

ASSESSMENT OF ON-STREET PARKING ISSUES IN CBD AREAS – A Review

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Abstract - The growth and development of Urban areas has been unprecedented in the recent years. As the cities are nurturing and prospering more and more the people have also spending more on luxurious items like cars and bikes as a status symbol. This has led to a drastic increase in the number of vehicles owned by individuals today. With the need of parking these vehicles every day, other utility areas such as footpaths, pavement and open grounds are used for parking officially or unofficially as parking lots. An attempt is being made to understand the parking demands in the Indian CBD areas as the need for parking has soared higher than ever and improper management has led to traffic congestion and other problems. The need of the hour seems to find the most optimized ways that can be implemented in order to overcome the current parking scenario. The idea of just increasing the number of parking spaces and decreasing parking fares isn't fulfilling the need of the hour efficiently. The focus has been tried be brought upon the fine assessment of parking policies, parking demands and redesigning the current parking scenario in the cities and especially in their CBD areas to meet with the demands.

Key Words: On-street parking, Accidents, Congestion, Parking Demand, Parking types, Angular parking, Journey delays

1. INTRODUCTION

Parking has been a trending issue which has bothered urban planners and transport officers plenty in the recent years. Parking is one of the major issues in today's world that has been created due to the increase in on road traffic. The unavailability of parking spaces has significantly increased the need of parking spaces especially in Central Business district areas. Indian major cities are facing major parking problems with the increase in vehicular traffic clubbed together with poor quality of roads and mismanagement. Parking issue not only creates a problem for the mode choice but also creates an economical setback for that location. This topic is very crucial as every transportation planner knows

about the issue but very few have addressed to it including the government. It is a genuine fact that all major cities in developing nations are facing this issue and are yet to find a suitable solution for the urban parking scenario. Till date, this issue related to parking is not limited to urban CBD areas but is being widespread across the cities and nearby regions. Thus, not only affecting the traffic conditions of the area and its working but also the overall picture of the transportation system and it has now become a fundamental concern regarding the modern transportation network. The accessibility of parking not only affects the preference of type and method of journey, but also influences the practicality and competitive position of business districts. Hence the issues related to the mismanagement of the parking system should be a major concern for a transportation planner. Every vehicle owner considers and prefers a good parking which is easily accessible, cheap and near to the desired location of the journey. It becomes very important to understand and facilitate the needs of a desirable parking system.

Generally there are two type of parking system, one is "Off-street parking" and the other is "On street parking".

1.1 Types of Parking

1.1.1 Off Street Parking

Off street parking signifies that the vehicles are parked off the street, away from the major traffic stream. In many urban areas, they are provided just outside a busy area for parking. There are different types of Off-street parking measures i.e. parking plazas, open lots, vertical lifts etc. Generally a fee is imposed for parking in order to discourage the use of private vehicles.



Figure-1. Illustration of off-street parking

1.1.2 On Street Parking

On street parking signifies that the vehicles are parked on the street itself. These are mainly operated by government agencies. A vehicle can be parked on the side of the street for a certain duration in an particular order as per the prevailing conditions. Parking charges vary as per the traffic conditions of the vicinity but illegal parking may still cause commotion. The different types of on street parking approaches are:

1. Parallel Parking i.e. parked parallel to the road.
2. 30° parking i.e. parked at an angle of 30° with the road.
3. 45° parking i.e. parked at an angle of 45° with the road.
4. 60° parking i.e. parked at an angle of 60° with the road.
5. 90° parking i.e. parked at an angle of 90° with the road.

Check out the figures for better understanding.

