



previous year shows that in spite of recording fewer accidents in 2016, more deaths have occurred this year as in 2015. In 2015, 1, 46,133 people had died in 5, 01,423 accidents. The accident severity, which is measured as the number of persons killed per 100 accidents, was recorded at 29.1 in 2015 which is lower than 31.4 in 2016.

The country loses Rs. 60,000 crore a year due to congestion (including fuel wastage), slow speed of freight vehicles and waiting time at toll plazas and checking points, a study on operational efficiencies of freight transportation by roads has claimed.

It said vehicles crawl at an average speed of less than 20 kmph on some key corridors such as Mumbai-Chennai, Delhi-Chennai and Delhi-Guwahati while it's only 21.35 kmph on Delhi-Mumbai stretch.

The Transport Corporation of India and IIM (Calcutta) study said while India's freight volume was increasing at a compounded annual growth rate of 9.08% and vehicles were growing at 10.76%, the road length was increasing at only 4.01%. This has resulted paucity of road space to accommodate vehicles and to increase the speed. [3]

### 3. PROBLEM DEFINITION.

In India we see traffic junction, we can see traffic signals with red, yellow and green lights along with the timer display. To move the traffic has to wait for a fixed interval of time. [4] For example, people have to wait for a small interval of time which is fixed for every signal even though the traffic is more in that particular lane. [5] This leads to a huge "TRAFFIC JAM" which is a major problem now a days – the society is facing. Another problem that people face in India is "LACK OF ELECTRICITY". Street lights are always glowing at night. For example, even if no vehicles are moving on roads at night, street lights are always glowing which is actually not necessary. Inappropriate use of street lights, electricity is used unnecessarily which is a "WASTE OF ELECTRICITY".

### 4. EXISTING SYSTEM

The individual traffic signals are connected with traffic control system to perform network wide traffic operation.

These control systems contain a central computer, a communication network, and intersection traffic signals. Coordination of control system can be implemented through different techniques like time-base, hardwired interconnection method. Coordination between traffic signals and agencies requires the development of data sharing and traffic signal control agreements. A traffic-signal system has only one purpose i.e. to deliver signal timings to the driver. The system provides features that improve the traffic engineer's ability to achieve this goal. These are primarily access features. They provide access to the intersection signal controller for maintenance and operations. The more complete and convenient the access,

the more efficient the operator will be and the more effective the system. In addition to control the traffic signals, modern technology also provide surveillance capabilities, including different kinds of video surveillance and traffic detection. [6]

### 5. PROPOSED SYSTEM

Despite of the innovation made to the mobiles, vehicles etc. we see less developments to the roads. There are several work that can be done on the roads which will help in inventing new technologies and reconstructing the driving experience when it comes to road safety. The masterminds in this sector are trying hard to improve driving experience by innovating various ideas like to use roads to store solar energy from the sun directly and transfer that energy into electricity for homes. [7]

When there is a huge traffic on the one lane of the traffic signal, it should be cleared as soon as possible. But in our existing traffic system, the driver should wait until their turn comes even if there is a huge traffic in that particular lane. To avoid this we can provide sensor which are capable of analyzing the traffic intensity. These sensors can be used to clear the traffic as soon as possible before causing a traffic jam.

In this new system, sensors are used to prevent loss of electricity by the unnecessary usage of street lights at night. At nights street lights are switched 'ON' even if there are zero vehicles on road. So, in order to overcome this, sensors are used for street lights and when a vehicle passes through the sensors, the street light will be switched 'ON' and when the vehicle passes through that street light, the upcoming street light will be switched 'ON' automatically and all the foregoing lights are switched 'OFF' as the vehicle has passed through that light. This is continued throughout the street thereby saving the energy. Ultrasonic sensors are used to detect the traffic which gives a signal to RASPBERRY PI 3 about the traffic and this will be able to clear the traffic. Camera module installed on road is used to detect the vehicles that are not following the traffic rules.

#### 5.1 MINIMIZING ELECTRICITY USAGE

##### 1. Glow in the Dark:



In the recent scenario, we see a large amount of money is spend on the road lighting system across lakhs of miles,

instead of spending on lights there is an innovative idea to use the markings which will glow at night which is an excellent alternative. These markings are already used in smart roads in an N329 highway, Netherland. The markings on roads are made using the color which consists of photo illuminating powder that charges up during the day. There are green glowing markings stretched for 1000m long and will shine for more than 7 hours every night and it will give us the excellent driving experience.

**2. Interactive Lighting system:**



Other than glow at night paint, there is also an innovative idea to make use of the motion sensors lights. These lights work as follows: when any vehicle moves through a particular lane of a road, the motion sensors will brighten only that lane of the road. The light will glow brighter as the car comes closer and will slowly become weaker as it moves away.

The lighting system is an innovative idea for the highways that are less used or not always traffic jammed. It provides the night visibility as and when needed without any electricity wastage, and it provides safety while travelling on such roads.

**3. The Wind-Powered Light System:**



Another innovative idea is that in which the wind-powered lights are used to power up itself using the pinwheels to generate the electricity. Now this electricity will be used to

light up the lights on the pinwheels, which will ultimately lighting up the roads. The wind is used to power up the lights. These wind-powered lights will only illuminate as vehicles pass by the area. The pinwheels are set along the vehicles path at the road so that it continuously light up the paths as the vehicles pass by.

**4. The Electric Priority Lane:**



Another fascinating idea is to build the smart road is electric priority lane the electric vehicles can charge up their battery by just driving on the right lane. The roads will have magnetic fields that can charge the vehicles on the go. This concept is useful in the countries where there are many electric vehicles on the road ensures that the electric vehicles do not require charging stations on the go and can even keep their vehicles charged for the long journeys.

**5. The Solar Roadways:**



As mentioned in the introduction about the roads that can reserve solar energy. It is an indiegogo projects which wants to install the solar panels on the roads which are made of glass with microprocessors and LEDs. The need for glass roads as? As glass can restore its environmental friendly and its strength can be improved.

The roads are no more a midway just loco mote from one place to another .Smart Roads allows us to charge vehicles and utilize the energy in an effective way. With the technological enhancement in every field, roads are not



behind. There will be more future enhancement that adds good experience and make our roads smart and safe to travel.

## 6. CONCLUSION

Road traffic and congestion is a huge problem in most of the developing countries like India, China, and Bangladesh etc. Most cities have poor traffic networks with several traffic systems. In this paper, we study the problem of road traffic and congestion in developing regions. Ultrasonic sensors are used to specify the strength of the vehicles which sends signals to RASPBERRY PI3 about the traffic. We hope that these mechanisms are easier to deploy in real-world.

We believe that this representation is just a first step in the development of low-cost strategies for reducing congestion in the developing regions. The future work is to generate electricity by evolving smart speed breakers on roads. We can implement charging the electric vehicles on the traffic signals by using induction coil. The paper discussed a means to detect and decrease the congestion on roads.

Although, the smart roads are effective for traffic, it is still not be able to reduce the traffic and congestion due to the localized focus approach.

Roads are now not used only for traveling from one place to another. We can use these roads to charge electric cars and solar energy due to large surface area. Hopefully there will be more future technology to make our roads smart and safe.

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