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STUDY OF DELAY 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 major reason for this problem is passage of more number of trains passing through here which results in closure of railway gate for longer periods of time. All the 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 3 week days surveys are conducted. As a part of study analysis is carries out and compared to each other that which railway crossing is getting more delay.*

KEYWORDS *: railway crossing, queue length , delay, classified volume count.*

I. INTRODUCTION

There are various examples of queuing processes in highway systems, such as at intersections, toll plazas, freeway bottlenecks, incident sites, merge areas, and behind slow-moving vehicles. The scholars in the traffic engineering field commit themselves to analyze queue length phenomena and calculate queue length. However, the study on the change rate of queue length is rarely reported at present. The queue length change rate reflects the changeable speed of queue length and describe the change of traffic congestion extent.

The queue clearance time is the time it takes to completely clear the queue and can be estimated by using information from the stop bar detector or stop watch. This calculation is based on the fact that the headway of vehicles being cleared from a queue is the minimum after the start-up lost time. By definition, queue clearance times can only be obtained for signal cycles, in which the queue clears within the subsequent period. The estimated queue clearance time can be incorrect if there are missed vehicles driver delay during the queue clearance.

Vehicular traffic on roads has grown at an uncontrollable rate over the years making travel tiring, and time delaying also unsafe one. These are junctions from where traffic from different directions converge and causing traffic congestion, delay and also accidents at railway crossings . The main reason for this traffic delay is overfilling at junctions due to the increased density of traffic from both directions of railway crossing. As traffic is not only problem of mega cities but also the problem of small developing cities in India.

In the country like India, the heterogeneous traffic is there, with vehicles of wide-ranging static and dynamic characteristics. Also the size of vehicles varies widely, and the lateral and longitudinal placement of vehicles on the carriageway are complex, with no lane discipline. They usually go off the particular lane and go to opposite lane after closing of the gate. The saturation flow is the maximum possible value of flow through various railway crossings approach, is an important factor in the analysis of delay.

II. STUDY AREA

Anand is a fast growing medium town which has 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 and Vidyanagar. The internal road traffic due to pressure from daily commuters mostly students, business people increase the problems on the roads such as traffic 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 of these factors railway crossings are facing the traffic problems like congestion, delay, an increase in queue length. People at

Vallabh Vidyanagar's railway crossing at Janta Chokdi are facing traffic congestion due to A.D.I.T. college campus, G.I.D.C. located in Vallabh Udhognagar.

People of vallabh vidyanagar and Anand town are facing the traffic problem at various railway crossings. They have to wait for several minutes to pass through these railway crossings. So They are facing delay many times in whole day.

At different railway crossings particular queue length is of different size. This is because there are different types of vehicles in different numbers at all railway crossings. So they require different different time to pass the railway crossing of different sites. Its also based on gate closure time at particular railway crossing.

III. DATA COLLECTION

A. JANTA CHOKDI

28/2/2017

Table 1 Janta Chokdi Vehicle Delay Time

1. JANTA TO BHAIKAKA		
TRAIN ARRIVAL TIME	TRAIN DEPARTURE TIME	VEHICLE DELAY TIME(min)
8:10	8:15	13:47
9:25	9:27	15:48
10:21	10:25	12:24
11:10	11:14	16:48
12:15	12:19	15:36
13:41	13:45	11:15
14:35	14:38	9:38
15:38	15:42	9:45
16:38	16:42	11:06
18:05	18:08	13:49
19:00	19:04	11:08
20:03	20:07	12:12

Table 2 Janta Chokdi Vehicle Delay Time

2. BHAIKAKA TO JANTA		
TRAIN ARRIVAL TIME	TRAIN DEPARTURE TIME	VEHICLE DELAY TIME(min)
8:10	8:15	14:12
9:25	9:27	14:49
10:21	10:25	12:19
11:10	11:14	9:51
12:15	12:19	7:58
13:41	13:45	8:45
14:35	14:38	8:42
15:38	15:42	12:02
16:38	16:42	9:48
18:05	18:08	12:45
19:00	19:04	14:12
20:03	20:07	11:49

1/3/2017

Table 3 Janta Chokdi Vehicle Delay Time

3. JANTA TO BHAIKAKA		
TRAIN ARRIVAL TIME	TRAIN DEPARTURE TIME	VEHICLE DELAY TIME(min)
8:10	8:15	16:48
9:25	9:27	15:36
10:21	10:25	11:15
11:10	11:14	9:38
12:15	12:19	9:28
13:41	13:45	10:19
14:35	14:38	9:42
15:38	15:42	11:38
16:38	16:42	12:19
18:05	18:08	14:35
19:00	19:04	9:48
20:03	20:07	11:26

Table 4 Janta Chokdi Vehicle Delay Time

4. BHAIKAKA TO JANTA		
TRAIN ARRIVAL TIME	TRAIN DEPARTURE TIME	VEHICLE DELAY TIME(min)
8:10	8:15	15:54
9:25	9:27	16:36
10:21	10:25	11:15
11:10	11:14	9:38
12:15	12:19	8:28
13:41	13:45	9:19
14:35	14:38	8:42
15:38	15:42	11:38
16:38	16:42	9:19
18:05	18:08	11:35
19:00	19:04	14:48
20:03	20:07	12:26

