

ILL Effects of Unauthorized Parking at Authority Rotary Intersection Greater Noida

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Abstract— The problem of traffic congestion in urban roads mainly at intersection is being viewed in recent years. Traffic management at intersection is a difficult task for traffic planners. The basic “3E” theory related for traffic management as Engineering, Education and Enforcement are the basic tools. Invalid parking, fast growing traffic rate and insufficient width of road due to on street parking at intersection resulted as severe traffic congestion sometimes as traffic jam. Raising trends in growth of vehicular traffic around Greater Noida and the steady growth of Delhi create a continuing demand for improvements in highway facilities in Greater Noida. Drivers in urban area want to reduce walking distance, resulted as on-street parking and it create an environmental and economic impact like traffic congestion, heighten pollutant emissions levels, noise, time delay etc. The paper identifies a research direction to investigate factors that influence parking search behavior across intersection at grade and suggest a policy to provide potential urban parking in present study which could reduce the number of on street parking which reduces road capacity.

Keywords— PCU, Traffic Congestion, Rotary Intersection.

I. INTRODUCTION

Adequate parking is one of the major problems of all urban cities. Fast growing rate of urbanization and rapidity are resulted as huge number of private vehicles in developed cities. So provision of efficient parking is a big task to all town planners and traffic engineers. Greater Noida is a satellite city to Delhi which is capital of India. It comes under National Capital Region (NCR) due to which urbanization rate of Greater Noida is very high. Greater Noida is also a big hub for education and industry. More than 25 engineering colleges and many multi National companies like Yamaha, INOX, LG, Denso etc are in Greater Noida. So traffic is increasing at a very high rate day by day in Greater Noida. Most of intersections in Greater Noida are in form of Rotary intersection which is limited to handle small traffic load. So most rotary intersections are inefficient due to large traffic in Greater Noida. Authority is one of main area in Greater noida which includes Rampur Jagir market, Gamma- 2 residential area and connaught place mall in its premises. Every car owner would wish to park his vehicle as closely as possible to his destination so as to minimize his walking distance and result in great demand for parking space. People are used to in Greater Noida for on-street parking for less walking distance and save time. But it reduces the road width and resulted as bottleneck formation. Both roads of Authority rotary intersection are very important and concern with high traffic volume. So each part of intersection should be clear. In this research work I am going to investigate problems due to invalid parking,

provision of parking space according to parking studies and parking charge.



Fig 1 Unauthorized parking at rotary

If it's projected to implement a system of parking charges it'll even be essential to understand what proportion to charge and what's going to be the have an effect on of the rating policy on parking. Parking survey is meant to produce of these quite data. With the growing population of cars, the matter of parking has assumed serious proportions. a scientific study of parking characteristic and demand and restrictive measures that ar attainable for dominant is of nice facilitate to a traffic still as city planner.

II. LITERATURE REVIEW

Some of the important literature which are beneficial to my research work and somewhat similar to my research are as following:

T. Subramani (2012) is described about parking study in Salem city in his research. Salem was the fifth largest city with a population of 7.54 lakhs (2011) in Tamil Nadu. Parking was one of the major problems that were created by the increasing vehicle traffic. It had an impact on transport development. The availability of less space in urban areas has been increased demand for parking space especially in central business area. This affected the mode choice also. This has been a great economical impact. Two wheeler sales at 15 million were expected to grow 14-15%, while car sales close to 8 lakhs units a year. In order to accommodate the large volume of vehicle, small cities and towns must develop the affect their infrastructures – roads, flyovers, car parks and other facilities. Otherwise their arteries were most likely to get clogged like it happens in big and mini metros. The solution for this was systemic survey and management of traffic and pedestrian, although at a nascent stage in India. Before taking any measures for betterment of conditioned, data regarding availability of parking space, extent of it usage and parking surveys were intended to all these information. Since the duration of parking varies with different vehicles, the data has been to be analyzed to access the parking need. As the traffic on the existing road system in the cities increased, congestion became serious problem.

My research work is similar to Salem city parking problems. This literature provides me a proper outline for my work.

