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# STUDY OF CONGESTION OF THE ROAD TRAFFIC AT RAILWAY CROSSINGS.

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**Abstract**
People of Anand and Vallabh Vidyanagar are facing acute traffic and delay problems at railway crossing roads. The main reason for this problem is passage of more number of trains from here which results in closure of railway gate for longer periods of time. People have to wait for several minutes to pass through this railway crossing. In the study area all the railway crossings are not having the median or wide roadway so creating more congestion at the time of approaching the train. In this paper various railway crossings of Anand and Vallabh Vidyanagar are visited and various primary surveys are conducted. As a part of study analysis is carried out.
***Keywords:*** *Railway crossing, Congestion, Delay, Classified volume count*

## I. INTRODUCTION

Vehicular traffic on roads has grown at an uncontrollable rate over the years making travel chaotic, tiring, and time delaying also unsafe one. It is common thing that when two roads intersect, junction appears and because of both the intersecting roads in the same horizontal plane. These are junctions from where traffic from different directions converge and causing traffic congestion, delay and also accidents. The main reason for this traffic delay is overfilling at junctions due to the increased density of traffic from both directions of railway crossing. To avoid subsequent congestion, flyover or road over bridge were designed which have partially solved the problem of congestion and accidents. As traffic is not only problem of mega cities but also the problem of small developing cities in India. Mega cities are well planned having transport system also well - equipped on other hand the developing cities are not so well planned. That's why if planning of small city is taken in to account it may create problems

## II. STUDY AREA

Anand is a fast growing medium town which has a major educational and cooperative type setup and also Vallabh Vidyanagar. The traffic problem in the approach roads in the Vallabh Vidyanagar have increased due to increased vehicular traffic between Anand-Vallabh Vidyanagar. The internal road traffic due to pressure from daily commuters mostly students, business people, workers and related persons increase the problems on the roads such as traffic, parking and accidents. The major access is also used by the public buses often passing from outside the city to another parts, creates problems for the regular traffic movements. Because these factors two railway crossings are facing acute traffic problems like congestion, delay. Meanwhile people at Vallabh Vidyanagar's railway crossing at Janta Chokdi are facing traffic congestion and delay due to A.D.I.T. college campus, G.I.D.C. located in Vallabh Udhognagar.

## III. DATACOLLECTION

Classified volume count survey.

| Direction | Unit | To Jaanta Chokadi 8 to 9 am | To Sardar Patel Statue 8 to 9 am | Total |
|---|---|---|---|---|
| 2 wheelers | Vehicle | 933 | 802 | 1735 |
| | PCU | 466.5 | 401 | 867 |
| 3 whellers | Vehicle | 189 | 95 | 274 |
| | PCU | 151.2 | 118.8 | 270 |
| 4 whellers | Vehicle | 302 | 197 | 499 |
| | PCU | 302 | 197 | 499 |
| Bus /truck | Vehicle | 60 | 49 | 109 |
| | PCU | 180 | 147 | 327 |

**Table 2: Janta Chokdi Railway Crossing (Evening Peak Hours)**

| Direction | Unit | To Ganesh Chokadi 8 to 9 am | Amul Dairy 8 to 9 am | Total |
|---|---|---|---|---|
| 2 Wheelers | Vehicle | 422 | 756 | 1178 |
| | PCU | 211 | 378 | 589 |
| 3 Wheelers | Vehicle | 365 | 451 | 816 |
| | PCU | 292 | 360.8 | 652.8 |

| | | | | |
|---|---|---|---|---|
| 4 Wheelers | Vehicle | 181 | 210 | 391 |
| Bus/Truck | Vehicle | 181 | 210 | 391 |
| | PCU | 75 | 53 | 128 |

| Direction | Unit | To Jaanta Chokadi 6 to 7 pm | To Sardar Patel Statue 6 to 7 pm | Total |
|---|---|---|---|---|
| 2 Wheelers | Vehicle | 950 | 1008 | 1958 |
| | PCU | 475 | 504 | 979 |
| 3 Wheelers | Vehicle | 129 | 220 | 349 |
| | PCU | 103.2 | 176 | 279.2 |
| 4 Wheelers | Vehicle | 247 | 340 | 687 |
| Bus/Truck | Vehicle | 47 | 61 | 108 |
| | PCU | 141 | 183 | 324 |

