

Study and Analysis of Risk Factors Cause the Traffic using Relative Importance Index

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Abstract

Now a day's road traffic has been growing at a very rapid rate in India. During the last decades, the number of motor vehicles has been growing at a rate of around 10% per annum. As this result shows the growth of motor vehicle population causes traffic on the road. This result creates severe congestion on the roads, so the speed of the vehicle was low and the operating cost became high and also the accident rate was increasing. Traffic engineering provides many valuable tools to rectify the problems. In this paper is to identify the factors which cause traffic and the data were collected through questionnaire survey from various peoples and analysed the data through Relative Important Index (RII).

Keywords: Traffic management, data collection relative important index (RII)

I. INTRODUCTION

Tamil Nadu have 14257km of highway network and road length of 19040km. there are 25 national highways in Tamil Nadu with in that 12 national highways runs in Tamil Nadu. Without signals and diverting routs and closing of side road in the national highways has increase the safety and reduced the accident [1]. Tamil Nadu was one of the main accident prone zone in India with highest rate of road accident. Road safety education for the drivers and road users for obey the proper rules and regulation. It will help to reduce the road accident [2]. The wide ranges of dynamic car unit values for different location were observed based on the side friction, composition, wide ranging traffic characteristic and lane width. The value for dynamic car unit help to determine the capacity of urban road [3]. Study for basic traffic flow characteristic like traffic volume was the pre-requisite for the effective planning, design, operating and management of road ways system. PCV values obtained from the different types of vehicles, for a wide range of traffic volume and composition. The flow of heterogeneous traffic is measured in term of PCV indicates the fairly accurate [4].

In questionnaire survey, data's were analysed using relative importance index (RII) and ranking the factors based on percentage of relative importance was the best method to rank the factor [5][6][7]. Today there are different methodologies and

techniques of planning in field of traffic. Application of AHP method is one of the possibilities that can be used within mentioned circumstances. The choice and application of some of the developed and accepted methods of decision making in transport, using AHP [8][9]. The study of traffic survey in depth to analysis present conditions, in innovative approach [10]. Field survey was conducted to know the vehicle pedestrian interaction, and this field data with respect to pedestrian crossing at signalized, Un signalized or at midblock sections is aimed to be observed to Reduce pedestrian exposure to vehicular traffic and to Reduce the vehicle speed [11].

A private bus like the company, college, school buses stops at the middle of the road while traveling inappropriate manner thus causes traffic. In padappai junction more roadside shops are there so many bike riders park the vehicle at the side of the road thus causes traffic. Padappai road is a two-lane road but more numbers of vehicles are increased so the width of the vehicle is not enough thus causes traffic. The two-lane road does not have median at the padappai junction so overtaking of the vehicle in opposite lane or insufficient of opposite side for the vehicle. Near bus stop at padappai junction medium size of roadside banners of Politian's and a marriage proposal that disruption to roadside walkers & bus stop passengers & vehicle parking thus causes traffic. In right turn from MANNIVAKKAM TO PUSPAGIRI ROAD turning of the vehicle at the junction causes traffic. In right turn from MANNIVAKKAM TO PUSPAGIRI ROAD turning of the vehicle at the junction causes traffic. Padappai road junction in that point not having median that causes traffic. A roadside animal which crosses or sat at the middle of the road or corner of the road thus causes traffic.

In this paper the data's where collected through questionnaire survey from varies peoples. The collected dates analyse through relative important (RIA)based on RII value ranking the factors .

TABLE 1: Demographic Details

RESPONDENTS	NUMBERS	%	CUMM %
DRIVERS	14	30.435	30.435
PERD	12	26.087	56.522
SHOP OWN	11	23.913	80.435
COMPANY WORKERS	9	19.565	100
TOTAL	46	100	

The above table 1 shows that the individual comments from the drivers, pedestrians, shop owner, company workers. The number was been calculated in percentage, such as drivers 30.4%, pedestrian 26.08%, shop owner 23.91% and company workers 19.56%

II. NEED FOR STUDY

To reduce the traffic flow in padappai junction is located in Chennai. It is Chennai to Bangalore National Highway (NH₄) and it is the main way to reach Oragadam, an industrial area located near padappai. Due to arriving of new industries in Oragadam region, in recent days the road traffic has been increasing in padappai. The main aim of this project is to control the traffic in padappai junction.

III. SCOPE

Traffic congestions in the padappai have been reduced and control the traffic flow. It helps to the Drivers and passengers where travel by a smooth, comfortable and safe driving.

IV. OBJECTIVE

- ✓ To measure the traffic flow in peak and non-peak hours by measure the volume count of the vehicle in padappai.
- ✓ To identify the factors which cause traffic through a questionnaire survey on the roadside in padappai.
- ✓ To analysis this parameter using Relative important index (RII).
- ✓ To suggest the ideas to control the traffic.

