

## **REVIEW PAPER FOR PARKING REQUIREMENT: CASE OF SURAT CITY**

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*Abstract: Parking is actually problems for urban mobility. Surat is the second largest city with a population of 44.62 lacs (as per Census of India, 2011) in Gujarat. Parking is one of the major problems that are created by the increasing vehicle traffic. Due to the fast commercial and industrial activities development of the city, increase of the personalized vehicle was found 11% annually. In Surat city mix mode of transport vehicles are seen in all zone of different T. P. Scheme. Due to the less parking space provision in town planning scheme the people parks their vehicle on the road side as on-street parking system wherever available. As per as survey carried out in India it is roughly estimated that out of 8760 hours in year the car runs for an average for only 400 hours leaving 8360 hours when it is parked. This paper focus on literature about important of parking requirement in urban area.*

*Keywords: Parking facility, Need of Parking in Urban Area, parking requirement, Parking space.*

### **I. INTRODUCTION**

Whenever the engine of any automobile is in off condition it will demand parking. The tremendously increase in the population concentration in few metropolitan cities in the India has resulted in increase in the travel demand, transportation facilities demand. The increase in population and expansion of urban centers has been attended by increasing growth of car ownership and increasing demand for movement for various purposes and it has not only leads to traffic congestion, but also makes parking a new social issue. Most of the metropolitan cities of India are experiencing increasing problems related to parking. With the growing number of vehicles on roads, parking causes enormous costs – traffic delays, congestion, pollution and wastage of fuel and driver frustration.

Vehicles must park at every destination. An average every vehicles is parked 23 hours each day, and utilizations a few parking spots every week. The designing of a parking space has always been a important and challenging part of a traffic and transportation system. The absence of well authorized off-street parking facility causes illegal parking on the carriageway thus resulting in congestion, delay in time, accidents and traffic chaos due to on-street parking. A proper study of parking characteristic, regulatory measures, demand and supply of parking facility is great help to a town planner as well as traffic engineers.

## II. PARKING PROBLEMS

For any person or cargo moving in a vehicle, a terminal facility is essential both at the origin and the destination. When the person has to stop on route for some purpose other than traffic related, the vehicle needs some halting facility, without disturbing traffic flow otherwise on the street. Such a service is called parking.

## III. TYPES OF PARKING

- On-street parking
  - Parallel parking
  - 30° parking
  - 45° parking
  - 60° parking
  - Perpendicular parking
- Off-street parking
  - Surface parking (on the ground surface)
  - Parking garage: That can be,
    - Underground
    - Multi-storied structure

## IV. TYPES OF PARKING SURVEY

The type of parking survey to be conducted for formulating a comprehensive parking plan for an area can be very detailed in scope. The data collected and the degree of sophistication employed depend upon the fund available. Detailed manuals for conducting such a survey give general guidance.

The following are the types of parking surveys usually conducted:

- I. Questionnaire type parking usage survey
- II. Photographic Methods
- III. Parking usage survey by patrol
- IV. Parking space inventory
- V. Cordon count

1. *Bhasker Vijaykumar Bhatt, Fenil Rajeshkumar Gandhi, "A Study on Parking Needs at Intersections – Case of Surat T. P. Schemes," no. July 2014, 2016.*

The paper discusses the parking needs at intersections of developed T. P. Schemes of Surat under GTPUD Law, 1976. Use of land and road width together with parking facilities have an impact when the act does not provisions. The study finds parking lot consumes 0.1% - 2.46% of land at intersections. Study different Intersections of selected TPS and land use around intersections. Parked vehicle at intersection make traffic problem.

2. *T. T. My Thanh and H. Friedrich, "Legalizing the illegal parking, a solution for parking scarcity in developing countries," Transp. Res. Procedia, vol. 25, pp. 4954–4969, 2017.*

During late 1980s-early 2000s, motorcycle population exponentially grew in Asian countries, for instances, China 25% per year, Vietnam 15%, India 11% and Indonesia and Thailand 9%. These unregistered spaces are used illegally by individuals to offer parking service and collect the illegal parking fee. The parking users might not even notice that they are parking illegally.

Illegal parking could lead to reduced traffic speeds, traffic volume/capacity loss (quality of traffic flow), delays or local congestions, changes in modal choice, loss of revenue from valid parking spaces, a decline in respect for the law compliance, streetscape and even to accidents. The prevalence of illegal parking was mainly due to parking supply shortage and lacking of parking information.

Author identify Car parking density in different zones, Walking distance, Payment for parking fee.

Para-parking concept

Para-parking means to utilize a place “similar” to a parking lot by improving a private area to become a semi-private parking lot. Characteristics of para-parking are shown in Table 1.

**Table 1 Characteristics of para-parking spaces Aspects**

Aspects	Description
Forms	Semi-private parking (private parking facilities, private operating, public utilization)
Investor/Operator	Private financing, private operating
Location	Located in areas with high parking demand (residence, shopping, business area)
Parking Pricing	Market – oriented pricing (government might limit the ceiling price)
Design Standards	Follow the minimum requirement of design standards (safety and security, lighting, entrance, and exit gate...)

