

Improvement Of Parking Facilities In The Central Business District Of Srinagar:-A Review

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Abstract-*The parking problems in the central business district of Srinagar can directly affect the economic development of the region. The ill effects of the unauthorized parking result in consequences which prove detrimental to the economic development. The timely congestions, high accident rates, high fuel wastage per annum are the topmost concerns in the area. On the other hand if all the vehicles in the area were parked in legal lots, it could boost the economic and social development of the region. It is inevitable that congestions and accident rates are reduced by providing adequate parking facilities. Hence the work force can be in office on time, fuel wastage per annum would eventually decrease, and hindrance to fire fighting operations will get revoked. The problems cause of inadequate as well as illegal parking can lead the city on the verge of economic backlash lest addressed in a proper and efficient way. The concern of widening gap between supply and demand of parking should be dealt in the systematic manner. All these factors can lead to the development of the region as a whole.*

I. INTRODUCTION

Due to the urbanization in recent decades and significant increase in manufacturing of vehicles, traffic engineers are facing challenges of providing proper parking facilities to the ever increasing vehicles hitting the streets of urban centers. On an average a vehicle runs only 400 hours per annum, for the rest of the time it should be parked at some safe adequate place, efficient parking can bring economic prosperity to the area with less congestions, accidents, less fuel wastage and less wastage of time, illegal parking activities can be the biggest problem that an urban center has to face, it can lead to big time congestions, accidents, environmental pollution, hindrance to fire hydrants and regular discomfort to the road users. The problems of improper parking facilities shout mainly in unplanned classic cities which were settled before the advent of technology. The commercial centers of those cities face improper parking facilities which mainly lead to congestion, discomfort and waste of time hence hindering the economic development of the region. Parking may be inadequate or ineffective due to the cramp of space, substantial increase in the vehicles of the area or vehicles coming from different regions. Hence the need of an hour is to upgrade existing parking facilities by innovative

techniques so as to meet the demand of traffic in Central Business Districts of urban centers.

II. LITERATURE REVIEW

1. General

Central business district of the city is the main commercial hub of the city accommodating the commercial units, business centers, markets, hospitals, government offices, thus the core metropolis of the region expecting large movement of people from the surrounding regions. Hence the region should be equipped with proper parking inventories to accommodate flood of vehicles entering the business district. The common problems of illegal and inadequate parking can be outlined below:-

Congestion:- Parking takes considerable street space leading to the lowering of the road capacity. Hence, speed will be reduced; journey time and delay will also subsequently increase. The operational cost of the vehicle increases leading to great economical loss to the community.

Accidents:- Careless maneuvering of parking and unparking leads to accidents which are referred to as parking accidents. Common type of parking accidents occur while driving out a car from the parking area, careless opening of the doors of parked cars, and while bringing in the vehicle to the parking lot for parking.

Environmental pollution:- They also cause pollution to the environment because stopping and starting of vehicles while parking and unparking results in noise and fumes. They also affect the aesthetic beauty of the buildings because cars parked at every available space create a feeling that building rises from a plinth of cars.

Ahteshamul Huq Osmani and Ashwini Gawade (2016) studied the major problems of parking in the cities. An efficient way to manage the parking system is using Internet Of Things (IOT). Traditional parking system commonly uses security ultrasonic sensors, camera or infrared ray sensors to manage the parking areas. However, these systems are not only expensive but time consuming. So it is necessary to have a smart parking system. So in this system we are using RFID tag to each of the car and also assigning a sensor to each parking slot. Using an android application user may be able to see the available parking slot so that it will require less time than previous system.

Avani Jain, AnudnyaKhandekaretal (2016) studied the city of Indore for parking facilities. If considered the problems of cities than the traffic has become the crucial factor for any city and we will get the space to park the vehicle. If we consider the locations, the spaces to park the vehicles are available, but we are not aware for those spaces and the proper utilization of parking is not taking place. In this paper, we have surveyed the locations of city Indore, where parking is very important and provide a way through which, we can efficiently utilized those spaces.