V. DATA COLLECTION

The data has been collected from road side interview in padappai .It is a small developing town .it's located 13 km from Tambaram to Bangalore highway. The Oragadam SIPCOT & many big companies like Nissan, Appolo tyres, Alstom T&D, Infac India are few companies nearest to this town.

In padappai junction, more numbers of the vehicle are passing that causing traffic in peak hours of vehicles have been collected. The types of vehicles

involved in the survey are the car, government bus, private buses, 2axle, 3axle, van, light commercial vehicle (LCV), motorcycle, multi-axle. The data were in collected noted at 6.00 AM TO 9.00 PM at the padappai junction by using the handhold tally counter numbers clicker.

Volume Count

The below Table 2 shows about the volume count of the various vehicle. In a particular time period. The volume count has been noted from 6:00am to 9:00pm.

TABLE 2: VOLUME COUNT OF THE VEHICLE

TIME	TYPE OF VEHICLE								TOTAL NO OF VEH
	C	P	2/3 A	M	V	Lcv	Motor	Gov	
6.00to7.00	111	35	65	10	88	66	135	21	531
7.00to8.00	206	97	119	11	68	94	195	36	829
8.00to9.00	229	142	175	12	69	82	274	30	1013
9.00to10.00	362	16	135	6	46	86	450	33	1134
10.00to11.00	578	7	226	9	224	214	1157	32	2223
11.00to12.00	580	10	141	14	63	71	940	29	1941
12.00to1.00	473	24	302	11	109	283	880	37	2116
1.00to2.00	367	33	188	7	100	220	441	44	1392
2.00to3.00	337	96	261	5	71	219	570	31	1630
4.00to5.00	244	269	134	4	224	309	425	42	1668
5.00to6.00	446	229	185	1	289	119	517	32	1818
6.00to7.00	441	130	217	1	239	172	492	38	1730
7.00to8.00	460	125	244	1	181	220	200	32	1553
8.00to9.00	412	113	174	2	161	181	225	32	1300

VI. DATA ANALYSIS (RII)

The questionnaire design took into consideration for easy understand the question. Special care was taken for phrasing the questions. The 3 point scale was used for this survey. The scale represents 1 as low traffic, 2 as medium traffic, 3 as high traffic.

The collected data were by relative important index (RII).RII will be calculated with the following expression.

Where;

$$RII = \frac{\sum_{i=1}^n w_i x_i}{AN} \text{----- (1)}$$

RII = Relative importance index

w = weighting given to each factor by respondents

x = frequency of ith response given for each cause

A = highest weight

N = total number of participants

The relative importance index for all the traffic factors using equation (1).the index were ranked for factors.

Table 3: % of RII TRAFFIC AFFECTED FACTORS

SI: NO	FACTORS	RII	% OF RII
1	Not enough of road width	0.86	85.51
2	Traffic due to the private bus like the company, college, school buses stop at road inappropriate manner	0.83	83.33
3	Traffic due to the bus stop near a junction	0.80	80.43
4	Traffic due to roadside shop by visitors vehicle	0.79	78.99
5	Traffic due to overtaking of a vehicle in opposite lane or insufficient of old for vehicle	0.72	71.74
6	Roadside banners made disruption to roadside walkers & bus stop passenger & vehicle parking	0.72	71.74
7	If right turn from mannivakam to puspagri road made traffic so that made to a restriction of right turn during peak hours (7:00 to 9:30 am) and (3:00 to 7:00 pm)	0.67	67.39
8	Traffic causes due to any accidents	0.65	65.22
9	Is road needs median to control overtaking vehicle	0.64	63.77
10	Roadside animal (cow, cattle) made traffic on a road	0.54	53.62

The Table 3 shows about the % of RII for factors that cause traffic in padappai based on this RII value of the factors that cause the traffic in the junction.

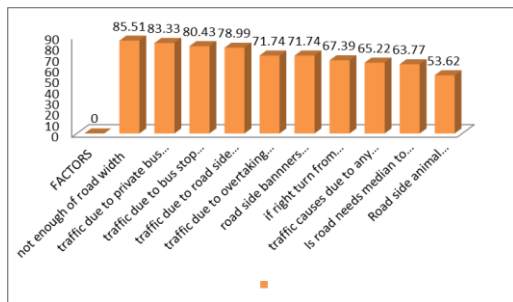


Fig 1: RII value for traffic affected factors

The above Fig.1 shows the RII percentage for individual factors. Not enough of road width RII (85.51%), traffic due to private bus like company, college, school buses stop at road inappropriate manner RII(83.33%), traffic due to bus stop near

junction RII(80.43%), traffic due to roadside shop by visitors vehicle RII(78.99%) traffic due to overtaking of vehicle in opposite lane or insufficient of old for vehicle RII(71.74%).

VII. CONCLUSION

From this study conclude not enough road width reduce the traffic by providing sufficient of road width and signals at the padappai junction and make new bypass it helps to cross the junction and make the uniform flow of traffic without any intercept. Have more than (80%)of RII that show more that cause the traffic in padappai junction .

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