

Parking Facility Design for Different Corridor of Anand City

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ABSTRACT

Rapid Growth in vehicles population has enormous strain in all million plus cities. Due to high vehicles ownership and poor transport facilities specially in the cities where the population between 1 to 2 million. The demand for parking has increase in alarming proportion in Central Business District (CBD) areas and other work or activity centers of the cities. This study focused on parking demand by collection of parking data, such as parking demand, parking accumulation, rate of turnover, to check the feasibility of paid parking service as well as it response on the mode shift of the two wheeler parkers. Feasibility of pay and park facility on two busy street “M.G.Road”, “MayFair Road” have been studied in this research work. The detail license plate surveying method and fixed period sampling method are used for analysis of survey data. This study also includes the In-Out survey or personal interview of people using the on-street parking at these two busy streets. In the study, On-street parking demand is very high in the study area on M.G.Road and MayFair Road for most part of day, but turnover is very poor, which reflects over occupancy of prime urban space for longer duration. All two streets having high commercial potential and high traffic flow.

Keywords: Parking Turnover, Parking Accumulation, Parking Demand, Congested Area.

I. INTRODUCTION

Urbanization gives rise to problem of congestion. As cities are growing, it will be important to plan and build new facilities for both public and private transport. There is a strong relationship between parking facilities and traffic flow characteristics in the city. Unplanned urbanization and transport facilities cause parking problems. Improper parking facilities result in decreased road capacity and many side effects such as air and noise pollution. It also causes economic consequences by losing time and fuel, loss of productivity, high energy consumption and increased accidental death rates. These parking problems are most disturbing problem in urban city. There are two type of parking facilities like on-street parking & other off-street parking. Customers and businessmen regards on-street parking as an essential service because on-street parking and provides convenient access to destination. All parking facilities should be designed and planned properly in order to provide a better life for the people and for the prosperity of the city.

1.1 Need of Study

Anand is considered to be an educational and cultural center of Gujarat. Every car owner would wish to park the car as closely as possible to his destination so as to minimize his walking. High volume of traffic consisting of both fast and slow moving vehicles is plying through the road. Major traffic generators such as commercial centers, shopping centers, restaurants, bank, residential flats, government office, hospitals, city bus stop, near railway station etc. are located in study area. In the scarcity of adequate off-street parking facilities, vehicles are parked haphazardly along curb causing traffic congestion and hazards. No parking bay is marked; hence people park their vehicles capital punishment on the on-street parking in all two streets. Capital punishment parking automatically reduced the carriage way width which create conflict and delay to through traffic, which also creates congestion problems.

1.2 Objective of Study

- To study existing parking facility of area.
- To analyze parking accumulation, turn over, parking duration.
- Recommendation for better parking Facilities.
- To Pay of on-street parking for two wheelers and peak hours park vehicles.

1.3 Study Area

The details description of all two roads are given in table no. 1

| Busy street | Right of way | Carriage way width | Commercial Activity | On-street parking |
|----------------------------------|--------------|--------------------|---------------------|-------------------|
| Mahatma Gandhi road | 11.0m | 8.2m | Both side | Either side |
| Mayfair road to laxmi char rasta | 10.3m | 8.0m | Both side | Either side |

Table 1: Existing properties of the various busy street in Anand city



Figure 1 : Google map of all two roads

1.4 Literature Review

- Parking study on Main Corridor in Major Urban Centre T.Subramani et.al (may2012) studied 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 great economical loss to

the community. According to the parking study on existing traffic condition on the road network it is must and required to remove on-street parking system for efficient transportation system.

To reduce the parking of vehicles we can implement the following.

- For short term measures pay and park method will be done at peak hours to control and regulate the parking.
- For long term measures Off-street parking have to be provided near CBD areas, within the radius of 1 Km.

- Study on Parking Needs at Intersections – Case of surat T.P.Scheme Bhasker V. Bhatt (July 2014) studied Parking needs at intersections of developed T. P. Schemes of Surat under the Gujarat Town Planning and Urban Development Act, 1976. Land use and width of road along with existing parking facilities have an impact where the act has no specific provisions. In general, road space consumed by parked vehicles varies from 0.1% to 2.46% in surveyed intersections having different land use of T. P. Schemes of Surat. However, for land use having 30%-40% commercial and residential each, the observed parking on road space was 2.46% and 2.60% respectively. Standing and parked vehicles obstruct the flow of traffic consuming valuable road space. Present practice of designing of intersections using Indian Road Congress as well as The Gujarat Town Planning and Urban Development Act, 1976 provide no guideline for parking land allocation at such locations.
- Off-street Parking Management Plan for Dharwad City, Karnataka Mrs Priyanka Kolhar et.al. (June 2012) studied to problems with current parking practices with the parking accumulation and supply survey in Dharwad. The demand for parking has increased in alarming proportion in Central Business District (CBD) areas and other work/activity centers of the cities. The Specific parking management strategies such as short term, medium term and long term. The study of parking duration analysis suggests that short duration parking is high. Hence, parking turn-over is high causing congestion on the streets. To reduce this, heavy parking fee is to be levied on the short duration parking vehicles. To solve the parking problems immediately short-term solution can be adopted with congestion pricing as,

operation and maintenance cost is very much less for on-street parking management rather than off-street and even IRR is high in on-street parking. But, based on the future parking demand in the study areas long term management plan is preferred.

