

Development Of Traffic Sign Asset Management System In Indian Context

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ABSTRACT :

In India, condition of traffic due to various kind of vehicles maneuvering with different lane behavior and driver behavior resulting in supremely heterogeneous nature due to their static and dynamic features. Currently the traffic on the road rises rapidly and traffic volume overcomes normal limit. Study of several features of highway traffic is essentially required for preparation, design and maneuver of roadway facilities. For the improved vehicular road traffic it needs better roadway structure with greater capacity. An intension of this work is to analyze capacity for urban roads in heterogeneous condition. For the capacity estimation it is relatively tough to estimate traffic volume on the road. The problem of measuring flow may addressed by using Dynamic PCU values. The Capacity of urban roads is find out by green shield model and the results are compared with Microscopic simulation model. The sudden increase in width of lane on the road is checked and result shows that with the increase in road width Capacity of road also increases.

Keywords: Traffic Volume, PCU, Traditional model, Simulation model, Traffic Capacity

Now a day's condition of traffic due to various kind of vehicles maneuvering with different lane behavior and driver behavior resulting in supremely heterogeneous nature due to their static and dynamic features. For the effective and quick vehicular traffic service it needs better highway infrastructure with greater capacity.

OBJECTIVES OF THE STUDY

The objectives of the traffic impact study are as follows:

- To review the existing traffic conditions of the adjacent road network;
- To estimate the potential traffic generation due to the proposed development;
- To assess the future traffic situation in the surrounding road network;
- To appraise the potential traffic impact of the proposed development on the surrounding road network;
- To consider road improvement proposals, if required; and
- To propose a feasible special traffic arrangement plan on festival days.

I. INTRODUCTION

BACKGROUND

In India, the length of total road network presently available is 4.2 million km still peoples in India, facing massive difficulties in providing superior Vehicular traffic flow and traffic operations. The traffic on Indian roads varies significantly as of Western condition. The proportion of vehicular movement is far diverse with poorer acting vehicle and deliberate mobile vehicles. Rapid as well as constant growth in population is foremost problem for highway engineers. As growth in population altered modes of transportation are rises and resulted in congested traffic flow situation on road, for the transport of goods and passengers for short to medium distance's roads plays a significant role and road transportation package is much flexible than further modes of transport available, Road transport play significant part in percentage shares in India GDP.

II. CHAPTER

THE PROPOSED DEVELOPMENT

The proposed development will consist of 2 major components: an Ecological Reserve of 51.9 hectares and a development site of 5.3 hectares.

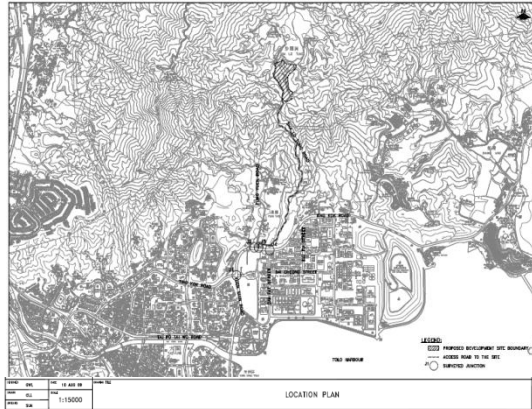
The Ecological Reserve comprises the following elements:

- Management of the SSSI zone for conservation of dragonfly and fish species, and conservation of other areas in a natural state (e.g. secondary woodland); and
- Provision of interpretation centre, nature education trails, gardens, visitor facilities, and managed walking activities.

The Multi-cultural Education Retreat cum Guntur NTR complex will be located at the development concession area (where it has the lowest eco-value) with 60,000 niches upon full completion. In the complex, there are also associated visitor facilities provided.

INTERNAL WALKWAY PROVISIONS

The main pedestrian walkway within the development will be of 4.5m wide. All other walkways will have a minimum of 2.5m wide.



III. EXISTING TRAFFIC SITUATION

EXISTING ROAD NETWORK

Guntur Road is a local access road connecting the Site with Gorantla Main Road. At present, the existing traffic volume is minimal.

