TRAFFIC SURVEY, ANALYSIS AND SUITABLE SOLUTION FOR THE SELECTED ROUTE AT PERAMBALUR

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Abstract: Rapid increase in the road traffic density results into a serious problem of traffic congestion in cities. During peak hours traffic congestion is very high and hence public search for least congested path for their journeys in order to minimize travel time and transportation cost. This report offers recommendations on the management, planning, and conduct of traffic analysis that will promote greater traffic analysis tool consistency over the typical project development life cycle. It is directed toward professionals operating in State departments of transportation and other agencies responsible for transportation project development and delivery. In this study a new empirical model was developed to estimate congestion levels using real time road traffic parameters such as vehicle density, speed, class and vehicle to vehicle gap. These real time road traffic parameters were collected by using manual count. The selected route is between Perambalur old bus stand signal to Kamarajar statue. New methods like Roundabouts, Automatic Speed Breaker and automatic traffic signals are likely to introduce to reduce the traffic congestion otherwise it may leads to accident.

Keywords: Vehicle Density, manual count, roundabouts, automatic speed breaker, automatic traffic signals.

1. INTRODUCTION:

Traffic engineering is a branch of civil engineering that uses engineering techniques to achieve the safe and efficient movement of people and goods on roadway. It focuses mainly on research for safe and efficient traffic flow, such as road geometry, sidewalk and crosswalk, cycling infrastructure traffic signs road surface markings and traffic lights. Traffic engineering deals with the functional part of transportation systems, except the infrastructure provided. After all the survey and observations solutions and suggestions are provided for better traffic condition and convenience of the users. And also give the solutions like, 'Roundtana, Automatic speed breaker, Automatic traffic signals'. These also helps to reduce the traffic volume, traffic congestion, and accidents.

2. LITERATURE REVIEW:

Yuri ichkitidze (2016) to determine the "potential for enhancing traffic safety on highways of Russia",The article investigates the corrections between the factors of enhancing traffic safety on highways and parameters of the economic growth in Russia and in countries with transition economy.

Vladimir zyryanov (2016) to determine the "investigation of dependencies between parameters of two component models of the kinetic theory of traffic flow and traffic characteristics". The paper reports the results of studies of changes in parameters of two component model of the kinetic theory of transports flows.

Anatoliyplotnikov (2016) to determine classification investigation of traffic management schemes having conflict loading at the signal controlled road junction. The result of classification investigation of the efficiency of the traffic management schemes are provided according to the criterion of their conflict loading.

Sourabhjain (2017) to determine the traffic congestion modeling based on origin and destination. This study attempts to make use of behavior on the aggregate level to estimate congestion on the urban arterial and sub arterial roads of a city exhibiting heterogeneous traffic conditions by breaking the route into independent segments and approximating the origin destinations based traffic flow behavior of the segments.

Jain k (2014) to determine the "traffic flow characteristics for multilane highways in India", the traffic compos ion on multilane highways in India comprises of a wide range of vehicles in terms of their type, size, engine, power, manicuring.

Michael osigbemeh (2016) to determine "design and development of an improved traffic light control system using hybrid lighting system", the development of lighting emitting diodes based traffic system control created the problem of dim displays when ambient light is similar to traffic lights, the use of traffic lights to eliminate confusions, chaos, time-wasting and accidents in road junctions and curvets.

Manfred Boltze (2016) to determine "megacities over the developing world have been facing increased traffic problems including congestions, pollutions and accidents traffic management with clearly predefined goals and objectives.

Ravilsafiullin(2016) to determine " the evaluation of functional efficiency of automated traffic enforcement system".

3. INFORMATION COLLECTION:

Strategic traffic management and control requires information about the operational state and characteristics of traffic flow. The parameters most relevant to ATMS includes:

❖   Traffic Flow or Volume – the number of vehicles passing a point per unit of time.

