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# Analysis and Solution of Traffic Congestion Problems in Front of VJCET Campus

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**Abstract:** *The sudden growth of traffic in Muvattupuzha –Vazhakulam road causes traffic congestion problems and road accidents. The present design of road in front of VJCET college does not ensure safety. Therefor the present design has to be modified in order to control the overtaking vehicles in curves and to ensure safety of students. This project is focused on the study of accidents in front of VJCET campus. The project also analyse the traffic congestion problems and determine solutions for the problems.*

**Keywords:** *Traffic Congestion, Road accidents, Safety, Modification, Overtaking*

## I. INTRODUCTION

This The Traffic congestion in front of VJCET can be reduced during peak hours as it pose a threat to the stakeholders accessing it. The present design in front of campus do not provide adequate safety for the people using it. Therefore the present design is to be modified as it will be beneficial for the people accessing it. The present situation pose a need to develop a safe traffic control system, in order to control the overtaking vehicles in the curves, as well as ensure the safety of students who are the future of the country.

## II. METHODOLOGY

### A. Road Survey by Using Total Station

A total station is an electronic theodolite integrated with EDM (Electronic Distance Measurement) used for surveying by measuring both the vertical angle and horizontal angle and also the slop distance to a particular point.

- 1) *Coordinate Measurement:* The total station is used to measure the coordinates of the given target points. The procedure for measuring coordinates is given below.
  - a) First of all, a file folder need to be created to save the data. For that, in the status screen, press [DATA], in that select job and press enter. Select JOB selection, press enter. Press [LIST].Selecta folder name with 0 points. If there is so much folder, delete a file and create space.
  - b) File name of the Coordinate Search JOB should be same as that of folder name created in the first step. Otherwise it should also be changed by pressing [LIST].
  - c) In JOB Details, enter the name of the JOB and press OK.
  - d) The coordinate values of the target can be found by measuring the target based on settings of the instrument station and backlight station.
  - e) In the first page of OBS mode screen, press (COORD)
  - f) Select "Oec.orien." to set the instrument station data and azimuth angle of the backsight point.
  - g) Input the Northing, -Easting and Z coordinates of the instrument station. (eg:NI000,E1000,Z100)
  - h) Enter the name of the instrument station in the space provided. (eg: PT :01)
  - i) Measure the height of the instrument and enter in the corresponding space. (eg: HI:L.6m)
  - j) The details of temperature and pressure is entred only if required
  - k) Press [IBS AZ]
  - l) Enter HA-R value as zero. Turn the telescope to the north direction. Press [OKJ. Now the instrument station was properly oriented in the north direction and all the angles will be measured from the north direction.
  - m) In <Coordinate, select " Observation " measurement.
  - n) Measure the height of the reflector and enter in the corresponding space provided.(eg:HR: 1.6m)
  - o) Enter the point name of the target satiox. (eg: PT: P1)

- p) Sight the prism kept at the target station and Press [AUTOJ to start measurement. Pressing "Auto" simultaneously measures and records the data.
- q) Press [STOP] to quit measurement
- r) If the measurement was successful, the name of the next target station will be displayed in the screen. Sight to the prism kept at the corresponding target station and press [AUTOJ. Repeat the procedure until all the target station points visible from the current instrument station is measured.
- s) If certain target points are not visible from the current instrument set up, then the instrument need to be shifted.
- t) Before shifting the instrument to a new station, note down the point name of the last target station sighted from the present instrument set up. Also measurement should be taken from the present instrument set up, to the station to which we are going to shift our instrument and should be named as 02. (Back sight need to be taken to the last target station after the instrument is shifted, so always ensure that the backsight station is visible from the new instrument station).
- u) Shift the instrument to the new station. Do all the necessary temporary adjustments and properly centre and level the instrument.
- v) Repeat the steps 2 and 3.
- w) Press [LOAD]. Select the name of the new station 02 and press enter.
- x) Enter the new height of the instrument in the space provided.
- y) Press [BS NEZ]. Press (LOAD] and select the name of the last target station (back sight point) from the first instrument set up. Sight to the back sight point and press [OK].Press [YES]. The screen will return back to the observation tab.
- z) Repeat the steps from 10 to 15.
- aa) To move the data to USB, in the status screen, press [USB], select S Type and select Survey Data and select the folder that need to be moved. Press enter and press [OKJ. Again press (OK). Out will be displayed in the screen against the corresponding folder. Press 1OK].

