NRSP

National Road Safety Plan

Prepared by:

T. Krishna Prasad, I.P.S.
DGP & Chairman
Road Safety Authority
Telangana

Submitted to:

Bureau of Police Research and Development
Ministry of Home Affairs
पुलिस अनुसंधान एवं विकास ब्यूरो, गृह मंत्रालय

National Police Mission
Bureau of Police Research & Development
Ministry of Home Affairs
Government of India
Mahipalpur, NH-08
New Delhi-110037

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Assisted by:
InfoTrans Engineers Pvt. Ltd.
6-3-1112/K4 (4th floor),
White Diamond,
Behind Landmark/ Westside Bldg.
B S Maqtha, Begumpet,
Hyderabad – 500016, Telangana

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ABBREVIATIONS

AI	Artificial Intelligence
ALS Ambulance	Advanced Life Support Ambulance
AMC	Annual Maintenance Charges
ANPR	Automatic Number Plate recognition
ASES	Automatic Speed Enforcement System
ATMS	Advanced Traffic Management System
AVIDS	Automatic Video Incident Detection System
BLS Ambulance	Basic Life Support Ambulance
BPR&D	Bureau of Police Research and Development
CAGR	Compound Annual Growth Rate
CCTV	Closed Circuit Television
CD Structures	Cross Drainage Structures
CHC	Community Health Center
CISF	Central Industrial Security Force
CMU	Corridor Management Unit
CMVR	Central Motor Vehicles Rules
CrPC	The Code of Criminal Procedure
DAVP	Directorate of Advertising & Visual Publicity
DM	Diabetes Mellitus
DOT	Department of Transportation in USA
DPR	Detailed Project Report
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EPC	Engineering, Procurement and Construction
EU	European Union
FHWA	Federal Highway Administration
GDP	Gross Domestic Product
GoI	Government of India
GPS	Global Positioning System
HA	Highway Administration
HAM	Hybrid Annuity Mode
HCV	Heavy Commercial Vehicle
HMV	Heavy Motor Vehicle
HQ	Headquarters
IMF	International Monetary Fund
IPC	Indian Penal Code
iRAP	International Road Assessment Program
IRC	Indian Road Congress
IT	Information Technology
ITS	Intelligent Transport Systems
Km	Kilometer
KPI	Key Performance Indicator
LMV	Light Motor Vehicle
M&E	Monitoring and Evaluation
MAV	Multi-Axle Vehicle
MDR	Major District Road
MHA	Ministry of Home Affairs
MoRTH	Ministry of Road Transport and Highways
MV Act	The Motor Vehicles Act, 1988
NCRB	National Crime Records Bureau
NGO	Non Governmental Organization
NH	National Highway
NHAI	National Highways Authority of India
NHARSS	National Highway Accident Relief Service Scheme
NHDP	National Highways Development Project

NHIDCL	National Highway Infrastructure Development Corporation Ltd.
NHRM	National Rural Health Mission
NHRSP	National Highways Road Safety Police
NHTSA	National Highway Traffic Safety Administration
NIC	National Informatics Centre
NIFT	National Institute of Fashion Technology
NIMHANS	National Institute of Mental Health and Neuro Sciences
NPM	National Police Mission
NRRDA	National Rural Road Development Agency
NRSC	National Road Safety Council
NRSP	National Road Safety Plan
ODR	Other District Road
OFC	Optical Fiber Communication
PD	Project Director
PIU	Project Implementation Unit
PMGSY	Pradhan Mantri Gram Sadak Yojana
PPP	Purchasing Power Parity
PPP	Public Private Partnership
PWD	Public Works Department
RADMS	Road Accident Data Management System
RO	Regional Office
RSO	Road Safety Officer
RTA	Road Transport Authority
RTI	Road Traffic Injury
SH	State Highway
SOP	Standard Operating Procedure
SPV	Special Purpose Vehicle
TB	Tuberculosis
TRW	Transport Research Wing, MoRTH
UK	United Kingdom
UN	United Nations
USA	United States of America
UT	Union Territory
VMD	Variable Messaging Display
VR	Village Road
VRU	Vulnerable Road User
WHO	World Health Organization
WPI	Wholesale Price Index

T. Krishna Prasad, IPS.,
DGP & Chairman
Road Safety Authority
Telangana State, Hyderabad

Executive Summary

1. Introduction to Road Safety

Road safety refers to methods and measures used to prevent road users from being killed or seriously injured. Typical road users include: pedestrians, cyclists, motorists, vehicle passengers, horse riders, and passengers of on-road public transport (mainly buses and trams) as well as private transport.

- **Brasilia Declaration on Road Safety**

High-Level Road Safety Conference in Brasilia in November 2015, India, a signatory to Brasilia Declaration, is committed to reduce the number of road accidents and fatalities by 50% by 2020 as part of UN Sustainable Development Goals adopted in September 2015. In 2015, about 1,46,133 people killed on Indian roads, more than half killed on the roads are Vulnerable Road Users (motorcyclists, pedestrian, bicyclists) and 54% of fatalities are young people in the age group of 15-34 years.

The road traffic accident deaths have increased from 1,14,444 in 2007 to 1,47,913 in 2017 i.e, over 30% increase in the road accident fatalities in 10 years. We could not achieve the targeted reduction despite various efforts, by both Centre and the State governments.

2. Various steps taken by Govt. of India on Road Safety

The New Motor Vehicle Amendment Act 2019 strengthens and enhances special provisions related to Road Safety. The Act provides grant of licenses and permits related to motor vehicles, standards for motor vehicles, and penalties for violation of these provisions. The amendment Act also facilitates Compensation for road accident victims, Compulsory insurance cover to all road users, Good Samaritans, recall of vehicles, and increases penalties for several offences etc. Key Features of the MV Amendment Act are as follows;

- **Compensation for road accident victims:** The central government will develop a scheme for cashless treatment of road accident victims during golden hour. The Act defines golden hour as the time period of

up to one hour following a traumatic injury, during which the likelihood of preventing death through prompt medical care is the highest. The central government may also make a scheme for providing interim relief to claimants seeking compensation under third party insurance. The Act increases the minimum compensation for hit and run cases as follows: (i) in case of death, from Rs 25,000 to two lakh rupees, and (ii) in case of grievous injury, from Rs 12,500 to Rs 50,000.

- **Compulsory insurance:** The Act requires the central government to constitute a Motor Vehicle Accident Fund, to provide compulsory insurance cover to all road users in India. It will be utilised for: (i) treatment of persons injured in road accidents as per the golden hour scheme, (ii) compensation to representatives of a person who died in a hit and run accident, (iii) compensation to a person grievously hurt in a hit and run accident, and (iv) compensation to any other persons as prescribed by the central government. This Fund will be credited through: (i) payment of a nature notified by the central government, (ii) a grant or loan made by the central government, (iii) balance of the Solatium Fund (existing fund under the Act to provide compensation for hit and run accidents), or (iv) any other source as prescribed the central government.
- **Good Samaritans:** The Act defines a Good Samaritan as a person who renders emergency medical or nonmedical assistance to a victim at the scene of an accident. The assistance must have been (i) in good faith, (ii) voluntary, and (iii) without the expectation of any reward. Such a person will not be liable for any civil or criminal action for any injury to or death of an accident victim, caused due to their negligence in providing assistance to the victim.
- **Recall of vehicles:** The Act allows the central government to order for recall of motor vehicles if a defect in the vehicle may cause damage to the environment, or the driver, or other road users. The manufacturer of the recalled vehicle will be required to: (i) reimburse the buyers for the full cost of the vehicle, or (ii) replace the defective vehicle with another vehicle with similar or better specifications.
- **National Transportation Policy:** The central government may develop a National Transportation Policy, in consultation with state governments. The Policy will: (i) establish a planning framework for road transport, (ii) develop a framework for grant of permits, and (iii) specify priorities for the transport system, among other things.
- **Road Safety Board:** The Act provides for a National Road Safety Board, to be created by the central government through a notification. The Board will advise the central and state governments on all aspects of

road safety and traffic management including: (i) standards of motor vehicles, (ii) registration and licensing of vehicles, (iii) standards for road safety, and (iv) promotion of new vehicle technology.

- **Offences and penalties:** The Act increases penalties for several offences under the Act. The central government may increase fines mentioned under the Act every year by up to 10%. For example,
    - The maximum penalty for driving under the influence of alcohol or drugs has been increased from Rs 2,000 to Rs 10,000.
    - If a vehicle manufacturer fails to comply with motor vehicle standards, the penalty will be a fine of up to Rs 100 crore, or imprisonment of up to one year, or both.
    - If a contractor fails to comply with road design standards, the penalty will be a fine of up to one lakh rupees.
- **Taxi aggregators:** The Act defines aggregators as digital intermediaries or market places which can be used by passengers to connect with a driver for transportation purposes (taxi services). These aggregators will be issued licenses by state governments. Further, they must comply with the Information Technology Act, 2000.
- **Electronic Monitoring of Road Safety:** The Act mandates state governments to ensure electronic monitoring and enforcement of road safety on National Highways, State Highways, and urban roads as per guidelines framed by the central government. It is unclear who will bear the cost of implementing such safety measures.
- **Agency responsible for road safety:** The Act provides for a National Road Safety Board, to be created by the central government through a notification. The Board will comprise of a Chairman, representatives of the state governments, and other members as specified by the central government. The Board will provide advice to the central and state governments on all aspects of road safety and traffic management including: (i) standards of design, weight, manufacturing process, operation and maintenance of motor vehicles, (ii) registration and licensing of vehicles, (iii) formulating standards for road safety, road infrastructure and control of traffic, (iv) promotion of new vehicle technology, and (v) safety of vulnerable road users. The central government may make rules regarding the terms and conditions of appointment if the Board, and other functions of the Board.
- **Road design and engineering:** The Act provides that any contractor or consultant responsible for the design, construction, or maintenance of the safety standards of roads must follow design, construction and maintenance standards specified by the central government. Failure to

comply with such standards will be punishable with a fine of up to one lakh rupees, and such amount will be credited to the Motor Vehicle Accident Fund. The Act also specifies certain road design characteristics that the Courts should consider when looking at such cases. These include: (i) characteristics of the road and the type of traffic which was expected on it, (ii) standard maintenance norms for roads, and (iii) the state of repair in which road users would have expected to find the road.

The Supreme Court has formed a three member committee on Road Safety, chaired by Hon'ble Mr. Justice K.S. Radhakrishnan Judge, Supreme Court of India and Mr. S. Sundar, Distinguished Fellow, TERI and Dr. (Mrs.) Nishi Mittal Ex. Chief Scientist, CRRI to look after the road safety issues and to assess the road safety situation in the country. This committee will ensure the success of the process undertaken, and constant supervision on the measures undertaken by the Central Government and the State Governments and the extent of affirmative action on part of the Union.