Indrajit Roy Chowdhury (2016) studied the city of Kolkata for supply and demand of parking. Parking is an essential requirement of the transportation system. In this paper an attempt has been made to point out various aspects of parking characteristics such as location, area, duration of parking, accumulation and volume in the parking spaces followed by some guidelines and provisions which will surely make better Kolkata city in future.

HinaKousar, Kavitha Kumar, Shoney Sebastian (2015) highlighted the implementation of dynamic memory allocation using arrays and how it is better than other methods, observed that parking vehicles manually takes longer time wherein user searches the parking area and parks the vehicle which is a tedious task, to save the time spent for searching the slot a registration based application circle parking system is designed which provides platform to users to book parking spaces online in advance for a given location and then park the vehicle with a minimal fees. This application allocates slots dynamically using array and stores the booking details.

Meng Li (2015) studied the cities with increasing demand for parking spaces. Traditional fixed parking spaces and surface parking spaces have been unable to meet the growing demand for parking spaces, on the other hand, the bustling city commercial district, government agencies and offices and other places will inevitably appear parking difficult problem. At the same time, the growth of parking fees in some areas has brought a lot of economic burden to the office workers. Through the investigation and interview path discovery, staggered time sharing spaces is an effective means to solve the problem of parking. To ease traffic congestion, save fuel to reduce exhaust emissions for the purpose, this paper proposes an efficient smart car system, including mobile terminal service system, data acquisition system, data transmission system and dynamic guidance system.

Xiaolong Ma (2013) this paper investigated the parking behavior at the tourist site. Based on the data collected at these six parking facilities through a stated-preference survey, a multinomial logit model was developed, which reveals the relationship between parking decision and influential factor. Lack of sufficient studies on parking choice behavior

investigation has been an issue in parking facility planning in China. Using six parking facilities in Beijing Lama Temple as an example.

III. IMPORTANT TERMS

1. Parking System The two main systems of parking can be explained below:-

On street parking :-It refers to the system when the vehicles are parked on the sides of the street itself. This is usually controlled by government agencies itself. Common types of on-street parking parallel parking and angle parking. This classification is based on the angle in which the vehicles are parked with respect to the road alignment.

Parallel parking :-The vehicles are parked along the length of the road. Here there is no backward movement involved while parking or unparking the vehicle. Hence, it is the safest parking from the accident perspective.

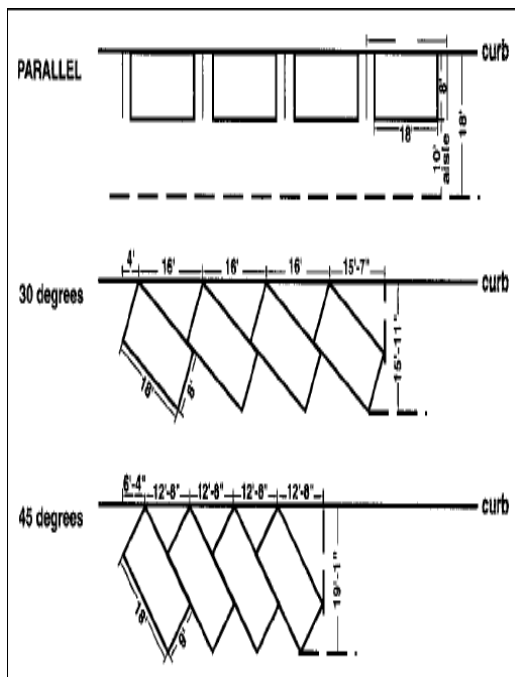
30° parking:- In thirty degree parking, the vehicles are parked at 30° with respect to the road alignment. In this case, more vehicles can be parked compared to parallel parking. Also there is better maneuverability.

45° parking:- As the angle of parking increases, more number of vehicles can be parked. Hence compared to parallel parking and thirty degree parking, more number of vehicles can be accommodated in this type of parking.

60° parking:-The vehicles are parked at 60° to the direction of road. More number of vehicles can be accommodated in this parking type.

