

THE STUDY OF AVAILABLE PARKING SPACE: A CASE STUDY OF UNA CITY

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Abstract

As the population increases, the requirement of more space for utilization of parking is also increases. In the last few years, there is a sudden growth in the life style of the individuals as compare than the previous times. Every individual like to travel with their own vehicle, it may of any type and kind, to approach their destination places. After the use of the vehicle, every individual need to stand their vehicle in such a way that it may get safe and it approaches the parking facility of the vehicles. But in the centre of the city, there is a lot of congestion and also very high density of the traffic, in such a way that maximum of the individuals need to park the vehicles. In the centre of the city, there is a very limited space available for the use of the parking. After the fulfilment of spaces of parking, individuals parked their vehicles on the road side, it may increase the risk of accidents. The proper use of parking pattern may increase the capacity of the parking in such a way that, maximum space would be available for the next use of the parker. So that, congestion may get reduced and also reduce the risk of accidents. Key Words – Parking pattern, Parking spaces availability.

I. INTRODUCTION

Parking is one of the first involvements that people have when travelling to a destination, so parking facilities are a merging part of the road system. Parking facilities are costly to build impressive financial cost on developers, the creation of users and government. India is the world's fastest growing and strong economies having a rich automobile market. It is a well-known that limited availability of parking in the metropolitan cities contributes to road congestion, air pollution and driver frustration.

The Indian automobile market has come on way from 1980 decade when only had a few chosen



from when it came to purchasing new car. Somehow the facts that buying a new car's is no longer a reputation sign are more of a necessity in metropolitan cities. But as there has been a wide gap in infrastructure development and rise of our Indian automobile industry has a large huge parking problem which faces the country today. India is currently the 11th largest passenger car market in the world and according to expectations of GD power and associated it will be the world's largest passenger car market in the end of 2020.

The problem of parking in H.P. is increasing day by day. The main reason is that the growing of population and the number of vehicles are also rises. Some people do not want to park their vehicle because of the saving of rupees so there is a lot of difficulty facing many times because not availability of parking lot.

1.1 NEED FOR THE STUDY

In congested cities, we constantly solve the problem of lack of office and residential space by constructing high skyscrapers. In the absence of adequate systematic parking space, the invaluable road space is being utilized for vehicular parking.

Apparently, parking demand has soared into alarming proportions in areas and other work station cities. A significant fraction of the travel time in the congested urban area can be spent looking for parking space. Where car parking spaces are a rarity and owners have not made the appropriate arrangements for their parking, ad hoc overspill parking is often accompanied by green sections of road, residential roads, foot paths and roads, causing frequent traffic jams. This problem needs to be proactively resolved by constructing multi level parking complexes at major locations. With increasing land prices and increasing traffic volume, multilevel parking systems are rapidly becoming a necessity.

1.2 STUDY AREA

The study area was conducted in Una city of Himachal Pradesh in India. At this time, the current population of about 5,21,173 and it covers an area of 1540 sq km and density is 328/km sq. It has latitude 31.28'34"N and longitude is 76.16'13"E. Una is the district head quarter and is the educational, financial and industrial hub for Himachal, the reason behind it touches its boundary with Punjab also and the general topography is plain. The Una city with an altitude varying between 350–1200m. It got the 6th rank of largest population of 5,21,173 lakhs as per 2011 census in H.P.





Figure 1.1: Distribution of Parking Survey Lots of the Una City

1.3 POPULATION GROWTH

According to census 2001, the population of district Una was 4,48,273 which rose to 5,21,173 in census 2011. The decade growth rate of district comes to 16.3%. The growth rate for district is 30.4%, respectively. The density of population in 2001 was 291/km sq and now it reached 338/km sq.

	1	1	
Year	Total	Male	Female
1981	3,17,422	1,56,491	1,60,931
1991	3,78,269	1,87,582	1,90,687
2001	4,48,273	2,24,524	2,23,749
2011	5,21,173	2,63,692	2,57,481

Table 1.1: Po	pulation Growtl	h of District Una	as per census	s 1981-2011

Source: District Statical Officer Una, District Una (H.P.)

Table 1.2: Population Growth of Municipal Coun	ncil (Una) as per census 1981-2011
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Year	Total	Male	Female
1981	9,157	4,894	4,263
1991	12,001	6,260	5,741
2001	15,900	8,488	7,412
2011	18,722	9,851	8,871

Source: District Statical Officer Una, District Una (H.P.)



1.4 AIM OF THE STUDY

- To observe the parameters of parking.
- Comparison between different parking lots.
- To evaluate the parking demand and parking efficiency.
- Categorization of parkers.
- To study existing parking conditions.
- Look at both public and private parking solutions.