Gorantla Main Road is a major road running at the northern part of ANDHRA PRADESH that leads to Guntur Inner ring road. The section of the road from Guntur Inner ring road to Guntur street2 is classified as a primary distributor while the section between Guntur street2 to Jinnah Tower centre is classified as a rural road type A.

Tadikonda X-Road Road is a primary distributor connecting Gorantla Main Road and ToloHighway. Signalized junctions exist along Tadikonda X-Road Road to permit turning movements to other parts of Andhra Pradesh. Guntur street2, which connects the Gorantla Main Road/Tadikonda X-Road Road junction, provides an access to the ANDHRA PRADESH Industrial Estate and helps to alleviate the congestion at Gorantla Main Road junction.

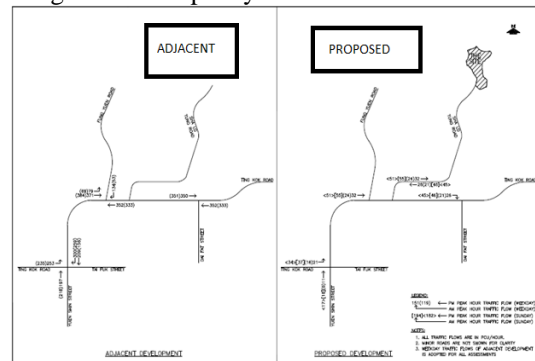
EXISTING JUNCTION CAPACITY ASSESSMENT

Based on the existing traffic flows, the performances of the key junctions we reassessed. The results are summarized below.

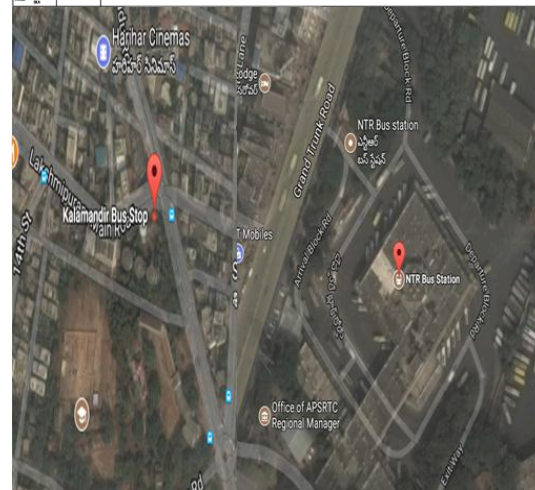
S. No.	Junction	Type	Weekday		Sunday	
			AM Peak	PM Peak	AM Peak	PM Peak
J1	Guntur - tenali - ponnur roads junction	Signalized/RC	24%	48%	+100%	+100%
J2	Hanuman Junction	Priority/DFC	0.13	0.09	0.05	0.08
J3	Khurda Road	Priority/DFC	0.02	0.04	0.02	0.03
J4	Wanaparti Road	Signalized/RC	38%	84%	+100%	74%

Notes:

1. The capacity index for signalized junction is reserve capacity.
2. The capacity index for priority junctions is design flow to capacity ratio.



EXISTING TRAFFIC FLOWS



LOCATION OF EXISTING BUS STOPS

IV. FUTURE TRAFFIC SITUATION

DESIGN YEAR

The proposed development is anticipated to be completed by year 2016 and this year is adopted as the "Design Year" in the study.

TRAFFIC PROJECTION

Reference was also made to the 2002 to 2008 Annual Traffic Census Reports. The traffic data recorded at relevant counting stations adjacent to the Site.

GUNTUR Residential Development – a major residential development along Gorantla Main Road. The recently approved development parameters would allow a total of 1860 number of flats;

- Guntur Town Lot No.161 – Residential development “The KODANAVEEDU Hills” along Kondaveedu village in the Chilakaluripet constituency of Guntur district Road will have a total of 547 units, about 90% was vacant (493 units);



LOCATION PLAN FOR ADJACENT DEVELOPMENTS
Scale: 1:15000

Notes:

1. Latest trip rates published by TD in August 2008.
2. The mean trip rate of Private Housing: High-Density/R(A) with average flat size equals to 60m² is adopted as R(A) trip rate.
3. The mean trip rate of Private Housing: Low-Density/R(B) with average flat size equals to 240m² is adopted as R(B) trip rate.