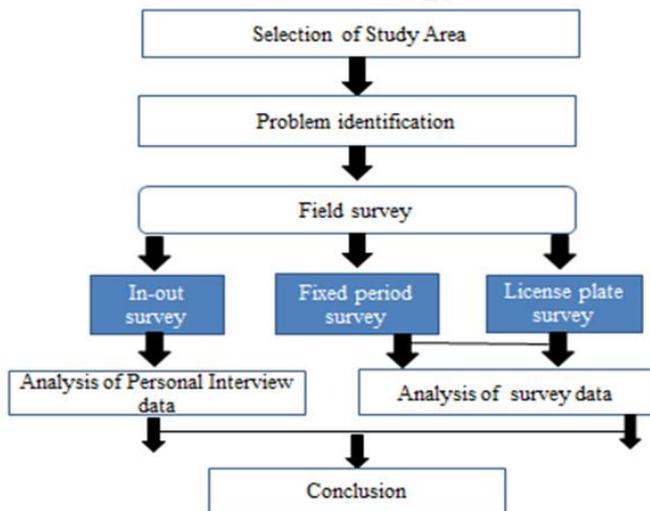
- Parking Management Blueprints For Rajkot-Solution To Urban Transport Problems Meet k Hingrajia and Pratik D Vagadia (sept 2015) studied the most vehicles are parked for very short durations during the peak hours because of trading areas. The area is also linked different important destinations of trading and commercial centers so traffic flow is obstructed because of existing on street parking facilities. Results in delay and waste of time occur for long trips. To prevent these delays and to best utilize space available in the area multistory parking or Roof parking are the solutions.
 - Examination Of On-Street Parking & Traffic Congestion Problems In Lokoja Olowosegun Adebola and Koffi Ayadu Edwin (2014) studied that Parking and traffic congestion is synonymous to each other because failure to meet parking demand of people in a city lead to on-street parking that results to traffic congestion. Traffic congestion is a condition on road networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased vehicular queuing. Norman and Wesley (2008) identified a number of ways by which on-street parking could be of importance. These are
- 1) Higher efficiency: Users of the downtowns consistently select on-street parking spaces over off-street surface lots and garage parking. The on-street spaces experience the most use and the highest turnover.
 - 2) Better land use: Using the curbside for parking saves considerable amounts of land from life as an off-street surface parking lot. Medium-sized town centers can save an average of more than two acres of land by providing street parking. This efficiency can allow for much higher-density commercial development than the center to rely solely on off-street surface lots.

II. METHODS AND MATERIAL

To most common parking survey conducted are as below:

1. **In-out survey:** In this survey, the occupancy count in the selected parking lot is taken at the beginning. Then the number of vehicles that enter the parking lot for a particular time interval is counted. The number of vehicles that leave the parking lot is also taken. The final occupancy in the parking is also taken. Hence the labor is required is very less. Only one person may be enough. But we won't get any data regarding the time duration for which a particular vehicle used that parking lot. Parking duration and turnover is not obtained. Hence we cannot estimate the parking fare from this survey.
2. **Fixed period sampling:** This is almost similar to in-out survey. All vehicles are counted at the beginning of the survey. Then after a fixed time interval that may vary between 15 minutes to 1 hour, the count is again taken. Here there are chances of missing the number of vehicles that were parked for a short duration.
3. **License plate method of survey:** This results in the most accurate and realistic data. In this case of survey, every parking stall is monitored at a continuous interval of 15 minutes or so and the license plate number is noted down. This will give the data regarding the duration for which a particular vehicle was using the parking bay. This will help in calculating the fare is estimated based on the duration for which the vehicle was parked. If the time interval is shorter, then there are less chances of missing short-term parkers. But this method is very labor intensive.

Methodology



III. CONCLUSION

In study area is provided with right angle on-street parking for two wheelers on either side of the carriage way according to odd-even date which causes frequent conflict and cross maneuvering with through traffic. Inadequate mark parking bay in the study area leads to the spillover of parking space and improper parking of vehicles. Parking policy of study area, on-street parking, which provide parking nearer to the destination place of the user is free and off-street parking, which users to walk for their destination place is payable.

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