II. LITERATURE REVIEW

Warden, Borgers, Tlmmermans, March 2006

Warden, Borgers, Tlmmermans (Urban planning group, Eindhoven university of technology, March 2006) car drivers study attitude and behavioral responses to planned parking measures at the campus of Eindhoven University of Technology, the Netherlands. In a street questionnaire, car drivers had been asked their opinion about limiting access to the campus area for non-university can driver's cars through the campus area. Most drivers wanted to continue by car at the university campus. Half of the car driver responded they paid parking charges, so they would change their mode of transportation of parked car outside the place.

Chakrabarty & Mazumdar, December 2010

Generalized parking rates to estimate parking demand and other parameters are ignored. Chakrabarty & Mazumdar (Institute of town planner, India magazine 7-4, December 2010). This paper took into account the various behavioural characteristics of various visits, locations and parking demands with different urban areas. Different factors had tried to influence parking demand and also find their impact on each other.

T. Subramani, May-June 2012

Salem is the fifth largest city in Tamil Nadu with a population of 7.54 lakh (2011). Parking is one of the major problems that are made by rising vehicle traffic. It has an impact on transportation development. The availability of low space in urban areas has notably increased the demand for parking space in the central business sector. This also affects the mode option. It has a huge economical effect. The sale of two wheeler at 15 million is expected to grow 14-15%, while car sales are close to 8 million units in a year. The solution for this is to manage systematic surveys and traffic and pedestrians, although in a nascent phase in India, it is an option to ease roads and to solve parking and pedestrian problems.

Mrs Priyanka. Kolhar, April-June 2012

This study examines problems with current parking practices with parking accumulation and surveys in Dharwad. The WTP survey was conducted to learn the willingness of potential user-appropriate parking fees for new services. Specific parking management strategies (short term, medium term and long term) and the way they are discussed can be implemented. The proposed parking facilities can result from savings and better management, that the cost of improvement is calculated. Parking problems are recommended with congestion pricing as short-term solutions to solve immediately, the operation and maintenance costs are much lower for on-road parking management rather than off-road and the return is also high in the street at the internal rate of



parking management. However, the long term management plan (provision of multi-level parking) can also be implemented based on future parking demand in the study areas.

III. METHODOLOGY

3.1 Data Collection Site

We collected data from different site in Una city, Himachal Pradesh.

Una City Site

- Taxi Stand
- Una City Centre
- Municipal Corporation
- Opposite D.C Office
- Government Hospital Parking

First we collected all the data from different site in Una City at the same time from 9:00 am to 6:00 pm. We surveyed all the above given parking place, from this survey how many two wheeler and four wheeler vehicle is being parked at a specified parking place.

Parking materials are intended to gather information about the existing parking supplies its use. The parking lists include overview of parking spaces and their location, time and type of parking facility. The study area is divided into several blocks to facilitate the recording of parking spots. The list data is then displayed in the tables to allow for a method of evaluating the data. An accumulation or occupancy investigation was used in analyzing the parking capacity of the study area.

3.2 Conduct Of Surveys

The study types are listed below in parking lot:

- Inventory of Parking Facilities.
- Accumulation Counts.
- Duration and Turnover Survey.
- User Information Survey.
- In-Out Survey.
- License Plate Method Survey.

Accumulation Counts

These are organized to collect data on the number of vehicles parked in a study area during a specific period of time. First the number of vehicles entering in that area is counted. Then the number of exiting vehicles during that specific period is noted. Accumulation data are commonly evaluated by time period for the whole study area. The occupancy can be calculated by taking total spaces.

License Plate Method Survey

License Plate Method survey conducted in Una city of Himachal Pradesh on May 06, 2019. During the survey vehicle license plate numbers were recorded at 5 parking lots. The method of recording



License Plate Method depends upon specific conditions.

Its results in the most accurate and reasonable data. It will give data about the period for which a particular vehicle was using the parking route. This will help to calculate the fare as the fare is based on the estimated period for which vehicle was parked. If the time is less than the interval, short term parker's disappearance is unlikely.

3.3 Data Collection Procedure

- Study area was divided into 5 different parking lots.
- Total duration of study of 9 hours was divided into 9 time slots.
- Each duration was 60 minutes.
- Each parking lot was surveyed by an observer.
- At start of each time slot each individual observer noted the registration number of vehicles parked in that particular lot.
- Same procedure was repeated for each time slot; in our case 9 times.
- The registration number of each vehicle was recorded.
- Then observed the parking parameters such as Parking accumulation, Parking capacity and Parking analysis.