The Ministry (Ministry of Road Transport and Highways, Transport Research Wing) under government of India has formulated a multi-pronged strategy to address the issue of road safety based on Education, Publicity and awareness campaigns, Engineering (both of roads and vehicles), Enforcement and Emergency Care. The various accidents mitigation measures taken up by the Ministry in the recent past are as follows:

- **Measures related to Education** include drivers training, publicity and awareness campaigns by spreading awareness through TV, films, radio, print media, celebrity campaigning, and road safety awareness workshops in states, by involving NGOs and other stakeholders in road safety activities, and research in road safety etc.
- **Measures related to Engineering (both of roads and vehicles) include** Identification and rectification of accident black spots, Road Safety Audits are made mandate for national and state highways, Installation of crash barriers, Training and capacity building in the field of road safety, Speed control measures, Vehicular engineering measures (with Compulsory Anti-lock Braking System (ABS) System in M1, M2 Categories and two wheeler, Automatic Head Light On, Crash Tests, Air Bags, Bus Body Code, Truck Body Code, Speed Alert System in Cars, Red Beacon Lights, etc.)
- **Measures related to Enforcement** includes implementation of Good Samaritans guidelines, Enforcement of Road Safety Laws, setting up of one model Inspection and Certification centre in each State/UT for automated fitness check of vehicles etc.

- **Measures related to Emergency (Post-crash response and Trauma Care)** include Emergency Medical Services for road Accidents, Incident Management System on National Highways etc.

3. Reasons for Road Crashes and Fatalities

Globalization, urbanization, and industrialization have changed people's lives leading to the emergence of newer health issues, referred to as behaviour and lifestyle problems. The level of urbanization increased further from 27.81% in the 2001 Census to 31.16% in the 2011 Census. Further, increase in the road length, increase in population and rapid growth of vehicular population also attributes to increased road crashes. This report discusses and highlights some of the major topics pertaining to road safety;

4. Road Crashes in India

- Road Accidents:
  - 8th leading cause of death for people of all ages.
  - #1 cause of death for children and young adults 5 – 29 years of age.
- Severity (Number of Deaths per 100 Road Accidents) is at **31.8** in 2017 whereas in 2007 it was at 23.9. This implies that **8 more people lost their lives per 100 accidents in 2017** when compared to 2007.
- GDP loss due to road accidents in India is about **3%**

5. Risk Factors and Causes of Road Crashes

The Global Risk Factors and major causes of road crashes in India are as listed below;

Global Risk Factors	Causes of Road Accidents in India
1. Speeding	1. Over speeding
2. Drink-driving	2. Non-use of helmets
3. Use of motorcycle helmets	3. Non-use of Seat belts
4. Use of seat-belts	4. Overloading
5. Use of child restraints	5. Drunk and Drive/ Driving under the influence of alcohol and Drugs
	6. Distracted driving with the use of cell phones plug and play devices

6. Pillars of Road Safety

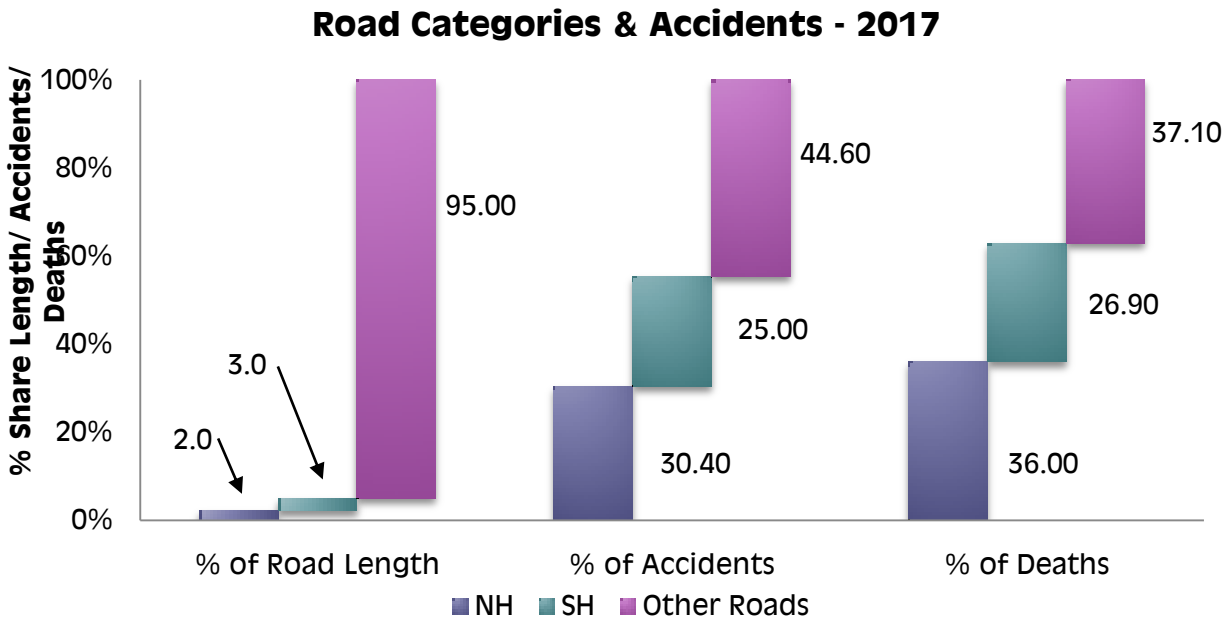
The major Road safety pillars, also termed as 4 E's of Road Safety (Engineering, Education, Enforcement and Emergency Care) for better road safety the following pillars of road safety has to be planned in a systemic approach;

- ❑ The roads should be safe – **Safe Roads**
- ❑ Vehicles should be safe – **Safer Vehicles**

- ❑ The road user should be protected – **Safer Road User**
- ❑ Road users are to be educated and make aware about traffic laws and rules – **Effective Education (Promotion and Awareness)**
- ❑ For enforcing the traffic laws – **Effective Enforcement**
- ❑ For helping the accident victims – **Effective Emergency Care**

7. Safe Roads (National Highways and State Highways Vs Other Roads)

Roads are the major assets of the country that supports travel by a means of conveyance and to satisfy the travel demand needs of the public. In 2017, 30.4% Road Accidents and 36.0% Road Accident Deaths were reported on the National Highways (NH). However, it is important to note that about 40 percent of the total road traffic in the country is carried by the National Highways. Combined lengths of all NHs (~2%) & SHs (~3%) in India constitute about 5% of the total road length. 55% of the total accidents and 63% of the fatalities are happening on the NHs & SHs. This grave concern has to be dealt with a comprehensive national approach. The National Highways traverses across all Indian States, a national approach has to be adopted. An imminent need of a comprehensive national approach is the one of the main objectives of the proposed National Road Safety Plan.



8. Global Best Practices

This report also studied the global best practices including Institutions and Processes followed in USA, UK, Republic of Korea, Australia, Germany related to road safety, accident prevention and compared the Institutional Set-Up with India. Study of Global Practices with respect to 4 pillars of Road Safety, best practices adopted in reducing the number of road accidents and fatalities and lessons learned on global practices reveals that, in most of the developed

countries, focused and scientific research is carried out on road safety and road crash injury prevention. These countries have specialized and dedicated bodies to plan adequate resources and administer the activities required to improve road safety. However, there is no such full-time dedicated agency in India to deal with road safety issues.

Global best practices with respect to four pillars of the road safety raveled that the European Union has come a long way in road safety and achieved incredible results, over the last 15 years, they have cut down the fatality rates by more than 50 %. Safer roads for all the EU Good Practice Guide, European Union, 2017, discuss a mix of measures adopted in reducing the fatalities like **Education and Enforcement**; as well as new and innovative solutions, especially when it comes to vehicles and infrastructure. The following are some of the highlights and lessons learned from the international best practices adopted in reducing the number of road accidents and fatalities;

- An **integrated and dedicated statutory body** is necessary to provide for continuity, expertise, and credibility to combat the rising menace of road accidents and fatalities in the country
- Need for a statutory body to perform the following functions, namely:—
    - *need for the application of traffic management techniques using advanced ITS/ AI technologies;*
    - *recommend minimum design, construction, operation and maintenance standards for the national highways or issue guidelines for the same;*
    - *recommend minimum standards for establishing and operating trauma facilities and para-medical facilities for dealing with traffic-related injuries on the national highways;*
    - *conduct or cause to be conducted safety audits to monitor compliance with the standards notified by the authority;*
    - *recommend minimum safety requirements and standards for the design and manufacture of vehicles;*
    - *recommend minimum conditions for safe usage of vehicles including specifying the maximum load-bearing and capacity limits;*
    - *conduct or cause to be conducted safety audits to monitor compliance with the standards notified by the authority;*
    - *recommend standards for vehicular traffic on the national highways including the schemes for segregation of various classes of vehicles in separate speed lanes and their right of way;*
- establishment procedures and centers for multidisciplinary crash investigation;

- promote relevant practices in road safety and traffic management, undertake road safety and traffic education programs, and conduct campaigns to create awareness amongst all sections of road users, children and students on matters relating to road safety;
- involve non-government organizations working in the area of road safety and traffic management, and assist them in the promotion of efficient traffic management and road safety;
- special requirements for women, children, senior citizens, disabled persons and pedestrians relating to road safety and traffic management;
- data collection and analysis, accident investigation, research, finance or administration;
- traffic management, road user behavior strategies or road safety education, trauma care, and rehabilitation.
- Study of the procedures followed by the National Highway Authority of India and compared with FHWA procedures of US.

9. Use of IT and IT Enabled Enforcement Equipment

This report identifies the need and use of Intelligent Transportation System (ITS) and Artificial Intelligence techniques to communicate, monitor, operate and manage the highways in a sensible and organized way. It is envisioned that ITS will set a benchmark for future enforcement and road operation activities on the highways.

To make the road users follow the Traffic Rules as the highest priority, based on the effective enforcement technique using the advanced technology, to instil discipline among the road users and discourage them to follow unsafe and aggressive driving behaviour on Indian Highways. The experience and current procedures reveal that the police have a limited presence on Nation Highways especially in rural areas and lacks resources, equipment & training to enforce traffic rule violations. Various ITS and AI technologies used across the globe (United States of America, Japan, Europe, United Kingdom, Middle East, and Canada) in the field of transportation have been reviewed and proposed Some of the technology-related enforcement techniques, their functionalities, benefits, working procedures, and server requirement have been presented in this report which is suitable for Indian conditions;

- Automatic Speed Enforcement System (ASES)
- Automatic Video Incident Detection System (AVIDS):
- Variable Message Display (VMD) System:
- Surveillance Camera (CCTV) System
- E-Challan System
- Hand-Held Devices for e-Challan System
- Optical Fiber Cable (OFC) Network for Corridor

- ITS Control Center Server Application & System

The research reveals that the Education, Enforcement and Emergency response are three predominant approaches capable of reducing the road accident fatalities. Implementation of these road safety interventions has a very high probability to reduce road accidents and fatalities considerably. This brings out that there is an imminent and immediate need for a dedicated agency to carry out the three road safety interventions (viz, Education, Enforcement, and Emergency Response) on the highways in various and unequal degrees in reducing the traffic violations, road accidents and fatalities.

This report proposes the formation of a dedicated agency (National Highway Road Safety Police) for effective enforcement on highways with sufficient manpower, enforcement equipment, and vehicles with sharply defined Standard Operating Procedures (SOPs). Further, this report highlights suitable Monitoring Evaluation Framework with clear measurable key performance indicators (KPI's), which will help in quantifying the effect of road safety activities implemented in the country in reducing road accidents and fatalities by implementing the road safety initiatives as mentioned above and by comparing the results with the baseline which was conducted before project implementation.