Parking operators have to ensure the accuracy of the parking information system (availability, capacity and pricing scheme of parking facilities) and security issues like the compensation for damaged or lost vehicles.

3. A. T. Rivadeneyra, M. Shirgaokar, E. Deakin, and W. Riggs, “Building more parking at major employment centers: Can full-cost recovery parking charges fund TDM programs?” *Case Stud. Transp. Policy*, vol. 5, no. 1, pp. 159–167, 2017.

This paper presents an analysis of parking costs versus price in these circumstances, i.e., where to free up land for other uses, surface parking must be replaced by costlier structured parking unless demand reductions can be achieved. Both the national average analysis and the UC Berkeley case show the high cost of replacing surface parking with parking structures.

Where land costs are high or land availability is constrained, garages are likely to be the most rational way to supply parking spaces for employees. Nevertheless, because the addition of structured parking will raise costs substantially in comparison to surface parking.

Urban employers and other institutional managers of parking should consider whether they have a range of options rather than simply assuming that parking lots converted to building sites must be replaced with parking garages. While simply replacing parking lots with parking structures may seem to be the most obvious step, it may necessitate unwelcome costs for everyone. A shift in policies using parking pricing to moderate parking demand and to finance TDM programs can be the more cost effective way forward.

4. Aderamo AJ, “Traffic Congestion at Road Intersections in Ilorin , Nigeria,” *Mediterr. J. Soc. Sci.*, vol. 3, no. 9, pp. 201–213, 2012.

The authors studied traffic congestion problems and their causes for selected road intersections in Ilorin, Nigeria. The spatial pattern, congestion problems and intersection characteristics were identified. The traffic volume delays and their cause are also identified. Traffic volume, their composition, delays and land use activities are identified and analysis shows spatial and temporal variations are existing in traffic delays and traffic flows at intersections. The parking in intersection area mostly creates congestion and delays at studied intersections.

They concluded that there is need to strictly prohibited at road intersections to reduce congestion and traffic problems and there is need to made traffic management method to reduce bottleneck. They suggested that there is need of immediate solution to traffic congestion and traffic delays at road intersections.

5. T. Subramani, "Parking Study on Main Corridors in Major Urban Centre," *Int. J. Mod. Eng. Res.*, vol. 2, no. 3, pp. 742–748, 2012.

The authors have studied the parking problems in Salem city of Tamil Nadu which is fifth largest in state. The study was taken for identify existing parking conditions, parking studies, and to formulate strategies for better management for parking. Authors scope of work to conduct survey for availability of public and private open space for exploring them to convert in parking areas. He explains how the parking studies are important like typical automobile parked for 23 hours each day and uses different parking spaces each week. He studied present and past conditions in Salem city. The concept of parking characteristics and type of parking survey and ill effects of parking are explained.

The author concluded that parking uses a larger amount of road apace which reduce capacity and speed results in to delay in journey time. For short term parking, the pay and park method used and for long term off street parking facilities used. The on-street parking cannot be entirely prohibited, so some regulatory measures in policy should be taken to mitigate ill effects of parking.

6. Duvanova, T. Bubnova, and M. Romanovich, "Efficiency of Use Underground (Dike) Multilevel Parking in Conditions of Cramped Housing Development," *Procedia Eng.*, vol. 165, no. 921, pp. 1794–1800, 2016.

As per the report storage of personal vehicle is major current problem. According to the forecast, auto mobilization level for population of St. Petersburg will have risen from 242 cars per 1000 people in 2006 to 450 passenger cars per 1000 people by 2025. So the parking problem not only in city but also in residential area.

Objective of study.

1. To develop the project of diked parking;
2. To evaluate the efficiency of the project use in a constrained residential development.

Research methodology includes collecting literature data of parking construction, systematic analysis of the scientific and legal literature, experimental design; computer modeling, economic and mathematical modeling.

Efficiency of use project in conditions of cramped housing development

- Calculation of efficiency of the project utilization in a congested residential area.
- The calculation of the cost of building parking and calculation of economic and social efficiency
- Determining the cost per square meter parking lot project

During the construction of multilevel parking Dike, the task of organizing entry / exit and outputs on the surrounding area is one of the most difficult.

## V. CONCLUSION

The study of literature related to parking problem, it is found that parking is fundamentally a land-use issue and the importance of parking to different travel demands. Para-parking concept & Economic assessment of parking supply measures is use for parking proposal. They concluded that there is need to strictly prohibit at road intersections to reduce congestion and traffic problems and there is need to made traffic management method to reduce bottleneck. Cost of replacing surface parking with a parking structure and finds that it may be equally cost effective to pursue travel demand management strategies. Parkers could be better off paying for TDM programs to reduce parking demand rather than paying to build new parking structures.

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