Parking Demand In Surat City

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Abstract—The increased in vehicle owning capacity and easily availability of vehicle loans has accelerated the total number of vehicles in India. Almost, all the metropolitans’ cities are experiencing increasing problems related to parking (Dr. Rajat Rastogi, 2006). Problems like congestion, increase in no of accident, pollution, reduction in carriageway, etc. has been faced due to on-street parking. Thus, we attempt to find out on-street parking demand at the busy urban streets of Surat city. A 03 hour survey using license plate method was carried out for the CBD area of Surat. Parking demand was found out in terms of parking load, parking accumulation, parking turnover, parking index. Further suitable paid parking policy was suggested for the existing situation. The study reveals that on-street parking has become one of the major problem for the CBD area and if proper parking policy are not adopted then situation will become worst.

Index Terms—Multi level parking, Hydraulic parking, sign and signal.

I. INTRODUCTION

Increase in vehicle population in the face of the limited road space used by a large variety of motorized and non-motorized traffic has heightened the need and urgency for a well thought out project on the issue of road congestion. The precious time of citizens is wasted due to traffic jams and if this problem is not solved at this stage, and then it would become a serious and complicated problem in future. One of the major cause of such a huge traffic in the Central business district area (CBD) of the cities is parking. The major problems faced by the road users due to parking are congestion, accidents, reduction in carriageway width, obstruction to flow traffic and much more. Thus, Parking is an essential component of the transportation system. Vehicles must park at every destination. A typical automobile is parked 23 hours each day, and uses several parking spaces each week. It has been observed that for 96 per cent of its lifetime, a private automobile is immobile. In spite of this, while traffic congestion, road connectivity and road quality are considered key issues in urban transport planning, the issue of parking remains on the sidelines as an insignificant factor in urban infrastructure planning. Big cities across the world have recognized parking as an important variable and have created specific policies and plans for parking. In India, however, the problem of parking has not been given its due importance. Some might argue that parking is one of the lesser woes of urban transport, but this view has led to its exclusion from the policy framework, causing many traffic bottlenecks. This results in poor quality urban transport, misuse of land and increasing social and environmental costs. All of India’s cities face an urban transport crisis. While issues such as poor connectivity, bad road quality, traffic congestion, air and noise pollution are constantly talked about, parking is seen as one having negligible effect on the quality of urban transport.

The MV Asia study on parking in Mumbai shows that a car spends only 4 per cent of its life in motion and the remaining 96 per cent of the time it is parked (Mumbai Transformation Support Unit 2008).

Objectives:

To calculate hourly parking variation for the period of survey. To carry out on street parking inventory survey on busy routes of CBD area of Ahmadabad and to calculate various parking statistics like parking volume, parking spill over and parking turn over. To evaluate and optimize the duration at which the parking survey is to be conducted and formulate the existing on street parking scenario for CBD area. To understand the root cause of the parking problem and to develop the parking duration model including the variable responsible for the huge demand of parking. To develop behavioral models of motorized vehicle users for various formulated parking polices in CBD area. To formulate the response to paid on street parking policy model using soft computing techniques like fuzzy logic and Artificial Neural...
Network. To estimate the revenue generated on account if paid parking policy are introduced in the existing situation.

II. AUTHOR GUIDELINE FOR MANUSCRIPT PREPARATION

On street parking :-
On street parking means the vehicles are parked on the sides of the street itself. This will be usually controlled by government agencies itself. Common types of on-street parking are as listed below. This classification is based on the angle in which the vehicles are parked with respect to the road alignment. As per IRC the standard dimensions of a car is taken as 5×2.5 meters and that for a truck is 3.75× 7.5 meters.

1. Parallel parking:- The vehicles are parked along the length of the road. Here there is no backward movement involved while parking or no parking the vehicle. Hence, it is the most safest parking from the accident perspective. However, it consumes the maximum curb length and therefore only a minimum number of vehicles can be parked for a given kerb length. This method of parking produces least obstruction to the on-going traffic on the road since least road width is used. Parallel parking of cars is shown below. The length available to park N number of vehicles, L = N 5.92.

2. 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.

<table>
<thead>
<tr>
<th>AB</th>
<th>= OBsin30° =</th>
<th>1.25,</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>= OPcos30° =</td>
<td>4.33,</td>
</tr>
<tr>
<td>BD</td>
<td>= DQcos60° =</td>
<td>5,</td>
</tr>
<tr>
<td>CD</td>
<td>= BD – BC = 5 – 4.33 =</td>
<td>0.67,</td>
</tr>
</tbody>
</table>

3. 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. As shown below length of parking space available for parking number of vehicles in a given kerb is = 3.54N+1.77

4. 60° parking:- The vehicles are parked at 60° to the direction of road. More number of vehicles can be accommodated in this parking type. As shown below length available for parking N vehicles=2.89N+2.16

5. Right angle parking:- In right angle parking or 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. An example is below, Length available for parking number of vehicles is =2.5N.
III. RESULT ANALYSIS

Picture 1: Sectional View of Chowk Bazar Road

Table

<table>
<thead>
<tr>
<th>MODE</th>
<th>MODE SHARE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorcycle</td>
<td>46.0 %</td>
</tr>
<tr>
<td>CAR</td>
<td>11.0 %</td>
</tr>
<tr>
<td>AUTO Rickshaw</td>
<td>9.0 %</td>
</tr>
<tr>
<td>BUS</td>
<td>6.0 %</td>
</tr>
<tr>
<td>Walk</td>
<td>14.0 %</td>
</tr>
<tr>
<td>BICYCLE</td>
<td>14.0 %</td>
</tr>
</tbody>
</table>

IV. CONCLUSION

License Plate Survey was carried out for the parking inventory survey to study the parking demand and to implement the parking policies. The data was collected and was analyzed in the software (i.e. M/S Excel). The results were obtained after the data was compiled and the answers were obtained. The peak
hour was obtained and it was found to be in between 4 P.M to 7 P.M. The maximum types of parkers are TWO wheelers and Three-wheelers. Short-term parkers were more in number than long term (i.e. 10 min parkers were more). The maximum numbers of vehicles parked during the peak hour were 345 (176 on Right sides and 169 on Left sides).

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