TRAFFIC STUDIES FOR SELECTED ROAD CORRIDOR OF ANAND CITY: GANESH INTERSECTION TO JANNA INTERSECTION

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ABSTRACT

The rapid increase in the traffic volume in most of the countries is surpassing the threshold level of the present transportation systems. The increase in population and motor vehicles requires more efficient transportation systems to provide safe and economic transport of goods. To study the traffic characteristics on road network there is a need to study the existing traffic conditions. For that the traffic surveys are carried out on selected stretch to analyze the changing traffic composition, speed characteristics and travel pattern by taking case study of SH-83, Ganesh intersection to Shri Krishna Hospital, Karamsad, and Anand. In this paper an attempt has been made to evaluate traffic volume and correlation between speed measured by spot speed measurements and travel time methods.

KEYWORDS: Traffic composition, Spot Speed, Travel Time, Cumulative Percentage Frequency, Statistical parameters

1. INTRODUCTION

Gujarat has been recognized as progressing state in India. This is attributed to attitude of people staying in the state and their promptness to reach the place where there is a good business potential. This requires the timely and safe travel as a prerequisite. This paper presents the traffic characteristics of selected stretch of SH-83 Ganesh intersection to Janta intersection. The effect of traffic composition, volume and speeds on Anand Sojitra road is discussed in paper. Based on the analysis and the type of problem probable solutions are suggested to ease the traffic problems.

2. OBJECTIVES

In a given region investigating existing traffic conditions from various aspects performing the analysis and proposing solutions to improve the transportation at selected road corridor with junctions.
To study existing traffic parameters by conducting traffic surveys at Ganesh intersection and Janta intersection to improve traffic flow conditions considering junction geometry.

- To evaluate deficiencies at intersections.
- Provide remedial measures.
- To collect and analyze accident data on stretch from Ganesh intersection to Janta intersection.
- Provision of traffic signs and parking facilities.

3. STUDY AREA PROFILE

Anand is the administrative centre of Anand district in the state of Gujarat, India. It is administrated by Anand municipality. It is part of the region known as Charotar, consisting of Anand and Kheda district. Anand is also known as “Milk Capital of India”. The selected road corridor for the study is a part of Anand Sojitra SH-83. The road stretch starts from Ganesh intersection to Janta intersection of length 4.2 KM. It is four lane two way divided highways with the provision of median.

Fig1: Location Map of Study Area

4. DATA COLLECTION METHODS

With reference to the problem statement it is necessary to obtain real data during the period of study. The data includes the following.

1) Classified Volume Count at Ganesh intersection and Janta intersection
2) Spot speed survey at two locations on stretch nr. Rolcon Engg.Co.Ltd.(S1) and nr. City Point Restaurant(S2)

3) Travel time and delay study by moving car observer method.

4.1 CLASSIFIED VOLUME COUNT

The classified traffic volume count survey has been conducted at two intersections. From these classified volume count, traffic in different hours of the day has been enumerated at all the count points and the data has been analysed to understand the composition of traffic. The count data were recorded at 15 minute time interval using video recording technique. A continuous 10 hour video recording was done by digital cameras. Actual turning movement of vehicles and total vehicles per hour for each vehicle category is counted. The volume variation during study period is as shown in figure 2. The morning hour occur at 11 to 12 hrs and evening peak at 17 hrs.

![PEAK HOUR AT INTERSECTION](image)

**Fig 2:** Volume Variation

4.1.2 TRAFFIC COMPOSITION

The percentile composition of traffic mix is as shown in figure 3 and 4. The composition shows that there are 50.50-54% two wheelers, 16.80-20.80% three wheelers and four wheelers more than 20%.

The figure 5 and 6 indicates traffic flow diagram at Ganesh intersection and Janta intersection for peak hour turning movement of vehicles per hour. On SH-83 traffic is highest, which is observed in flow diagrams.
4.2 SPOT SPEED STUDY

Spot speed survey has been conducted at two road stretches covering some part of road corridor. A simple device called “Enoscope” which is L shaped mirror box in which mirror set at 45° is used. The stop watch is started as soon as the vehicle passes the observation and is stopped as soon as it passes the Enoscope. Thus the time required for the vehicle to cross the known length is noted and speed is converted in kmph.
The cumulative percentage frequency curve for speed in figure 7 and 8 shows that at location S1 and S2 the speed of 4wheeler is highest. Due to roadside development at S2 speed seems to be low. Table 1 shows statistical parameters of spot speed study. The correlation between speed measurements at S1 and S2 indicates $R^2=0.213$.

Fig 6: Traffic Flow Diagram at Ganesh Intersection

Fig 7: Cumulative Percentage Frequency Curve For S1
Fig 8: Cumulative Percentage Frequency Curve For S2

Table 1: Statistical Parameters of Spot Speed Study

<table>
<thead>
<tr>
<th>Mode</th>
<th>Nr. Rolcon Engg. Co.Ltd Stretch S1</th>
<th>Nr. City Point Restaurant, Anand Stretch S2</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>No. Mode</td>
<td>No. Of Observation</td>
</tr>
<tr>
<td>1</td>
<td>2W</td>
<td>214</td>
</tr>
<tr>
<td>2</td>
<td>3W</td>
<td>214</td>
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<td>3</td>
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<tr>
<td>4</td>
<td>BUS</td>
<td>39</td>
</tr>
<tr>
<td>5</td>
<td>TRUCK</td>
<td>89</td>
</tr>
<tr>
<td>6</td>
<td>AVG OFALL</td>
<td>154</td>
</tr>
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</table>

4.3 TRAVEL TIME AND DELAY BY MOVING CAR OBSERVER METHOD

Travel time studies determine the amount of time required to travel from one point to another on a given route. Data obtained from travel time and delay studies gives a good indication of level of service that exists on the study section. Total six runs along section are carried out to find average travel time. The travel time required to cover total stretch of 9.20 km from Ganesh intersection to Karamsad hospital. The total traffic from opposite direction, number of vehicles overtaking the test car and number of vehicles overtaken by test car are noted. The observations are given in table 2.
Table 2: Travel Time and Delay by Moving Car Observer Method
Run 1,3,5: Between Karamsad Hospital to Ganesh Intersection (Dir W-E)
Run 2,4,6: Between Ganesh Intersection to Karamsad Hospital (Dir E-W)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td>Min</td>
<td>Sec</td>
<td>60(Mw + Q + R)</td>
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<tr>
<td>1</td>
<td>12</td>
<td>45</td>
<td>472</td>
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<tr>
<td>2</td>
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<td>42</td>
<td>460</td>
<td>59</td>
<td>70</td>
</tr>
<tr>
<td>Run1,3 5 Avg</td>
<td>14</td>
<td>6</td>
<td>458</td>
<td>62</td>
<td>70</td>
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<tr>
<td>Run2,4 6 Avg</td>
<td>14</td>
<td>47</td>
<td>465</td>
<td>57</td>
<td>72</td>
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</table>

CONCLUSIONS
1. Traffic composition indicates 2wheelers are 50.50-54%, 3wheelers are 16.80-20.80% 4wheelers are 20.10-21.97% and the remaining includes buses, truck and other vehicles.
2. Spot speed survey gives speed parameters like mean speed, variance, standard deviation and space mean speed as in table 1 for each mode and all modes together.
3. Travel time and delay study gives the travel time equal to 14.47 min for stretch between Ganesh intersection and Karamsad hospital (9.2 km) and space mean speed as 38.14 kmph.

REFERENCES
2. IRC 106-1990 “Guidelines For Capacity Of Urban Roads In Plain Areas”, Indian Road Congress, New Delhi.