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Planning of Flyover : A Solution for Traffic Congestion At Kayamkulam - Haripad Road

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Abstract — **Flyover is an overpass, a high-level road bridge that crosses over a highway interchange or intersection. Technically the entire highway is a single bridge., Alappuzha district in the state of Kerala, India.The kayamkulam - Haripad road is one of the major road in Alappuzha district. Nangiarkulangara is the central point of three major towns in central Travancore. The national highway NH 66 passes through this town. The main purpose is to get better present state of affairs vastly and make association of traffic convenient to possible extend, although a completely difference free situation cannot be understood. Day by day the rate of vehicles increases dramatically and causes traffic congestion. This study deals with planning a Flyover at Kayamkulam – Haripad road to reduce traffic congestion.**

Keywords : Field survey, Traffic volume survey, Questionnaire survey, Soil study

I. INTRODUCTION

Traffic congestion is a condition in which large number of vehicles at a point at a particular period of time. As demand approaches capacity of road, extreme traffic congestion sets in. When vehicles are stopped for a period of time it leads to traffic jam.

Flyover is a grade separated structure helps to reduce traffic congestion and provide good aesthetic appearance. Flyover may refer to as overpass, a high-level road bridge that crosses over a highway interchange or intersection. It is a bridge that carries one road or railway line above another either with or without subsidiary roads, for communication between the two sides. As the traffic on the road goes on increasing and we don't have any space left in both the dimensions, then the only option left will be to go to the third dimension and that is done through flyover construction. the main road is used for fast traffic, which is made to pass at a high level by a bridge, providing ramps on both the approaches; and the slow traffic is made to pass underneath. Thus, the traffics pass at two different levels, and leave no chance for an accident. We can increase the level of service of road by providing flyover in urban corridors. To satisfy the present and fulfill future demands of the traffic. For orderly movement, left turning and right turning maneuver can be provided. The capacity of road (vehicles per km) can be increased without changing road geometrics. The present study is at Nangiyarkulangara junction. The existing condition is very worst with traffic congestion and accidental rate . As a solution this project proposes a flyover to reduce traffic congestion.

II. OBJECTIVE

- Identification and studying the present scenario of traffic congestion at Nangiyarkulangara junction and proposed a Flyover.
- Conduct Questionnaire survey and traffic volume survey.
- Collect necessary datas for the project.
- Tackle the problem of traffic congestion, to increase safety and easiness of vehicle movement through junction.

III. SCOPE

- To reduce traffic congestion at the Nagiyarkulangara junction.
- To provide a safe and efficient movement of traffic through intersection.
- To reduce the accident rate by reducing vehicle congestion.
- Emergency vehicle like ambulance can easily reach at hospitals without any delay due to traffic.
- Time can be very much saved thus help the public to reach their destination easily.

IV. SITE SELECTIONS

Site selected for the study is Nangiyarkulangara junction. Nangiyarkulangara is relatively small town situated near Haripad, Alappuzha district in state of Kerala India. Roads from Mavelikara, Thrikkunapuzha and Kyamkulam meets at this pivot joint the road selected for the study is part of NH 47.

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Fig.1: Map of Nangiyarkulangara Junction

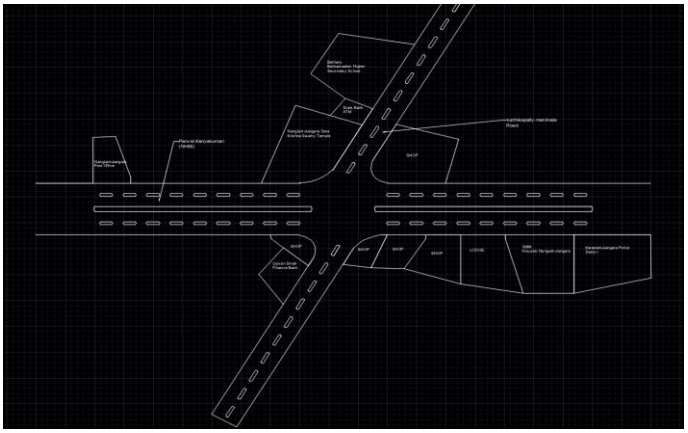

Fig.2: Location Plan of Nangiyarkulangara Junction

V. STUDIES AND SURVEYS

A. *Soil Study*

Soil investigation must be undertaken to determine the bearing capacity of the soil, its settlement rate and the position of the water table. One of the easiest methods is to dig trial pits and visual inspections carried out then samples with minimum disturbance are collected for subsequent laboratory testing. Where possible, drilling should be undertaken as this enables one to obtain undisturbed samples from which settlement rate and bearing capacity may be obtained. For soils that loosen, such as sand and gravel, a plate-bearing test can be used to determine the bearing capacity of the soil insitu and designing of the static loads on spread footings. If the strength of the soil is not adequate for the increased loading, it is necessary to improve on the foundations by introducing piles or enlarging the footing and reinforcing it betters to sustain the increased loading.

