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Traffic Analysis and Alternative Solution

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Abstract - *Road junctions are designed at place where vehicular traffic can move in different direction in a systematic way. The traffic at road junction is controlled and resumed in a systematic way to produce further in their respective direction with the help of traffic signals. Study on Road junction is a crucial subject and is very important so as to propose a suitable road junction design and it involves understanding the nature of traffic, kind of area, density of population, rectifying the present problems, finding alternatives, etc. so we have taken initiation to study and analysis the traffic and provide solution i.e. study area is near Konanakunte junction which is located about 8.5km away from Banashankari, bengaluru. It is four legged intersection with arms leading towards Banashankari road side, kanakaupra road side, Electronic city side, kengeri road side and it has a lot of delay and queue length during office hours.*

Keywords*: *Traffic, Junction, Density, Population, Intersection.

1. INTRODUCTION

Bangalore is the capital city of Karnataka and is the fifth largest city in the country and it is growing at a higher rate than other cities. Due to the growth in economic activities, it is attracting more migrants and it requires developed roads, grade separators, subways, mass transit system etc. In Bangalore on an average, 2 major and 2 minor junctions are there per kilometer of road length, due to which increase in travel time and frequent bottlenecks and break downs occur and also delay and congestion beyond tolerable limits.

A traffic study is a detailed examination and analysis of a transportation system supported by data collection. Transportation studies serve to quantify the extent of a transportation problem or to provide an analysis of a proposed transportation solution.

2. OBJECTIVE

- To identify the various proposals to reduce travel time and queue length.
- To conduct speed studies.
- To conduct the classified volume studies and turning movements.
- To provide best proposal at reduced land acquisition.
- To arrive with a best proposal to reduce traffic congestion, delay and queue length.
- To provide higher level of service.

3. BACKGROUND

3.1 STUDY AREA MAP:

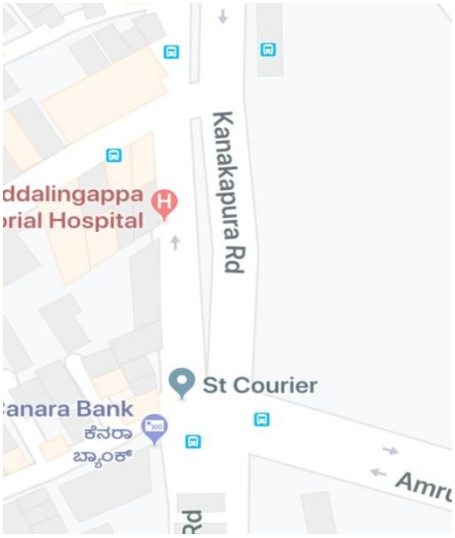

Figure 1 Study area map (Konanakunte cross)

3.2 PCU Equivalents as Per IRC

Vehicle Type	PCU Equivalency Factor
Passenger Car	1.00
Motor Cycle or Scooter	0.50
Tractor, Light Commercial Vehicles	1.50
Truck or Bus	3.00
Truck Trailer, Tractor-Trailer	4.50