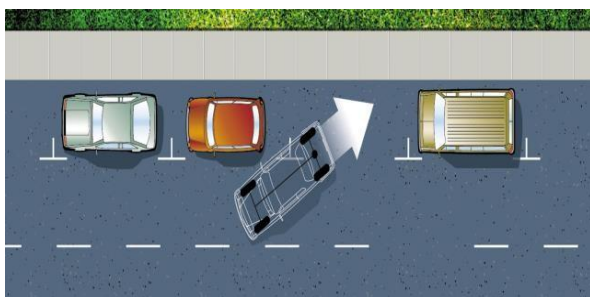


Figure 1: Illustration of parallel parking

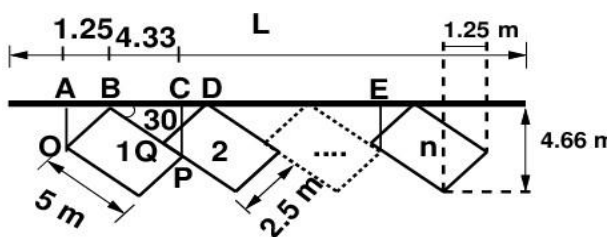


Figure 2: Illustration of 30° parking

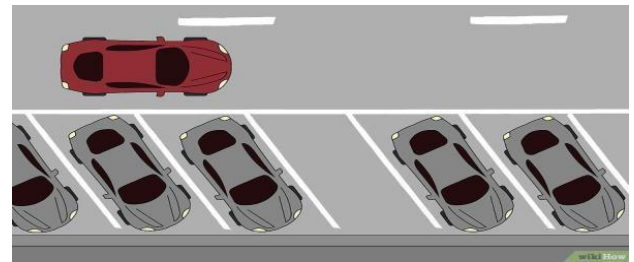


Figure 3: Illustration of 45° parking



Figure 4: Illustration of 60° parking



Figure 5: Illustration of 90° parking

1.2 Ill Effects of Parking

When considering the ill effects of the parking system, the nature of on street parking weighs more than that of the Off street parking conditions with reference to the creation of undesirable effects, but as on street parking is irreplaceable, certain obstacles have to be faced almost every day. They are mainly as follows:

1. Clogging of streets
2. Accidents
3. Environmental pollution
4. Obstruction to fire fighting operations etc.

2. RESEARCH REVIEW

Rahul Pitroda et al [1] CBD areas are characterized as areas of high population and thus leads to high parking demands which is one of the major problems for developing countries like India. This paper also addresses the issue of lack of on street parking data under various conditions. There seems to be missing policies regarding the on street parking. To obtain the parking statistics, two CBD zones of the Rajkot city, Gujrat

had been taken into consideration on two usage parameters i.e. Medical zone and business zone. To carry out the statistical data survey of On-street parking, "license plate method" technique at hourly interval during heavy traffic timings for an regular work day was utilized to find out peak parking durations. In detailed parking examination was then accomplished during peak parking duration by collection of demand data for data monitoring at 10 min gap for four regular week days and weekends. Uniform patterns of parking were noticed throughout the study period of regularity at 10 min gap, however, deviation in demand was seen through the day. The suggested conclusions were to carry out more on street parking supply study and access on-street parking demand in terms of Equivalent 2-Wheeler wherever the demand is subjected by 2 wheelers and Percentage Uniform Parking Vehicle (PUPV) efficiency must be evaluated at an interval of 30 min and Percentage Repetitive Vehicle (PRV) be evaluated at interval of 20 min. Finally the study suggests to design a on street parking policy on the basis of efficiency rather than based on land cost.

Rakesh j Prajapatil et al [2] This paper acknowledges that On-street parking problem is not limited to a single country but is a universal one. The paper looked forward to understand the parking problems and their effect on the user, how to manage it and identify the variables affecting the response of the people towards the paid parking policy. It makes effort to enlighten us with the benefits related to Paid parking system. A lot more research needs to be carried on the parking market. The needs for improved pricing solutions as per the parking variables like congestions, demand and accidents needs to be addressed. It was found that the available parking facilities are under-utilized and as On-street parking is free, people find it easy to travel in their own vehicle and thus increases traffic, thus paid parking can be implemented and proper On-street parking management must be encouraged. Paid parking policies are likely to discourage the use of private vehicles. Also, facilities like Park and ride should be researched upon.

Dixit Chauhan et al [1] In this paper the author has done a Comparative study of the Legal and Illegal On- street Parking behavior. Two CBD areas of Surat city was considered and macroscopic and microscopic analysis was done in order to understand the On-street parking behavior of people. Preference of private vehicles over public transit has lead to heavy denad in business districts. Unmanageable demand for On-street parking in CBD areas has led to illegal parking and increased traffic congestion and decreased capacity and road flexibility. "License plate method" was used to carry out the initial survey. The various types of vehicles were classifies as

equivalent vehicles and as usage was significant for 2 wheeler, analysis was done on the basis of 2 wheeler usage.. The solution suggested included to charge On-street parking on the basis of efficiency rather than land cost and stern illegal parking enforcement must be done in order to control it.

Pinky Rome et al [3] A driver always consider a free and comfortable parking space as an encouragement for the use of personal vehicles. This has lead to increase in private vehicular traffic and lead to problems with congestion due to lack of facilities and mismanagement of the parking areas and it is not an unknown scenario in the metropolitan cities. The author has taken into consideration 3 study areas of the city of Kolkata. The lack of parking has led to widespread On-street parking and encroachment onto the footpaths. In many places the on street parking spaces are not designed properly, fake or unauthorized. The suggestive measures brought forward have been done by collecting macroscopic data of the peak hour parking duration. It is clear that the major reason is lack of parking areas, illegal parking and lack of public awareness without much enforcement measures which leads to parking and traffic congestion every day. Suggestive measures like proper management, restricting entry, effective pricing, multimodel integration, public awareness and strict enforcement and penalizing has been discussed.