10. Use of Air Ambulances and Drones

It is suggested to adopt air ambulances and drone technology to perform rescue operations; supply of food, and essential medical equipment for the accident victims fell in accessible where persons are not able to reach easily and for Over-speeding enforcement.

11. Problems of Road Safety in India

The road safety initiative in India suffers from coordination between centre and state. Lack or near absence of budgetary support with several states for requisite road safety enhancement amplify situation. Therefore, the National Road Safety Plan should essentially have a strong State driven field narratives complemented by strong budgetary support from the central government. Such budgetary support should essentially and primarily be dependent and based on monitoring the States' performances on key performance indicators (KPI) as discussed in section 7.10.6 of this report.

12. Need for National Highway Road Safety Police

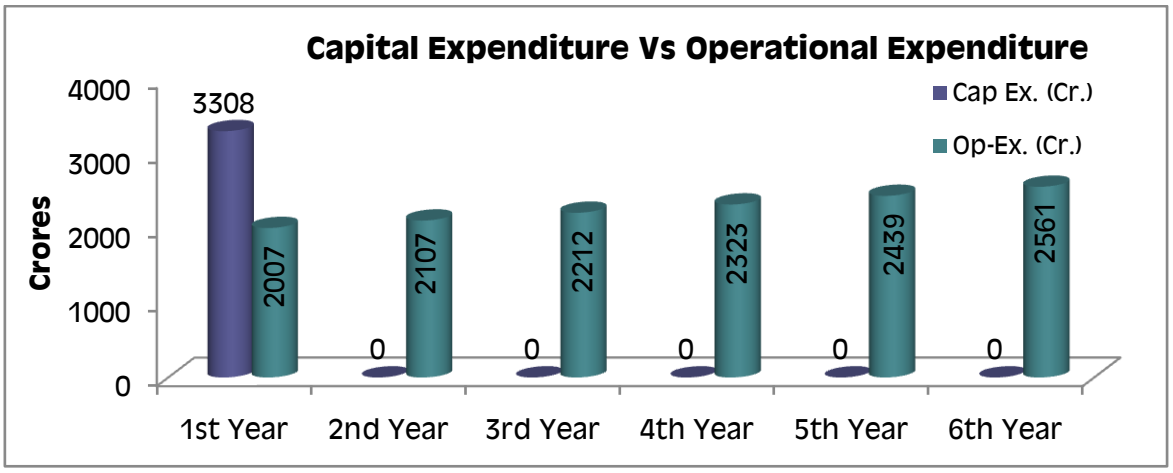
In order to reduce the accidents and fatalities in India, it is suggested to have a dedicated and separate agency for strict enforcement of the traffic violations across India, especially on National Highways. To achieve this, it is proposed

that a National Highways Road Safety Police (NHRSP) be established for strict enforcement on national highways.

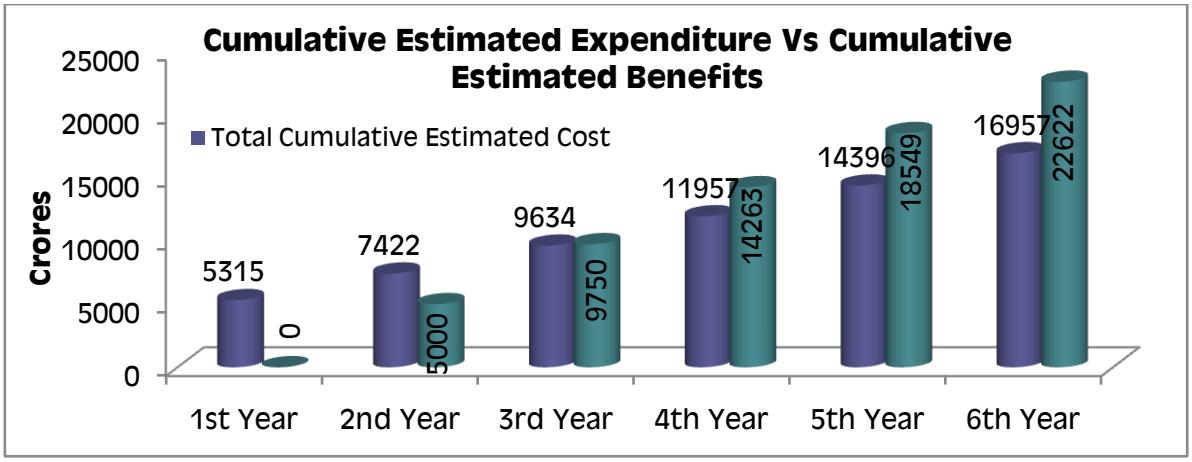
The highway development in India has seen much awaited push since last two decades. The road length has increased considerably by construction of several multi Lane highways. However, over the same time, the safety performance of the roads has deteriorated in terms of increase in the number of road fatalities.

A budgetary support arrangement coupled with a pan India Road Safety Police, i.e. National Highways Road Safety Police – NHRSP, will effectively complement India's endeavor in reducing the road accident deaths and also resulting in saving of the cumulative loss to the GDP to the extent of about 5 lakh crore rupees by the end of the fifth year.

While the cumulative capital expenditure and operational expenditure of the proposed National Highway Road Safety Police at the end of the fifth year is estimated to reach rupees (~16,957 crores), the following graph explains the capital and operation expenditure incurred initially and over a period of 5 years.



With the large amount of the expenditure incurred in the form of man power, IT enabled enforcement equipment, etc., for pan India Road Safety Police (i.e. National Highways Road Safety Police – NHRSP) to perform enforcement activities on the National Highways, leads to generate some sort of the revenue in the form of fines collect for each type of violations done by the road users. The cumulative revenue generated through IT enabled compounding fee collection for the same period is estimated to reach 22,622 crores. When comparing the expenditure to that of the revenue generated, it is clearly indicating that the revenue generated is more for the dame period thus recovering the entire capital expenditure and operational expenditure. The following graph explains the total cumulative expenditure for each year to the cumulative revenue generated for each year.



Note:

- Expected Operational Costs are increased 5% annually
- Revenue from Penalties are reduced 5% annually, assuming decrease in violations

The following key performance indicators (KPI's) are suggested for monitoring and evaluation and incentivizing the states based on the performance of the state's every year. Performance of states, in reducing the number of accidents or fatalities or the states which are under performing/ not performing to reach the assigned targets (or) the states with increasing accidents and fatalities will attract reduction in the budgetary grant. The following are the key performance indicators (KPI's);

- Accident Severity (Fatalities per 100 crashes).
- Crash Density (crashes per km/yr).
- Fatality Density (fatalities per km/yr).
- Speed Violations cases booked per Year.
- Avg. Total Response Time (Remote Point to Accident Location to Trauma Care Center).
- Number of Road Safety Awareness Campaigns & Counseling Secessions conducted per Km per Year.

13. NHRSP, SHRSP and SHO

In India, enforcement is majorly restricted to city limits only. There exists no enforcing mechanism on national and state highways. Hence it is anticipated that the road crashes and deaths are happening more on highways. In fact, 55% of road crashes and 62% of road fatalities happen on just 5% of road length of National and State highways. Therefore, it is strongly recommend initiating the effective enforcement activities on national highways, state highways and other roads as well. For this purpose, the following structure of statutory bodies has proposed to do effective enforcement;

- National Highways Road Safety Police (NHRSP)

- State Highways Road Safety Police (SHRSP)
- Station House Officer (SHO)

They will be empowered and equipped to perform **"EEE" duties** – Enforcement, Emergency Response and Education.

Type of Road	National Highway Road Safety Police	State Highways Road Safety Police	Station House Officer
National Highway	☑	☑	☑
State Highway	☒	☑	☑
Major District Roads/ Other Roads	☒	☒	☑

All the three agencies will perform 3 E duties on National Highways. SRDP and SHO will perform the same duties on State Highways. Thus on National Highways, and State Highways where large number of crashes and fatalities takes place, all the three agencies will perform Road Safety duties.

NHRSP, SHRSP and SHOs not only restricted to enforcing of traffic violations but also perform emergency and medical related duties (both enforcement and saving of life) during accidents to facilitate the accident victims reach hospital during the golden hour.

14. Centre, State Collaboration for Road Safety

There is an eminent need for all the states to increase their efforts to reduce road crashes and deaths. However, some states do not have adequate resources and infrastructure. Hence, there is a need for proactive and intense collaboration between the central government and state government.

Central government may accept funds from the multi lateral agencies such as United Nations, World Bank, ADB etc., for National Road Safety Plan (NRSP). It is strongly recommended that the national road safety plan should have;

- Institutional framework
- Robust funding mechanism
- All pervasive Enforcement, Emergency Response, and Education apparatus and mechanisms.

15. Institutional Framework

Under institutional framework, it is essential to have statutory bodies in the form of Road Safety Authorities/ Board's both at National level and State level, with quasi judicial powers and sizable Road Safety Funds.

16. Robust Funding Mechanism

With respect to the robust and sustainable funding mechanism, it is strongly recommended that the central government should raise central road safety fund (CRSF) to the tune of rupees 15,000 crores (i.e. 2 billion dollars) involving contribution from centre, state and multi lateral agencies. This fund will be utilised to provide grants to different states to take up activities in road safety.

For the first two years, the grants are decided on the basis of the base line data, from the third year onwards the grants are commensurate to the performance and outcomes (impact) as well by each state in the first two years. Sharply defined key performance indicators (KPI's) as mentioned in section 7.10.6 of the report should be used. The evaluation system should be Dynamic Performance Evaluation System (DPES) in which the evaluation parameters can be modified as per future needs.

17. All pervasive Enforcement, Emergency Response, and Education apparatus and mechanisms.

The National Highways Road Safety Police and the State Highways Road Safety Police on similar lines should fan out in the length and breadth of the country for;

- Effective Enforcement
- Medical Emergencies
- Following Golden Hour Principle and
- Massive Education Programs

18. I hope the recommendations made in the report are implemented and efforts are made to reduce Road Crashes and Fatalities by 50% in the next 5 years.

Chapter-1

Introduction

1. INTRODUCTION

India, the biggest democracy, is a topographically, culturally, linguistically and ethnically diverse federal republic, governed under a parliamentary system with 29 states and 7 union territories. India with a population of about 1.2 billion (Indian Census Report 2011), is the second populous country in the world. India has recorded significant growth in population, 21.54% between 1991 & 2001 and 17.64% between 2001 & 2011. Since its independence in 1947 from colonial rule of British, India has nearly doubled in terms of population size, infrastructure as well as overall socioeconomic development, albeit with regional variations.

According to the International Monetary Fund (IMF), the Indian economy in 2017 was nominally worth US$ 2.611 trillion; it is the sixth-largest economy by market exchange rates, and is, at US$ 9.459 trillion, the third largest by purchasing power parity, or PPP. With its average annual GDP growth rate of 5.8% over the past two decades, and reaching 6.1% during 2011–12, India is one of the world's fastest-growing economies. However, the country ranks 140th in the world in nominal GDP per capita and 129th in GDP per capita at PPP.

