

STUDY OF TRAFFIC FLOW CHARACTERISTICS AND REMEDIAL MEASURES TO OVERCOME CONGESTION

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Abstract – With the increase in population in Bangalore, the number of vehicles have also increased. A significant effort has been made to study the traffic volume of Kengeri – Uttarahalli road also known as Dr. Vishnuvardhan road. The safe and efficient movement of people and vehicle depends on the traffic characteristics or the traffic flow. In the absence of effective traffic management of the city, the current road cannot accommodate the traffic capacity which has led to traffic congestion due to the development or growth of the city. The vehicle and pedestrian volume has been increased significantly. In this work, importance is given on traffic volume and traffic volume count was carried at 4 major junctions which contributes to traffic congestion. Other than this, Pedestrian volume count and pedestrian opinion survey was also carried to know the problems faced by the pedestrians. After analyzing all the data some of the remedial measures such as widening of road, increasing the number of lanes, providing medians or separators between the opposite lanes, improving the footpath condition and providing skywalks or pedestrian cross over where the congestion is more. These are some of the remedies suggested based on the outcome of the work.

Key Words: Traffic characteristics, Traffic congestion, Traffic volume study, Pedestrian flow, Pedestrian opinion, Widening of road and Lanes.

1.INTRODUCTION

Traffic congestion has become a major problem in all the developing cities like Bangalore. It results in many problems like delay in journey, wasting time and also road accidents [3]. The main reason for traffic congestion is the width of the road, at present the road is a two way two lane having a width of 7.5m. The presence of IT companies, schools, colleges and hospitals has caused traffic congestion.

Different classes of vehicles like car, buses, motor cycles, heavy commercial vehicles, bullock carts and auto rickshaws are found to use the common roadway facilities [2]. The flow of traffic with unrestricted mixing of different vehicle classes on the roadways

form heterogeneous traffic flow or mixed traffic flow [1].

The traffic is found to be more at peak hours i.e 7.30 AM-10.30 AM and 5.00 PM-7.30 PM. The pedestrian flow is also more at peak hours which has caused traffic congestion due to crossing of people resulting in obstruction of traffic flow.

This problem can be solved by improving the condition of the road such as widening, increasing the number of lanes, providing signals at intersection and providing cross overs or skywalks.

1.1 Study Area

Kengeri-Uttarahalli road also known as Dr. Vishnuvardhan road is situated towards the southern part of Bangalore. The road links some important towns like Electronic city, Kengeri, Uttarahalli, Banashankari and Rajarajeshwari nagar. The total stretch of the road is about 7.7 km.

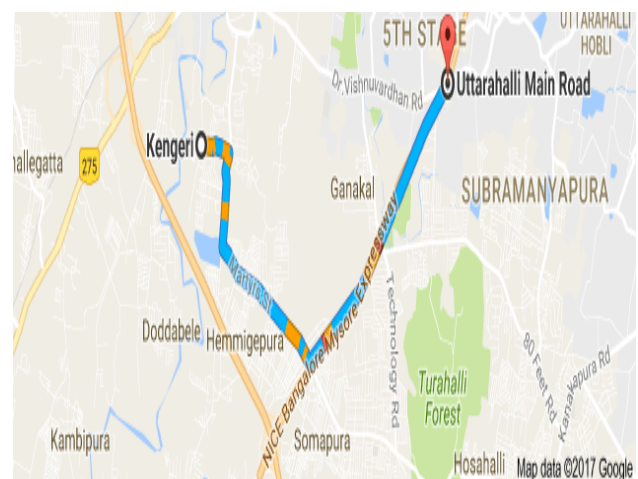


Fig-1: Location of study area

2. OBJECTIVE AND METHODOLOGY OF THE STUDY

The main objective of the study are:

- To measure traffic volumes and note other related traffic characteristics.
- To determine vehicle composition in traffic stream.
- To investigate the geometric elements.
- To determine remedial measures to reduce traffic congestion.
- To investigate the problems faced by pedestrians while crossing.

Study methodology has following steps:

- Pilot survey: pilot survey was conducted in order to understand the road network and the existing problems in that area.
- Selection of critical points: this was done based on pilot survey.
- Data collection: the data was collected for the volume studies of vehicles and pedestrians, for the purpose of designing or improving, planning and management.
- Traffic volume study: both vehicular count and pedestrian count were done by manual counting method.
- Pedestrian opinion survey was carried to know the problems faced by the pedestrians.

2.1 DATA COLLECTION AND ANALYSIS

The data collection was done after carefully studying the study area. After doing the pilot survey, the location where data has to be taken was decided. The 4 major locations which contributes to traffic congestion are Kengeri [origin of the study], Uttarahalli [destination of the study], RNSIT entrance and BGS hospital entrance were selected based on pilot study.

Traffic volume study was conducted on all the days i.e from Sunday to Saturday continuously for 12 hours from 7.30 AM to 7.30 PM. From pilot survey, it is observed that these were the busiest hours during which the traffic survey is very high. The traffic count was taken for both the directions i.e towards Kengeri and towards Uttarahalli. Pedestrian count was done for 4 hrs i.e 8.00 AM to 10.00 AM and 5 PM to 7 PM. Pedestrian opinion survey was conducted and for this, 20 people were interviewed.

2.2 METHOD USED FOR VOLUME STUDY

For calculation of volumes, manual count method was used for both vehicular and pedestrian count. The data obtained from manual count method were tabulated in a tally sheet which is recommended by IRC [Indian road congress]. Different classes of vehicles like car, buses, motor cycles, auto rickshaws, bullock cart etc were entered in their respective columns in tally sheet.