Cycle	0.50
Cycle Rickshaw	2.00
Horse Drawn Vehicle	4.00
Bullock Cart	8.00

4. PROBLEM STATEMENT

4.1 STUDY AREA

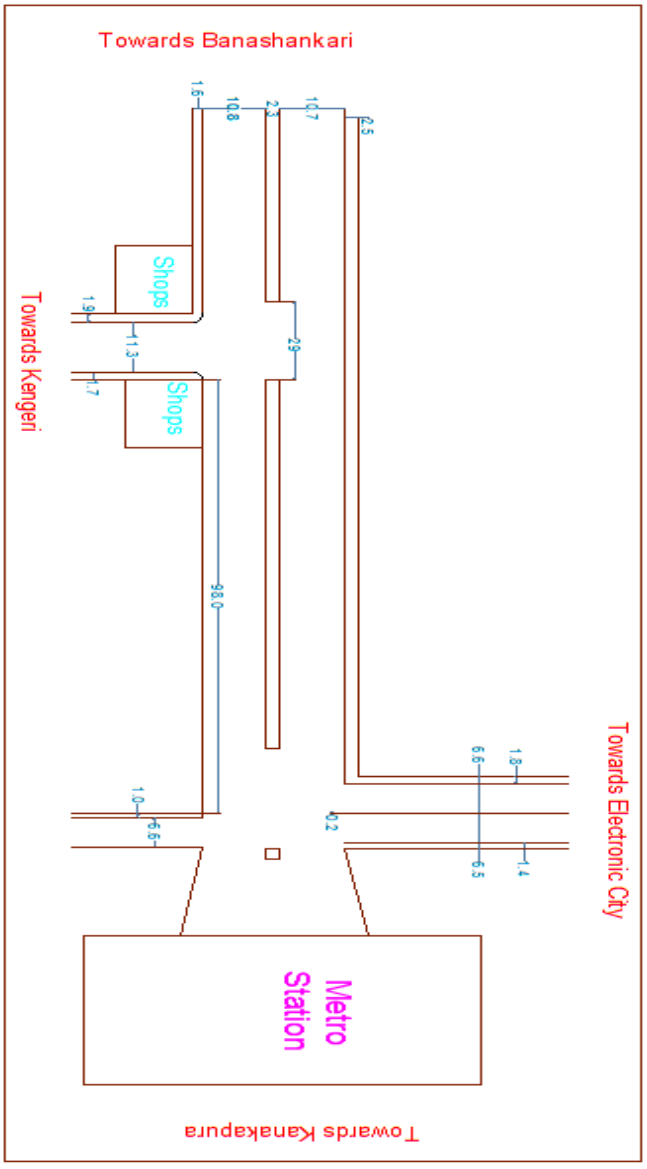

Figure 2 Problem statement of the study area

Konanakunte is a main junction in which traffic flows here from four sides, two sides of hundred feet ring road and two sides of Kanakapura road. Every time the signal halts a stop, vehicles pile up within seconds for few 100m long.

The major problems at konanakunte junctions are as follows,

- High traffic volume during peak time
- Increased vehicle loads on road network
- No proper measure on pedestrian safety

Figure 3 Traffic congestion at konankunte junction

Figure 4 No Zebra Crossing at konankunte Junction

5. METHODOLOGY

5.1 TRAFFIC DATA COLLECTION

Traffic data collection and projection thereof traffic volumes are basic requirements for planning of road development and management schemes. Traffic data forms an integral part in the science of descriptive national economics and such knowledge is essential in drawing up a rotational transport policy for movement of passenger and goods by both government and the private sector.

Traffic volume studies, spot speed studies, speed and delay studies, O&D studies, Parking studies, Accident studies.

5.2 TRAFFIC DATA ANALYSIS

Traffic engineering studies are carried out to analyse the traffic characteristic and their movements along the identified roads. The results of these studies are used for the design of geometric features and traffic controls measures for safe and efficient traffic movements. The analyses of results of these studies are also useful for assessing the need of the proposed road project.

5.3 PASSENGER CAR UNITS (PCU)

Capacity is expressed in 'Passenger Car Units (PCU) per hour. If the addition of one vehicle per hour in a traffic stream reduces the average speed of the vehicles by the same amount as the addition of 'x' cars per hr, then the vehicle of that type is considered to be equivalent to x PCUs.

6. DATA COLLECTION

6.1 TRAFFIC VOLUME COUNT

6.1.1 TOWARDS ELECTRONIC CITY

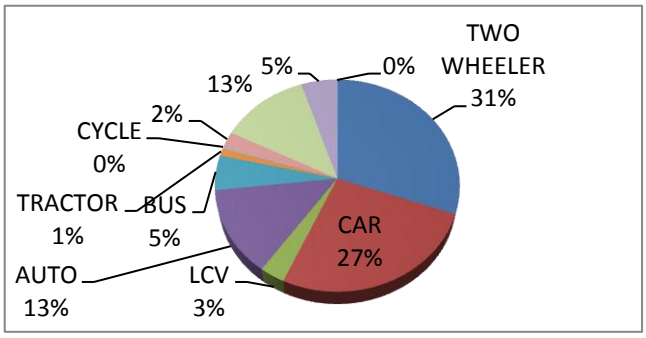

Figure 5 Pie Chart for Vehicular Count in Peak Hours towards Electronic city (Morning)