Globalization, urbanization, and industrialization have changed people's lives leading to the emergence of newer health issues, referred to as behavior and lifestyle problems. The level of urbanization increased further from 27.81% in the 2001 Census to 31.16% in the 2011 Census. According to the 2011 census, there are 53 million-plus urban agglomerations in India; among them Mumbai, Delhi, Kolkata, Chennai, Bangalore, Hyderabad, and Ahmadabad, in decreasing order by population.

1.1. Road Traffic Injury is a Public Health Issue

Today, non-communicable diseases (diabetes, hypertension, cardiovascular diseases, cancers, diabetes mellitus (DM), etc.) and Injuries contribute to a greater share of mortality, morbidity, and disability in Indian society than communicable diseases such as human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) and tuberculosis (TB). There is a growing association between communicable and non-communicable diseases in low- and high-income countries and amongst the rich and the poor[1]. In low- and middle-income countries especially, adults continue to be plagued by communicable diseases while at the same time being increasingly threatened by non-communicable diseases. Reducing these deaths will require not only the implementation of specific treatments for each disease but also the recognition that there are important interactions between different diseases and useful synergies and benefits that can be gained from exploiting overlapping treatments and strategies.

In recent years, India has witnessed an increase in deaths, hospitalization, and disabilities due to road accidents. Several factors like globalization, industrialization, migration, changing economic levels, access to modern ways of living, increasing income levels, easy availability of vehicles /products, media influence and others have brought human beings in close contact with a variety of new products as well as changing physical

[1] Gururaj G, Gautham M S. Advancing Road Safety in India-Implementation is the Key, Bengaluru, 2017. National Institute of Mental Health & Neuro Sciences; 2017. Publication Number :136.

environments, resulting in an increased occurrence of injuries and Road Traffic Injuries (RTIs).

1.2. Accidental Deaths in India

According to the ***"Accidental Deaths and Suicides in India' Report 2015, National Crime Records Bureau, Ministry of Home Affairs",*** in 2015, the number of deaths reported due to various causes (considering both Natural Causes and Un-Natural Causes) were **4,13,457.** Out of which, **1,77,423** deaths were attributed to Traffic Accidents (Road & Rail related) which is nearly about **43%**. The following table provides the natural as well as un-natural deaths in India from 2010 to 2015 including various major causes, the data reveals that in all these years, Traffic Accidents (Road & Rail related) causes more deaths than any other category.

Table 1. Major Natural & Un-Natural causes of deaths (2010 - 2015[2])

Sl. No.	Cause of Death	Category	2010	2011	2012	2013	2014	2015
1	**Traffic accidents**	**Un-Natural**	**1,61,736**	**1,65,072**	**1,68,301**	**1,66,506**	**1,69,107**	**1,77,423**
2	Other causes	Un-Natural	**40,057**	39,473	41,611	45,917	1,25,338	64,427
3	Sudden deaths	Un-Natural	**27,364**	26,649	28,961	31,278	26,526	35,023
4	Drowning	Un-Natural	**28,001**	29,708	27,558	30,041	29,903	29,822
5	Poisoning	Un-Natural	**28,012**	29,478	30,748	29,249	20,587	26,173
6	Fire	Un-Natural	**24,414**	24,576	23,281	22,177	19,513	17,700
7	Falls	Un-Natural	**11,571**	11,867	12,319	12,803	15,399	16,759
8	Causes not known	Un-Natural	**20,591**	21,254	21,707	20,113	8,588	15,165
9	Other Natural Causes	Natural	**18,372**	17,932	17,173	16,379	14,035	3,114
10	Lightning	Natural	**2,622**	2,550	2,263	2,833	2,582	2,641
11	Heatstroke	Natural	**1,274**	793	1,247	1,216	1,248	1,908
12	Cold &Exposure	Natural	**937**	849	997	946	913	1,149
13	Floods	Natural	**965**	585	420	700	541	846

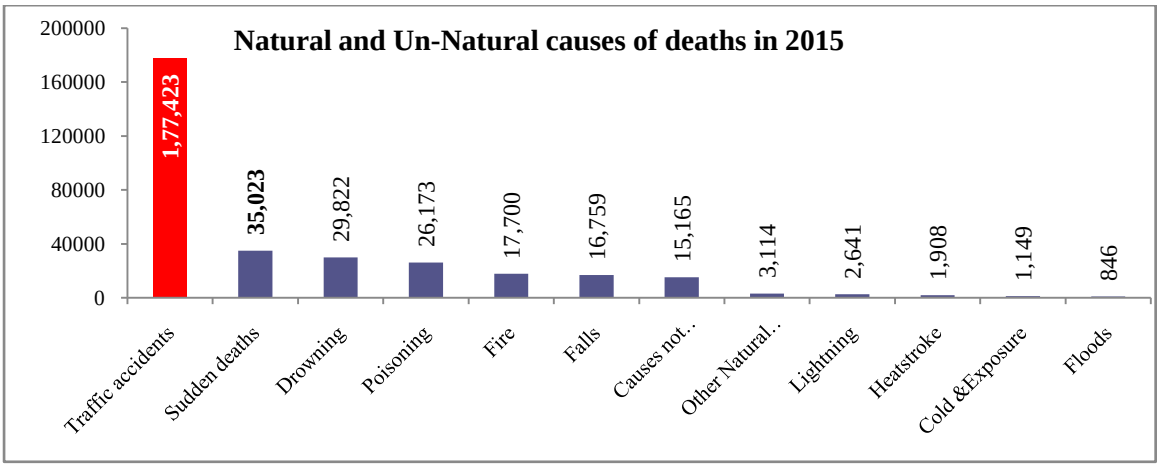


Figure 1. Natural and Un-Natural causes of deaths in 2015

[2] 'Accidental Deaths and Suicides in India' Report 2016, National Crime Records Bureau, MHA, GoI.

From the data, it is evident that in 2015, the deaths caused due to natural causes like Lightning, Heatstroke, Cold & Exposure, and Floods constitutes about 5,798 deaths, which are about 1.4% of total deaths in India. Whereas, the deaths due to traffic accidents are 1,77,423 contributes around 43% of total deaths (considering both Natural Causes and Un-Natural Causes) in India. Even though the deaths due to traffic accidents are more than 30 times that of natural causes, road accidents are yet to be recognized as a major ***"calamity"*** in India.

1.2.1. Share of Road Accidents in Total Accidental Deaths in India

1,77,423 deaths were caused due to Traffic Accidents in 2015, which includes accidents caused on roads, railways and at railway crossings. In order to see the severity of road accidents, traffic accidents were further classified as road accidents, railway accidents, and railway crossing accidents and are summarized in the following table[3]:

Table 2. Distribution of Traffic Accidents during 2011 – 2015

Sl. No.	Year	Number of Accidental Deaths				Total Accidental deaths	% Share of 'Traffic Accident Deaths' in Total Accidental deaths
		Road Accidents	Railway Accidents	Railway Crossing Accidents	Total Traffic Accidents		
1	2011	1,36,834	25,872	2,366	1,65,072	3,67,194	45.0%
2	2012	1,39,091	27,402	1,808	1,68,301	3,72,022	45.2%
3	2013	1,37,423	27,765	1,318	1,66,506	3,77,758	44.1%
4	2014	1,41,526	25,006	2,575	1,69,107	4,31,556	39.2%
5	2015	**1,48,707**	26,066	2,650	**1,77,423**	4,13,457	**42.9%**

BOX-1: Traffic Accidents

- A total of 4,96,762 'Traffic Accidents' were reported during the year which include 4,64,674 (93.5%) 'Road Accidents', 2,669 (0.5%) 'Railways Crossing Accidents' and 29,419 (5.9%) 'Railway Accidents'. The traffic accidents caused injuries to 4,86,567 persons and 1,77,423 deaths during 2015.
- The percentage share of deaths in traffic accidents due to 'Road Accidents', 'Railways Accidents' and 'Railway Crossing Accidents' was reported as 83.8% (1,48,707 deaths), 14.7% (26,066 deaths) and 1.5% (2,650 deaths) respectively during 2015.
- It observed that the rate of deaths per thousand vehicles has decreased from 1.0 in 2011 to 0.8 in 2015.

The deaths due to traffic accidents (Rail & Road related) in India is about 43% of total deaths (considering both Natural Causes and Un-Natural Causes) in 2015. This is very alarming and reflects the need for immediate measures in the reduction of such accidents. This report concentrates on the road safety scenario in India, road safety issues and needs for the strengthening of road safety in India.

[3] Table 1A(A) Number and Share of Deaths due to Traffic Accidents during 2011 - 2015, 'Accidental Deaths and Suicides in India' Report 2016, National Crime Records Bureau, MHA, GoI.

1.3. Road Safety scenario in India

Driving in India is not easy, in fact, it has always been dangerous, but the recent statistics show that it is getting worse, with respect to the number of accidents, deaths, and injuries. According to the report "Road Accidents in India – 2017 by Ministry of Road Transport & Highways, Transport Research Wing (TRW, MoRTH), during the calendar year 2017 road accidents claimed **1,47,913 lives**, which is about 1.9% less than that of previous calendar year 2016. However, the accident severity, the number of persons killed for 100 accidents, has increased by 1.4%.

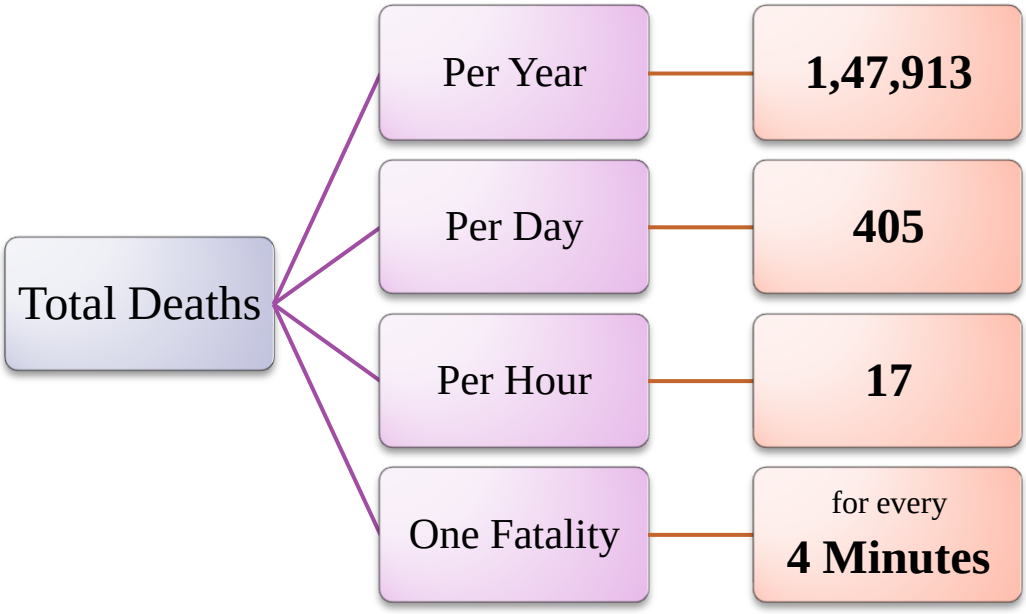


Figure 2. Deaths due to Road Accidents in 2017

MoRTH 2017 report reveals that for every 4 minutes one (1) precious life is lost and every day 405 lives are lost on the Indian roads i.e. equivalent to a fatal crash of a passenger airplane carrier (Airbus A340 or Boeing 747/ 777[4]). Since the accidents are scattered on various types of roads, across various states in this vast nation, due attention is not imparted on the phenomenon of road accidents, unlike an airplane crash which draws all the attention and requisite course corrections are imparted after due investigations by various agencies.