Right angle parking:- In right angle parking or 90° parking, the vehicles are parked perpendicular to the direction of the road. Although it consumes maximum width, kerb length required is very little. In this type of parking, the vehicles need complex maneuvering and this may cause severe accidents. This arrangement causes obstruction to the road traffic particularly if the road width is less. However, it can accommodate maximum number of vehicles for a given kerb length.

Off street parking:- In many urban centers, some areas are exclusively allotted for parking which will be at some distance away from the main stream of traffic. Such a parking is referred to as off-street



Different types of parking

2. Central Business District:-

CBD is the commercial and business centre of a city. In larger cities, it is often synonymous with the city's "financial district". Geographically, it often coincides with the "city centre" or "downtown", but the two concepts are separate: many cities have a central business district located away from its commercial or cultural city centre or downtown.

The CBD is often also the "city centre" or "downtown", but this is also often not the case. Midtown Manhattan is the largest central business district in New York City and in the world; yet Lower Manhattan, commonly called Downtown Manhattan, represents the second largest distinct CBD in New York City and is geographically situated south of Midtown. For example, London's "city centre" is usually regarded as encompassing the historic City of London and the medieval City of Westminster, whereas the City of London and the transformed Docklands area are regarded as its two CBDs. Mexico City also has a historic city centre, the colonial-era Centro Histórico, along with two CBDs: the mid-late 20th century Paseo de la Reforma - Polanco, and the new Santa Fe. In Taipei, Taiwan, the area around its main railway station is regarded as the historic city centre while the Xinyi Planned Area located to the east of the said railway station is the current CBD of Taipei, being both the financial district and the premier shopping area, and the location of Taipei 101, Taipei's tallest building. This research is focused on the parking for the Central business district of Srinagar.

3. Need For Parking Studies:-

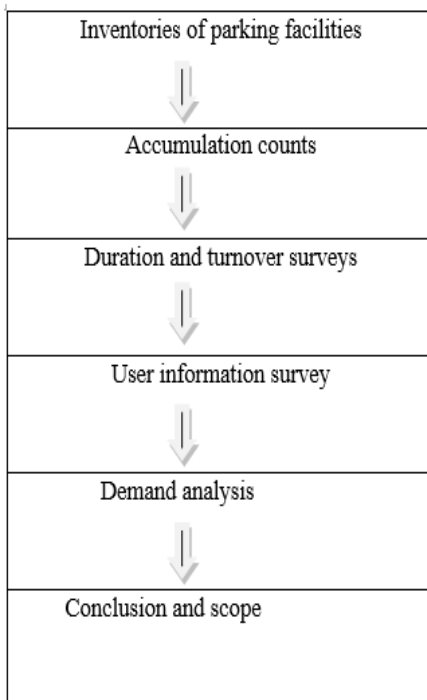
CBD of any city is the key to economic growth of the region, hence the overall development of the city. India has thus far 7935 cities according to the statistics formulated by the ministry of housing and urban affairs in 2017. Hence by simple logic development of cities means development of nation. A proper parking facility provide comfort to passengers using local city transport because of negligible congestion, reduces the walking distance for the people using the facilities, avoid accidents caused due to improper parking, and reduces general traffic congestion in cities. Hence allowing the residents to be on time at their respective places. All these factors lead to comparatively less wastage of fuel, time, and reduces accident rate hence enhancing the development of the region. In a survey in India, out of 8760 hours of time in a year, vehicles run in urban centers for an average of 400 hours only and thus are parked for 8360 hours annually these statistics clearly state the need of proper parking facilities in urban centers. In case of catastrophic events, proper parking facilities in CBD ensures that there is no obstruction to the fire fighting operation as improper facilities can block access to hydrants and access to fire affected structures. Moreover vehicle users tend to park as close to their places of work to avoid lead distances. This results in high demand of parking facilities in CBD and co regions where urban activities are concentrated. Parking problems in CBD of Srinagar is the major issue and is ever increasing due to the widening gap between parking supply and parking demand. The illegally parked vehicles not only pose the problems to the pedestrians and also lead to long traffic congestions, accidents and discomfort to the passengers. The increased standard of living in the past 3 decades has led to the extreme increase in number of private cars owned by the residents of the city hence demanding the adequate facilities for parking their vehicles.