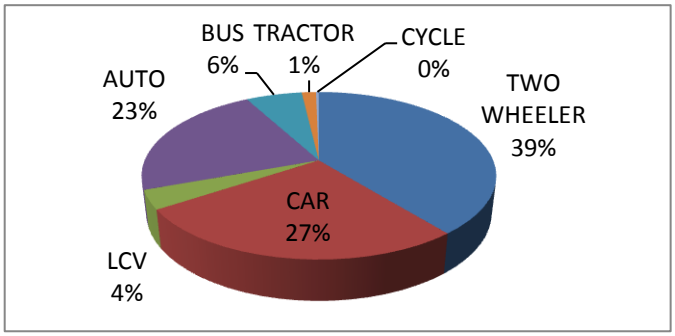

Figure 6 Pie Chart for Vehicular Count in Peak Hours towards Electronic city (Evening)

6.1.2 TOWARDS KENGRI

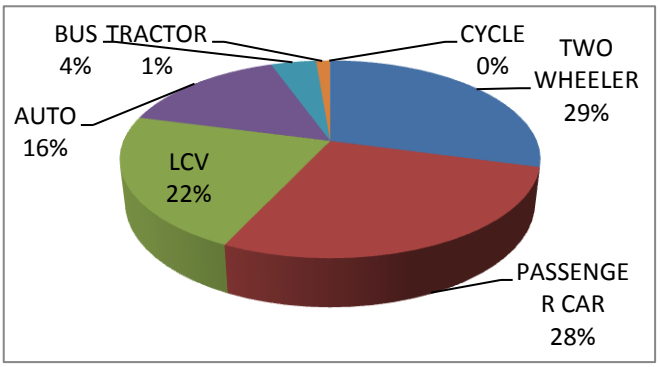

Figure 7 Pie Chart for Vehicular Count in Peak Hours towards Kengri (Morning)

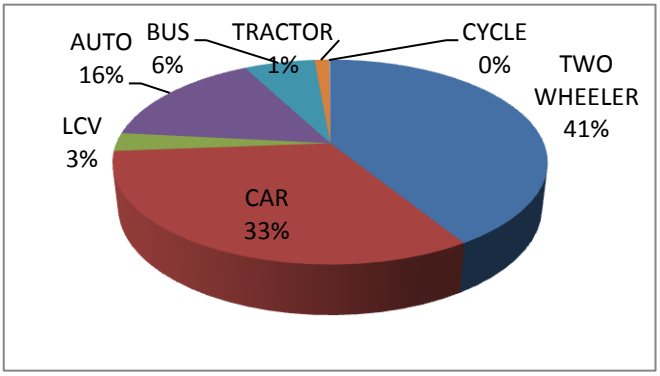

Figure 8 Pie Chart for Vehicular Count in Peak Hours towards Kengri (Evening)

6.1.3 TOWARDS BANASHANKRI

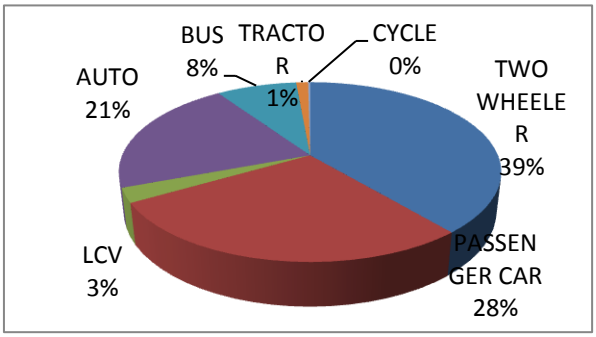

Figure 9 Pie Chart for Vehicular Count in Peak Hours towards Banashankari (Morning)

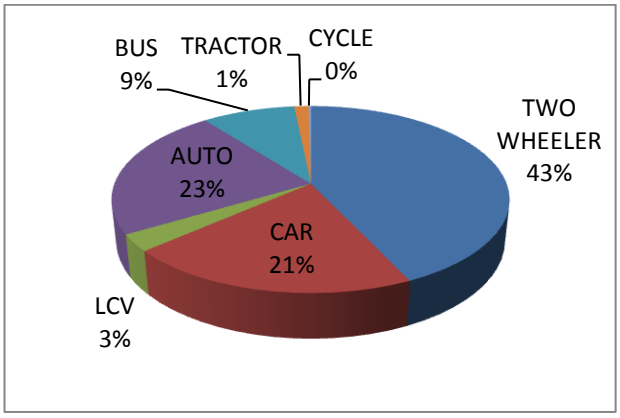

Figure 10 Pie Chart for Vehicular Count in Peak Hours towards Banashankari (Evening)