1.3.1. Long-Run Trends of Road Accidents & Related Indices

Increase of road accidents in India is not a recent phenomenon. Road Accidents have been increasing along with population, registration of motor vehicles and up-gradation/ construction/ expansion of the country's road network (all categories of roads) over the period, road accident fatalities peaked to 1.51 lakh deaths in 2016.

A long-term (>20 years) growth trend of population, registered motor vehicles, road lengths (all categories of roads) and road accidents are presented in this section. To understand the trend in these aspects, the actual numbers are indexed to 100 for a particular year, which shows a realistic growth pattern.

[4] Article Titled "The biggest passenger airplanes in the world", https://www.aerospace-technology.com/features/feature-biggest-passenger-airplanes-in-the-world/

1.3.1.1. Population & Registered Motor Vehicles

Indian population, which was at 960 million in 1997, grew at a CAGR of ~1.5% to about 1.28 billion in 2017. In the same period registered motor vehicles grew at a CAGR of >10% from 37 million to 230 million. The exponential growth in the number of registered motor vehicles is mainly attributed to the economic prosperity that the country has witnessed after the early '90s. Growth trends in population and number of registered motor vehicles are shown in Figure 3.

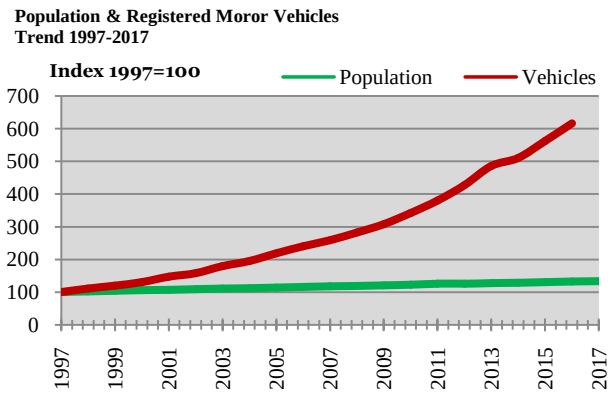


Figure 3. Population & Reg. Motor Vehicles Long run Trend (1997-2017)[5]

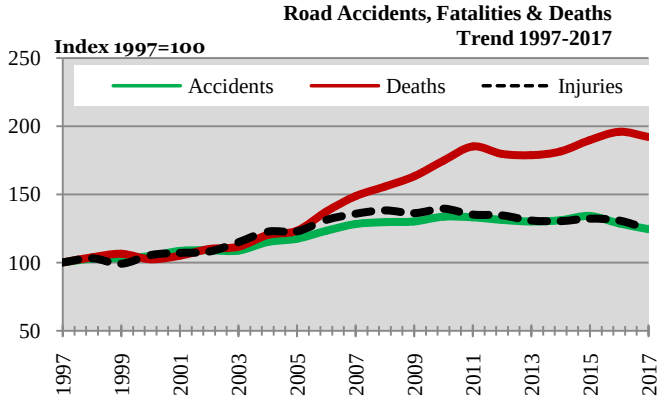


Figure 4. Road Accidents, Fatalities & Deaths Long run Trend (1997-2017)

1.3.1.2. Road Accidents

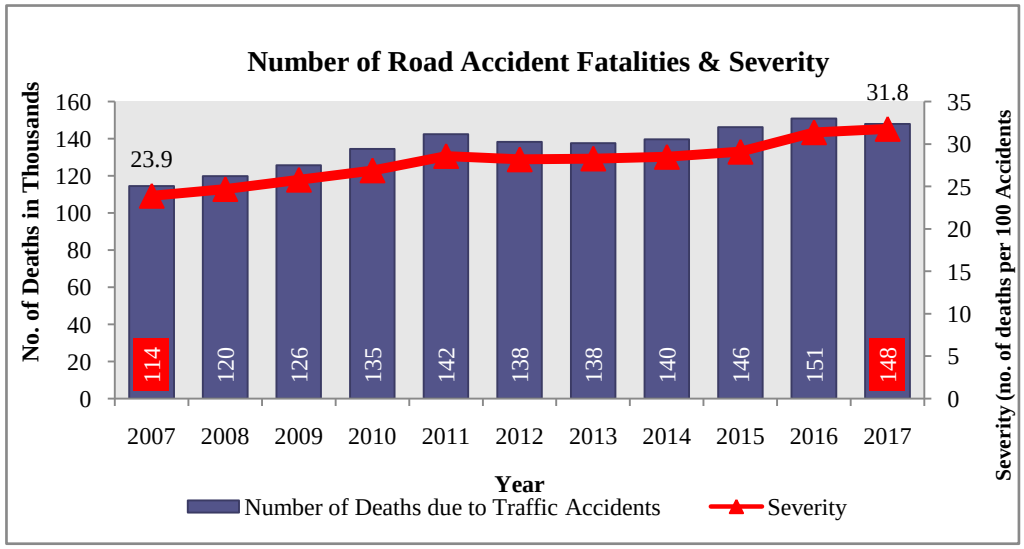
Despite some fluctuations, there has been a clear declining trend in the number of road accidents and the number of persons injured in India from 2010. The fatality numbers, which showed a consistent increase from 2013 to 2016, has also recorded a marked decline in 2017. Growth trends in the number of road accidents, fatalities and injuries are shown in Figure 4.

Study of growth trends as in Figure 4 and as per Annexure – 1: Road Accidents, Persons Killed and Injured: 1970-2017 of the report Road Accidents in India 2017, has revealed that road accidents, fatalities and injuries peaked during 1980-1990. Subsequently, the growth rates in respect of the number of road accidents and injuries have declined consistently over the decades and by current decade; there has been a decline even in the absolute numbers. The number of fatalities on account of road accidents, however, showed a slightly different growth trend over the decades.

The number of fatalities has seen a higher growth rate in 2000 – 2010 than in the preceding decade of 1990-2000, but recorded a sharp decline in 2010-2017. The decadal trend of growth rates suggests that reduction in fatality follows a decline in incidences of a road accident, but with a lag.

[5] Data source: Annexure-1, "Road Accidents, Persons Killed and Injured: 1970-2017" Road Accidents in India 2017, MoRTH Publication

BOX-2: Road Accident Fatalities & Severity



- More than **33,000** people have lost lives in 2017 compared to 2007. Fatality numbers are growing at a CAGR of **2.6%**.
- Severity of Road Accidents means number of deaths per 100 road accidents.
- Severity is at **31.8** in 2017 whereas in 2007 it was at **23.9**. This implies that 8 more people are losing lives in 2017 when compared to 2007.

1.3.1.3. Road Lengths

As on 31.3.2016, the existing stock of road length in India was 56.03 lakh kilometers. The road network consists of National Highways (NH), State Highways (SH) District Roads, Rural Roads, Urban Roads, and Project Roads. The development and maintenance of roads in India are undertaken by various agencies of both Central and State governments. State PWD's, National Highways Authority of India, Border Roads Organization, National Highway Infrastructure Development Corporation Ltd. (NHIDCL), National Rural Road Development Agency (NRRDA) are the main agencies.

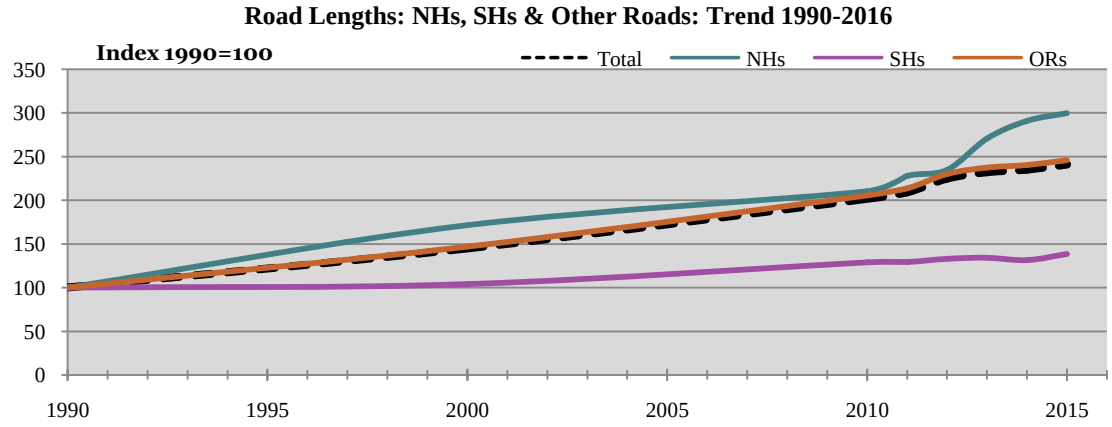


Figure 5. Road Lengths Long run Trend (1990-2016)[6]

[6] Data source: Basic Road Statistics of India (Various Annual Reports), MoRTH Publication

The Ministry of Road Transport & Highways is primarily responsible for the development and maintenance of National Highways. All roads other than the National Highways are with the State Governments. The total road length of the country increased significantly from 23.27 lakh km in 1990 to 56.03 lakh km in 2016, growing at a Compound Annual Growth Rate (CAGR) of 3.44% during the year 1990 to 2016.

1.3.2. Loss of Demographic Dividend

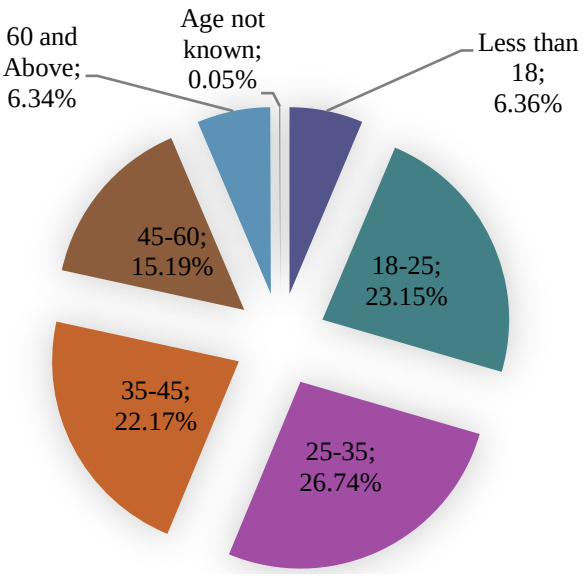


Figure 6. Age Profile of road accident victims in 2017

The majority of the population is in the age group of 15-59, which are about 65% of the total population of India[7].

This age group is very crucial as this age group contains college students (Future of India), middle age working groups (workers and revenue generators) forming great souls of India.

An attempt is made to compare the loss of Democratic Dividend from these groups due to road accidents.

BOX-3: <u>Loss of Democratic Dividend</u>

- Road Accidents in India
  - started **claiming more than one lakh lives** every year since calendar year **2006**
  - peaked highest (**1,50,785**) during calendar year **2016**.
- It is a poignant situation that in calendar year 2017
  - **~87%** in the working age group of **18-60** years lost their lives to road accidents
  - **~72%** in the "Demographic Dividend" age group of **18-45** years, i.e. about **1.1** lakh people lost their lives to road accidents
- *Shri Sardar Vallabhbhai Patel, the First Home Minister, Government of India had said that:*

"there is something unique in this soil, which despite many obstacles has always remained the abode of great souls."

