

## A Case Study on Analysis of Traffic Flow in Chennai City

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**Abstract:** The principle objective of this paper was to demonstrate the need for the regulation and control of traffic. A case study was undertaken at the junctions of Sterling road - Valluvarkottam road - College road - Chetpet road in Chennai city. The present day vehicular flow of the particular study area was determined. After considering a plethora of real time issues it has been finally being recommended to construct a flyover. The structural details of the proposed flyover was found out and perspective view of the flyover was produced in Revit Architecture software. The main goal of this paper was not to provide a “here, this is how it works” answer, rather the goal was to setup a clear and concise framework of the plan that can help to solve congestion of traffic, that can be contributed to the public

**Keywords:** Congestion, Control, Regulation, Traffic, Vehicular flow.

### I. INTRODUCTION

Planning is considered as the best way to manage traffic. The management of traffic varies from place to place [1]. Traffic congestion results in a number of problems, including economic cost due to delayed travel times, stop and go situation of traffic at both link and nodes in any traffic network and its concomitant air pollution and of course road accidents [2]. One of the difficulties in examining the problem of urban traffic congestion and its potential solutions is that no detailed quantification of either the size of the problem or its projected future growth has been available [3]. As a result, the relative effectiveness of various types of solutions to the problem cannot be described. Reducing road traffic congestion can be achieved through effective management strategies [4].

A general study cannot be made on this topic, since traffic density and the surrounding environment differs from place to place, hence the study was undertaken for a particular traffic prone zone. Henceforth the junction between Sterling road - Valluvarkottam road - College road - Chetpet road was taken. Traffic at this junction is intractable and traffic management along all these roads are not up to the mark. The presence of a school also paves way for greater traffic. The present day status of the particular study will be explained in detail. The framework of this study was built off the following three points, (1) Analysis: the present roadway was analyzed, (2) Defects: defects of the roadway were analyzed and studied, (3) Rectification: a proposed idea for the rectification of its defect was discussed. The rectification can be made after considering surfeit number of issue like resources and funding. The details and plan for the construction of the bridge were elaborated

### II. THE CASE STUDY

To make a case study on traffic the most busiest and congested roads and junctions in Chennai city were selected. The following are the four roads which is prone to heavy traffic.

- I. Valluvar kottam Road
- II. Chetpet road
- III. Sterling road and
- IV. College road

Majority of traffic were in the following directions

- Valluvar kottam road to Chetpet road
- Chetpet road to Sterling road

Transportation details were given below

- One way : College road
- No entry : Valluvarkottam road

All other roads are two way. Fig 1 shows the map of study area from google earth web source



Figure 1. Index map of study corridor

### III. METHODOLOGY

#### 3.1 Questionnaire Survey

A survey was undertaken with the peoples of that locality and their displeasure regarding the heavy traffic throughout the entire day was observed and this is a problem which is for almost a decade. A self administrated questionnaire survey was developed to test how road users felt the road travel through the particular road stretches. Survey questions related to:

- User’s opinion on average speed
- User’s opinion on quality of the road
- Delay time experienced on the road

Thus this made the need for a solution to this traffic congestion at this junction which is in the hotspot of the city. Peak and off peak hour volume count were also collected for these road stretches

#### 3.2 Volume Survey

The volume survey has been conducted in the morning peak and evening peak hours on typical working day in both directions. The survey starts from 7:00 AM m to 11:00 A.M for 4 hours in the morning session and 2.00 P.M to 10 P.M during the evening session, to procure the data on peak and off peak hour volume free flow speed etc. The following are the traffic pattern appeared in different time periods.

- Moderate traffic (7AM- 8AM): Early morning traffic is due to the presence of a school in that junction.
- Peak traffic (8.30AM- 11AM): crowd increases in a rapid manner. This is mainly due to the people who go for working and schools and colleges
- Off- Peak traffic (2- 4 PM): Traffic becomes normal during afternoon.
- Peak traffic (6 PM- 10 PM): crowd increases in a rapid manner. This is mainly due to the people who go out from offices, schools and colleges

The following table shows the categorized traffic for the evening peak hours

Table 1. Peak hour traffic flow

Time	Categorized volume					Total no
	Buses	Van/car	3 wheelers	2 wheelers	cycles	
6- 6.30	78	98	60	82	1	319
6.30-7	69	102	54	96	6	327
7-7.30	71	105	51	100	1	264
7.30-8	68	101	50	114	4	337
8-8.30	54	95	49	109	2	309
8.30-9	40	91	32	98	2	263
9.30-10	25	77	18	86	0	206