III. OBJECTIVE

The overall objective of this study is to investigate the current problems due to invalid on street parking near authority Chowk rotary intersection in Greater Noida, Uttar Pradesh. Then calculate the requirement of parking space with the help of cordon method near rotary intersection as per IRC SP-12 guide lines. If it's planned to implement a system of parking charges it'll even be necessary to understand what quantity to charge and what is going to be the have an effect on of the rating policy on parking.

IV. PARKING SURVEY

This study is related with determine the PCU values of vehicles in under mixed nature traffic flow at on congested Authority Rotary intersection. It is channelized intersection at-grade circular rotary system is available. Traffic volume is medium. Traffic volume increases because population of Greater Noida increases. Rotary intersections or round about are special form of at-grade intersections.

A. 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 defined as total number of vehicles parked at a given duration of time. This does not take 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 calculate 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 turnover: It is the ratio of total number of vehicles parked in a duration to the number of parking bays available in that area. **Parking duration =** Parking volume / Number of bays available this can be expressed as number of vehicles per day per time requirement.

Parking Requirement as per IRC SP 12: There is some minimum parking requirement for different types of building

- For residential plot less than 300 square meter only community parking space is required.
- For residential area from 500 to 1000 square meter minimum one fourth of the open area should be reserved for parking.
- Offices may require at least one space for every 70 square meter Parking area.
- One parking space is enough for 10 seats in a restaurant.
- One space for every 80 square meter of floor area.
- Where as theatres and cinema halls need to keep only one parking space for 20 seats.

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

B. Types Of Parking Surveys

Parking surveys are conducted to collect the above said parking statistics. The most commonly parking surveys conducted are given below:

1. **In-out survey / Cordon Survey :** In this survey the occupancy count in the selected parking area is taken at the beginning. Then the number of vehicles that enter the area for a particular time interval is counted. The number of vehicle that leaves the area is also counted. Here the labor required is very less as 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 as in this method all vehicles are counted at the beginning of the survey than 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:** It provides most accurate and realistic data. In this survey, every area 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 on street parking. This will help in calculating the fare because fare is estimated based on the duration for which the vehicle was parked.



Fig 2 Data collection at Authority rotary intersection

Location: Authority Chowk, Greater Noida, India

Method: Cordon Method

V. METHODOLOGY

First of all I have to collect traffic volume data and analyze the data of Authority rotary intersection. Then by calculating the traffic volume and converting it into PCU we can calculate Practical Capacity of rotary intersection. Parking is a critical point of transportation policy and management for any locale, but especially for urban areas like Greater Noida. The purpose of the study is

- to identify and review “on-street” parking policies’
- to recommend best practice strategies for on-street parking in Greater Noida.

i) Ill effects of parking

Congestion

The problem of traffic congestion in Greater Noida is worse at road intersections. Indeed, there is no other point on cities roads that can be greatly congested as road intersections. The studied intersections are comprised of 4-legged rotary intersection road junction. The intersections serve as links to major routes which connect different types of land use activities. Unsignalized intersections are very

common to all rotary intersections in Greater Noida and presence of road-side hawkers and traders, and invalid parking along the intersecting roads. These result in road-side obstructions and thereby impeding the free movements of vehicles.

B. Delay

An intersection is a mutual area that is used by more than one approach at a time and delay and queuing process are the main characteristics of such an intersection.

C. Pollution

Air Pollution

Passenger vehicles are a major pollution contributor, producing significant amounts of nitrogen oxides, carbon monoxide, and other pollution. The health risks of air pollution are extremely serious. Polluted air increases at very high rate respiratory diseases like asthma and bronchitis, heightens the risk of life-threatening conditions like cancer in Delhi NCR region and burdens our health care system with substantial medical costs. Automobiles are a necessary evil, while they have made living easy and convenient but also made human life more complicated and vulnerable to both toxic emissions and an increased risk of accidents

Noise Pollution

According to the World Health Organization (WHO), noise is second only to air pollution in the impact it has on human health. It is a major cause of hearing loss, heart disease, learning problems in children and sleep disturbance. The Central Pollution Control Board constituted a Committee on Noise Pollution Control. The Committee allowed noise standards for ambient air and for automobiles, domestic appliances and construction equipments, which were later notified in Environment (Protection) Rules, 1986 as given below:-

Code	Area	Day Time	Night time
A	Industrial	75 dB	70 dB
B	Commercial	65 dB	55 dB
C	Residential	55 dB	45 dB
D	Silent Zone	50 dB	40 dB

Table 1 Noise standard by NPC

Due to traffic congestion near intersection noise increases due to different types of engine sound in mixed traffic as well as excessive horn which creates discomfort to local residential area and market area.