Trip Generation of the “Jinnah Tower centre” Development In order to estimate the traffic for the “Jinnah Tower centre” temple, a pedestrian and vehicular survey had been carried out at on 3 weekdays during their operational hours and the results on the pedestrian and vehicular survey are shown below.

Table 4.1 Weekday Hourly Pedestrian Flows at

Time	Generation			Attraction			2-Way Total		
	Tue	Wed	Thu	Tue	Wed	Thu	Tue	Wed	Thu
8:30 - 9:30	25	91	64	138	188	151	163	279	215
8:45 - 9:45	18	79	60	157	200	172	175	279	232
9:00 - 10:00	22	71	62	159	190	167	181	261	229
9:15 - 10:15	23	63	50	138	168	139	161	231	189
9:30 - 10:30	24	71	43	108	137	134	132	208	177
17:00 - 18:00	123	197	122	58	89	59	181	286	181
17:15 - 18:15	176	218	148	65	72	64	241	290	212
17:30 - 18:30	201	189	164	52	55	58	253	244	222
17:45 - 18:45	178	186	172	42	49	50	220	235	222
18:00 - 19:00	165	165	160	45	52	49	210	217	209

Table 4.2 Weekday Hourly In/Out Vehicular Flows at

Time	Generation			Attraction			2-Way Total		
	Tue	Wed	Thu	Tue	Wed	Thu	Tue	Wed	Thu
8:30 - 9:30	12	24	12	11	27	11	22	50	22
8:45 - 9:45	15	16	15	22	30	22	37	46	37
9:00 - 10:00	14	17	14	19	25	19	33	41	33
9:15 - 10:15	11	8	11	16	16	16	28	24	28
9:30 - 10:30	9	4	9	13	10	13	22	13	22
17:00 - 18:00	8	7	5	12	14	8	20	21	12
17:15 - 18:15	11	14	3	12	6	4	23	19	7
17:30 - 18:30	12	13	6	9	3	5	21	16	11
17:45 - 18:45	11	10	8	4	3	3	15	13	11
18:00 - 19:00	8	8	8	2	0	4	10	8	12

Because of the similarity of the development nature, it is assumed that the “Jinnah Tower centre” development will generate the same amount of pedestrian trips (visitors) during peak periods as.

Reference was made to the “Travel Characteristics Study 2002 (TCS 2002)”, published by Transport Department, to estimate the transport modal split of visitors arriving the “Jinnah Tower centre” development. Table 4.3 shows the modal split of person trips by “Home Based Others (HBO)” and “Non-Home-Based (NHB)” purposes documented in TCS2002.

Table 4.3 Distribution of HBO and NHB Boardings by Transport Modes

Transport Mode	Home Based Others (HBO)	Non-Home-Based (NHB)
MTR	11%	17%
KCR	6%	6%
LRT	2%	1%
Tram	2%	2%
Ferry	1%	1%
PLB	12%	8%
Franchised Bus	33%	24%
Private Car	14%	20%
Taxi	12%	13%
SPB	7%	8%
Total	100%	100%
Total Boardings (000's)	4,425	1,761

Since there are no MTR, KCR, LRT, Tram, Ferry and SPB services serving the Ting Kok area, these trips were re-assigned to PLB, Franchised Bus and Taxi based on the proportion among the three transport modes. The adjusted modal splits are shown in Table 4.4.

Table 4.4 Adjusted Modal Splits

Transport Mode	Home Based Others	Non-Home-Based	Overall
PLB	18%	14%	16%
Franchised Bus	50%	43%	48%
Private Car	14%	20%	16%
Taxi	18%	23%	20%
Total	100%	100%	100%

From Table 4.4, the pedestrian trips that use PLBs and franchised buses to access the “Jinnah Tower centre” development will not induce additional vehicular trips onto the road network because both transport modes are operating on a scheduled service. For pedestrian trips that use private cars and taxis, the additional traffic generated in pcu is shown in Table 4.5.