IV. RESEARCH METHODOLOGY

The first step in the research methodology is to define the inventory of parking facilities available. This may include location, number and type of parking space (on street, off street) layout of spaces and general geometry of lots and parking rates. The new spaces that can be utilized to meet the demand shall be noted down. The illegal parking surveys can be conducted in the area to get the valuable information about the reasons for the illegal parking, the simple questionnaires can provide information about reasons behind the illegal parking. Individual surveys using interviews can provide valuable information in parking studies. This may include direct interviews or return post card methods.

The methodology strictly comprises of steps as under:-

- Inventories of parking facilities: The inventories include no. of parking lots, capacity of each lot for Light motor vehicles, parking fares, location of lot, and governing agency.
- Accumulation counts: The no. of vehicles occupying all parking bays or slots in peak hours gives accumulation counts.
- Duration and turnover surveys: The time for which the slot is used and no. of turnovers during peak hours in a particular bay is calculated by turnover and duration surveys.
- User information survey: The set of questionnaires asked to users about the reasons of illegal parking activities or for gathering information about inventories and demand in land use method are called as user information surveys.
- License plate method: The method used to calculate accumulation counts, and turnovers and peak occupancy of parking.
- Land use method for demand analysis: The method calculates the demand of parking by generating parking generation rates for each land use.
- Conclusions: The set of outcomes after experimental work for the improvement of parking facilities in the area.



The method that is employed for the purpose of study is license plate method of survey. It is accurate and comprehensive method for parking analysis

1. License Plate Method:-

This method provides realistic and accurate data for analysis. Parking stall may be monitored at the time intervals of 15 minutes. This provides information about vehicle accumulation profile that is the time for which the vehicle resides in the bay. Turnover may be computed as the number of vehicles present in that bay for the particular hour. Accumulation is calculated by the number of vehicles accumulated divided by total spaces. Parking volume is the sum of turnover in all bays. Parking capacity is the number of bays multiplied number of hours. Parking load is total number of vehicle accumulations at the end of each time interval multiplied by time. Efficiency may be calculated by dividing parking load to the number of bays. Comparative analysis of results yielded after the research would result in conclusions which would be helpful in planning, improving and managing parking facilities and would have future scope in other cities. For the purpose of illegal parking survey, the certain day duration is chosen and the survey is carried out to count the illegally parked vehicles, then the average of all days can be calculated by the arithmetic means, the set of questionnaires can be beneficial to obtain the reasons behind the illegally parked vehicles, the information from the questionnaires can be effectively used to reduce the rate of illegal parking. After the license plate method and illegal parking survey and calculation of inventories, Land use method can be employed for the purpose of calculating demand for parking for different land uses, the simple set of Questionnaire forms that are used in land use method are given below, they provide the vital information about the demand of parking for land use like Banks, Offices, Shops, Hotels, Restaurants, Mosques, Stores etc.

2. Questionnaire Forms Used In Land Use Survey:-

The questionnaire forms for land use method has the set of questions about the name of the land use, address, square area of the building, peak hours, available parking facilities in the land use, no. of employees with vehicles in the office and the column for contacting higher officials in the office if the permission for survey is not granted at first.

3. Field Survey Observation Form:-

The field observation form indicates the land to be surveyed, contact numbers of owners, name of the facility with address, the day and time of survey, weather conditions, peak hours, no. of vehicles parked in peak hours, parking capacity of land use if any, shared parking details and some other miscellaneous comments.

V. AIM OF THIS STUDY:-

The study topic "analysis of parking facilities in CBD" of Srinagar by conducting parking surveys and emerging at fruitful results that will curb the parking problem in the commercial center has the following objectives under consideration

- Study of existing parking conditions in CBD, facilities available, number of parking lots and their behavior and mode of parking.
- Inventory of additional space for parking that can be brought to good use availed for the purpose.
- To carry out parking studies for the determination of actual parking demand during the different periods of the day.
- To emerge at suitable techniques for planning and designing of parking facilities to meet the demand of traffic and to formulate strategies for better management of parking

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