TRAFFIC RULE VIOLATION MONITORING SYSTEM

Road accidents are the ninth leading cause of death globally with over 12 lakh people dying on the roads each year across the globe. India stands 8thin the world traffic index. It has a traffic index of 46.83 minutes. It also has a CO2 emission index of 6,061.95. India was ranked number 1 in the position of total road fatalities by WHO (World Health Organization) with fatalities of 2,99,091. Bengaluru (A city in Southern part of INDIA) is the 'most traffic-congested city' in the world. One of the major reasons for this would be traffic rule violations.

Various causes of road accidents:

1- Over speeding

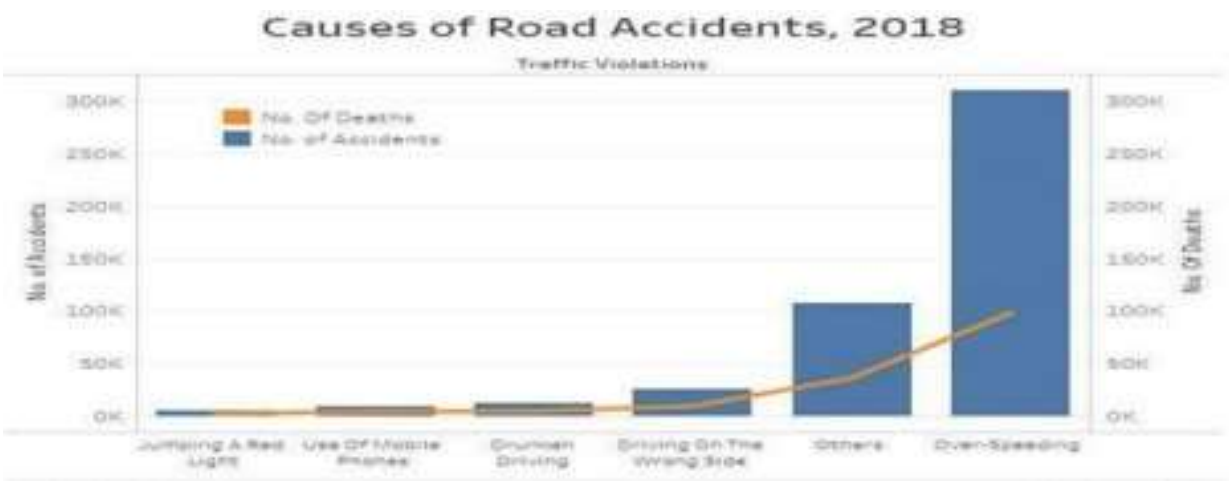
2- Drunken Driving

3- Red light jumping

4- Avoiding safety gears like seat belts and helmets

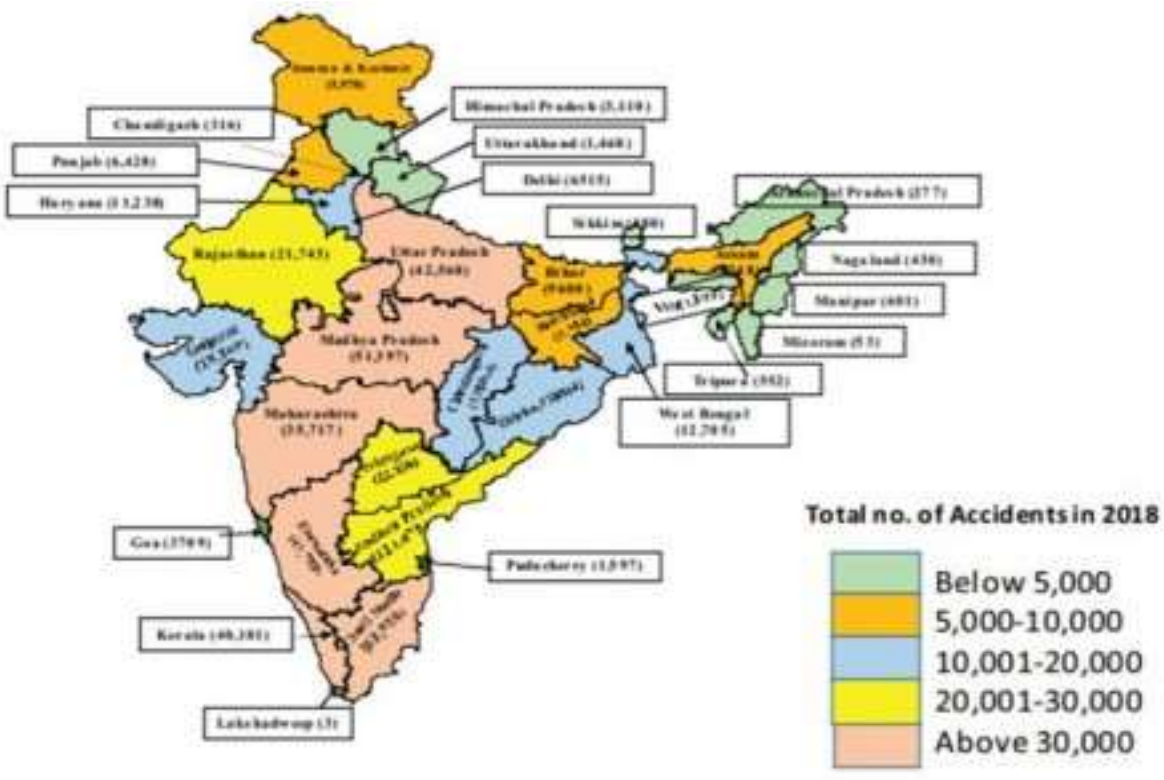
5- Wrong-Way Driving/ Improper Turns

Over-speeding is the major cause of deaths in India.



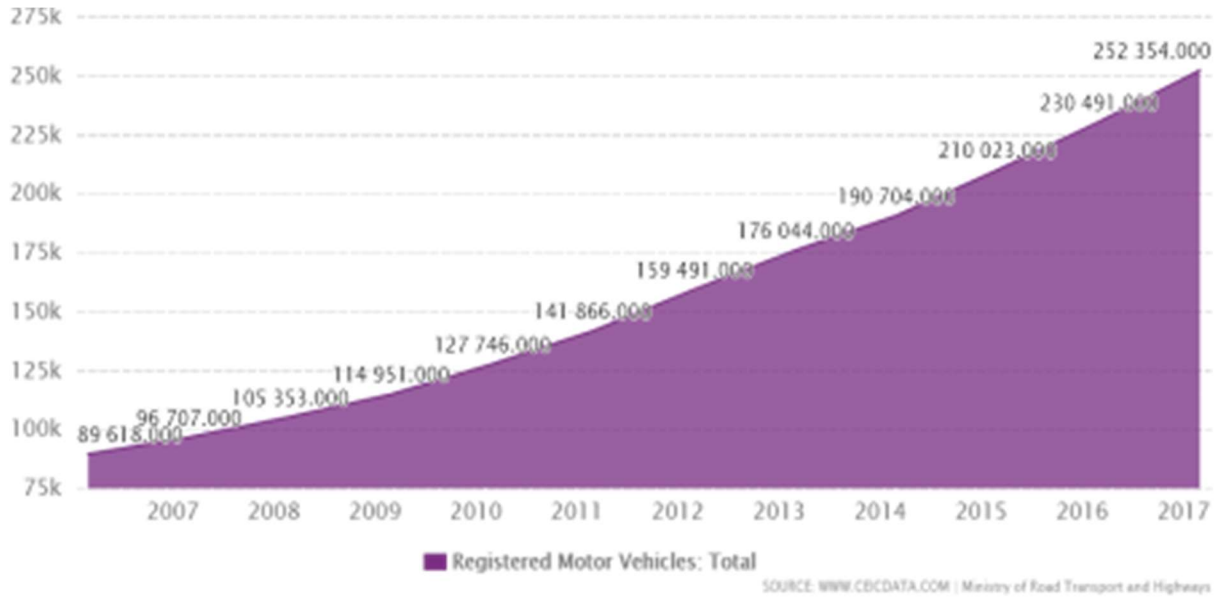