- ❖ Vehicle speed – the distance travelled by a vehicles passing a point per unit of time.
- ❖ Traffic density – the number of vehicles occupying a road lane per unit of time usually expressed in km/hr.
- ❖ Occupancy – similar to traffic density, usually expressed as a percentage representing the percentage of time in detection zone on the road is occupied.
- ❖ Incident- an unplanned event that occurs within a roadway that impacts the capacity of the roadway. Relevant details of incident includes location, direction of travel, type of impact, weather condition , class of collision, road surface condition, number of vehicles involved, number of lane blocked, etc.,
- ❖ Weather condition – relevant details on current weather conditions, such as wind speed, humidity, temperature, visibility etc.,

To measure those parameters, many different types of detectors/sensor are available including roadway sector and vehicle probes.

Roadway sensor:

Roadway sensor can be divided into two categories.

- • Embedded or Intrusive
- • Non - intrusive and environment

Embedded or intrusive:

An inductive loop detector consists of a copper wire embedded in the road surface in the shape of a loop. Passing an electrical current through the copper wire induces magnetic field in the vicinity of the loop. Connecting the loop to a roadside cabinet through a lead in cables allows electronic equipment to monitor the magnetic field and changes in inductance as a vehicle passes over loop.

Non-intrusive detectors:

Radar detectors actively emit ratio wave signals and can register vehicular presence and speed depending upon the characteristics of the signal returned to them by the moving vehicles.

3.1. LOCATION PHOTOS:

Fig-1. Perambalur traffic old bus stand 1

Fig-2. Perambalur traffic old bus stand 2

PERAMBALUR TRAFFIC LOCATION 2

3.2 Traffic management

Traffic management is the planning, monitoring and control or influencing of traffic. Maximize the effectiveness of the use of existing infrastructure; Ensure reliable and safe operation of transport; address environmental goals, ensure fair allocation of infrastructure space, rail slots and among competing users.

4. PCU VALUES FOR DIFFERENT VEHCLES:

Table no-4.1.PCU VALUES OF VEHICLES AS IN IRC64-1990

S.NO	VEHICLE TYPE	PCU
1	TWO WHEELER	0.5
2	BUS OR TRUCK	3.0
3	MINI TRUCK	3.0
4	MINI BUS	1.5
5	AUTO RICHSHAW	1.0
6	TRACTOR TRAILER	4.5

4.1TRAFFIC DENSITY READING:

Table no-4.2. Traffic density at location 1(a)

DATE	DAY	TIME	Two Wheeler	Three Wheeler	Four Wheeler	Heavy Wheeler
05.1.2019	1	7-10 am	1542	266	286	51
06.1.2019	2	7-10 am	2052	301	240	49
07.1.2019	3	7-10 am	1661	325	306	31
11.1.2019	4	7-10 am	1738	334	338	46
13.1.2019	5	7-10 am	2176	389	393	33
14.1.2019	6	7-10 am	2267	397	398	59

Table no-4.2. Traffic density at location 1(b)

DATE	DAY	TIME	Two Wheeler	Three Wheeler	Four Wheeler	Heavy Wheeler
05.1.2019	1	4-7 pm	1643	292	290	42
06.1.2019	2	4-7 pm	2103	316	218	37
07.1.2019	3	4-7 pm	1724	343	324	26
11.1.2019	4	4-7 pm	1679	356	317	37
13.1.2019	5	4-7 pm	2045	372	367	27
14.1.2019	6	4-7 pm	2178	383	374	38

Traffic density at location 2(a)

DATE	DAY	TIME	Two Wheeler	Three Wheeler	Four Wheeler	Heavy Wheeler
18.01.2019	1	7-10 am	655	97	89	13
20.01.2019	2	7-10 am	794	117	83	18
21.01.2019	3	7-10 am	679	129	98	16
26.01.2019	4	7-10 am	598	114	104	9
27.01.2019	5	7-10 am	672	126	126	11

Traffic density at location 2(b)