3.4 Details of survey

- Location: Una city
- Survey technique adopted: License Plate Survey
- Number of Parking Lots : 5
- Date: 06th May 2019, Monday
- Time: 9:00 am to 6:00 pm
- Number of time slots: 9 (60 minutes duration)
- Type of vehicle surveyed: 2 (Two wheeler, Four wheeler)

Figure 1.2: Mixed Type Parking (2W &4W)



City Centre (Una)



Figure 1.3: Use of Land for Improper Manner of Parking.



Municipal Corporation Office

Figure 1.4: Actual Density of Traffic Generated for Parking Use.



Una Bus Stand

IV. RESULT AND DISCUSSION

The parking capacity at Una city is calculated by dividing the total block by the average length of parking. Parking capacity is calculated at 9:00 am to 6:00 pm, the peak busy hour in Una where the activity of the city mainly started and finished.

So based on the calculation of the parking load towards parking area, capacity of parking space must pay attention to the existence of a system that take to consideration the function of area, service function of road and traffic volume.

1. Taxi stand parking

It is observed that the peak parking hour in between 10 am to 2 pm. Parking lot is situated on one side of the road. Parking supply for four wheeler is 60 and demand is 72, thus supply is not



meeting the demand. No parking for two wheeler.



2. Una City Centre Parking

It is observed that the peak parking hour in between 10 am to 1 pm. No proper parking bays for two and four wheeler are provided. Supply for two wheeler is 45 and four wheeler is also 45 respectively. Parking demand for two wheeler and four wheeler is 77 and 72. Parking place is limited.



Figure 1.6: Parking Accumulation Graph at City Center (Una)

3. Parking Near Municipal Corporation Office

It is observed that the peak parking hour in between 10 am to 1 pm. The parking supply for four wheeler is 80 and the demand is 111, hence supply is not meeting the demand.



90 80 70 60 50 40 30 20 4W 10 0 09:00:10:00 03:00.04:00 05:00.06:00 10:00-12:00 04.0005:00 02:0003:00 12.00^{12.00} 12.00^{01.00} 01.00^{2.00}

Figure 1.7: Parking Accumulation Graph at Municipal Corporation Office

4. Opposite DC Office Parking

It is observed that the peak parking hour in between 10 am to 2 pm. parking demand increases on Monday due to first day of week. Parking demand increases. Parking supply for four wheeler is 37 and demand is 75. Parking place and facility is limited.



Figure 1.8: Parking Accumulation Graph at Opposite D.C. Office

5. Government Hospital Parking

It is observed that the peak parking hour in between 10 am to 2 pm. Parking demand increases. Parking supply for four wheeler is 52 and demand is 62. Parking place is limited.





Figure 1.9: Parking Accumulation Graph at Government Hospital Parking

Lot. No.	Vehicle Type	Supply	No. of different vehicles utilizing parking space in 9 hrs.	Parking turnover
Taxi Stand	4-w	60	72	1.2
Una City Centre	2-w	45	77	1.7
Parking	4-w	45	72	1.6
Municipal	4-w	80	111	1.4
Corporation				
Opp. D.C. Office	4-w	37	75	2.1
Govt. Hospital	4-w	52	62	1.2
Parking				



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Lot		Deficiency	
Taxi Stand		12	
Una City Centre Parking	2-w	32	
	4-w	27	
Municipal Corporation		31	
Opposite D.C. Office		38	
Govt. Hospital Parking		10	

Table 1.4: Demand Deficiency

V. CONCLUSION AND FUTURE SCOPE

The area for parking is insufficient as per the density of the users and also the parking facility is isolated and conservative. Utility of the variety land is also affected parking facility. Most of the places is found commercial, business and work related but in a grid. The users approach the places by parking their vehicles from a long distance to the commercial areas for a very short period of time. Because of the shortening of time, maximum of the individuals prefers to park their vehicles to the road sides instead of using the parking facility. Timing, location and individual behaviour is also affects the decision for approaching and the use of the parking facility. On the other hand, insufficient space for the parking in the centre of the city is the basic reason for congestion due to the road side parking system. Most of the crowd approaches the centre part of the city as their daily routine and park their vehicles to near surrounding of their shops and work places and it might be road sides. To control the illegal parking's and also to avoid the road side parking, must be provide the proper spaces of the parking in the centre of the city. The control of the road side parking is also possible by construction of new parking facility like the vertical parking system at those places where the parkers access the centre part of the city easily without park their vehicles at road side.

By the passage of time, the density of the vehicles will be increases and requirement of the parking facility will also be increases. It is possible to analyse the traffic density in such a way that, provision of the parking spaces may get accessed by the user directly. The analysis of the utility of the land may organize in such a manner that, the un-required structures should be demolished for generating the new parking facility and also increase the parking management in such a way that, it cleanly avoided the parking of the road side vehicles.

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