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Website: www.aarf.asia Email : editor@aarf.asia , editoraarf@gmail.com

TRAFFIC IMPROVEMENT MEASURES ON STATION ROAD AT ASILAMETTA JUNCTION, VISAKHAPATNAM

Ramkrishna Rao. Kemburu[1], Durga Rani K[2], Gopala Raju. SSSV[3]

[1] M.E., Student, Dept. of Civil Engineering , Andhra University, Visakhapatnam, A.P.

[2] Professor, Dept. of Civil Engineering , Andhra University, Visakhapatnam, A.P.

[3] Associate Professor, RGUKT Nuzvid, Krishna District A.P.

ABSTRACT

Greater Visakhapatnam is located midway between two metropolitan cities of India, i.e., Chennai in South and Kolkata in the east, and has a prime role in the development and economy of modern Andhra Pradesh. Traffic congestion, the predominance of two-wheelers, cars, Heavy Commercial vehicles in the traffic mix, and the inability of public transport to attract significant rider ship have all been responsible for the severe air quality problems, especially the prevalence of respirable particulate matter (RSPM) as well as rapidly growing emissions of greenhouse gases (GHGs). In the present study traffic improvement on station road have been studied at various junctions i.e. Siripuram Junction, Asilmetta Junction, RTC Junction, Sangam Sarat Junction, Dondaparty Junction, Rednam Junction, Ambedkar Junction, Maddilapalem Junction and Jagadamba Junction.

INTRODUCTION:

Visakhapatnam is second largest city in Andhra Pradesh with an area of 550 km² and eleventh largest city in India. It is primarily an industrial city, apart from being a port city. National Highway 5 and National Highway 43 passes through the Visakhapatnam and well connected with State Highways and Major District Roads. Village roads are also well connected with the MDRs, SHs, and National Highways. Out of 374 villages, about 300 villages (80%) are well connected with the Major road network.

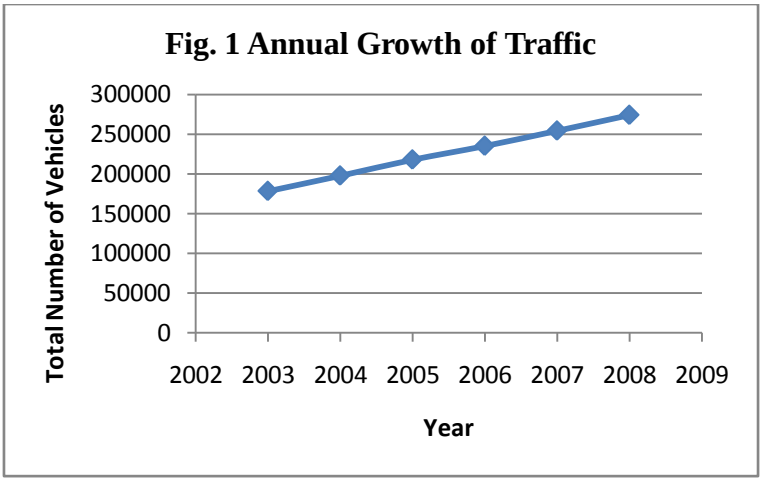
The Municipal Corporation of Visakhapatnam, prior to its constitution as Greater Visakhapatnam Municipal Corporation in 2005 has a jurisdiction of 105 Sq. km with a population of 9.69 lakhs as per the 2001 census. Presently, the Greater Visakhapatnam Municipal Corporation (GVMC) jurisdiction extended to an enormous geographical area of over 540 Sq. Km. Visakhapatnam, the City of Destiny, is rated as the fastest growing city in the east. The industrialization and the accompanying urbanization are responsible for the rapid growth of the city. The dynamic growth in the economy of the region accompanied by the rapid growth of the population has resulted in gross inadequacies in infrastructural services in the City. At all the major junctions of the city, Volumes of pedestrian and vehicular traffic are so large that an intersection with exclusive pedestrian phase will increase the cycle time for traffic signals beyond 120 seconds. A comprehensive planning for handling the current and future traffic in the urban area is must.

Vehicle Growth: According to official records about 5.0 lakh vehicles are currently plying on the roads of the VMR. Total vehicular strength in Visakhapatnam district (up to 2005) was recorded as 4, 64,780 vehicles and 2, 63,646 vehicles were recorded in Visakhapatnam City, which is 56.72% of the total vehicles strength of the district. Yearly registered classified vehicles information is presented in Table 1. The trend of annual growth of traffic is shown in Fig.1

Table 1. Registered Vehicles in Visakhaptnam

Class of Vehicle	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Two Wheelers	148285	165153	181613	194122	206911	220830
Car	17171	19528	22243	25480	29616	33554
Auto	9478	9277	9768	10766	12304	13622
Cabs/Jeeps	3138	3493	3978	4475	5142	5721
APSRTC (BUS)	491	495	521	543	553	567
Total:	**178563**	**197946**	**218123**	**235386**	**254526**	**274294**

(Source: RTA, Visakhapatnam)



The statistics clearly shows an increased growth rate of Two Wheelers (14.64%), 3 Wheelers (56.63%), Cars/Jeeps (15.01%), LCVs (40.0%), and HCVs (57.67%) from 2004 to 2005. The HCVs increase is a clear evidence of industrial & infrastructure development in the region. While Private and Para transit modes have grown substantially, the growth of buses has not kept pace with the growth rate of population and Para transit. According to the draft revised Master Plan 2021, average fleet size of buses is 776 no's, which makes 8439 trips and carries on an average 4.15 km length of passengers per day.