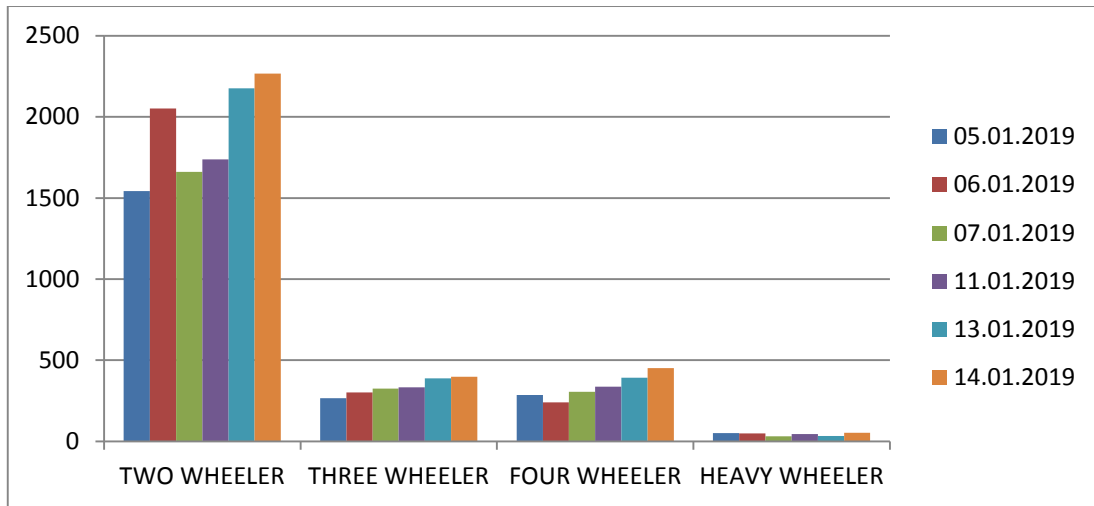| DATE	DAY	TIME	Two Wheeler	Three Wheeler	Four Wheeler	Heavy Wheeler
18.01.2019	1	4-7 pm	543	126	76	7
20.01.2019	2	4-7 pm	693	135	93	9
21.01.2019	3	4-7 pm	679	121	85	15
26.01.2019	4	4-7 pm	516	119	99	11
27.01.2019	5	4-7 pm	791	148	104	19

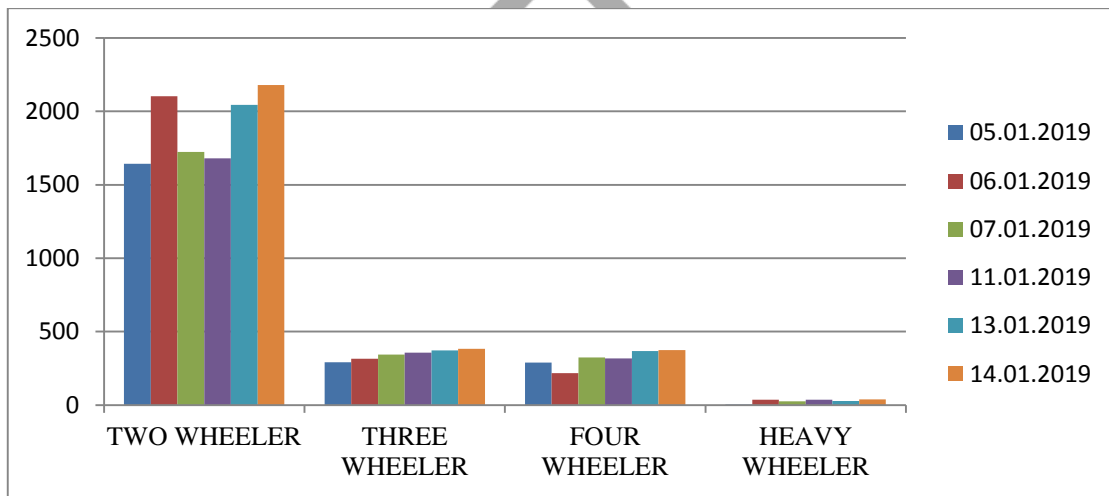**Fig-3 Traffic density at location 1(a)**