From the table 2 it can be observed that the at level crossing from total of 1958 from janta chokdi total of 1008 vehicles travels in the crossing on the other hand total of 950 vehicles travel in opposite direction. Which is the almost equal in both directions. From the table it can be also observed that movement of two wheelers is higher followed by three wheelers and four wheelers. 1963 PCU in morning peak hours and 2269.2 PCU in evening peak hours. From the table 3 it can be observed that the at level crossing from total of 1178 vehicles from Ganesh chokdi total of 756 vehicles travels in the crossing, on the other hand total of 422 vehicles travel in opposite direction. In which former is the higher. 2016.8 pcu From the table it can be also observed that movement of two wheelers is higher followed by three wheelers and four wheelers. It's observed from the tables above that there are more numbers of three wheelers at ganesh chokadi railway crossing compared to four wheelers. And also there are more numbers of four wheelers at janta chokdi railway crossing as compared to three wheelers. Frequency and duration of gate closure: From the study, there are total 16 numbers of trains passing through this line. In which all 16 numbers of passenger trains passing through this level crossing. The gate closures per day were observed 2 hours and 43 minutes. It was observed that due to shunting operation of trains. Janta rail crossing is frequently closing this causing maximum of inconvenience to the road users. On the day of the survey the gate was closed continuously for 20 minutes due to repetitive shunting operations of trains. But it also observed in the morning peak and evening peak hours. This is causing hazardous situation at this crossing. The gate closure detail is summarized below in

**Table 5: Frequency and Duration of Gate Closure**

| Time Duration (24 Hour Format) From | To | Total Time (Hours) |
|---|---|---|
| 5:00 | 5:10 | 0:10 |
| 6:00 | 6:09 | 0:09 |
| 7:08 | 7:20 | 0:12 |
| 8:05 | 8:14 | 0:09 |
| 9:25 | 9:35 | 0:10 |
| 10:20 | 10:29 | 0:09 |
| 11:15 | 11:25 | 0:10 |
| 12:15 | 12:24 | 0:09 |
| 13:40 | 13:49 | 0:08 |
| 14:35 | 14:45 | 0:10 |
| 15:38 | 15:45 | 0:07 |
| 16:38 | 16:45 | 0:07 |
| 18:05 | 18:14 | 0:09 |
| 19:00 | 19:10 | 0:10 |
| 20:15 | 20:27 | 0:12 |
| 21:10 | 21:19 | 0:09 |
| Total (Hours) | 2:43 | |

**TABLE 6 Vehicle Affected By Gate Closure**

| Direction | Janta Chokdi to Sardar Patel Statue | Sardar Patel Statue to Janta Chokdi | Total | | | |
|---|---|---|---|---|---|---|
| | Veh. | PCU | Veh. | PCU | Veh. | |
| 2 Wheelers | 130 | 70 | 70 | 35 | 210 | 105 |
| 3 Wheelers | 30 | 24 | 19 | 15.2 | 49 | 39.2 |
| 4 Wheelers Bus/Truck | 41 | 41 | 21 | 21 | 62 | 65 |
| Total | 201 | 135 | 110 | 71.2 | 321 | 209.2 |

Location: Janta Chokadi Railway crossing (Morning Peak Hour)

Delay Time It begins when the vehicle is fully stopped and ends when the vehicle in traffic flows normally. Average stopped-time delay is the average for all vehicles during a specified time period. The delay observed maximum was 14.30 minutes that was at ganesh chokdi as a pilot survey.

**CONCUSION**

1) From the results of the analysis and from the field observation of traffic characteristics it may be concluded

that: Under saturated flow conditions, the inter correlation of vehicle groups, in addition to intersection geometry and average vehicular composition, is an important factor influencing the value of the passenger car unit (PCU) for different kinds of vehicles.

2) Janta chokdi railway crossing facing traffic having total highest PCU 2269.2. so more numbers of people have to face congestion and delay as compared to ganesh chokdi railway crossing having PCU 2016.2.

3)Also people passing through Janta chokdi railway crossing are most of four wheelers as compared to three wheelers causing more congestion and total delay.

4)Also crossing gate closure duration total of 2:43 hours during the whole day causing more stopped delay.

5) The vehicles affected by gate closure there are higher number of four wheelers than three wheelers caused increase in queue length at Janta chokdi railway crossing at vidyanagar railway station.

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