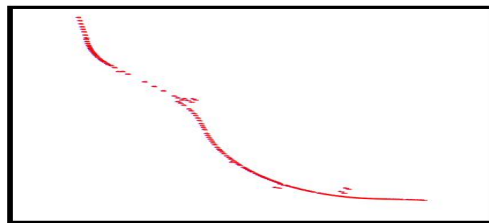


Fig 1. Auto cad drawing of the road

**B. Traffic Volume Count**

Traffic volume count is count of vehicles or pedestrians passing through a particular stretch of road at a particular period of time. Traffic counting is normally undertaken either manually or mechanically. The observer count and record traffic volume on a tally sheet or electronic device.

1) *Manual Methods:* The field data sheet can be prepared to the particular requirement at any intersection or junction. At the main gate of VJCET campus the count of the traffic can be classified in to three categories based on the direction flow. Then take the reading in a tally sheet. Traffic counting was conducted at muvattupuzha vazhakulam road for a period of one week from 8 A.M to 9 A.M.

TABLE I TRAFFIC VOLUME COUNT

Sl.No	Flow Towards	Type of Vehicle		
		Heavy Vehicles	Light vehicles	2 Wheelers
1	Muvattupuzha	40	44	15
2	Thodupuzha	274	285	32
3	College	234	211	59

The recorded data shows that the traffic volume is increasing unlike before. This over growth of vehicle population leads to the present scenario of traffic congestion in front of VJCET campus.

**C. Accident Data Collection from Police Station**

Accident data collection from police station is a main requirement or step in traffic modification. The total number of accidents for the past 4 years from the period of 2015 to 2019 was collected by studying records from vazhakulam police station.

**TABLE 2**  
**ACCIDENT DATA COLLECTION**

Sl. No	Year	No. of Accidents
1	2016	82
2	2017	68
3	2018	68
4	2019	72
5	2020	?

The high rate of growth of vehicle population on road parking and all the indiscipline among the road users are the factors contributing to the traffic congestion and road accidents. The present design of road in front of VJcet campus does not ensure safety. Therefore the present design need to be modified.

**D. Data Collection from PWD**

The drawings and sketches of present road were collected from PWD road division ,Muvattupuzha.

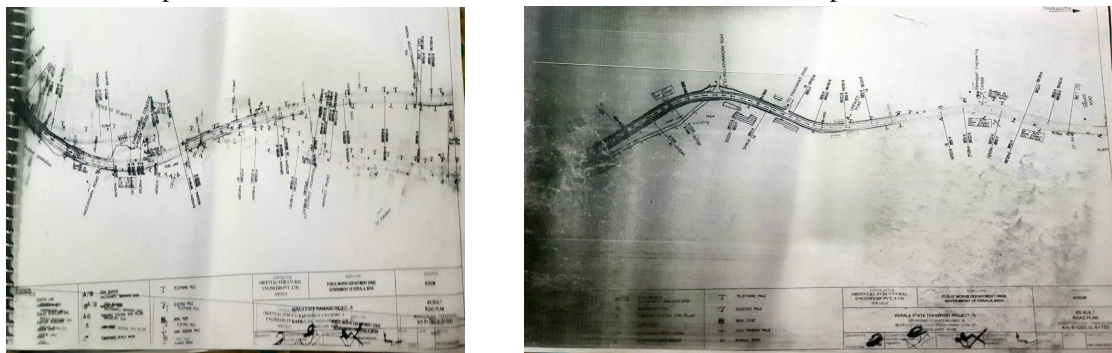


Fig.2 Existing stretch of road

**III.MODIFIED DESIGN**

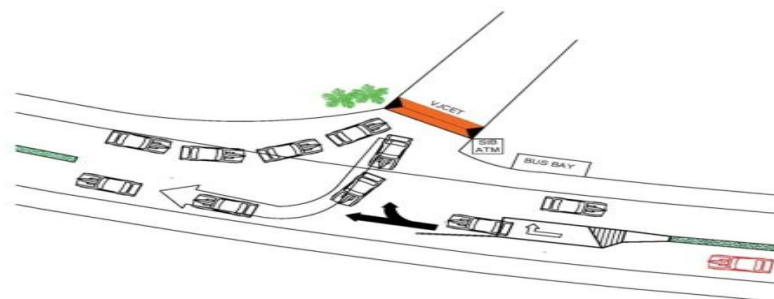


Fig.3 Modified Design



#### IV. CONCLUSIONS

The current design of the road in front of VJCET campus do not assure safety for the stake holders. The concerned authorities are not aware of the issue. So the traffic design of the road have been modified, along with provision for adequate sign boards and medians. Disabled persons also have been provided with access with priority. The aim of the study is to suggest a better traffic design in order to magnify the safety in front of the VJCET campus.

#### V. ACKNOWLEDGMENT

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