National Conference on Recent Research in Engineering and Technology (NCRRET-2015)
International Journal of Advance Engineering and Research Development (IJAERD)
e-ISSN: 2348 - 4470 , print-ISSN:2348-6406

Parking space demand study on the busy corridor of Modasa Town.

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Abstract:

One of the problems created by road traffic is parking. Not only do vehicles require street space to move about, but also do they require space to park. Every vehicle owner would wish to park their vehicles closely as possible near to their destination so to minimize their walking. This results in a great demand for parking space in the CBD where the activities are concentrated.

In Modasa town due to the lack of parking facilities on the busy corridor faces the parking problems like delay of vehicles travel time, congestions, accidents, no utilization of footpaths.

This paper reports the on-street parking behavior and the analysis of parking space demand study on the busy corridor of Modasa town and some remedial measures to overcome these problems.

Keywords: Parked vehicles, Parking problems, Pedestrians

Introduction:

1 General:

Modasa is a city and a municipality in Aravalli district in the Indian state of Gujarat. Modasa became headquarters of new Aravalli district, carved out from tribal-dominated areas of Sabarkantha. The Modasa Municipality has population of 67,648 of which 34,917 are males while 32,731 are females as per report released by Census India 2011.

The parking is always been one of the serious problem of the traffic in CBD areas, the one such CBD area parking problems is described here of Modasa Town.

CBD (Central Business District) area is defined as the area which comprises of most of government and private offices, residential and commercial areas, focal points of commercial activities and bus terminals.

In Modasa the corridor from Bus-Stand to Char-Rasta is known as the CBD area of the town and so this is also the busiest corridor. The corridor have Bus-Stand , schools, hospitals, commercial shops, vegetable market, residential areas and Modasa Town Hall nearby side to it. .

Every vehicle owner would wish to park their vehicles closely as possible near to their destination so to minimize their walking and some footpath

area is consumed by vegetable vendors and stalls, due to this there a problem arises of parking of the vehicles. The vehicles are parked on-street which consumes almost one of the lanes of each direction, so the problems of accidents of the running vehicles with parked vehicles and with the pedestrians, the congestions of the traffic which results the delay of vehicles travel time.

2 PARKING STUDIES:

2.1 PARKING CHARACTERISTICS

- Parking accumulation: It is defines as the number of vehicle parked at a given instant of time. Normally this is expressed by accumulation curve. Accumulation curve is a graph obtained by plotting the numbers of bays occupied with respect to time.
- Parking volume: Parking volume is the total number of vehicle parked at a given duration of time. This does not account for repetition of vehicles. The actual volume of vehicles entered in the area is recorded.
- Parking load: parking load gives the area under the accumulation curve. It can also be obtained by simply multiplying the numbers of vehicles occupying the parking area at each time interval with the time interval. It is expressed as vehicle hour.
- Average parking duration: It is the ratio of total vehicle hours to the number of vehicles parked. Parking duration = Parking load Parking volume
- Parking turnover: It is the ratio of number of vehicles parked in duration to the number of parking bays available.
- Parking duration = Parking volume Number of bays available. This can be expressed as number of vehicles per day per time requirement.
- Parking Requirement

There is some minimum parking requirement for different types of building

- For residential plot less than 300 Sq.m. only community parking space is required.
- For residential plot area from 500 to 1000Sq.m, minimum one fourth of the open area should be reserved for parking.
- Offices may require at least one space for every 70Sq.m parking area.
- One parking space is enough for 10 seats in a restaurant
- Whereas theatres and cinema halls need to keeps only one parking space for 20 seats.

Thus the parking requirement is different for different land use zones.

3 METHODOLOGY & DATA COLLECTION

The study has been conducted by the TRANSPORTATION ENGINEERING students of TATVA INSTITUTE OF TECHNOLOGICAL STUDIES COLLEGE, MODASA. The purpose of the study is for assessing the existing Parking space demand study on the busy corridor of Modasa Town.

3.1 TYPES OF PARKING SURVEYS

Parking surveys are conducted to collect the parking statistics. The most common parking surveys conducted are:

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 vehicle that leaves the parking lot is also taken. The final occupancy in the parking lot is also

taken. Here the labour 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 use 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. Han 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 because fare is estimated based on the duration for which the vehicle was parked. If the time interval is shorter, than there are less chances of missing short term parkers. But this method is very labour intensive.

3.2 Analysis and Data collection:

The data is collected by license plate method survey on the study area from Char-Rasta to Bus-Stand, during the morning peak hour from 10:30 to 11:30 am. The data is collected in two parts right and left side of corridor w.r.t from Char-Rasta with time intervals of 10 and 5 minutes to the respective sides.