6.1.4 TOWARDS KANAKAPURA ROAD

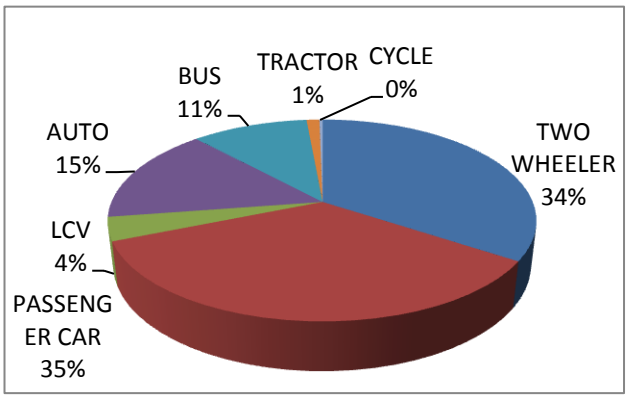

Figure 11 Pie Chart for Vehicular Count in Peak Hours towards Kanakapura road (Morning)

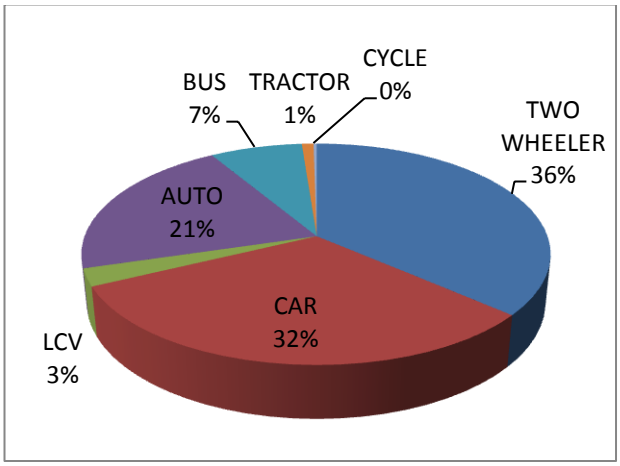

Figure 12 Pie Chart for Vehicular Count in Peak Hours towards Kanakapura (Evening)

7. DATA ANALYSIS

7.1 DATA ANALYSIS ON HOURLY BASIS

7.1.1 TOWARDS ELECTRONIC CITY

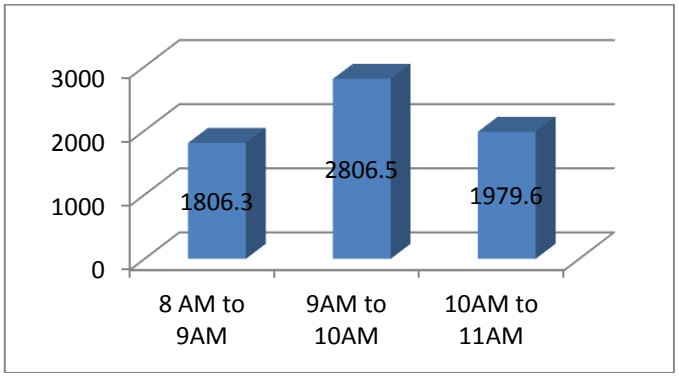

Figure 13 PCU Graph towards Electronic City (Morning)

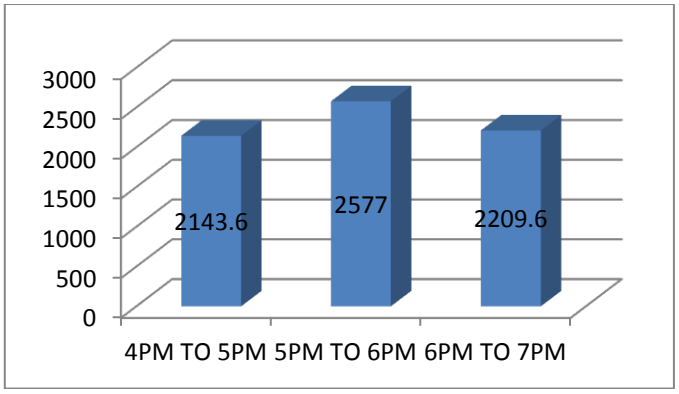

Figure 14 PCU Graph towards Electronic city (Evening)

