation curve during a specified period is known as parking load.
- c) **Parking Volume:** Parking volume may be defined as the number of vehicle parked in a particular area over a given period of time. Parking volume is generally measured as vehicles per day.
- d) **Parking Duration:** The period of time for which a vehicle remains parked in the parking space is taken as parking duration. Normally the average walking distance increases with increase in the city size.
- e) **Trip Purpose:** Trip purpose is defined as the reason for which a person ventures out to some destination. The trip purpose governs the parking duration and the walking distance also depends on it.

### PARKING PROBLEM IN ROHTAK

Rohtak city can be called a land of plenty when it comes to automobiles. However, of late, it has become a land of plenty of parking space problems as well. In 1991, Rohtak had over 1.5 lakh vehicles registered here. That figure has crossed the 6-lakh mark now.

The floating vehicles (those, which arrive in the city on a regular basis) take the count up to 8 lakh, which is equal to city's approximate population. Rohtak has 20 paid parking lots and 50 that offer the facility for free, which together can provide space for 20,000 cars.

The vehicle problem in the commercial areas is also causing environmental pollution .The total absence of the any parking fees has led to unduly long parking duration and has reduced the parking turn-over, resulting in increasing parking accumulation. Due to lack of the knowledge people using two wheeler often park their vehicles in parking stall where four wheelers have to be parked leading to the congestion and inconvenience to the pedestrians.

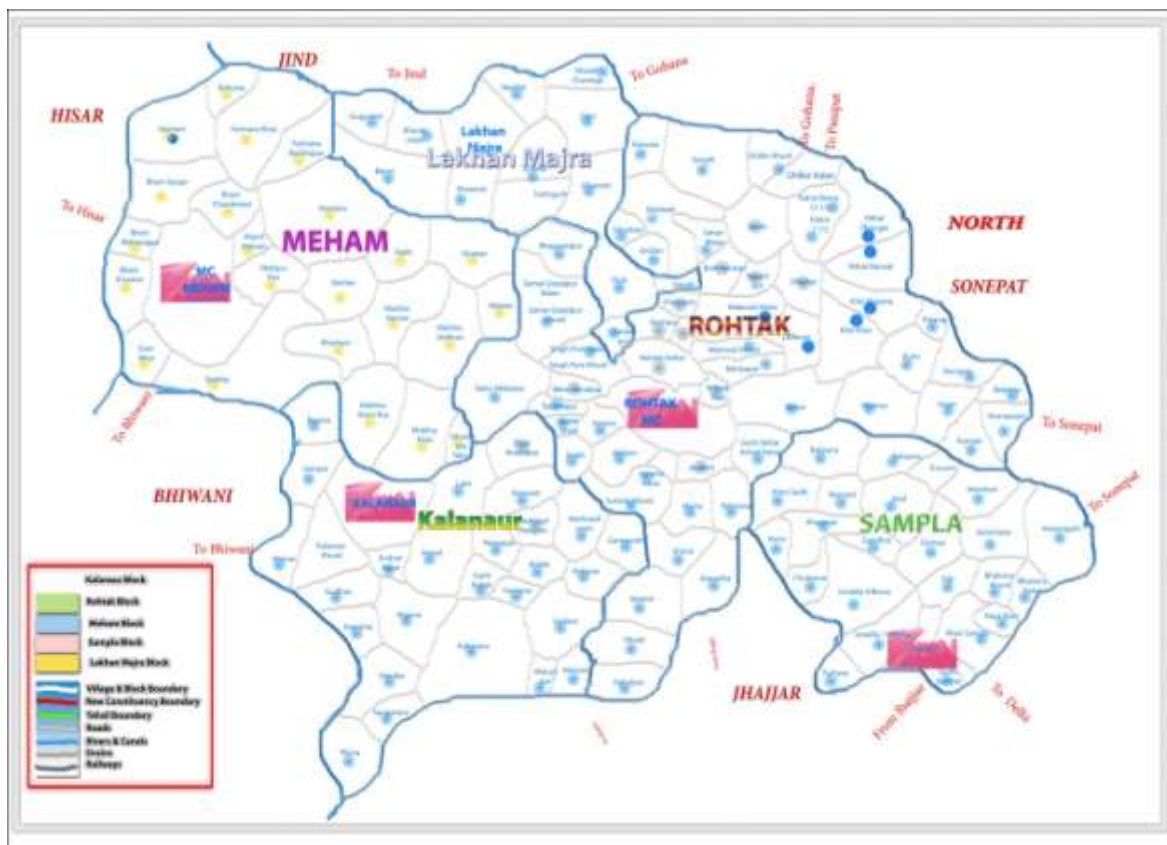


Figure 1: Simplified road network of Rohtak City

## SOLUTION OF PARKING PROBLEMS

Since the parking problems are dynamic varying with time, solutions generated and provided for the present parking problem become inadequate after certain period. Depending upon the duration for which a solution shall remain effective for handling the parking problems the approach adopted in arriving at the solution can be broadly classified in the following two categories :

- A) Durational Approach
- B) Implementation Approach

### A) Durational Approach

In this kind of approach, the planner tries to assess the likely parking demand in future years and also analyses the various solutions along with the duration's upto which the particular solution shall remain effective. This is necessary as the planner has to assure himself about the duration upto which the area shall have no parking problems. Durational approach can be further classified into two categories:

- 1. Short Term Approach
- 2. Long Term Approach

#### 1. Short Term Approach

Short term approach gives temporary remedy and relief to the existing parking problems and after a year or two new set of solutions is required. Such approach for short term duration is normally adopted when limited finance is available or great difficulty shall be encountered in implementing long term solutions. This is also adopted when additional space is not available for creating new off-street parking lots.