OBJECTIVES OF THE STUDY

The objectives of the study includes reduction of traffic conflicts between Siripuram to Station Roads, reduce the signal timings, increase vehicular speeds between two junctions i.e. minimum 20 KMPH, Geometrical improvements between junctions, reduce the Vehicle Operating Cost (VOC), to reduce the cost of fuel and lubricants of vehicles and to reduce the Idle Fuel Consumption (IFC) and value of time.

EXISTING SCENARIO*:* The study includes identification of 9 major intersections in the Visakhapatnam city i.e. Siripuram Junction, Asilmetta Junction, RTC Junction, Sangam Sarat Junction, Dondaparty Junction, Rednam Junction, Ambedkar Junction, Maddilapalem Junction and Jagadamba Junction. Out of those junctions Jagadamba & RTC junctions are crossed the IRC Standards i.e. Junction volume has crossed peak hour traffic 10,000 PCU/HR, signal timings shall not be more than 120 seconds and LOS out E and D i.e. speed less than 20 KMPH. The main junction jagadamba having no scope to extent the roads widening because big existing buildings are existing. The other major junction is RTC Junction which lies

between Siripuram to Railway Station Road having scope to extent of road widening and other improvement methods. So the present study is feasibility study for traffic improvement on station road at Asilmetta junction in Visakhapatnam. The details of the peak hour and peak hour traffic is given in Table No.2.

Table No.2 Peak Hour Traffic in PCU/Hr

Name of the Junction	Peak Hour Traffic (PCU/Hr)	Peak Hour
Siripuram	9623	18:45 - 19:45
Aseelmetta	9339	09:45 - 10:45
RTC	10130	12:00 - 13:00
Sangam sarat	8116	18:45 - 19:45
Ambedkar	7918	19:30 - 20:30
Rednam	7322	17:00 - 18:00
Rama talkies	7347	19:00 - 20:00
Madillapalem	8555	09:45 - 10:45
Jagadambha	10913	18:15 - 19:15

Improvement Options: As per IRC standards peak hour traffic shall not exceed 10000 pcu/hr at junction, operating Level of service shall not deteriorate than C and signal timings shall not be more than 120 seconds. RTC junction has crossed the IRC limits, other junctions are on threshold limits and all junctions are at los E and D i.e speed less than 20 KMPH, frequent delays and stop and go situations. Three junctions have signal time of more than 150 seconds, back log of vehicles and increase in vehicle operation cost. Finally traffic improvement measures are traffic circulation plan one way flow/tidal flow, development of new road networks/improve existing road networks and grade separators-Flyover/underpass.

The following options are easing traffic improvement at above three junctions. Rerouting bus movement ,One-way circulation movement ,Underpass at Aseelmetta and RTC Junctions, Flyover between Aseelmetta and Sangam Sarat junctions and underpass at Aseelmetta and RTC Junctions, Of the three traffic improvement schemes, it is observed that grade separator option will bring out substantial relief to traffic congestion in the area. Various options for improving the traffic movement in the study area was worked out and the merits and demerits of different options are listed below.

Rerouting RTC Bus Traffic. In this proposal, the following measures are considered: In-coming bus traffic to RTC complex will ply on Ramatalkies road and enter RTC complex at gate opening at Aseelmetta junction. Exit bus traffic from RTC complex will use the rear entrance on Daba Garden road and ply on Dwarakanagar road at RTC junction. Traffic movement for other vehicular classes remain unchanged. The only merit of this proposal is that the bus traffic on Dwarakanagar road and Ramatalkies road will be more streamlined. The demerits of this proposal are as listed below: Re-routing of RTC buses will not result in significant improvement at junction traffic as the entry and exit traffic at junctions are almost same. There will be no change in traffic signal cycle time at both junctions.

One-Way System. In this proposal, a system of one-way traffic movement is proposed in the Aseelmetta - Station road corridor. Accordingly, following traffic circulation is proposed: One-way traffic movement permitted from Station to Aseelmetta junction. -One-way traffic movement permitted from Aseelmetta junction - Rednam junction-Allipuram junction to station. All turning movements at Aseelmetta junction, RTC junction, Sangam Sarat junction, Dondaparthy junction, Tachetlapalem junction towards railway station banned. All turning movements at Rednam junction and Ambedkar junction towards Aseelmetta, RTC and Sangam Sarat junctions banned. Following are the merits of this option: Since turning movements towards station road is not permitted, the signal phase time at Aseelmetta, RTC and Sangam Sarat junctions will be reduced. The traffic conflicts at above junctions are reduced. Some of the demerits of this option are listed below: There will be an increase in traffic at Ambedkar and Rednam junctions since right turning traffic from Aseelmetta, RTC and Sangam Sarat junctions are not permitted. Rednam and Ambedkar junction will reach 10000 PCU in near future, which will warrant for grade separation. Rednam and Ambedkar junctions shall be signalized. Road section between Ambedkar junction and Allipuram junction is three lanes at present, which is not adequate for the through traffic towards station.

