Parking Study of CBD Area of Indore – A Case Study

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ABSTRACT

Indore is the commercial capital of Madhya Pradesh. It had a registered vehicle population of about 0.48 million in 2000 which is increasing at an average annual rate of 8.8 percent. Indore has a population of 3,276,697 with an area of only 3,898 square kilometers (as per the Census-estimated 2011). It is the most densely populated city in the central province. Thus being the most densely populated city it has major parking problems everywhere, especially at CBD areas. In the present study parking behavior and present parking scheme has been studied at Novelty Market Jail Road. The average of the total vehicles parked has been determined by cordon count, patrolling and questionnaire method. An average of seven days of vehicle count has been considered.
Keywords: CBD, Parking Turnover, Parking Index, Cordon Count, Patrolling.

I. INTRODUCTION

Growing population of India has created many problems among which parking has been one of the most common problems which we encounter every day. There is not only problem of space for the traffic moving on the road but also for the parking of the vehicles. The problem of parking is quiet high in Indore district. The CBD areas of the city are mostly affected with insufficient or no parking spaces at all during the entire daytime. This encourages people to opt for illegal parking which further leads to traffic congestions and sometimes many a times causes jamming condition.

Novelty market of Indore is one of the most congested areas of Indore. It has about an average of 1300 shops with no suitable parking scheme. The only parking facility is on street right angled parking. The lack of suitable parking scheme makes it inconvenient for the costumers to park their vehicles. Also, this makes the area most susceptible to jamming about any time of the days.

II. METHODS AND MATERIAL

The following are the objectives of the present study :

- To determine the total number of vehicles parked per day
- To determine the actual number of parking spaces available
- To determine the number of legal and illegal parking
- To suggest a suitable parking scheme, if required
- To suggest suitable parking charges for the same
- To suggest the amount of revenue generated from the parking scheme

A. Methodology

The following methodology has been adopted:

- **Determination of total number of parked vehicles**

Three methods were used for the determination of number of vehicles parked in Novelty area:

- Cordon count method
- Patrolling method
- Questionnaire method

Cordon Count:

The two ends of the novelty market i.e. intersection at Jail road and intersection at Devi Ahilya Marg were marked with cordon lines. The difference between the

total number of incoming traffic and total outgoing traffic provided the total number of parked vehicles. This was computed for every 15 minutes.

Patrolling Method

The total length of Road is about 425 meters. Patrolling was done for every hour. The total number of parked vehicles was counted.

Questionnaire method: The questionnaire was carried for a week excluding Sunday. In this 150 people were questioned regarding:

- Trip purpose
- Time of arrival
- Time of departure
- Regularity of visit

Questionnaire Method

Questionnaire was conducted separately for the shopkeepers.

- **Determination of actual number of parking space available**

Since, the entire parking scheme of the Novelty Market is On Street parking the total length available for parking was measured and the total parking space was computed for the same. The difference between the total parked vehicles and the number of parking space available gave the total number of illegal parking.

- **Determination of suitable parking scheme**

On the basis of available land space for construction of a parking system a suitable parking scheme has been suggested.

- **Cost Analysis**

The following features were taken into account for cost analysis:

- Tentative cost of construction for parking scheme
- Revenue generated from the parking scheme
- Miscellaneous (maintenance, electricity, guards etc.)

B. Calculations

- **For Parking Determination of total number of parked vehicles**

Total Length of road available for parking = 1300 meters (approximately)
*This includes all the congested lanes connecting the main road where parking is allowed.

Average space required to park a bike = 0.8 X 350 m2
*As per the field dimensions

Total parking spaces (for bikes) = 1000/0.8 = 1250

Total number of shops in novelty market = 1300 (approximately)

As per the questionnaire conducted each shop has atleast two shopkeepers at an average and each shopkeeper has his separate vehicle.

Therefore, total number of parking spaces required for shopkeepers = 1300 X 2 = 2600

TABLE I
NUMBER OF VEHICLES PARKED PER DAY AT DIFFERENT TIME INTERVALS

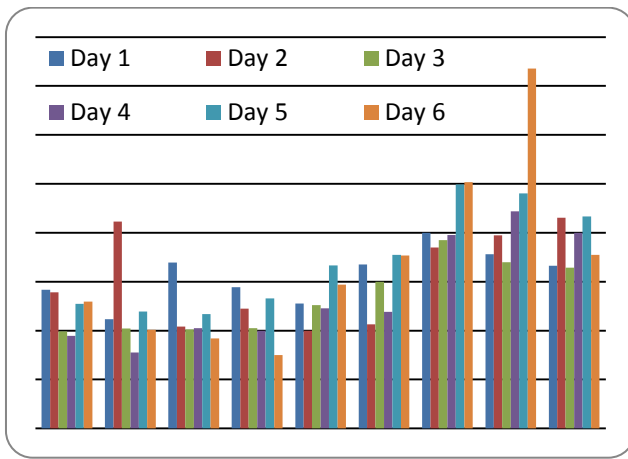| Time	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
12 p.m. to 01 p.m.	567	557	397	379	509	519
01 p.m. to 02 p.m.	447	846	409	310	478	403
02 p.m. to 03 p.m.	678	417	405	410	468	368
03 p.m. to 04 p.m.	577	490	410	400	532	300
04 p.m. to 05 p.m.	511	400	504	491	667	588
05 p.m. to 06 p.m.	670	426	599	477	709	707
06 p.m. to 07 p.m.	800	740	770	791	997	1007
07 p.m. to 08 p.m.	712	790	680	887	961	1471
08 p.m. to 09 p.m.	665	861	657	800	867	709
Total	5627	5527	4831	4945	6188	6472

Figure 1: Bar chart showing comparison between number of vehicles parked per day at different time intervals

As per the cordon count at an average of about 5500 Vehicles Park in Novelty every day from morning 12 p.m. to 10 p.m. i.e. 555 vehicles per hour.

From questionnaire the total time taken by a costumer is about 15 minutes.

Thus, total parking space required = 2728 (for fifteen minutes)

Thus average total illegal parking= 2728 – 1250 = 1478

Parking Volume = 2600 + 5000 = 7600 vehicles per day

Average parking duration of customers = 15 minutes

Average parking duration of shopkeepers = 11 hours

Average parking index = 2728/1250 = 2.18

For Revenue Generated

Total number of parking space reserved for shopkeepers = 2600

Total revenue generated from shopkeepers (@ 250 Rs. per month) = 2600 X 250 = 6, 50,000/-

Total number of parking space for customers = 300
*Assuming average growth rate of 7.5% for 10 years

Total revenue generated from customers (@ 5 Rs. per 15 minutes) = 250 X 4 X 10 X 30 = 3, 00,000/- (at present)

Total revenue collected per month = 9, 50, 000/-

III. RESULTS AND CONCLUSION

The following are the conclusions of the present study:

- The average total illegal parking for Novelty area is found out to be 1478 vehicles.
- The average parking volume for Novelty area is found out to be 7600 vehicles per day.
- The average parking index for Novelty area is found out to be 2.18.
- As per the space available at Novelty market the most suitable parking scheme could be a multi-level parking system.
- The average revenue which could be generated from the parking scheme is Rs.9, 50,000.

IV. REFERENCES

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