It is observed that along directions the flow is almost smooth except during 7:30 to 8.00 P.M where there is a pronounced peak occurring along valluvar kottam direction. This is probably due to improper variations in signal timings. Vehicle population from the past few years for the area has been collected from the highway department. Fig 2 shows the details of population

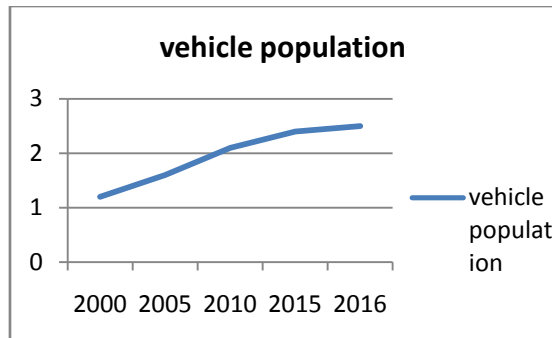


Figure 2. Vehicle population for the previous years

Jam density of the location for the whole day has been shown in Fig 3.

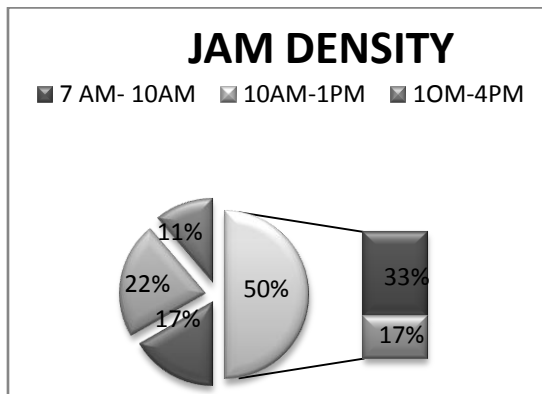


Figure 3. Jam density in the road stretch

#### IV. PROPOSED REMEDIAL MEASURES

Construction of a Flyover based on a complete study about this area was proposed. This flyover will connect three roads, Valluvarkottam road - Chetpet road - Sterling road. The main advantage of this flyover is that it will be avoiding signals throughout the entire road stretch. This might be a just a single difference from the present day statues to the time after the completion of the flyover but this will surely resolve the traffic congestion since all the vehicle travelling from all the directions will be allowed to free flow and thus there is no waiting time and hence there will be no congestion of vehicles leading to traffic.

The details of the proposed flyover are given below

- The flyover is erected at an angle of 30 degree.
- The distance between two columns is 15 to 20 meters.
- The peek height of the flyover at its centre is 6meters.
- The wings of bridges along Valluvarkottam road and Chetpet road will be of 8m width.
- The wing of the bridge along Sterling road will be 4m width allowing one way traffic.
- A round-about is formed at the centre avoiding signal at the top of the bridge.
- The length of each wing extends to about 100meters.

The layout of the proposed flyover has been done by using the Revit architecture software to give a pictorial representation. Fig 4 and Fig 5 shows the proposed model of the flyover in Revit Architecture software.

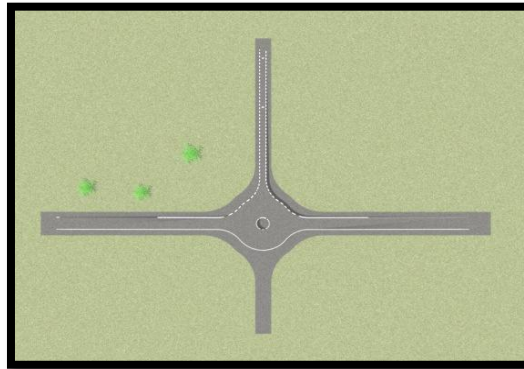


Figure 4. Top view of the proposed flyover

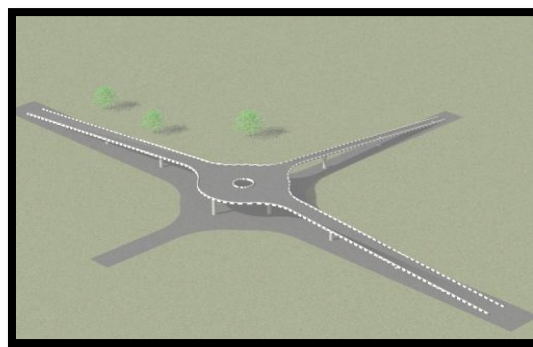


Figure 5. Perspective view of the proposed flyover

## V. CONCLUSION

A detailed study on the main problem in Chennai city was done in this paper. Traffic study was done on the three major corridors of the city and results were analysed. A solution was proposed to minimize the traffic congestion and jam density. Fly over connecting the study area was found to be the best solution. A view of the proposed flyover was shown with Revit architecture software.

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