

AREA TRAFFIC MANAGEMENT IN HIGH DENSE URBAN CORRIDOR- A CASE STUDY IN HYDERABAD CITY

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ABSTRACT

Area traffic management in high dense urban corridors is an essential prerequisite for the effective planning in urban area. Most of the traffic problems are caused by certain deficiencies in planning, engineering and management issues. The traffic congestion, vehicular delays, risk of accident, uneconomic travel and other psychological strains are the observed features in the urban area.

The development of built up areas is a reflection of land use change in urban activated areas. The road infrastructure density, its functionality, hierarchical connectivity should reciprocate to the demand profiles like trip length, trip inter actions and trip densities. This project envisages studying the various issues related to traffic congestion like level of service, speed, congestion, pedestrian, facility in a given local area. The study of including congestion survey to capture the traffic data in a corridor covering from TV tower to Kothapet on the NH-65 in Hyderabad.

From the survey data the level of service on the street was found out an indicates level of "D" indicating high congestion the facility for parking of vehicles were in adequate unauthorized parking at many location was identification proper walkways for pedestrians were absent and pedestrians crossings were also not provided. The observation to traffic due to unauthorized encroachment was observed. Having identified the deficiencies from the analysis of the data from survey, recommendations are made to improve the condition by necessary intersection.

Keywords: Traffic congestion, TV tower, ADT.

PROBLEM CONTEXT:

The rapid growth of urban population generates problems like congestion with increase in traffic, unbalanced land use pattern and its distribution under different land users, growth of slums in the core as well as at the peripheries of the urban areas and degradation of environment etc. in order to bring a balanced urban growth, a proper understanding of geographic characteristics, land use distribution and population levels predicted to a future date may help on urban planner to develop sound and rational planning methodologies for solving the urban problems.

What are the general issues on traffic in given area?

Speed and congestion:

Traffic speed: Speed is one of the most important characteristics of traffic and its measurement is a frequent necessity in traffic engineering studies speed is the rate of moment of traffic of specified components of traffic. Spot speed is the instantaneous speed of a vehicle at a specified location.

Traffic congestion:

In all situations where capacity cannot be provided for big demands, waiting and delay are inevitable, in low traffic especially the peaking phenomenon is very pronounced giving rise to congestion is the impedance and delay imposed by one vehicle on another. For given road the larger the volume, the grater the chances of one vehicle delaying the other and hence greater is the congestion. Whenever congestion occurs the costs are affected delay to people, freight and vehicles is one component of the congestion cost.

Level of service:

A term closely related to capacity and often confused with it is service volume. When capacity gives a quantitative measure of track, level of service of (LOS) tries to give a qualitative measure. A service volume is the maximum no of vehicles passengers or the like, which can be accommodated by a given facility or system under given condition at a given level of service.

Traffic flow/ Volume: Number of vehicles passing a particular point of road way during unit time. Traffic volume expressed as vehicle per hour or vehicle per day.

Daily volume: Average daily traffic (ADT) consider day to day variation of traffic

- Annual average daily traffic (AADT) considers seasonal variation of daily traffic within a year.

Capacity of the road network:

- Capacity of a facility is defined as the maximum hourly rated which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic control conditions.

Traffic demand: It is the application of strategies and policies to reduce travel demand or to re distribute demand in space or in time. In transport as in any network managing demand can be a cost effective alternative to increasing capacity.

Effects of traffic:

Traffic flow: Speed limit lead to a decrease in the average speed of traffic. The largest decreases were observed in free flow situations.

Congestion: Wasting time of motorists and passengers ("opportunity cost"). As a non-productive activity for most people, congestion reduces regional economic health. Delays, which may result in late arrival for employment, meetings, and education, resulting in lost business, disciplinary action or other personal losses. Emergencies: blocked traffic may interfere with the passage of emergency vehicles traveling to their destinations where they are urgently needed.