Figure 1 PRESENT SCNERIO OF THE CORRIDOR

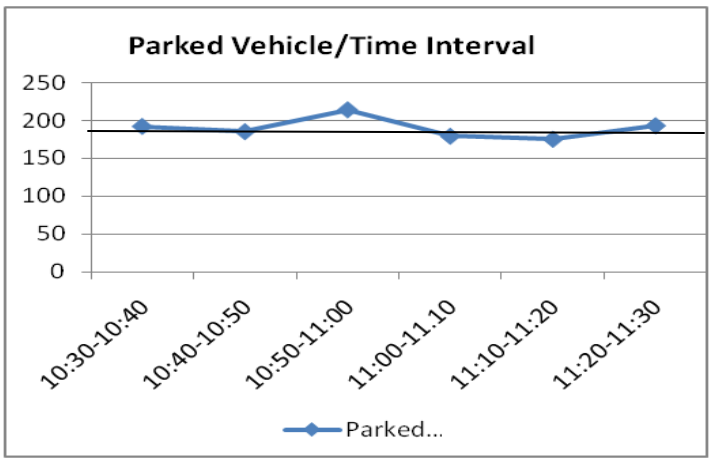

Figure 2 PARKED VEHICLE/TIME INTERVEL OF 10 MINUTES AT RIGHT HAND SIDE

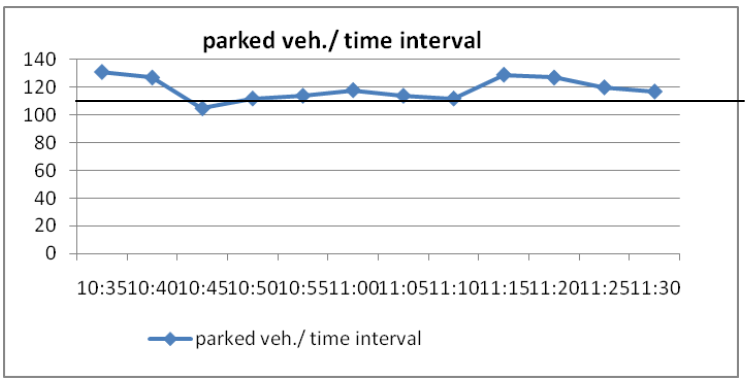

Figure 5 PARKED VEHICLES/ TIME INTERVAL OF 5 MINUTES AT LEFT HAND SIDE

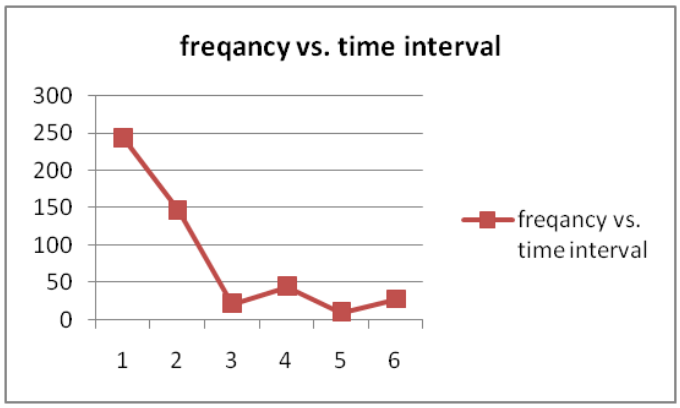

Figure 3 FREQUENCY/ TIME INTERVAL OF RIGHT HAND SIDE

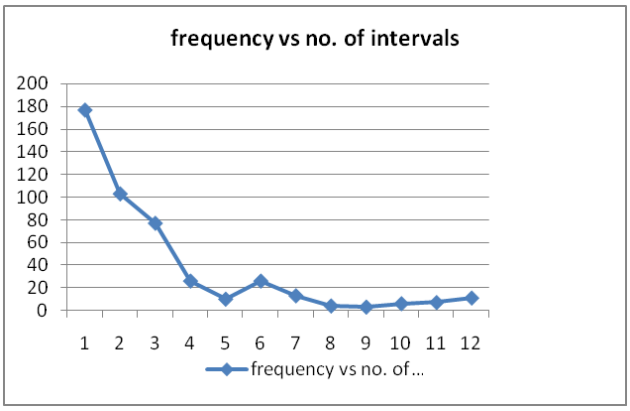

Figure 6 FREQUENCY/ TIME INTREVAL OF LEFT HAND SIDE

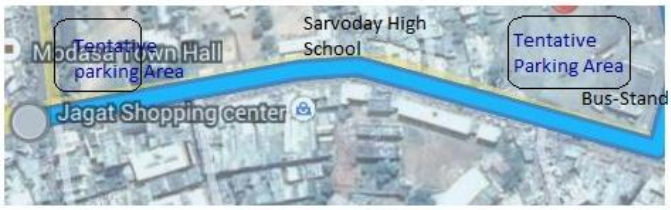

Figure 4 Study Area with Tentative Area

4 CONCLUSIONS:

➢ Parking takes considerable lane space leading to the lowering of the road capacity, hence, speed will be reduced; Journey time and delay will also subsequently increase.

➢ The approx 110 vehicles can be parked on left side and 180 vehicles on the right side officially considering 2m wide footpath and the respective length of the lanes, taking 2x1 Sq.m for each vehicle.

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.

➢ Careless maneuvering of parking and un-parking leads to accidents

- Common type of parking accidents occur while driving out a car from the parked area,
- Careless opening of doors of parked cars, and while bringing in the vehicle to the parking lot for parking.
- Accidents between the pedestrians and the vehicles, since the footpath is utilized by the shops, stalls and vegetable vendors.

➢ Also cause pollution to the environment because stopping and starting of vehicle while parking and un-parking results are noise and fumes.

➢ Affect the aesthetic beauty of the city because vehicles parked at every available space create a feeling that building rises from plinth of vehicles.

➢ The on street parked vehicles obstruct the emergency vehicles like; fire fighting vehicles & ambulances.

5 SUGGESTIONS FOR IMPROVEMENT:

✓ Prohibiting the on street parking ,

- Though on street parking is an extravagant use of the precious space it cannot be entirely prohibited
- Angle parking seems to be better than parallel parking which is usually involves a backing motion. Delay of traffic is minimized with angle parking.

✓ For long term measures Off street parking have to be provided near within the radius of 1 Km

✓ The tentative area for parking around 100 Sq.m can be easily provided in the open space near Modasa Town Hall and the open area of Bus-Stand which can sort out the parking problems.

✓ A judicious application of appropriate traffic management measures will help to mitigate some of the ill effects of on street parking's, these measures should be of a comprehensive parking policy for the city.

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