2/3/2017

Table 5 Janta Chokdi Vehicle Delay Time

5. JANTA TO BHAIKAKA		
TRAIN ARRIVAL TIME	TRAIN DEPARTURE TIME	VEHICLE DELAY TIME(min)
8:10	8:15	15:45
9:25	9:27	14:55
10:21	10:25	12:47
11:10	11:14	10:09
12:15	12:19	9:08

13:41	13:45	12:03
14:35	14:38	9:49
15:38	15:42	12:20
16:38	16:42	11:54
18:05	18:08	13:43
19:00	19:04	9:45
20:03	20:07	12:45

Table 6 Janta Chokdi Vehicle Delay Time

6. BHAIKAKA TO JANTA		
TRAIN ARRIVAL TIME	TRAIN DEPARTURE TIME	VEHICLE DELAY TIME(min)
8:10	8:15	14:45
9:25	9:27	15:45
10:21	10:25	14:49
11:10	11:14	10:43
12:15	12:19	9:39
13:41	13:45	9:19
14:35	14:38	8:58
15:38	15:42	11:56
16:38	16:42	9:29
18:05	18:08	12:14
19:00	19:04	14:25
20:03	20:07	11:57

All these tables shows that vehicle delay time is greater when there are peak hours. The maximum time taken for a vehicle to pass the railway crossing is 16:48 min at 8:15 am. And lowest time to pass the railway crossing is 7:58 min at 12:15 pm.

B. BORSAD CHOKDI

7/3/2017

Table : 7 Borsad chokdi railway crossing

From Borsad chokdi to Anand	
TRAIN ARRIVAL TIME	VEHICLE DELAY TIME(min)
8:18AM	5:45
9:30	5:30
10:27	10:45
11:17	8:30
12:22PM	7:50
1:39PM	6:30
2:32	5:45
3:45	5:52
4:45	5:48
6:03	7:49
7:09	8:35
8:10	7:46

Table : 8 Borsad chokdi railway crossing

from Anand to Borsad Chokdi	
TRAIN ARRIVAL TIME	VEHICLE DELAY TIME(min)
8:18AM	9:30
9:30	8:49
10:27	7:12
11:17	6:49
12:22PM	5:45
1:39	5:42
2:32	4:00
3:45	3:30
4:45	6:47
6:03	7:45
7:09	6.33
8:10	6:30

8/3/2017

Table : 9 Borsad chokdi railway crossing

From Borsad chokdi to Anand	
TRAIN ARRIVAL TIME	VEHICLE DELAY TIME(min)
8:18AM	7:45
9:30	8:30
10:27	8:45
11:17	7:30
12:22PM	6:30
1:39	6:30
2:32	7:45
3:45	6:52
4:45	8:14
6:03	10:49
7:09	8:35
8:10	6.46

Table : 10 Borsad chokdi railway crossing

from Anand to Borsad chokdi	
TRAIN ARRIVAL TIME	VEHICLE DELAY TIME(min)
8:18AM	8:30
9:30	7:49
10:27	6:12

11:17	6:49
12:22PM	5:45
1:39	6:42
2:32	3:00
3:45	6:30
4:45	7:47
6:03	8:45
7:09	9.33
8:10	8:30

9/3/2017

Table : 11 Borsad chokdi railway crossing

From Borsad chokdi to Anand	
TRAIN ARRIVAL TIME	VEHICLE DELAY TIME(min)
8:18AM	7:45
9:30	8:48
10:27	7:18
11:17	8:30
12:22PM	7:37
1:39	6:30
2:32	7:45
3:45	7:52
4:45	9:14
6:03	10:57
7:09	8:35
8:10	6.46

Table : 12 Borsad chokdi railway crossing

from Anand to Borsad chokdi	
TRAIN ARRIVAL TIME	VEHICLE DELAY TIME(min)
8:18AM	7:45
9:30	8:01
10:27	7:18
11:17	6:15
12:22PM	7:19
1:39	7:28
2:32	6:20
3:45	7:00
4:45	8:45
6:03	9:15
7:09	8:16
8:10	7:45

From All these tables it can be depicted that vehicle delay time is greater when there are peak hours. The maximum time taken for a vehicle to pass the railway crossing is 10:48 min at 6:03 pm. And lowest time to pass the railway crossing is 3:02 min at 2:32 pm.

IV. CONCLUSION

At Janta Chokdi railway crossing train stops for few of minutes as it is a railway station. When gate get closed, people have to wait for gate to open after leaving the train and also they have to wait until all the vehicle in the queue crosses the railway track. So delay at Janta Chokdi railway crossing will be more compared to Borsad chokdi railway crossing, as at Borsad chokdi railway crossing there is delay because people have to wait till the clearance of the queue and time of gate closer in which train doesn't stop. So delay time at Borsad chokdi railway crossing will be less. Also the delay time depends on day time , at peak hours the delay is greater than off-peak hours because more people pass through that particular crossing when there is peak hour. Also at Janta Chokdi railway crossing, there are more numbers of 4-wheelers as compared to 3-wheerles so it needs more time to clear the queue, so more delay. Whereas at Borsad chokdi railway crossing there are less numbers of 4-wheelers compared to 3-wheelers, so needs less time to clear the queue, so the less delay.

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