Traffic safety: The number of accidents and victims decreased substantially (around 60 and 90%). The positive effects were caused by lower speeds and more homogeneous traffic flows because of route control.

Pollution: One of the most harmful affects of traffic its impact on the environment.

TRAFFIC SYSTEMMANAGEMENT:

Traffic flow:

Traffic flow is the study of interactions between vehicles, drivers, and infrastructure (including highways, signage, and traffic control devices), with the aim of understanding and developing an optimal road network with efficient movement of traffic and minimum traffic congestion traffic problems.

Regulation: The motor vehicle is a machine in charge of a human being and this makes it necessary for the formulation of suitable regulation for safe operation of traffic and enforcement of this regulation.

Problems: Parking is the loss of street space and the attendant traffic congestion. The capacity of the street is reduced, the journey speed drops down and the journey time and delay increase. The man curves associates with parking and un parking are to cause accidents.

Traffic planning: Rising trends in growth of population and traffic around cities and the steady growth of national productivity create a continuing demand for improvements in highway facilities.

Problems: The problem of traffic accidents and congestion in urban roads is being viewed with grave concern in the recent years. The main causes for this problem are improper planning of road net-work and other road facilities and poor traffic planning. Hence traffic functions now

occupy a good position in corporation and municipalities. The functions and duties of traffic engineering units were initially limited to traffic survey sand control devices.

Field studies, Accident analysis, Traffic control devices, Design and planning, Special investigation Economic analysis and decision theory in engineering design, and Administration

Urban transportation planning process:

The transportation process is developed in a series of stages:

- Inventories
- Trip generation
- Trip distribution
- Model split
- Traffic assignment
- Plan preparation and evaluation

Traffic infrastructure:

1. Intersections:

An intersection is defined as the general area where two or more highways join or cross, within which are included the roadway and road side facilities for traffic movements in that area.

The following principles should be considered in a good design:

- The number of intersections should be kept at minimum. If necessary, some minor roads

may be connected with each other before joining a major road.

- The geometric layout should be so selected that hazardous movements by drivers are eliminated. This can be achieved by various techniques such as channelizing and staggering.
- The design should permit the driver to discern quickly either from the layout or from traffic signs the path he should follow and the actions of merging and diverging. This can be achieved by good layout, traffic islands, signs and carriageway markings. Good visibility improves safety..
- Vehicles that are forced to wait in order to cross a traffic stream should be provided with adequate space at the junctions.

2. Traffic management:

Scope of the traffic management Measures: Many of the urban streets carry traffic volumes for which they were simply not designed. The inevitable result is delay, congestion and accidents.

- Restrictions on turning movements
- One-way streets
- Tidal-flow operations
- Exclusive bus-lanes
- Closing side-streets.

Travel demand management: Travel demand management techniques are aimed at reducing the traffic flows, especially during the peak hours. Some of the techniques commonly adopted are:

Car pooling and other ride-sharing programs

Peripheral parking schemes

Chartered buses (institutional buses) to serve areas of trip origins to common work place

Staggering of office hours and flexible time of work, Internal shuttle service in the CBD, Parking restraint, Road pricing, Entry fee, Priority for buses in traffic

Restriction on entry of trucks during day-time.

Area traffic management:

Area traffic control can be defined as a technique which provides for a centralized control of numerous signal installations distributed throughout an urban area, such that there is a planned coordination between signals at different junctions. The technique invariably employs digital computers for achieving the desired objective.

The objectives in an area control system are one or more of the following:

- Minimizing journey time for vehicles
- Minimizing vehicular stops, resulting in less noise, less pollution and less consumption of fuel
- Reducing accidents
- Discouraging use of certain areas
- Minimizing person-time.

PROBLEMS CAUSE DUE TO PARKING:

Congestion: Parking is the loss of street space and the attendant traffic congestion. The capacity of the street is reduced, the

journey speed down and the journey time and delay increase.