Noise standards for automobiles, domestic appliances and construction equipments have been notified in Part 'E', Schedule-VI of Environment Rules, 1986, as ammended on 19th May 1993, as given in the Tables below.

Category of Vehicle	Noise limit
Motorcycle, scooters and three wheelers	80 dB
Passenger Cars	82 dB
Passenger or commercial vehicles up to 4 MT	85 dB
Passenger or commercial vehicles above 4 MT and up to 12 MT	89 dB
Passenger or commercial vehicles exceeding 12 MT	91 dB

Table 2 Noise standard for automobiles

VI. CONCLUSION

On street parking takes considerable street area resulting in the lowering of the road capability. Hence, speed is going to be decreased; journey time and delay also will afterwards increase. As per the parking study on existing traffic condition on the road network of Authority rotary intersection space, it's should to get rid of on-street parking system for economical transportation. Common type of parking accidents occur whereas careless opening of doors of standing cars, and whereas transfer within the vehicle to the car parking zone for parking. It also creates pollution to the environment because stopping and starting of vehicle resulted as noise and air pollution take place due to traffic congestion due to invalid parking. To reduce the parking of vehicles we can implement the following.

- For short term measures parking charge 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 Authority intersection area, within the radius of 500 meter.
- Reduce road width due to invalid parking.
- Decrease aesthetic due to pollution and congestion.

FUTURE SCOPE

A even handed application of applicable traffic management measures can facilitate to mitigate a number of the sick effects of on street parking. These measures ought to be of a comprehensive parking policy for town. The regulative measures vary from waiting restrictions associate exceedingly in a very street to the excellent management over an extended space, lying down wherever the vehicles could or might not park. The measures ought to be sporadically reviewed and altered, if necessary. The regulative measures square measure usually of 2 sorts, one wherever the employment of parking lot is allowed certainly periods free or for payment and alternative wherever parking is prohibited, however that permits parking for choosing up or setting down the products and

passengers. Once a controlled parking theme is planned, the zone boundaries ought to be represented and appropriate traffic signs square measure put in.

Parking spaces are designed at desirable location alone and no parking is allowed elsewhere, the measure will be successful only if the streets are probably signed and the carriageway marking are adequate. Angle parking proves to be better than parallel parking which is usually involves a reversing motion. Delay of traffic is minimized with angle parking due to less reduction in road width.

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REFERENCES

- Khanna, S.K., and Justo, C.E.G., (2011), "Highway Engineering", New Chand and Bros, 9th Edition, New Delhi.
- Dr. L.R. Kadiyali, "Traffic Engineering and transport planning", 8th edition, New Delhi.
- Guidelines for pedestrian facilities, IRC:103-1988
- V.N.Vazirani & S.P.Chandola, "Transportation Engineering Vol.I", 5th edition, Khanna Publishers, New Delhi
- C.Jotin Khisty & B.Kent Lall, "Transportation Engineering" 3rd edition, PHI Learning Private Limited, New Delhi
- R.K. Khitoliya, "Principles of Highway Engineering" 1st edition, Dhanpat Rai Publishing Company, New Delhi.
- Meyer M.d.Miller E.J (1984), "Urban Transportation Planning", Mcgraw – Hill series, New Delhi.
- IRC SP -12:** Tentative Recommendations on the provision of parking spaces for urban areas, 1973, *Indian Road Congress*.
- IRC 65:** Recommended Practice for Traffic Rotaries, 1976, *Indian Road Congress*.

BIOGRAPHIES



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