Parking Problem in Chandigarh

Abstract: Transportation is the key infrastructure of the country. With the increasing rate of traffic, the vehicle ownership rate is also increasing because of which parking problem have prevailed. If the vehicle will be parked accurately and efficiently then almost half of the problem related to parking will be solved. A good parking system not only saves time but fuel too. The problem includes congestion, jam, reduction in road width and also increased rate of accidents. The present study includes the parking problem in city beautiful- Chandigarh.

Keywords- Congestion, Parking Demand, Accidents, ITS

I. INTRODUCTION
Due to increase in traffic congestion, there has been significant increase in demand for parking spaces. As the number of vehicles are increasing, the parking area for offices and shopping mall complexes have become inappropriate. This increasing demand has also lead to economic, social and environmental losses. Thus the optimum utilization of space and its control is a great challenge faced by the planners a day. Therefore, the demand for the intelligent transport system arises. The need for the intelligent transport system comes from problems caused by traffic congestion and a synergy of new information technology for simulation, real time control and communication network. An example of sector 17 Chandigarh is taken and elaborated along with other examples in the city.

II. OBJECTIVE
• To assess existing parking demand and its characteristics.
• To analyse and eliminate existing parking area.
• To analyse future parking needs. The parking of past year is studied and other alternatives are discussed.

III. REASONS BEHIND PARKING PROBLEM
A. Insufficient Information for Motorists on Parking Availability:
Motorists are not aware about the parking space and the free parking available. They spend excessive time in searching for parking space therefore is more likely to get frustrated.

B. In efficient Use of Existing Parking Area:
Due to development in transport, vehicle ownership rates have increased which has resulted in over supply of parking spaces and inefficient use of existing parking area.

C. Spillover Problem:
As the parking demand is increasing a certain parking area is not able to accommodate all the vehicles due to which all the adjacent on street spaces are utilized.

D. Inaccessible Parking Options:
Parking is not available within reasonable distance during specific times of the day.

E. Confusing Parking Policies:
Regulation and fee for parking may apply at certain times. There is no fixed policy for parking.

F. Inadequate Pricing Methods:
Price structure is usually not fixed for a particular parking space .as a result of which motorists end up paying for the time they don't actually use. [1]

IV. DISADVANTAGES OF IMPROPER PARKING
A. Congestion:
Congestion and parking are interrelated as looking and waiting for the parking space causes additional delays and impairs local circulation. This causes traffic congestion to be more complex. Recurring traffic congestion is frequent because the roadways have insufficient capacity for the volume of vehicles.

B. Accidents:
Improper parking is also a major cause for accidents. As the parking area is insufficient mobility of vehicles is difficult as well as time consuming because of which collision occurs.

V. MANAGEMENT TO PARKING PROBLEM
• Funds should be properly utilized.
• Long term parking areas should be considered.
• Proper information should be provided for the vehicles.
• Increase public transport instead of using one vehicle per person.
• Parking should be done once and then walking should be preferred.

VI. METHODS TO ELIMINATE PARKING PROBLEMS
The various systems of parking could be adopted in order to reduce the parking problems.

A. Automated Parking System
APS system provides parking for cars on multiple levels. It is a mechanical system which is designed to minimise the area required for parking the cars. It uses mechanical system in order to transport the cars to and from the parking spaces so as to eliminate space wasted in multi storey parking. The concept behind the automated transport system is to decrease the parking area. In this system the car is driven up to entry point and then the passengers and driver exit from the car. The car is then moved either automatically or semi-automatically to its parking space.Elevators or conveyor belts can be used for taking the car to the parking area. A popular mechanics article showed the use of conveyor belts in an underground garage for the parking of cars. [2]

B. Multi-Level Parking System
This system more essentially is a stacked parking consisting of floors and levels on which parking takes place. In recent times it is built to serve residential and business centres as a part of their basement. This saves the land for other uses and also the parking is hidden. This system is much cheaper and practical as compared to other systems. In such parking optimum utilization of space is there.
C. Intelligent Transport System

Intelligent system aims at providing innovative services to the vehicles as well as the users to be safer and better informed about the smarter use of networks. It combines traffic monitoring, communication, processing and variable technologies in order to provide parking guidance and information. ITS system helps the motorists to find the unoccupied parking space and also the location of the car when the user returns back to the vehicle. It includes sensors and LED indicators (red for occupied, green for available and blue for reserved). The objective of ITS system is to reduce the searching time for the parking space which in turn reduces congestion.[3]

1. Parking Guidance System

It has sensors which are installed in the indoor park which helps to determine whether the car has already taken lot. This can be indicated by the LED lights. Bluetooth or SMS can also be used with parking space number to indicate empty space. A parking guidance system has various elements such as detectors, zone controllers, LED indicators, data/intermediate controllers, central control system and signs.

2. Intelligent transport technologies

It uses various technologies such as:

- Wireless communications: various forms of wireless technologies are being used for intelligent transport system such as short range communications and long range communications.
- Computational technologies: this includes the use of microprocessor modules and Real time operating system.
- Floating car data: This includes methods to obtain travel time, vehicle speed etc. Various raw methods are used to collect this data.
- Sensing technologies: technological advances in the world of telecommunications have enhanced the technical capabilities that facilitate safety benefits to the motorists. The sensors are embedded in the road.

3. Intelligent transport applications

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| 1     | Advance traveller information system (ATIS) | • Real time traffic information  
• Route guidance |
| 2     | Advance transportation management system (ATMS) | • Traffic operation centres |
| 3     | ITS-enabled transportation pricing system (ITS-ETPS) | • Electronic toll collection  
Variable parking fee |
| 4     | Advance public transportation system (APTS) | • Real time status information for public transit system  
• Automatic vehicle location |
| 5     | Fully integrated intelligent transportation (FIIT) | Collision avoidance |

4. Advantages of ITS system for Indian cities like Chandigarh:

- Time Savings
- Better emergency response times and services
- Reduced Crashes and Fatalities
- Cost Avoidance
- increased Customer Satisfaction
- Energy and Environmental Benefit
- Decreasing of probability of congestion occurred

VII. PRESENT PARKING SCENARIO IN CHANDIGARH

As the city is developing, vehicle ownership rates have also increased. This has increased traffic congestion and also gave rise to the parking problems. Till date old free parking system is used in sector 17-the heart of Chandigarh. The multi-level parking system will be started soon which would accommodate around 931 vehicles. Two level parking systems will be used in sector 34.[5]

VIII. NEW TECHNOLOGIES TO BE ADOPTED

The low power sensors and the smart meters can be used in the parking spaces as done in the city of Los Angles in order detect the occupancy of the parking spaces. The sensors are installed beneath the pavement. The smart meters are attached to the regular meters that allow the user to pay the parking fee with their mobile phones. This technology would help to reduce the travel time driving within the parking area thus reduces congestion. The price of parking could also be changed according to demand i.e. the price could be increased. There is a free app called ‘parker’ for the drivers. This app helps the driver to find available space for parking and therefore saves time and reduces congestion.

CONCLUSION

The parking problems which are the result of urbanisation and motorization are the growing concerns now a day. The results of which are congestion, environmental issues and other traffic related problems. In this paper we make some effort to put together various methods that could be used to eliminate parking problems in city -beautiful Chandigarh.

References

[7] https://coeiu.iitd.ac.in\^\text{\#}ITS synthesis
[8] Rijurekha Sen and Bhaskaran Raman. Intelligent Transport System for Indian Cities