Accidents: The sharp curves associated with parking and un parking are known to cause road accidents. Careless opening of the doors of parked vehicles, moving out of a parked position and bringing a car to the parking location from main stream of traffic are some of the common cause of parking accidents.

OBJECTIVE:

The objective of the present study is to identify the traffic problems in a given corridor and to find the solutions.

The parameters considered are

- Traffic flows
- Congestion levels
- Pedestrian facility
- Parking problems
- Bus bays also stops

SCOPE:

To survey the traffic condition and infrastructure in a T.V tower to Kothapet T junction corridor in Hyderabad and suggest possible solutions to facilitate improved traffic conditions.

LITERATURE SURVEY

Area traffic management deals with the problems associated with the traffic and transportation issues related to the given area. The integration of all neighboring areas gives a solution to the problems in a given urban area.

HMDA REPORT: The comprehensive traffic study conducted by HMDA (2014) indicates the following suggestive measure.

Signs and signals:

Suggesting the installation of signs and signals for effectively regulating and controlling the traffic flows for efficient and safe operations, identifying the places where traffic signals are to be installed and traffic signs and markings are to be posted to help the traffic control and regulation with least manual intervention.

Removal of damaged or broken down /abandoned vehicles: Arranging the removal of damaged or broken down vehicles which are hindering the traffic flow. Coordinate with road owning agencies to get any disabled vehicle or materials causing physical obstruction to the traffic flows removed.

Local area traffic management: The main objectives of a local management study are to address road safety issues, traffic speed and volume issues, parking problem and improve the residential environment.

Local area traffic management studies:

- Analyze existing traffic condition in a local area
- Aims to improve safety and residential environs
- Consider the impact of traffic on an area basis, and
- Involves the community in identifying issues, developing solutions and aims to achieve majority support.

Traffic characteristic in Hyderabad:

Major transportation issue faced is the numerous commuters getting into the central core (MCH area) from its hinterland through a high capacity rapid network with low capacity carriage way in the core area being unable to accept the influence of these flows leading to traffic constrictions.

Travel demand forecast:

The strategic urban travel demand modes developed under this study is used to predict the travel patterns and modal shares in the horizon year i.e. 2031 under respective land use and transport network scenarios.

Corridor improvements:

There are total 98 corridors identified for the short medium term improvements to give better connectivity, linkages and free flow to existing and immediate future traffic movement by improving, redesigning congested location, acquiring/providing adequate row, improving street signs and road markings, restriction on speed, regularize on street parking etc.

Proposed cycle tracks in HMA:

Cycle tracks are proposed in HMA region in some of the corridor identified for traffic management depending upon the technical feasibility.

Objectives of CTS:

The major objectives of CTS as enumerated in the TOR are as follows;

- Identify socio-economic background of different groups and their travel pattern of residents in HMA.
- Select, develop and operationalize on urban transport planning model using state of the art modeling techniques and software package appropriate for the conditions and planning needs of HMA.

Highway research number 39(March-2009):

Study of traffic impacts of construction work zones using simulation.

Dr.RAMACHANDRA REDDY (2008) in his Ph.D thesis explain the effect of on-street parking:

Scope of study:

From the above studies and the objective of the present project, the scope of the project is formulated as follows.

1. To study the traffic condition in an area from T V tower to kothapet in Hyderabad.
2. Conduct traffic surveys, inventory surveys, parking surveys, interaction surveys in the given corridor.
3. To analyze and find out the problems.
4. To suggest possible solution for improving the area traffic management.

STUDY AREA DESCRIPTION AND SURVEYS CONDUCTED

Description of the corridor: For the present study, selected the corridor from TV tower to Kothapet junction in Hyderabad. The corridor is having wide roads with three T-Junction namely Moosarambagh Gaddinnaram and Kothapet. It is observed that all intersections mentioned above are overloaded with heavy traffic moving

along the corridor. All intersection are provided with traffic signals each intersection the signals are having three phases. The corridor of NH-65 passing through Hyderabad and is one of the main roads in the Hyderabad city serving the traffic coming from Nalgonda cross roads and travelling towards Moosarambagh and Dilsukhnagar etc. The traffic at intersection is saturated in all phases. The condition of the roads is found to be good along the corridor, having the median at the centre.