Flyover between Aseelmetta and Sangam Sarat Junctions and Underpass at seelmetta and RTC Junctions: A bidirectional flyover is proposed between Siripuram and Station road across Aseelmetta, RTC and Sangam Sarat junctions. A uni-directional underpass is proposed along Ramatalkies road -Jagadambha road for traffic towards Rednam junction with an arm to RTC complex. A unidirectional underpass is proposed between RTC complex and Dwarakanagar road. One-way traffic movement in midblock section between RTC junction and Aseelmetta junction. Prohibit**,** Left turning movement from Jagadambha side to Station road side at Aseelmetta**,** Right turning movement from Ramatalkies side to Station roadside at

Aseelmetta. Straight movement from Dwarakanagar side to Daba garden side at RTC junction. Right turning from Sangam Sarat side to Daba garden side at RTC junction.

The Benefits are among various improvement options considered for improvement, the option of constructing a flyover and two vehicular underpasses one at RTC and other at Aseelmetta junctions are proposed. The estimated benefits for the study area during peak hour have been calculated to the average hour values and further to the 24-hour period values considering the hourly distribution of traffic.

Stopped Delay The estimated stopped delays at Study Intersections are presented in Table 3. The average savings in stopped delay for the at grade traffic at Sangam Sarat Junction is about 17 seconds in the base year (2013) and is likely to increase to 22 seconds by 2011 and to 32 seconds by 2026. The savings to traffic likely to use the proposed flyover is about 42 seconds on average in base year and is likely to be about 50 seconds by 2011 and 74 seconds by horizon year.

Table No: 3Estimated Average Delay Savings (Seconds) per Signal Cycle

Junction Name		**Arms of the Intersection**			
Aseelmeta Junction		To Siripuram	To Jagadambha	To Ramatalki	To RTC
	Existing	59.86	51.26	35.37	45.63
	Proposed	0	0	0	0
RTC Junction		To	To Dwarakanagar	To Daba Gardens	To
	Existing	38.89	48.01	51.26	52.92
	Proposed	0	0	0	0
Sangam Sarat Junction		To Station	To Diamond Park	To Daba Gardens	To RTC
	Existing	60.75	34.00	30.00	43.00
	Proposed	15.43	22.22	22.22	**28.54**

Travel Time: The savings in travel time, due to increased running speeds because of construction of flyover would occur for traffic moving in the study area. The savings would be of the order of about 23 seconds in the base year and is likely to increase to about 27 seconds by 2015 and to about 33 seconds by 2027. Monetary savings due to various benefits - vehicle operating cost, reduced stopped delay, travel time and idle fuel consumption - were estimated per day considering the factor derived based on the hourly variation of traffic through the study intersection. Urban traffic is consistent across different weekdays and months. Thus, one could estimate the yearly benefits considering 365 days a year. However, considering that the benefits on a Sunday would be lower than **a** weekday and are is approximately considered 50

percent of weekday. Hence, the number of days in year that need to be considered for estimation of yearly benefits would be **339** only. Yearly monetary savings that are estimated for the base year and horizon years are presented in Table No:4

Table No: 4 Yearly Monetary Savings (Rs. In Lakh)

Year	Delay	Travel Time	IFC	VOC	Total
2007	303	325	91	671	1390
2015	601	705	181	1249	2736
2027	1330	1704	402	2617	6052

SUMMARY

The following options are studied for easing traffic improvement at the above junctions are 1.Rerouting bus movement 2. Oneway circulation movement and 3. Flyover between Asillmetta and Sangamsarat junctions and underpass at Asilmetta and RTC junctions of the three traffic implement schemes, it is observed that grade separator option will bring out substantial relief to traffic congestion in the area. Projects benefits are beach road to railway stations road is one of the important corridor in the city along East – West Direction in city attaching majority of the traffic. The benefits accruing due to the constructions of the proposed facility have thus been estimated considering the proportion of traffic through the study intersections during the whole day. The estimated of the savings can be considered conservative. The estimated stopped delay at study intersections are presented in previous tables. The average savings in stopped delay for the at grade traffic at Sangam Sarat junctions is about 17 seconds in the base year (2006) and is likely to increase to 22 seconds by 2011 and to 32 seconds by 2026. The savings to traffic likely to use the proposed flyover is about 42 seconds on average in base year and is likely to be about 50 seconds by 2011 and 74 seconds by horizon year. The savings in travel time, due to increased running speeds because of construction of flyover would occur for traffic moving in the study year. The savings would be of the order of about 23 seconds in the base year and is likely to increase to about 27 seconds by 2015 and to about 33 seconds by 2017.

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