- Reflecting on the first Home Ministers quote, it is a poignant situation that about 50% of the road accident victims are in the age bracket of 18 – 35, i.e. "great souls" in the making.

[7] SRS Statistical Report 2016

1.3.3. Road Accidents: State-Wise Break-Up

Based on Road Accidents in India – 2017, MoRTH report, the states are ranked/ rated under six different criteria as given below:

(1) Total Number of Road Accidents
(2) Total Number of Persons Killed in Road Accidents
(3) Total No. of Road Accidents per 10,000 Km of Roads in 2016*
(4) The severity of Road Accidents
(5) Total No. of Road Accidents per 10,000 Vehicles in 2016#
(6) Total No. of Accidents Per Lakh Population

* & # *Total length of roads (all categories) and Total number of registered vehicles up to 31.03.2016*

Table 3. State-wise Comparison (Set – 1)

RANK	Total Number of Road Accidents		Total Number of Persons Killed in Road Accidents		Total No. of Road Accidents per 10,000 Km of Roads in 2016	
	State	Accidents	State	Persons Killed	States/UTs	Road Accidents
1.	Tamil Nadu	65,562	Uttar Pradesh	20,124	Pondicherry	5564.7
2.	Madhya Pradesh	53,399	Tamil Nadu	16,157	Delhi	4184.4
3.	Karnataka	42,542	Maharashtra	12,264	Tamil Nadu	2736.5
4.	Uttar Pradesh	38,783	Karnataka	10,609	Goa	2679.4
5.	Kerala	38,470	Rajasthan	10,444	Haryana	2317.1
6.	Maharashtra	35,853	Madhya Pradesh	10,177	Kerala	1963.1
7.	Andhra Pradesh	25,727	Andhra Pradesh	8,060	Madhya Pradesh	1861.5
8.	Telangana	22,484	Gujarat	7,289	Telangana	1846
9.	Rajasthan	22,112	Telangana	6,596	Andaman & Nicobar Islands	1594.3
10.	Gujarat	19,081	West Bengal	5,769	Chandigarh	1517.2

Table 4. State-wise Comparison (Set – 2)

RANK	Severity of Road Accidents		Total No. of Road Accidents per 10,000 Vehicles in 2016		Total No. of Accidents Per Lakh Population	
	State	Severity	States/UTs	Road Accidents	States/UTs	Road Accidents
1.	Mizoram	88.2%	Madhya Pradesh	48.4	Goa	193.6
2.	Punjab	71.1%	Sikkim	42.9	Kerala	107.2
3.	Dadra & Nagar Haveli	64.2%	Jammu & Kashmir	40.3	Pondicherry	97.7
4.	Bihar	62.7%	Kerala	38.8	Tamil Nadu	94
5.	Jharkhand	62.6%	Goa	37.2	Karnataka	67.6
6.	Uttarakhand	58.8%	Tamil Nadu	29.5	Madhya Pradesh	67.6
7.	Uttar Pradesh	51.9%	Andhra Pradesh	28.5	Chhattisgarh	51.8
8.	West Bengal	49.6%	Chhattisgarh	28.2	Jammu & Kashmir	44.8
9.	Rajasthan	47.2%	Karnataka	27.3	Himachal Pradesh	43.5
10.	Arunachal Pradesh	45.6%	Himachal Pradesh	27	Haryana	40.4

An attempt is made to find the states, which are critical in accidents and are common in all or most of the categories.

Table 5. States & Categories

S. No.	State	Appearing in No. of categories
1	Madhya Pradesh	5
2	Tamil Nadu	5
3	Kerala	4
4	Karnataka	4
5	Goa	3
6	Andhra Pradesh	3
7	Rajasthan	3
8	Telangana	3
9	Uttar Pradesh	3

From the table, the following are the observation derived;

- MP & TN are common in five out of the six categories.
- KL & KA are common in four out of the six categories.
- GA, AP, RJ, TS & UP are common in three out of the six categories.
- MP & TN states can be termed as the most vulnerable states as they are commonly appearing in five categories.
- Tamil Nadu (65,562), Madhya Pradesh (53,399), Karnataka (42,542), Uttar Pradesh (38,783), and Kerala (38,470) are top five states with respect to the total road accidents.
- Uttar Pradesh (20,124), Tamil Nadu (16,157), Maharashtra (12,264), Karnataka (10,609), Rajasthan (10,444) & Madhya Pradesh (10,177) are the top six states with respect to the number of fatalities due to road accidents, contributing to more than 50% of the total number of fatalities.

1.3.4. Road Accidents: Type of Road

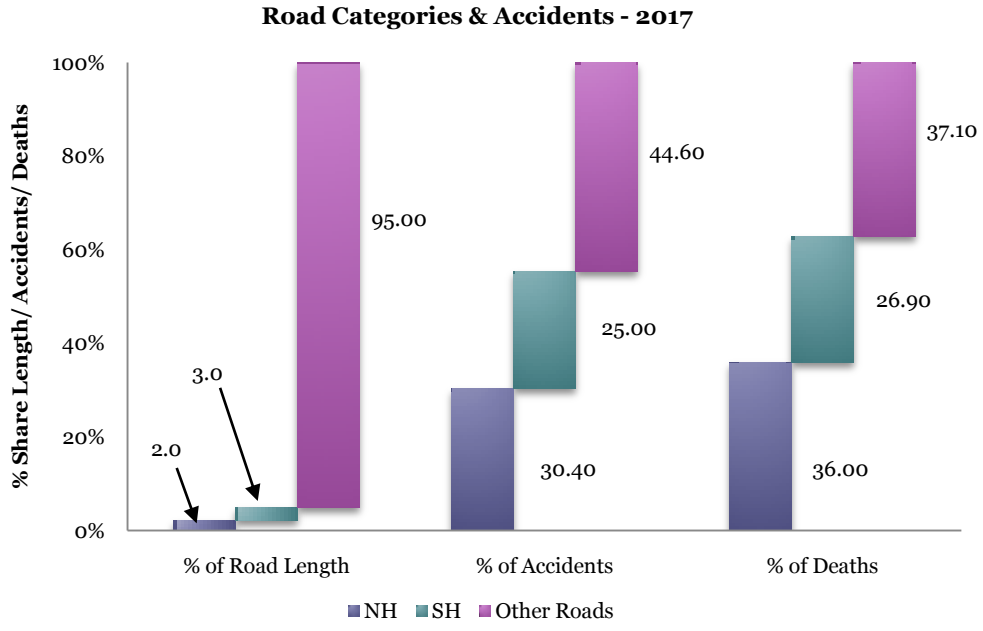


Figure 7. % share of length, accidents & deaths for different type of roads in 2017

BOX-4: Road Accident Fatalities on NHs

- National Highways constitute only about 2 per cent of the road network, it carries 40 per cent of the total road traffic.
- 30% of road accidents are happening on National Highways
- 36% of deaths due to road accidents are happening on National Highways
- This is very alarming situation and giving an impression that even though the national highways are very useful in achieving swift mobility, but they are the sites on which more than 50,000 lives are lost in 2017.

The total road length in India is about 56 lakh kilometers (as on 31st March 2016) consisting of 1.01 lakh kilometers of National Highways, 1.76 lakh kilometers of State Highways and the remaining 53.26 lakh kilometers consist of district roads, rural roads, urban roads and project roads. In percentage term, National Highways and State Highways constitute less than 5% and other roads 95% of the total road length in the country.

1.3.5. Major Causes of Accidents

Road accidents are multi-causal and are the result of the interplay of various factors, which can be broadly categorized into human errors, road condition/ environment, and vehicular condition. From the perspective of road safety strategy, an objective way to establish the factors responsible for a road accident would be to look into data pertaining to the circumstance under which it has occurred. The aggregate data on different types of traffic violations have been explained hereunder.

Table 6. Road accidents by type of traffic rules violations - 2017

Traffic rules violations	# Accidents	# Fatalities
Over-speeding	*3,27,448 (70.4)*	*98,613 (66.7)*
Driving on wrong side	*29,148 (6.3)*	*9,527 (6.4)*
Drunken driving/consumption of alcohol & drug	*14,071 (3.0)*	*4,776 (3.2)*
Use of mobile phone	*8,526 (1.8)*	*3,172 (2.1)*
Jumping red light	*6,324 (1.4)*	*1,826 (1.2)*
No violation & not known	*79,394 (17.1)*	*29,999 (20.3)*
Total	***4,64,910***	***1,47,913***

Note: Figures in parentheses are percentage share in the total of respective columns.

According to the report, "Road Accidents in India – 2017" by Ministry of Road Transport & Highways, Transport Research Wing (TRW, MoRTH), during the calendar year 2017; the causes of road accidents have been studied and a summary of total accidents, persons killed and injured is presented.

Further, the MoRTH report states that,

- In 2017, a total of **48,746** road users on two-wheelers lost their lives to road accidents and constitute a single largest road user category in the number of road accident deaths. ***Out of this, 73.8% did not wear helmets***.

- In 2017, a total of **26,896** persons killed in road accidents did not use seatbelts though were required to fasten seatbelts.
- In case of overloading, vehicles involved in road accidents during 2017 constitute 11.9 percent of total accidents and 14.1 percent of the total fatalities (i.e. **20,848** fatalities).
- Total Number of fatalities in 2017, due to non-use of helmets & seat belts and due to overloading, is **83,719**, which is about 56% of total deaths.
- Considering the other traffic rule violations as presented in Table 6, it can be stated that the top traffic rule violations, which resulted in accidents/ deaths are:

  (i) Over Speeding (ii) Non-use of helmets
  (iii)Non-use of Seat belts (iv)Overloading

Apart from these cause it is widely presented in various research reports that Drunk and Drive/ Driving under the influence of alcohol & Drugs and Distracted driving with the use of cell phones plug and play devices are also considered as the main causes of the road accidents.

1.3.5.1. 5 - Key GLOBAL Risk Factors[8]

Low-income countries have 3 times the Road Accident Death Rates compared to High-income countries. More than half of global traffic deaths are amongst Vulnerable Road Users – VRUs (pedestrians, cyclists and motorcyclists). VRUs are often neglected in road traffic system design in many countries.

In the year 2005, the WHO in its report "Updated projections of global mortality and burden of disease, 2002-2030: data sources, methods, and results. (Mathers C, Loncar D.)", projected that "Road Traffic Injuries" will attain 8th Position of Top 10 Leading Causes for Death in the World by the year 2030.

10 years ahead of the projections; "Road Traffic Injuries" has attained 8th Position of Top 10 Leading Causes for Death in the World, as per WHO Global Status Report on Road Safety – 2018.

The Top 5 Risk Factors stated by WHO are:

1. *Speeding*
2. *Drink-driving*
3. *Use of motorcycle helmets*
4. *Use of seat-belts*
5. *Use of child restraints*

BOX-5: Road Accidents - Global Status

- The number of road traffic deaths on the world's roads remains unacceptably high.
- **1.35 million** deaths each year.
- Road Accidents:
  - **8th leading cause of death** for people of all ages.
  - #1 cause of death for children and young adults **5 – 29 years of age**.