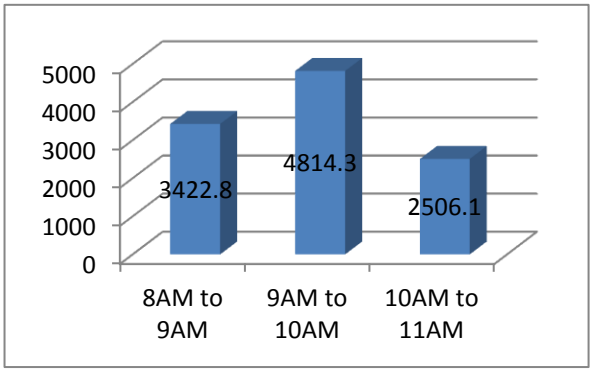

Figure 15 PCU Graph towards Kengeri (Morning)

7.1.2 TOWARDS KENGERI

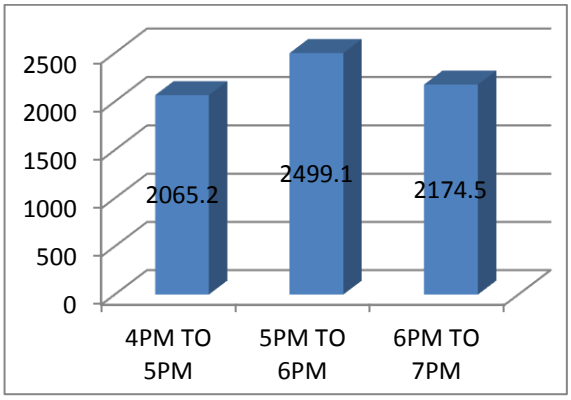

Figure 16 PCU Graph Towards Kengeri (Evening)

7.1.3 TOWARDS BANSHANKARI

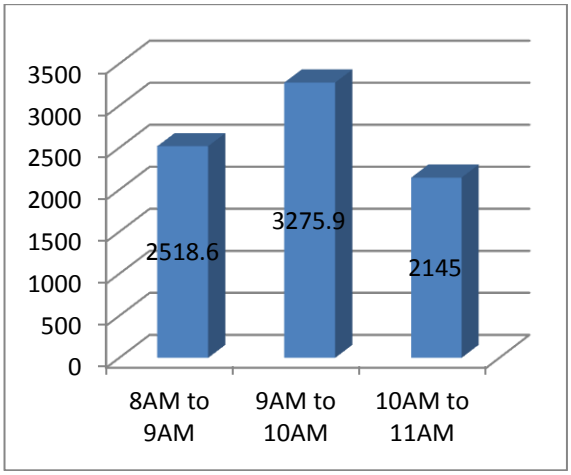

Figure 17 PCU Graph Towards Banashankari (Morning)

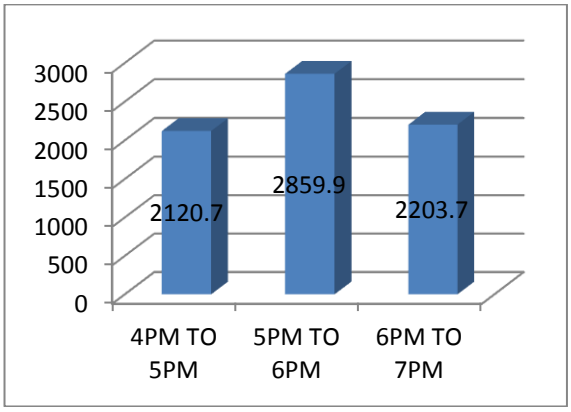

Figure 18 PCU Graph towards Banashankari (Evening)

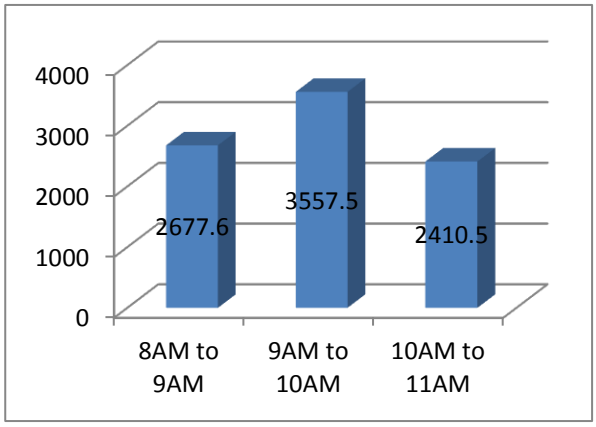

Figure 19 PCU Graph Towards Kanakapura (Morning)

