Abstract— The spectacular increase in the number of motor vehicles on the road has created a major social problem—the loss of lives through road accidents. The accident situation is serious in India because of the rapid growth of motor vehicles in the past few years and the inadequacy of many of our roads and streets to cope up with this traffic. Red light runners cause hundreds of deaths and tens of thousands of injuries each year. Due to such serious loss of human lives and economic loss, there is a strong requirement of finding solution to prevent or at least reduce them. So, by finding a method to prevent violation of red light will reduce accidents.

Key words: Traffic Signal, Accident, Road Traffic Victims

I. INTRODUCTION

A. Traffic Signals

Traffic lights, also known as traffic signals are signalling devices positioned at road intersections, pedestrian crossings and other locations to control competing flows of traffic. Traffic signals provide orderly movement of traffic and with proper geometric layout and control measures; they can increase the traffic handling capacity of the roads. They reduce frequency of traffic accidents and regulate heavy traffic flow. Traffic signal consist of three main notations—red light, yellow light, green light; the green light allows traffic to proceed in the direction denoted, if it is safe to do so the yellow light provides warning that the signal will be changing from green to red. A flashing yellow indication is a warning signal the red signal prohibits any traffic from proceeding a flashing red indication is treated as a stop sign.

B. Accidents at Traffic Signals

An accident or a mishap is an unforeseen and unplanned event or circumstance. Accidents took place when two moving objects collide, or the distance between two objects reduces to zero, with the intensity of the accident depending upon vehicle speed, orientation and road conditions among other things. Crashes often occur at intersections because these are the locations where two or more roads cross each other and activities such as turning left, crossing over, and turning right have chances for conflicts resulting in crashes. Even though intersections constitute only a small proportion of the entire roadway system, a significantly large proportion of crashes occur at intersections.

Red light running occurs for three main reasons:
- It may be inadvertent if the driver fails to see the signal,
- Deliberate if the driver tries to beat the lights, or
- The driver may be caught in the dilemma zone with the choice between braking and continuing through the junction not clear cut. The dilemma zone is mainly a problem at high speed junctions.

The others causes are:
- Internal Distraction,
- False Assumption of Other’s Action,
- Too Fast for Conditions or Aggressive Driving,
- External Distraction,
- Turned With Obstructed View,
- Critical Non-Performance Error,
- Illegal Manoeuvre,
- Inattention,
- Misjudgement of Gap or Other’s Speed,
- Inadequate Surveillance.

C. Survey in Ahmedabad

![Fig. 1: traffic signal](image1.png)

![Fig. 2: increment in number of vehicles and accidents](image2.png)

With a population of more than 5.8 million and an extended population of 6.3 million, it is the fifth-largest city and seventh-largest metropolitan area of India. The city and district of Ahmedabad have also remained on the top in road accidents in the state. On an average, 15,000 accidents are reported in the city and its periphery annually, or 41 accidents on a daily basis.

The data released by research wing of GVK EMRI 108 on the World Day for Remembrance of Road Traffic Victims highlighted this trend. As per the data, 108 in Gujarat attended to more than 1.10 lakh road accident victims annually in the past five years of operation. Against the average of 4,144 accidents annually in the districts, Ahmedabad reported 11,221 cases in 2012 so far. Surat, Vadodara and Rajkot reported 6,926, 5,755 and 4,927 cases respectively. While earlier the highways were the hotspots for accidents, the latest figures show that currently, 50.77%
cases come from rural areas and 49.23% cases are from urban centres. Among the victims, 79.10% are males.

D. Violation of Rules

<table>
<thead>
<tr>
<th>Fatal</th>
<th>Major</th>
<th>Minor</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Unique circle</td>
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<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Mehdipat</td>
<td>2</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>Isanpur</td>
<td>2</td>
<td>33</td>
<td>10</td>
</tr>
<tr>
<td>Ghodasar</td>
<td>2</td>
<td>55</td>
<td>9</td>
</tr>
<tr>
<td>Rahari Colony</td>
<td>5</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>Senti ni Chad</td>
<td>5</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>Ramrajnagar</td>
<td>2</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>CTM</td>
<td>6</td>
<td>41</td>
<td>12</td>
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<tr>
<td>Jodhpur Nagar</td>
<td>1</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Wonder Point</td>
<td>2</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Expressway</td>
<td>7</td>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>148</td>
<td>41</td>
</tr>
</tbody>
</table>

Fig. 3: Accident survey data (According Record Data of AMC)

The number of traffic rule violations recorded so far this year has already crossed the figures from previous years for the same period. And data released by the traffic police shows a year on year growth in traffic rule violations and an unrelenting resistance to some rules such as wearing seat belts and obeying traffic signals. Signal jumping has been the most rampant offence with more than 1.1 lakhs cases so far this year, followed by the number of violations of the seat-belt rule and halting vehicles beyond the stop-line at traffic signals. Signal jumping is one of the main reasons of accidents at traffic signal. In spite of making people aware and forcing them to follow rules, so far no improvement has been seen.

The figures below show the violation of rules at traffic signal at helmet cross roads, Ahmedabad.

Fig. 4(a): and 4(b) show red light jumping.

Fig. 4(c): shows vehicles standing beyond the zebra crossing.

II. Research Problem

There is lack of awareness in people about traffic rules. So people break the signals due to lack of knowledge and others deliberately due to impatience. People do not stop at the marked stop line during red light and proceed on their way. Even pedestrians do not cross the road using zebra crossing. So we are trying to find a solution so that the number of red light runners can be reduced, thereby avoiding the chances of accidents at intersections.

III. Objectives

In order to reduce such accidents, one needs to come up with a solution. A method and system to detect these situations, and take necessary actions to prevent vehicles from breaking the signal is proposed in this method. Development of a model will show how the system will work and a method to reduce red light running at intersections.

With the help of a system to prevent red light violation of vehicles, there would be a reduction in number of accidents on roads. This will help save many lives as chances of accidents would be less.

IV. Experimental Program

- Topic Selection
- Problem Definition
- Literature Review
- Survey at Traffic Junction
- Collection of data
- Analysis of data
- Find suitable solution to reduce accidents at junction
- Prepare model of solution
- Conclusion

Chart – 1 Methodology
V. CONCLUSION

Efforts to increase yellow interval duration or to reduce driver speed are very likely to be effective at reducing red-light violations; however, they are likely to have a more modest effect on red-light-related crashes (only crashes that are left-turn related are likely to be reduced). In contrast, efforts to improve driver attention (such that unintentional red-light violations are reduced) are likely to be more effective at reducing red-light-related crash frequency.[5]

The installation of intersection signals reduces mean casualty accident rates from 3.4 to 1.5 per 10 million entering vehicles, a reduction of 55%. The construction of roundabouts reduces mean casualty accident rates from 3.1 to 0.8 per 10 million entering vehicles, a reduction of 74%. [6] These results further support the view that, in general, roundabouts exhibit superior safety performance to intersection signals. This may, however, only apply at intersections where a roundabout is more appropriate than intersection signals, taking into account traffic mix, traffic flows and turning movements, as well as intersection geometry. Hence, there is a need for guidelines for the systematic selection of appropriate intersections for conversion, as well as for evaluation of the program after implementation.

REFERENCES