Subhadip Biswas et al [4] The real scenario of parking has been presented in this paper. First the paper provides a detailed study regarding the pros and cons of On-street parking in CBD areas and all the factors regarding the On-street parking scenarios. The pros highlight the importance of on street parking in CBD areas and how businesses are affected by it and then the its ill effect. Thus, Parking facilities a lead to economical and commercial development of an area. Also, then the paper highlights the effects of road user safety by providing on street parking and how it reduces accident percentages on various types of roads whereas effect on road capacity as to how parking leads to reduction in road width and causes congestion. Measures like removal of angled parking from CBD and be replaced by parallel parking as it leads to less accidents but utilizes more space. It further provides a numerical approach on how speed is affected due to parking and accidents rates related to parking on the streets.

T. SUBRAMANI [5] presented the paper which addresses the issue of parking on major corridors in urban areas with reference to the case study of Salem city in Tamil Nadu. The limited availability of space in busy district areas has brought a increase in demand for parking space. This also

influences the mode choice, which has a great cost-effective impact. Two-wheeler sales at 15000000 are expected to grow 14-15%, while car sales close to 800000 units a year. The way to overcome this is by systemic development and infrastructure and management. Survey Data shows that the duration a vehicle is used throughout a year in percentage is merely 4.5% and is parked for rest of the time. Data accumulation has been done by parking survey on 15 different sites near CBD areas. The data highlights the physical features of the sites and the ill effects caused due parking problems like congestion, accidents, environmental pollution etc. The importance of a proper parking management is more significant than just increasing spaces for vehicle accumulations. It tries to highlight the importance of charging heavily for parking in CBD areas to demote parking and provide parking plaza near the vicinity. On street parking cannot be completely prohibited but proper management can improve the current scenario. Angled parking can be used for better management has been suggested. Further scope has been considered about clubbing together both Private and public parking spaces for confronting the need of high parking demand duration during rush hours.

Saad Yousif and Purnawan [6] On street parking problems are not only limited to developing countries but also developed countries like the UK. This paper showcases the parking conditions of Manchester, UK. On-street parking is very desirable by the drivers as it is mostly free, near to the destination and convenient, but as the demand increases it leads to several problems on congestion, accidents, delays etc. street parking spaces are not able to meet with the traffic demands. Also maneuvering of vehicles in and out of parking stalls leads to major delays and accidents. But when this scenario is merged with illegal on street parking, the condition only deteriorates. In this paper three types of parking were considered are parallel (legal), parallel (illegal) and angle parking (legal). The different parking movements of each type of parking, time, delays and effects of traffic has been considered. These motions were subjective to many variables like the type of parking, travel direction, already parked vehicles, drivers driving skills and traffic conditions. In case of heavy traffic condition parking and unparking maneuvers causes bottlenecks, which leads to traffic congestion, delays and possibly accidents. The parking should be managed on the basis of traffic conditions and be flexible to change whenever required.

Mahak Dawra, Sahil Kulshreshtha [7] in recent times the growth of Indian cities has been significant. This has led to increase in level of lifestyle, thus vehicles and created a parking demand everywhere, especially in business districts.

The paper suggests that increasing the number of parking spaces is not the only solution but proper management and system approach can also be adopted in order to make full utilization of the resources in hand. It suggests the method of zonal distribution of parking in order to smooth out the parking demand over a larger scale. If understood properly, there are enough parking spaces in the city but problem arises in business district at peak hour. The improper management leads to illegal or incorrect parking by the drivers. The paper refers to zonal distribution i.e. 3 to 4 zone A, B, C, D. A good public transit network to be enforced in Zone A with restricted admission to cars. High parking pricing can discourage parking. Zone B are the areas having mixed conditions for transit as well as cars. Parking pricing is moderate. Zone C has a lot of space and thus poor access to public transit system. Parking pricing is free in order to encourage parking here and shifting to public transport thereon. Parking facilities and charges changes according to the zones and changing conditions. Finally, it can be stated that parking needs to be distributed throughout the city in order to decrease the load from the CBD areas and the goal should be to make private and public vehicles work in sync in order to meet the parking demands.

3. CONCLUSION

Looking at the various case studies under various scenarios it has been observed that parking studies both on street and off street are a very aspect for a transportation planner today. People buy vehicles not only for transportation but also as a status symbol which has led to drastic increase in the number of vehicles today. Of course the toll has been taken out on the transportation network within the city as roads in CBD areas face traffic congestion problems on a daily basis. Not only this but the accidents rates and pollution level have also increased. Studies also showed that a major problem of not being able to fulfill traffic demand has been due to mismanagement. It is also observed that parking spaces available are not utilized properly and hence there isn't a need to provide more parking spaces in most of the scenarios. A proper study is required and literature is needed to understand the various variables in On street parking studies and thus opting of various types of measures can be taken accordingly. A number of solutions are available which can only be applicable with proper management and education of the road user.

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