7.1.4 TOWARDS KANAKAPURA

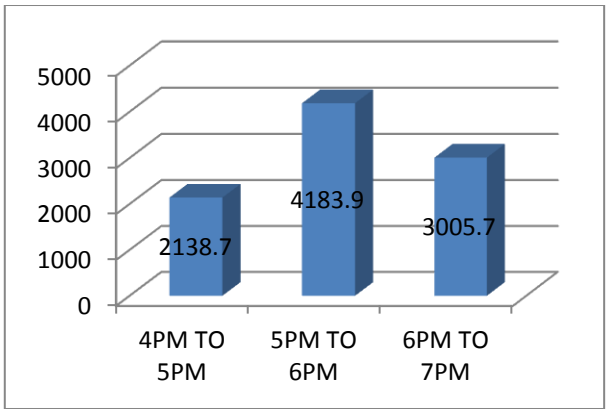

Figure 20 PCU Graph Towards Kanakapura (Evening)

8. DEVELOPMENT SUGGESTION

SL. NO.	Type of carriageway	Total design services volume		
		Arterial	Sub-arterial	Collector
1	2-Lane One-Way	2400	1900	1400
2	2-Lane Two-Way	1500	1200	900
3	3-Lane One-Way	3600	2900	2200
4	4-Lane Undivided	3000	2400	1800

5	4-Lane Divided	3600	2900	-
6	6-Lane Undivided	4800	3800	-
7	6-Lane Divided	5400	4300	-
8	8-Lane Divided	7200	-	-
-	-	-	-	-

- According to IS-106-1990 code the recommended design service volume of 2-lane two-way should be 1200 for sub-arterial,4-lane divided is 2900 for sub-arterial and 6-lane divided is 5400 for arterial.
- But when we see the data collected for the selected junction, we have 1 road of 2-lane two-way sub-arterial, another road 4-lane divided sub-arterial and 2 roads of 6-lane divided arterial.
- The volume towards the electronic city road in the morning peak hours the data is obtained as 2806.5 and in the evening peak hour it is 2577.Which is almost to the recommended design service volume of 2900.
- Even for other road of 2-lane two-way kengeri road, the volume is 4814.3 in the morning peak hour and 2499.1 in the evening peak hour which is again exceeding the service volume of 1200.
- Then for other 2 roads of 6-lane divided the recommended design service volume should be 5400 for arterial.
- For both the roads of kanakapura and banashankari as the collected data volume is not crossing above the recommended service volume, there is no problem from these two roads

9. CONCLUSION

- Electronic city road has to be widened in future.
- Kengeri road has to be widened as it is exceeding twice the volume of recommended traffic volume.
- Road widening at the critical part of the junction.
- Proper road marking has to be done.
- By providing rotary, the accidents and collision can be reduced.
- Proper sign boards and zebra crossing.
- Proper footpaths has to be given for the drainage and easy accessibility of pedestrians.
- Bus stop has to be provided 75 meters after the junction.
- Turning lane for kengeri road as to be provided.

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REFERENCES

[1] Guideline for capacity of urban roads by IRC: 106:1990.

[2] Bharath H Aithal, Vinay S and Ramachandra T V, 2103. Modeling and simulation of urbanization in greater bangalore, India, Proc. Of national spatial data infrastructure 2013 conference, IIT Bombay, November 29-30,2013

[3] Manuj Darbari Sanjay Medhavi and Abhay Kumar Srivastava."Development of effective Urban Road Traffic Management using workflow techniques for upcoming metro cities(India)",International Journal of Hybrid Information Technology, Vol.1, NO. 3, pp. 99-108, July, 2008.

[4] HIGHWAY CAPACITY MANUAL-2000

[5] Dr.L.R.Kadiyali."TRAFFIC ENGINEERING AND TRANSPORT PLANNING", Hanna publishers.Edition-2010,2011

[6] Khanna and Justo."Highway Engineering",New Chand and Bros,Civil lines,Roorkee. Edition-2010

[7] Indian Roads Congress, "Manual for survey, investigation and preparation of roads"

[8] PCU equivalents in India Prof S L Dhingra at civil.iitb.ernet.in sun

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