Pile foundation is adopted with respect soil study results in Table 1 and the details collected from PWD of Government U P School compound, Haripad , which is nearer to the proposed site.

Table 1: Soil study results

GENERAL SOIL STUDY	RESULTS
Liquid limit	34%
Moisture Content	3.35%
Specific Gravity	2.7
Particle sieve analysis	Fine graded

B. *Traffic Volume Survey*

Traffic volume survey was conducted on 6 days at four points, near SMM Hospital towards Kayamkulam, SMM Hospital towards Haripad, Nangiyarkulangara post office towards Kaymkulam and Nangiyarkulangara post office towards Haripad. From the traffic volume survey conducted at the site for 6 days, we concluded that peak hours are at 9am- 10am at morning and 5pm – 6pm at evening.

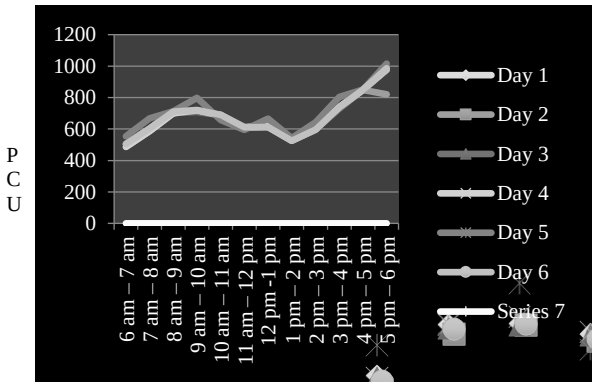

Fig.3: Traffic Volume Survey Graph

C. *Questionnaire Survey*

Often a questionnaire uses both open and closed questions to collect data. This is beneficial as it means both quantitative and qualitative data can be obtained. The questionnaire survey was conducted over Nangiyarkulangara junction. The people included for the survey were pedestrians, nearby households and regular vehicle users. A questionnaire was prepared and distributed among the above-mentioned people. And their feedbacks were collected. Almost 95% of people liked the proposed project of elevated highway. The average of the rating for the proposed project was calculated to be 8.92 out of 10. From Questionnaire survey conducted 89.2% of people support the construction of flyover at the proposed site shown in Table 2.

Table 2: Questionnaire Survey

SL.NO	QUESTIONS	YES	NO
1	Do you think the traffic congestion is affecting badly at Nangiarkulangara junction?	95%	5%
2	Is there any sort of problems for pedestrian facing on road?	85%	15%
3	Have you ever encountered or witnessed any accidents on road?	90%	10%

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4	Do you think flyover construction over this area will reduce traffic congestion?	95%	5%
5	What rating would you give for idea of construction of flyover at Nangiarkulangara junction out of 10?	8.92	

D. Field Survey

A total station (TS) or total station theodolite (TST) is an electronic/optical instrument used for surveying and building construction. It is an electronic transit theodolite integrated with electronic distance measurement (EDM) to measure both vertical and horizontal angles and the slope distance from the instrument to a particular point, and an on-board computer to collect data and perform triangulation calculations.

Table 3: Road Details

Existing Road Details	
Type of road	NH 47
Width of road	10m
Length of road surveyed	1100m

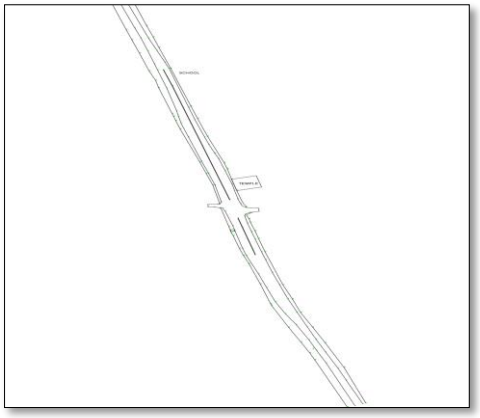

Fig.4 Total Station Results

VI. CONCLUSION

- The present situation of traffic congestion is thoroughly studied at Haripad – Kayamkulam route.
- The Nangiyarkulangara junction was identified as the most traffic congestion zone.
- The surveys conducted are traffic volume survey, questionnaire survey and total station survey.
- The proposed project could help rectify the traffic conjunction problems at Nangiyarkulangara junction thus allowing smooth flow of traffic.
- The proposal can be adapted for the infrastructural as well as developmental improvement of the district.

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