Type of road accident	Parameter	2014	2015	2016	2017	2018
Fatal accident	Number	1,25,828	1,31,726	1,36,071	1,34,796	1,37,726
	% age increase /decrease		4.7	3.3	-0.9	2.2
	share in total	25.7	26.3	28.3	29.0	29.5
Grievous injury accidents	Number	1,15,454	1,19,668	1,20,848	1,20,971	1,25,311
	% age increase /decrease		3.6	1.0	0.1	3.6
	share in total	23.6	23.9	25.1	26.0	26.8
Minor injury accidents	Number	1,92,310	1,92,634	1,87,642	1,74,400	1,69,920
	% age increase /decrease	0.0	0.005	0.0	0.0	0.0
	share in total	39.3	38.4	39.0	37.5	36.4
Non-injury accidents	Number	55,808	57,395	36,091	34,743	34,087
	% age increase /decrease		2.8	-37.1	-3.7	-1.9
	share in total	11.4	11.4	7.51	7.47	7.30
Total	**Number**	**4,89,400**	**5,01,423**	**4,80,652**	**4,64,910**	**4,67,044**
	% age increase /decrease		**2.5**	**-4.1**	**-3.3**	**0.5**

A State-wise road accident report (which is caused by traffic rule violation) of India shows that 8 states contribute to more than 20,000 road accidents per year.