In short term approach, the following measures are normally adopted:

- i) Limiting the parking by various controls during peak-hour.
- ii) Diversion of traffic.
- iii) Providing temporary new off-street parking lots on vacant land meant for other land use.

#### 2. Long Term Approach

This approach is adopted when the zone is critical and important for the whole city and adequate fund is available for implementing the long term solution when additional and adequate space is available for creating new parking lots.

### B. Implementation Approach

In this approach, importance is given to the ease with solution can be implemented normally; easy solutions are selected for implementation. In such approach, normally the decisions are taken under the following two manners :

- 1. Restrictive Approach
- 2. Constructive Approach

#### 1. Restrictive Approach

Under this, the administration identifies various restrictive measures required to be adopted for taking the parking problems. The following are the commonly adopted measures under this category :

- 1. Parking is fully prohibited on the curbs.
- 2. Parking is partially prohibited on the street at specified locations.
- 3. Selected parking lots are made paid ones.
- 4. All parking lots are made paid ones.
- 5. Free parking zones in the vicinity of the congested area are created.

## 2. Constructive Approach

Under this approach, additional facilities for parking are created at selected locations as per requirement. The following measures are normally adopted:

1. Providing new parking lots of adequate capacity at convenient locations.
2. Future buildings and premises to have adequate parking space inside the premises, either at the ground level or in the basement.
3. Introducing non-conventional parking facilities such as multi-level parking, roof parking, and mechanical parking.

## RESULTS & DISCUSSIONS

The entire study area of the city has been divided into six sections. These parking lots have been assigned a particular section for the purpose of identification.

The division of the entire study area along with identification number is presented below:

**Table 1: Distribution of various sections of the city**

S. No.	Sections	Location of section
1.	SECTION-1	Parking lot in front of Railway Station
2.	SECTION-2	Parking lot in front of New Bus Stand
3.	SECTION-3	Parking lot in front of Old Bus Stand
4.	SECTION-4	Parking lot in MDU University
5.	SECTION-5	Parking lot in PGIMS Rohtak
6.	SECTION-6	Parking lot at Quilla Road Market

**Table 2: Maximum area wise demand at the time of study**

SERIAL NO.	SECTIONS	MAXIMUM DEMAND
1.	SECTION-1	350
2.	SECTION-2	265
3.	SECTION-3	160
4.	SECTION-4	1523
5.	SECTION-5	2563
6.	SECTION-6	1105

**Table 3: Current Status of different parking sections**

SERIAL NO.	SECTIONS	MAXIMUM PARKING DEMAND	MAXIMUM AVAILABLE CAPACITY	RATIO	CURRENT STATUS
1.	SECTION-1	350	256	1.36	INSUFFICIENT
2.	SECTION-2	265	185	1.43	INSUFFICIENT
3.	SECTION-3	160	145	1.10	SUFFICIENT
4.	SECTION-4	1523	1206	1.26	SUFFICIENT
5.	SECTION-5	2563	1853	1.38	INSUFFICIENT
6.	SECTION-6	1105	563	1.96	INSUFFICIENT

- For section-1 as per the present parking condition there is no marking but they can be redesigned to increase the parking space for the vehicle users if we provide 90° parking for all area then parking capacity can be increased by 100 numbers.
- For section-2 at presently there is no marking in the block, so people park there vehicle randomly, 90° angle parking should be preferred which will lead to increase the capacity by 30 numbers.
- Section -3 is one of the heavily rushed section amongst all the sections so an attempt can be done to increase the parking space and to utilize maximum available area by providing 90° parking thus resulting in increased 45 numbers.
- For section-4 at presently there is somewhere marking but many places there is no marking in the block, so people park there vehicle randomly, 90° angle parking should be preferred which will lead to increase the capacity by 180 numbers.
- For section-5 at presently there is marking in the block, but people still park there vehicle randomly, 90° angle parking should be preferred which will lead to increase the capacity by 150 numbers.
- For section-6 at present there is no marking in this block, there is no any vacant space available due to highly congested market place but if it can be utilised properly even in the current situation there is extra space for 25 vehicles, but if proper 90° marking is done the capacity is increased by 56 numbers.

### CONCLUSIONS

The following proposals are made to improve parking facilities in Rohtak City:-

1. The mechanical parking system should be installed.
2. Parking signs should be installed properly and on right place.
3. The visitors in the private vehicles are not allowed to park on the main road. They should park their vehicles in a proper place where the parking facilities are provided.
4. Proper bus service may be provided for employees coming in IMT Rohtak.
5. When there is peak hours on front blocks such as front of Railway Station , front of times of india and front of New Bus Stand bank, at that time there is some space on backside blocks. So there is need of proper management.

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