The following table gives the details of the study corridor:

S.No	Name of the road	Length(m)
1	Moosarmbagh to Dilsuknagar	1100m
2	Dilsuknagar to Chaitanyapuri	800m
3	Chaitanyapuri to Kothapet	800m

Details of corridor

Intersection:As far as the study, the corridor from TV TOWER to KOTHAPET in Hyderabad is selected. The three stretches of the intersection which are selected along the corridor, are

- (i) T V tower junction
- (ii) Gaddainarram junction
- (iii) Kothapet junction
- (iv) T V tower junction

ANALYSIS & RESULTS

- Private car: 1
- Motor c cycle : 0.5
- Bicycle: 0.2
- Bus, tractor, truck:3

In kothapet junction:

The number of vehicle passing through junction that is concerted to PCU values.

WAY	AVERAGE PCU
L B. Nagar to Dsnr	2886
Huda to Dsnr	1294
Dsnr to Huda complex	2504
Huda complex to Lb nagar	1653
Dsnr to Lb. nagar	8805

Average PCU value at kothapet junction

In Gaddiannaram junction:

The number of vehicle passing through junction that are concerted to PCU values.

WAY	AVERAGE PCU
Dsnr to Koti	3181
Dsnr to Ganga theater	107
Ganga theater to Koti	2553
Ganga theater to Dsnr	1008
Koti to Ganga theater	1008
Koti to Dsnr	2508

Average PCU value at gaddiannaram junction

In TV tower junction:

The number of vehicle passing through junction that is converted to PCU values.

WAY	AVRERAGE PCU
Dsnr to koti	6811
Dsnr to Amberpet	3606
Koti to Dsnr	2391
Koti to Amberpet	322
Amberpet to Dsnr	3371
Amberpet to Koti	1654

Average PCU value at TV tower junction

Level of service:

Level of service is qualitative measure used to relate the quality of traffic service. Los is used to analysis high by categorizing traffic flow and assigning quality level of traffic based on performance measure like speed, den city.

Los for signalized and un signalized interaction as a function of the average vehicle control delay. Los may be calculated per movement or per approach for any interaction configuration, but Los defined as signalized and all way stop configurations. Los of vehicle are passing road and capacity of the road that is v/c of ratio of Los. The level of service in the segments of study area is analyzed and presented below:

LOS at Kothapet junction:

The number of vehicle passing through junction that is concerted to PCU values.

Lane width: 15m

Average speed: 20kmph

WAY	AVERAGE PCU	LOS
L B. Nagar towards Dsnr L.b nagar to	4180	0.95

Dsnr Huda to Dsnr		
Dsnr towards Huda Dsnr to Huda L.b nagar to Huda	2971	0.88
Dsnr towards Lb. nagar Dsnr to Lb. nagar Huda to Lb nagar	3955	0.89

LOS at Kothapet junction

LOS at Gaddiannaram junction:

The number of vehicle passing through junction that are concerted to PCU values

Lane width: 15m

Average speed: 20 kmph

WAY	AVERAGE PCU	LOS
Dsnr towards Koti Dsnr to kotiGanga theater to koti	4131	0.93
Dsnr towardsGanga theater Dsnr to ganga theater Koti to Ganga	1890	0.85
Koti towards Dsnr Koti to Dsnr Ganga theater to Dsnr	4016	0.91

LOS at Gaddiannaram junction

LOS at TV tower junction:

The number of vehicle passing through junction that is converted to PCU values. Lane width: 15m Average speed: 20kmph

WAY	AVRERAGE PCU	LOS
Dsnr towards koti Dsnr to koti Amberpet to koti	4170	0.93
Dsnr towards amberpet Dsnr to amberpet Malakpet to amberpet	3928	0.89
Koti towards Dsnr Koti to Dsnr Amberpet to Dsnr	4141	0.94

LOS at TV tower junction

CONCLUCTION & RECOMMANDATION

Level of service:

Where the critical v/c ratio is less than 1.0 but some lane groups have v/c ratios greater than 1.0 the green time is generally not appropriately apportioned, and a retiming using the existing phasing should be attempted.