The above-mentioned statistics prove that the major cause of road accidents in India is due to traffic rule violation. There are traffic rule violations all over the world. But the statistics prove that Indians indulge in plethoric violations of rules.

Though the police have taken efforts to create awareness of the importance of strictly following traffic rules among motorists and the public, roads are yet to become safer for users. School students continue to ride two-wheelers at high speed and without helmets, due to poor enforcement of the law. Sources in the police say acute manpower shortage in the traffic wing has badly hampered its functioning and enforcement of the law to curb traffic violations. According to United Nations standards, there should be about 230 police for every 100,000 people. But in India, there are only 125 police officers for every 100,000 population. This is one of the lowest police to population ratios in the world. 16.6 lakh police personnel is the sanctioned strength there is in fact only 14.2 lakh in service. That means there is a shortage of about 14.4%. On the contrary, the numbers of vehicles entering the street have seen a steep rise over the years.



With the surge in vehicles entering the streets and less police personnel on duty, violation of traffic rules is cognised. The following ways could be implemented to reduce the violations: ● Payment of fines.

- Attending defensive driving lessons.
- Payment of additional taxes.
- Surrendering of license.
- Gaining punitive points in the license.
- Increase in vigilance.

This massive drop in offences was recorded after the introduction of the new Motor Vehicles (Amendment) **Act**, 2019. But the major issue would be monitoring the offences. The following might be the causes of poor monitoring:

1. Lack of vigilance personnel
2. Human error (concentration, stress, sickness,...)
3. Disrespecting the police
4. Corruption
5. **Lack of effective device/gadget to prove the offences**

DIGITALIZATION OF TRAFFIC RULES VIOLATION

With the development in the field of computers, electronics, semiconductors, internet-of-things, networking and artificial-intelligence, one can completely rely on these sources, a lot more than one believes humans. They are accurate and error-free. Using

all the current amenities, an electronic, network equipped and real time device which can monitor the vehicles can be developed. This idea would revolutionize the field of automobiles, as it solves some of the most paramount complications, all in one. The device would perform all the essential tasks of various machines as well as vigilators. It urges to monitor as well as safeguard the end user with its features. It would not only help the user, it would also strive to help the government and various organisations in diverse domains. This project would serve its purpose with its full intensity only when the motor vehicle company is instructed to fit in the device into their commodity.

FEATURES OF THE DEVICE

- ***A real time location tracker***

  The device would track the real location of the vehicle via GPS.

- ***Traffic Signal violation detector and penalty***

  The GPS would detect if the vehicle passed through a red-light signal, record the offence, notify it to the police control room, and send a message to the violator with necessary details such as date, time, location, image(if taken), and the penalty levied.

- ***Road Accident detector and emergency alert***

  The device would contain proximity sensors. When the vehicle hits the ground(topple) or other moving/stationary body amidst a road, the device would notify the nearest hospital and police station about the accident.

  - ***Driving licenseand registration certificate***

  The device would store the information of drivers who would drive the vehicle and the registration certificate/document of the vehicle.

- ***Driving without Seat belt detector and penalty***

  The device would contain proximity sensors in the buckle of the seat belt. If the sensor doesn't sense the latch, it would notify the device as well as the driver.

  - Road condition information

  The device would contain an accelerometer, which would detect minute vibrations in the vehicle on the road. Parallelly it would notify the mean vibrations/disturbances along with the location of the place. Thus, keeping the department updated about the condition of the roads.

- ***License and Insurance expiry notifier***

  The device would notify the user before the expiry of the documents uploaded, in order to help the user to get them renewed on time. It would also notify the police after the expiry of the documents, so that they can track and levy fine on the vehicle.

- ***Emission test expiry notifier***
- ***Vehicle service and tune-up notifier***
- ***Excessive honking detector and penalty***
- ***E-notification of 'violence of rules' via E-mail/message/WhatsApp***

- ***Violating road rules and penalty***

  The device with the use of network and sensors, would detect/track all possible road rule violations and notify the police control room.
- ***Over-speed warning and penalty***

  The device would instantly notify the rider/driver about overspeeding. If the rider/driver continues to overspeed, the device would notify the police control room.
- ***Overload warning and penalty***

  The device would contain analog weight detectors. It would notify the driver/rider instantly.
- ***No-Parking warning and penalty***

  The device would detect the right side to park the vehicle and would warn the driver before parking his vehicle in a no-parking area.

ADVANTAGES

- Rapid reduction in corruption
- Monitoring citizen movements
- Knowing the condition of road and fixing them
- E-registration of license and insurance
- Anti-theft and Anti-lost system
- Environmental pollution control
- Reduction in the personnel for vigilance
- Enhanced monitoring of traffic violations
- Avoid mortality due to road accidents
- Discipline and responsibility in citizens

Disadvantages:

- System breakdown.
- Use of redundant systems will result in a greater cost.
- Difficulty in getting a permit from local authorities.