[8] WHO Global Status Report on Road Safety - 2018

1.3.5.2. Top 6 major causes in India

As per the number of accidents/ deaths attributed to a traffic rule violation, the violations are ranked as depicted above and studies. The top 6 major causes of road accidents and fatalities are listed below:

1. Over speeding
2. Non-use of helmets
3. Non-use of Seat belts
4. Overloading
5. Drunk and Drive/ Driving under the influence of alcohol and Drugs
6. Distracted driving with the use of cell phones plug and play devices

1.3.5.3. Comprehensive Strategy

A comprehensive strategy is proposed under the National Road Safety Plan to tackle road safety issues by use of effective enforcement techniques:

- Use of Intelligent Transportation Systems and Artificial Intelligence Technology for better and efficient traffic management and enforcement
- Evidence-based & Contact Less Enforcement
- Use of scientific methods for collecting accident data for obtaining reliable data
- E-challan System, etc.

1.4. Pillars of Road Safety

The term transportation includes the road infrastructure, road users/ people, and the vehicles that are delivery channels, the road environment that is the medium of delivery and the larger systems that govern these activities are all partners of national growth and development. This triple combination of road users/ people, vehicles and road environments has resulted in heterogeneous transport and traffic environments. With respect to road safety, these three components (road, vehicle & user) should be studied, designed carefully with suitable inbuilt safety measures ensuring protection and safe movements. Apart from this, Education, Enforcement and Emergency Care are also key factors in reducing the number of accidents and fatalities. An effective enforcement system, which deals with "Safer Vehicles" and "Safer Road Users", is envisioned in the proposed National Road Safety Plan (NRSP).

The flow chart (Figure 8) below presents existing controls/ stakeholder agencies with respect to the discussed pillars of road safety.

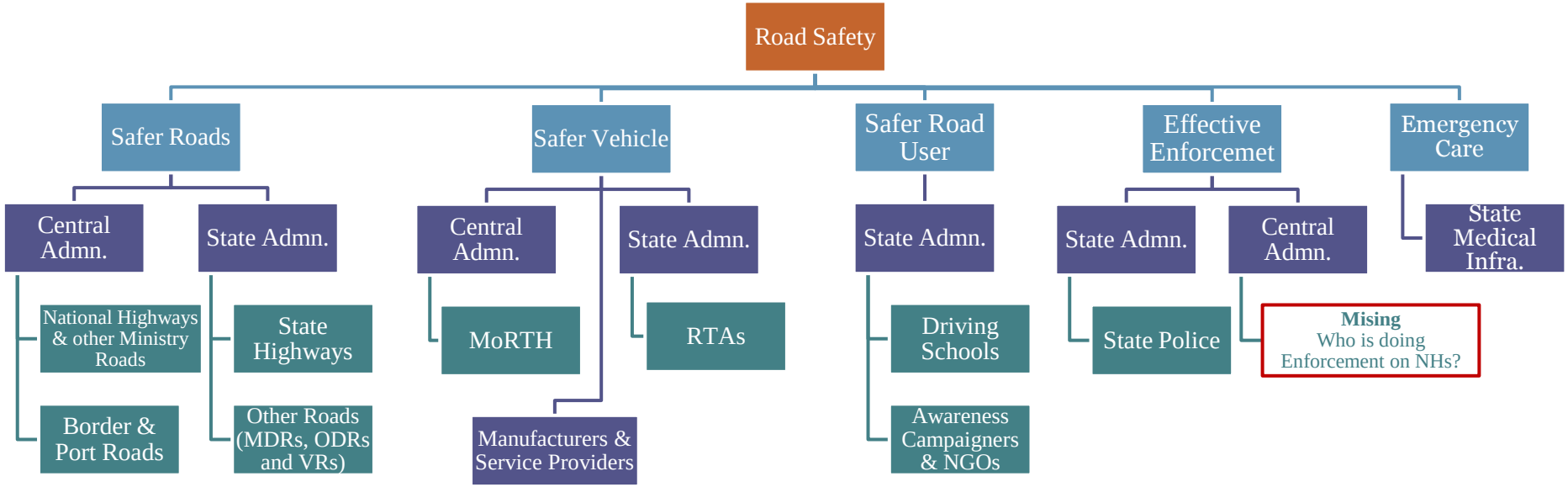


Figure 8. Road Safety Pillars – Present Scenario

1.4.1.4 E's of Road Safety

The Ministry of Road Transport & Highways formed[9] 4 separate working groups on 4 E's of Road Safety viz. (i) Education; (ii) Enforcement; (iii) Engineering (roads as well as vehicles); and (iv) Emergency care. In the following sections, a brief extracts of reports on each of the road safety pillars are presented herein:

1.4.1.1. 4 E's Road Safety

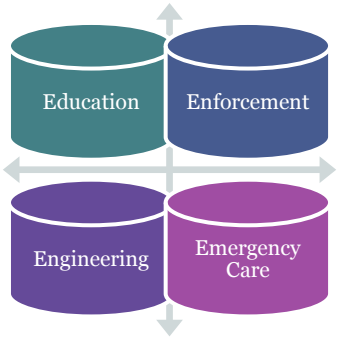


Figure 9. 4 E's Road Safety

The main thrust of accident prevention and control across the world has been on 4 E's vis (i) Education; (ii) Enforcement; (iii) Engineering; and (iv) Emergency care of road accident victims.

1.4.1.2. Education

Awareness is generated through various Road Safety Campaigns utilizing audio-visual (short films, Ads, Radio jingles etc.,) and other print media and through NGOs. With the view to raise road safety awareness among the general public, the Government has been undertaking various publicity measures through Directorate of Advertising & Visual Publicity (DAVP) and professional agencies in the form of telecasting/broadcasting of TV spots/Radio spots, display of cinema slides, distribution of posters, books on road safety signage & signs, organizing Road Safety Week, Seminars, Exhibitions.

The Government's activities in education and awareness form an important contribution to its efforts to foster road safety. Education and awareness measures, such as road safety campaigns, road safety information days and community outreach programs continue to influence the attitudes and behaviors of all road users.

Steps are recommended to create awareness regarding road safety amongst the population through education, training and publicity campaigns. Road safety education will also focus on school children and college going students, while road safety publicity campaigns will be used to propagate good road safety practices among the community.

Impact of Public Awareness and Educational Campaigns[10]

Various studies, technical articles/ journals/ papers have examined the effectiveness of public awareness and educational campaigns on road accident prevention;

- In Mexico, an awareness campaign targeting seat belt and child restraint use were added after a one-year long law enforcement campaign. The evaluation results after the first year of the study, showed a reduction in accidents.

[9] MoRTH PIB Press Brief (Release ID:72469), http://www.pib.nic.in/newsite/erelcontent.aspx?relid=72469
[10] Staton C, Vissoci J, Gong E, Toomey N, Wafula R, Abdelgadir J, et al. (2016) Road Traffic Injury Prevention Initiatives: A Systematic Review and Metasummary of Effectiveness in Low and Middle Income Countries. PLoS ONE 11(1): e0144971. doi:10.1371/journal.pone.0144971

- In Brazil, a multifaceted public awareness/education intervention campaign was conducted focusing on educational training in health centers and schools/ universities, and public awareness campaign with media distribution of videos, souvenirs, and pamphlets. Results showed decrease in deaths as well as moderate and severe trauma.
- Two other educational interventions evaluated in Brazil and Thailand consisted of pre-post surveys with control groups and an educational intervention, which focused on safety and injury rates for bicyclists and motorcyclists, respectively. Results support that education interventions reduced overall injuries (10.1% fewer injuries), crashes (12.0% fewer crashes), and increased helmet use (25.5% more helmet use). No impact was observed on deaths.
- A study evaluated the introduction of the World Health Organization Safe Community (SC) model in an Iranian region. Evaluation of this intervention compared the injuries reported at the emergency department of the intervention region and 44 other regions in Iran. When compared to the other regions, there was a significant decrease in injury rate (23.3%) for three years after implementing the WHO's SC model.

1.4.1.3. Enforcement

The Motor Vehicles Act 1988 and Central Motor Vehicles Rules 1989 contain a number of provisions, which if enforced correctly, would curb traffic violations by drivers. The enforcement of these provisions is primarily the responsibility of the concerned State Government. The control of National Highways (Land and Traffic) Act, 2002 provides powers to Highway Administration for control of land within the National highways, Right of Way and traffic moving on the National Highways also for removal of unauthorized occupation of land within the national highways.

Theoretical estimates of the potential accident reduction impact of policing, based on enforcement inducing full compliance are fairly high. The Norwegian Traffic Safety Handbook estimates that full compliance with speed regulations, avoiding drink-driving and always using protective devices could save up to 38 % of fatalities and up to 17% of other traffic injuries. Manual speed enforcement reduced the number of accidents by 2%. The reduction in fatal and injury accidents is higher, -14% and -6%. Automated speed enforcement shows a reduction of 19% to 35% of accidents. Speed cameras have a larger effect in urban areas[11].

Drink-driving, more than any other non-compliance issue was always considered a social behavior issue. The overall effect of controlling drink-driving by direct policing and all other accompanying measures is a reduction of 3.7%, 9%, and 7%, of all, fatal, and injury accidents, respectively. Some specific measures have a larger impact; for example, revocation of driving license has reduced the number of drink-driving accidents by 18%. Safety belts enforcement has had a 5% to 14% impact. In assessing the separate effects of

[11] David M. Zaidel, 'The impact of enforcement on accidents', Project "ESCAPE" (Enhanced Safety Coming from Appropriate Police Enforcement) 2002

various sanctions-, warning letters and license revocation stand out as having had 15% impact on accident reduction compared to 5% influence by demerit-points systems.

Table 7. Reduction in Accidents attributed to Traffic Law Enforcement[12]

Potential of reduction in personal injuries and fatalities assuming full compliance Traffic Law Enforcement		
Main groups of traffic laws	**% change in the number of injuries and fatalities (95% confidence interval)**	
	Injured persons	**Fatalities**
Speed limits	-9 (±5)	-15 (±8)
Use of protective equipment	-5 (±3)	-14 (±8)
Alcohol Laws	-3 (±2)	-10 (±7)
Other behavior rules in traffic	-8 (±6)	-7 (±5)
Vehicle technical requirements	-1 (±1)	-1 (±1)
Requirement of drivers	-1 (±1)	-1 (±1)

Several careful evaluation studies of community-wide and state-wide long terms speed and drink-driving enforcement program in Canada, USA, Australia, and New Zealand reported 10%, 25% and even 33% reductions in relevant accident categories. Studies in Israel suggested much smaller reductions. The positive impact is larger with fatalities and serious injuries, pointing to the importance of speed control and possibly also of improved emergency response with improved or increased police deployment. The Norwegian Traffic Safety Handbook gives the estimates (based on a meta-analysis of studies in many countries) of the potential safety impact of full compliance with traffic regulations.

The proposed NRSP will concentrate on existing gaps for effective enforcement on the national highways.