TABLE-1 : Traffic data towards kengeri

DAYS	KENG ERI JUNC TION	BGS ENTR ANCE JUNCT ION	RNSIT ENTR ANCE JUNCT ION	UTTARA HALLI JUNCTIO N	TOTAL NO. OF VEHIC LES OF ALL JUNCT IONS
MONDA Y	5616	6073	5020	5469	22178
TUESDA Y	5297	5983	5002	5021	21303
WEDNE SDAY	5090	5716	4879	5499	21184
THURS DAY	5025	5745	4918	5383	21071
FRIDAY	5319	5990	5012	5493	21814
SATUR DAY	4954	5451	5105	5410	20920
SUNDA Y	3946	4160	3170	3583	14859
TOTAL VOLUM E	35247	39118	33106	35858	143329
AVERA GE DAILY TRAFFI C	5036	5588	4730	5123	20477

TABLE-2: Traffic data towards uttarahalli

DAYS	KENGERI JUNCTION	BGS ENTRANCE JUNCTION	RNSIT ENTRANCE JUNCTION	UTTARAHALLI JUNCTION	TOTAL NO. OF VEHICLES IN ALL JUNCTIONS
MONDAY	6463	6667	5082	5553	23765
TUESDAY	6231	6588	5026	5433	23278
WEDNESDAY	6061	6345	5019	5984	23409
THURSDAY	5948	6214	4960	5544	22666
FRIDAY	5928	6414	4986	4986	22314
SATURDAY	5894	6073	5198	5644	22809
SUNDAY	4265	4162	3263	3636	15326
TOTAL VOLUME	40790	42463	33533	36780	153566
AVERAGE DAILY TRAFFIC	5827	6066	4791	5254	21938

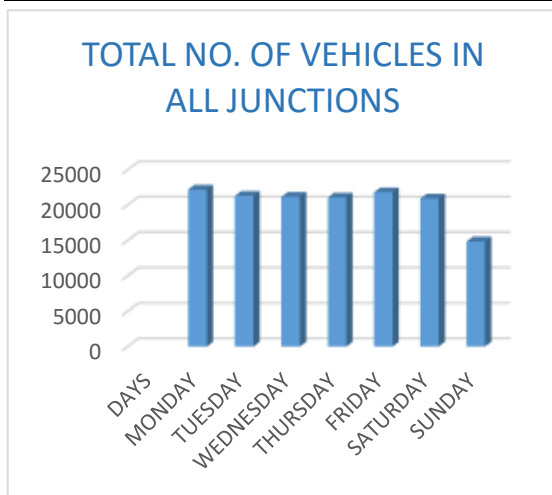


CHART-1: days vs total no. of vehicles [towards kengeri]

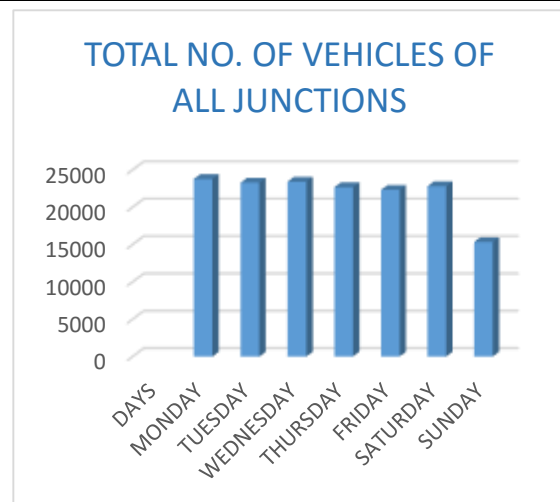


CHART-2: days vs total no. of vehicles [towards uttarahalli]

TABLE-3: pedestrian data of all junctions

DAYS	BGS HOSPITAL ENTRANCE	JSSA TE BUS STOP	RNSIT ENTRANCE	TOTAL NO OF PEOPLE CROSSING THE ROAD OF ALL JUNCTIONS
THURSDAY	666	461	544	1671
FRIDAY	573	397	510	1480
SATURDAY	674	460	569	1703
TOTAL	1913	1318	1623	4854
AVERAGE PEDESTRIAN/ DAY	638	439	541	1618

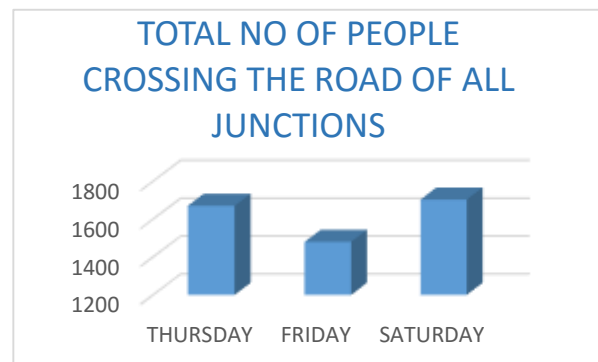


CHART-3: days vs total no of people crossing the road of all junction

3. CONCLUSIONS

The present study has been conducted to analyze the traffic characteristics of Kengeri-Uttarahalli road. The following main conclusions are drawn from the work.

As per the data collected it is found that the maximum number of vehicles is on Monday and minimum number of vehicles is on Sunday, the traffic volume is more in peak hours which is the main reason for congestion.

In addition to this the pedestrian flow is also high during peak hours. This leads to the obstruction to traffic flow. From the results of pedestrian opinion survey the problems faced by the pedestrians are also known. It is concluded that present urban road caters very heavy traffic and does not produce required level of service. The condition of existing road is also not good at some location which obstruct the speed of vehicle so it should be improved. Some of the remedial measures was also suggested such as widening of the road, increasing the number of lanes, providing signals at intersection, providing medians or separators between the opposite lanes, improving the footpath condition and providing pedestrian crossover or skywalks.

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