Table 4.5 Traffic Generated by the “Jinnah Tower centre” Development

Surveyed Trips Type	Transport Mode	Pedestrian Trips				Traffic Flows (pcu/hr)			
		Generation		Attraction		Generation		Attraction	
		AM	PM	AM	PM	AM	PM	AM	PM
Pedestrian Trips	Private Car (16%)	15	36	32	12	10	24	21	8
	Taxi (20%)	20	45	39	15	13	30	26	10
	Sub-total	35	81	71	27	23	54	47	18
Vehicular Trips	All					24	11	27	12
	Total					47	65	74	30

Bathing Beach at Suryalanka :

The project is currently under feasibility study stage. In the draft project brief, it is noted that 100 car parking spaces and 10 coaches parking spaces will be provided. With a conservative

estimate, it is assumed that 50% and 25% of the parking spaces will arrive and depart during morning peak hour, respectively. The figures in the evening peak are 25% and 50% of the parking spaces will arrive and depart, respectively. Table 4-6 shows the traffic generated by the bathing beach.

Table 4.6 Traffic Generated by the Bathing Beach at Suryalanka.

Mode	Traffic generations (pcu/hour)			
	AM peak hour		PM peak hour	
	Generation (out)	Attraction (in)	Generation (out)	Attraction (in)
Private Car	25	50	50	25
Coach	8	15	15	8

V. GUNTUR NTR COMPLEX – SPECIAL TRAFFIC ARRANGEMENT ON FESTIVAL DAYS

Special Traffic Arrangement on Existing Guntur NTR complex/Cemetery Sites

In the territory, it is observed that most Guntur NTR complex/cemetery sites required to have special traffic arrangement being implemented on festival periods. The special traffic arrangements will be either to have temporary road closure, provide special public transport facilities or a combination of both.

PROPOSED SPECIAL TRAFFIC ARRANGEMENT PLAN

Restriction of Guntur Road on Festival Days As discussed in the previous sub-section, this is a common practice that most of the existing Guntur NTR complex and cemetery sites required special traffic arrangements to be implemented Festival periods. To avoid creating significant traffic impact, special traffic arrangement will be implemented at Guntur Road during festival periods similar to other existing Guntur NTR complex and cemetery sites.

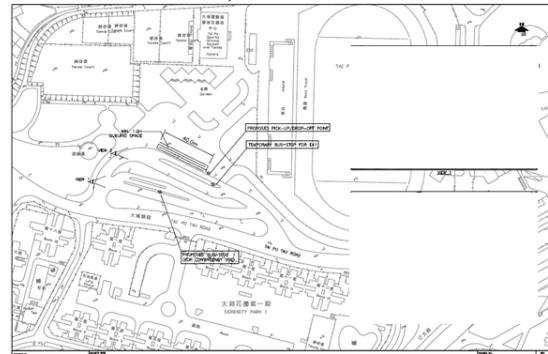
Guntur Road will be closed from 7:00 am to 7:00pm for all vehicular traffic, except for shuttle buses provided by the project proponent, vehicles with permit and emergency vehicles.

Provision of Shuttle Service

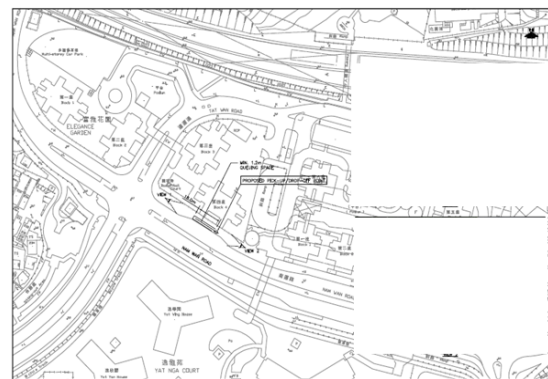
Unlike few existing Guntur NTR complex sites that require the visitors to walk a long distance for grave sweeping, the project proponent offers a comfort and effective way by running a shuttle service between the proposed Guntur NTR complex and some convenient locations, e.g. mass transit railway stations. There are three feasible locations being considered in the early planning stage and they are listed as follows:

- Location 1 (Figure 5.1) - ANDHRA PRADESH Mahatma Gandhi Inner Ring Road;

- Location 2 (Figure 5.2) - Guntur Inner ring road (5 minutes walk from Andhra Pradesh Market Station); and
- Location 3 (Figure 5.3) - Bus Terminus at Guntur street2 (within the Andhra Pradesh Industrial Estate).