- The LOS of the corridor is found to be "D" class.

- The road was constructed to serve as an urban road, but it is a part of N.H 65.
- An urban road preferable should have "B" class, therefore congestion is seen.
- To increase the LOS necessary steps should be taken to prevent the entrance of NMV, stop road side parking, organize proper pedestrian crossings; introduce optimum traffic signal system.
- Construct foot over bridges at necessary point for pedestrian crossing.

Flows: In this corridor vehicle average speed less it creates the more congestion if average speed and capacity of road network in more it's give more level of service.

Obstructions:

1. From the surveys conducted, analysis made, the following results have emerged and accordingly suggestions are made to ease the traffic problems in the given study area. In this corridor various encroachments such as temples, drainage system, graveyard and footpath vendors are causing the traffic congestion. 2. At kothapet Omni hospital there is temple in the middle of the carriageway. So it is causing the traffic congestion. The encroachment of the road should be removed.



Encroachment at Kothapet

3. At Kothapet fruit market there is a temple in the middle of the carriageway, creating

huge traffic congestion in peak hours during morning. The vehicles coming from and in to fruit market and there is no proper parking for the customers and as well as for the vehicles for unloading the goods



Encroachment at Fruit market

4. In this corridor the work related to metro rail construction is progress a part of the carriageway is used for elevated lines it occupies a part of the road and narrow is road width causing a narrow road width.



Narrow encroachment at Fruit market

5. At Chaitanyapuri bus stop there is drainage passing by side of the road causing the traffic congestion due to narrowing of the road. The obstruction should be removed by caring proper drainage so that the traffic congestion is reduced to some extent.



Encroachment at Chaithanyapuri

6. At Dilsuknagar traffic signal there is a graveyard in the middle of the road and it is causing the traffic congestion. The encroachment should be removed.



Encroachment at Dilshuknagar

7. At the shopping malls there are no proper parking for the customers to park their vehicles. Therefore the customers are parking at curb side of the road and this is causing traffic congestion. Parking facilities by mall owners shall be insisted and regulated.

Pedestrian facilities: In these corridor pedestrians facilities are not sufficient. There must be proper pedestrian crossings, preferably with PELICAN signals at mid blocks to ensure pedestrian safety as well relieving traffic obstruction from Pedestrians.



Unauthorized parking at PVT shopping mall

Bus bays & bus stops:

In this corridor only one bus bay is exists at DSNR at and other places only bus stops available on carriage way, due to this ,at buses are stopped an carriage way and the road is congested.

To avoid the above problems

- Provide sufficient space for city bus bays.
- If possible provide the more area for district buses at Dilskunagar bus stand.
- The number of RTC buses stops shall be organized properly to facilitate boarding of passengers are safely

Public transportations facilities:

In this corridor number of people traveled to offices, colleges, industries....etc, the public transportation facility is not sufficient and number of buses arrive at the same time at same bus stop and create the traffic problems. To avoid this timing between bus to bus be scheduled properly and regulated.

Metro temporary phase:

In this study corridor the traffic problem is caused temporarily due to metro rail construction occupying some carriage way. proper traffic management measures necessary to reduce congestion and improve safety of the road users.

Further scope of work

Due to constraint of time, work on facilities of off-street parking cold not be done in this project. Future study may explore the possibility of creating off-street parking at places liable VM home, fruit

market and Malakpet quarters to release traffic congestion.

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