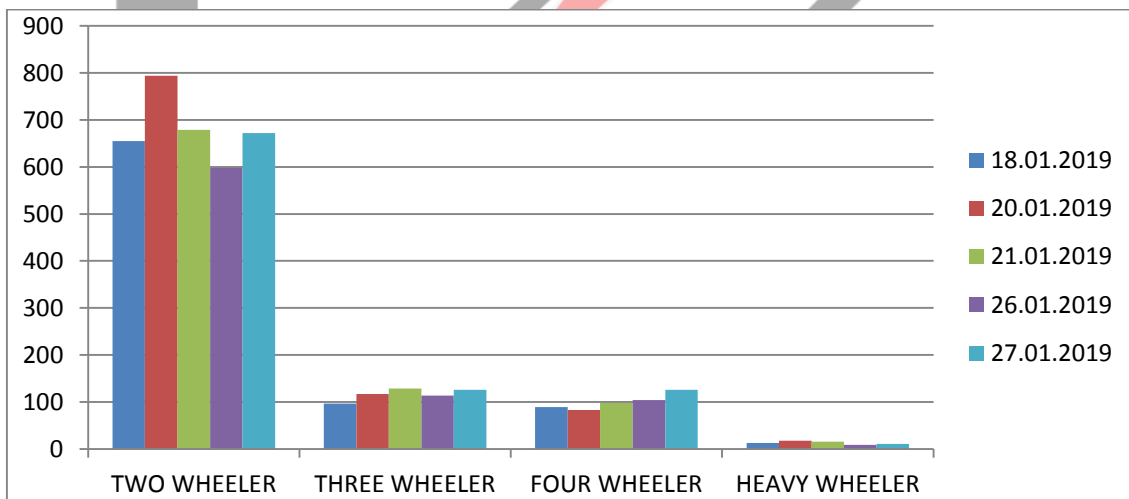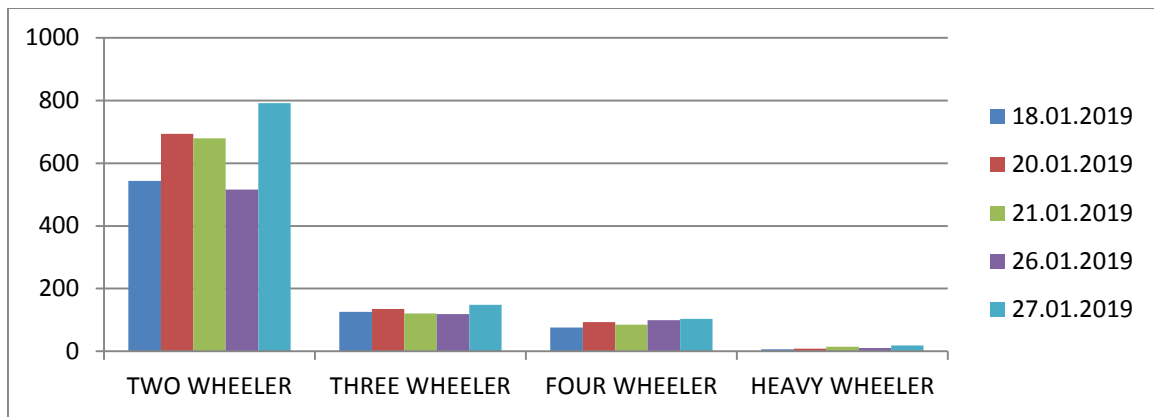**Fig-4 Traffic density at location 1(b)**

Fig-5 Traffic density at location 2(a)

Fig-6 Traffic density at location 2(b)

SOLUTIONS:

- **ROUND ABOUTS**
- **AUTOMATIC SPEED BREAKER**
- **AUTOMATIC TRAFFIC SIGNAL**

CONCLUSION:

- There are more apps available to know the traffic on a particular road or the condition of jam.
- This paper proposes the concept of promoting automatic traffic signal and automatic speed breaker thus indicating a jam on a practical scenario and thus helping in avoiding congestion.
- This paper also proposes the concept of traffic management of traffic without much changes in the existing designs and thus saving extra costs**.**

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