LOCATION 1 - PROPOSED PICK-UP/DROP-OFF ARRANGEMENT



LOCATION 2 - PROPOSED PICK-UP/DROP-OFF ARRANGEMENT

ASSESSMENT ON VISITORS GENERATED BY CLASS B NICHES

For the other 40,000 Class B niches, families are not allowed to visit the Guntur NTR complex on festival and special days. The family members must be fully aware of this special condition when they purchase the niche. As a result, it is expected that these visitors will spread over the year, including weekdays and weekends, except those weekends (Total 6 weekends) with special traffic arrangements before and after the festival days.

To serve the demand, the project proponent will provide shuttle service to transport the visitors from ANDHRA PRADESH Industrial Estate or Mass Transit Railway Station at 10 to 15-minute frequency. For visitors who visited by private cars, they are required to make reservation on carparks.

VII. SUMMARY

The Proposal is for a PPP project at Guntur. The Site has an area of some 57 hectares. Upon development, it will consist of an Ecological Reserve and a Multi-cultural Education Retreat cum Guntur NTR complex.

The proposed development will provide 40 car parking spaces, 2 taxi lay-bys and 4 shuttle bus lay-bys respectively. 4.5m walkway will be provided for the main pedestrian path and a minimum 2.5m will be provided at the other walkways.

Traffic count surveys were carried out to collect information on the existing traffic situation in the vicinity of the Site on weekday and Sunday. Junction capacity assessments were carried out for the existing traffic situation at the key junctions in the vicinity of the Site. The results indicate that all of the key junctions are operating with ample reserve capacities on all days.

The proposed development is expected to generate two-way traffic volumes of 58 pcu/hour and 101 pcu/hour in a typical weekday and a Sunday peak hour, respectively. The generated traffic was distributed and assigned to the road network according to the observed traffic pattern and the anticipated route choice. In accordance with the Transport Planning and Design Manual, Volume 2 published by Transport Department, Guntur Road can accommodate two-way flows of 100 vehicles per hour, or equivalent to 125 pcu per hour with an average pcu factor of 1.25, and it is capable to handle the peak hour traffic generated by the proposed development.

Traffic forecast has been carried out by applying a 1.5% per annum nominal growth rate to the existing flows to obtain the 2016 Base flows. By summing up the estimated traffic generated by the planned and committed developments and the projected 2016 Base flows, 2016 Reference flows are obtained. 2016 Design flows are obtained by adding the proposed development traffic flows to the 2016 Reference flows.

Junction capacity assessments were carried out for the key junctions for both the Reference and Design scenarios in 2016. The assessment results reveal that most junctions would perform satisfactorily with adequate spare capacity in both scenarios.

As the proposed development will include a Guntur NTR complex comprising 60,000 niches, it is proposed to have two classes of niches to relieve the possible traffic impact, which only Class A niches families can visit the Guntur NTR complex on festival days period. A special traffic

arrangement plan on festival days at Guntur Road is proposed and the main features are as follows:

- Restriction of Guntur Road on Festival Days – The road will be closed from 7:00 am to 7:00pm for all vehicular traffic, except for shuttle buses provided by the project proponent, vehicles with permit and emergency vehicles.
- Provision of Shuttle Service – To provide a comfort and effective way by running a shuttle service between the proposed Guntur NTR complex and some convenient locations, e.g. mass transit railway stations.

VIII. CONCLUSIONS

The findings of this traffic impact assessment study reveal that the proposed development would cause negligible traffic impact on the local road network as the amount of additional traffic during normal weekdays and weekends is insignificant.

For the critical situation on festival days, a special traffic arrangement plan is required. In this report, the main features of the special traffic arrangement are being formulated and it is clearly demonstrated that the proposed special traffic arrangement of closure of Guntur Road and provision of shuttle service is capable to handle the visitor demand on festival periods generated by the 20,000 Class A niches.

For the other 40,000 Class B niches, it is expected that these visitors will spread over the year, including weekdays and weekends, except those weekends with special traffic arrangements during the festival periods. The project proponent will provide shuttle service to transport the visitors from ANDHRA PRADESH Industrial Estate or Mass Transit Railway Station. For visitors who visited by private cars, they are required to make reservation on car parks.

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