The causes of most crashes cannot truly be considered crimes except in the sense that negligent driving "without due care and attention" or breaking road rules is a crime. Nonetheless, the methods and opportunities for road crash prevention and crime prevention in particular, and situational crime prevention are at heart closely similar. Both involve the notion that coordinated action to make (breaking the law) more difficult or risky can achieve general reductions in the volume of law-breaking[13].

Road rules will only be obeyed if people believe that not obeying them will result in unwanted outcomes like fines or license cancellation. The perceived likelihood of being caught and penalized for disobeying road rules should be high. In addition, the penalties should be large enough to discourage people from disobeying the rules.

To maximize the road safety benefit, enforcement should be aimed at road rule violations that have been proven to increase the likelihood or severity of crashes. Safety benefits can be further increased through intelligence-led policing. In road rule enforcement,

[12] Elvik, R., Mysen, A.B and Vaa, T. (1997) Traffic Safety Handbook. Institute of Transport Economics, Oslo, Norway.

[13] Using Police Enforcement to Prevent Road Crashes: The Randomized Scheduled Management System by L. M. W. Leggett Land Transport & Safety Division, Queensland Transport

intelligence-led policing involves the use of data (for example, data on when and where crashes are occurring, data on severity factors such as not using seatbelts or helmets, or data on causal factors such as speeding or drink driving) to focus enforcement on the times and places that present the greatest risk.

1.4.1.4. Engineering (Safer Roads & Safer Vehicles)

Safer Roads

Every day, various vehicles travel on a variety of Indian roads that are national/ state highways, urban /municipal roads, non-highway, arterials, and non-arterials, which are constructed using different road technology. The development, maintenance, operation, investment and certification of these roads rest with multiple agencies at different levels as safety and infrastructure is the divided responsibility of not only the central and state governments but also local district authorities.

The major attributes related to road infrastructure to be looked into are;

- Funding for the project
- Designing the roads
- Design standards are followed
- Construction of the roads (Agency)
- Supervision during construction and operation & maintenance stages
- Third-party Audits and Safety Audits, etc
- Operation and maintenance of the roads
- Rules and Guidelines / standard operating procedures for operation and maintenance
- Toll collections
- Enforce Traffic rules on highways
- The gap in operations from Enforcement perspective

These attributes are to be defined carefully at every stage and the need for a comprehensive plan, policy, set of rules & guidelines, roles and responsibilities for stakeholder's involved, separate powers in doing so is required.

As per MoRTH's circular the following engineering measures are considered essential for adoption so as to help in improving road safety leading to the reduction of accidents:- Geometry of the road; Separation of local traffic; Pedestrian facility; Bus bays; Illuminations; Development of Junction; Signages; Traffic calming & Safety Management Measures; Bridges/CD Structures and Road Safety Audits at Design Stage, Construction Stage, Pre-opening Stage and Operation & Maintenance Stage.

Safer Vehicles

In India, there are several types and variety of vehicle of differing size, shape, engine capacity, technology, standards, all varying with each other to travel in the shortest possible time on the existing roads. Nearly 30-40 different types of vehicles use our roads.

Use of vehicles, Competition in the market, demand for more vehicles, aggressive marketing and favorable financial environment has contributed to an increase in vehicular growth in India. In addition, many locally manufactured vehicles do not have adequate safety standards thereby compromising safety aspects. Issues with regard to registration, renewal of registration, certification of fitness and safety are evolving at a slow pace and have not received much prominence. Most importantly, to ensure the safety of vehicles manufactured in India, especially two-wheeler vehicles, serious attention needs to be paid by vehicle manufacturers.

It is universally acknowledged that vehicular defect(s), poorly maintained vehicles, vehicles with fewer safety performance features add to a greater risk of accidents either alone or in combination with other factors. Provisions in the Motor Vehicle Act specify safety standards for certain vehicles and the new amended act aims to improve these standards. Enforcement of vehicle safety/ fitness standards is an important aspect, which the NRSP will look into.

1.4.1.5. Emergency care for road accident victims

National Highway Accident Relief Service Scheme (NHARSS) that entails providing cranes and ambulances to States/UTs/NGOs for relief and rescue measures in the aftermath of accidents by way of evacuating road accident victims to nearest medical aid center and for clearing the accident site.

National Health Policy 2017 (Emergency Care & Disaster preparedness)[14]

Better response to disasters, both natural and manmade, requires a dispersed and effective capacity for emergency management. It requires an army of community members trained as the first responder for accidents and disasters. It also requires regular strengthening of their capacities in close collaboration with the local self-government and community-based organizations. The policy supports the development of earthquake and cyclone-resistant health infrastructure in vulnerable geographies. It also supports the development of mass casualty management protocols for CHC and higher facilities and emergency response protocols at all levels. To respond to disasters and emergencies, the public healthcare system needs to be adequately skilled and equipped at defined levels, so as to respond effectively during emergencies. The policy envisages the creation of a unified emergency response system, linked to a dedicated universal access number, with a network of emergency care that has an assured provision of life support ambulances, trauma management centers:

- one per 30 lakh population in urban areas and
- one for every 10 lakh population in rural areas

National Road Safety Policy[15]

Policy Statement "(ix) Emergency Medical Services for Road Accidents": The Government will strive to ensure that all persons involved in road accidents benefit from speedy and effective trauma care and management. The essential functions of such a service would include the provision of the rescue operation and administration of first aid

[14] National Health Policy 2017, Ministry of Health & Family Welfare, Government of India
[15] National Road Safety Policy, Government of India

at the site of an accident and the transport of the victim from the accident site to a nearby hospital. Hospitals alongside the National Highways and State Highways would be adequately equipped to provide for trauma care and rehabilitation.

1.4.2. Stakeholders

Multiple national and state stakeholders are engaged in developing the road infrastructure and road safety mainly, transport, police, health/ medical, trauma, etc, and many institutions, organizations, and agencies like NHAI, MoRTH, The International Road Federation, etc, and behavioral issues of road users and is considered a public health problem.

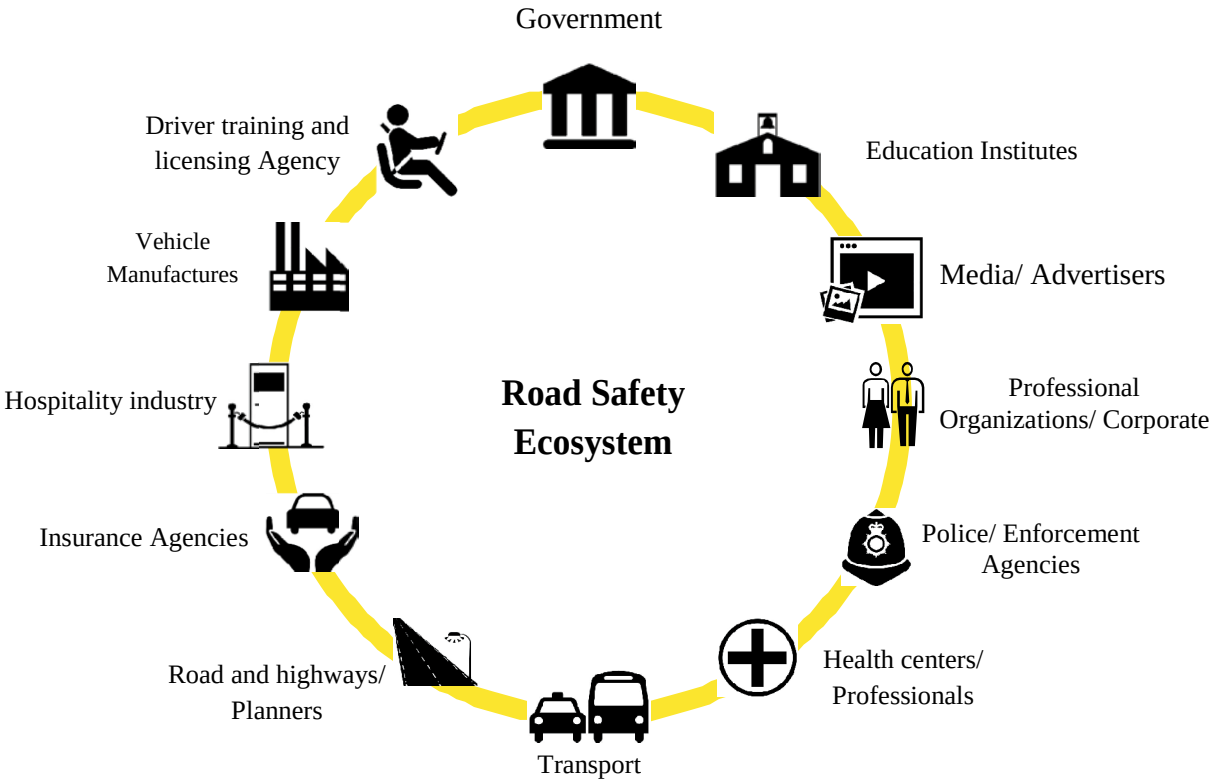


Figure 10. Road Safety Ecosystem

The lack of coordination between multiple agencies has been found to be the single greatest problem and mechanisms are not in place to address the issues. The mechanisms to address road safety in India have also witnessed numerous guidelines, legislation, amendments, court directives, empowered and non-empowered committees at both the central and state levels. In addition, traffic violations by road users are booked under a variety of rules, which vary from state to state.

In order to reduce the severity of road accidents; the combined effort from different organizations as well as individuals is needed. Each stakeholder/ department/ organizations has to be cautious, spread the importance of road safety in reducing accidents, and promote good driving behaviors. Combined efforts from all stakeholders are likely to ensure a safe road environment for citizens of the country. The stakeholders involved in the road safety ecosystem can play an imperative role in reducing road accidents and deaths.

1.5. International Comparison

The international comparison of road accident fatality risk, i.e., fatality per 1,00,000 population and injury risk, i.e., road accident injury per 1,00,000 population as per World Road Statistics 2017 published by International Road Federation, Geneva.

Among 22 countries, as listed below, the Russian Federation has a higher incidence of road accident deaths per 1,00,000 than India. Incidence of road accident related deaths is at 16 in the Russian Federation, which is substantially higher than the figure of 11 for India. The following table presents a comparison of the incidence of road accident deaths and injury accidents relative to population in select 22 countries.

Table 8. Road related Deaths and Injury in different countries (in 2015)[16]

Sl. No.	Country	Killed per 100,000 Population	Injury Accidents per100,000 Population	Accident Severity
1	Australia	5	286*	1.75%
2	Canada	5	330	1.52%
3	China	4	14	28.57%
4	Denmark	3	50	6.00%
5	France	5	85	5.88%
6	Germany	4	374	1.07%
7	India	11	38	28.95%
8	Israel	4	145	2.76%
9	Japan	4	422	0.95%
10	Republic of Korea (ROK)	9	2,238	0.40%
11	Mauritius	3#	217	1.38%
12	Mexico	3	8	37.50%
13	Myanmar	10	30	33.33%
14	New Zealand	7	213	3.29%
15	Norway	2	88	2.27%
16	Portugal	6	344	1.74%
17	Russian Federation	16	128	12.50%
18	Singapore	3	143$	2.10%
19	United Kingdom	3	215	1.40%
20	United States of America	11	545	2.02%

* pertain to 2011; # pertain to 2013; $ pertain to 2014

[16] World Road Statistics, 2017, International Road Federation, Geneva.

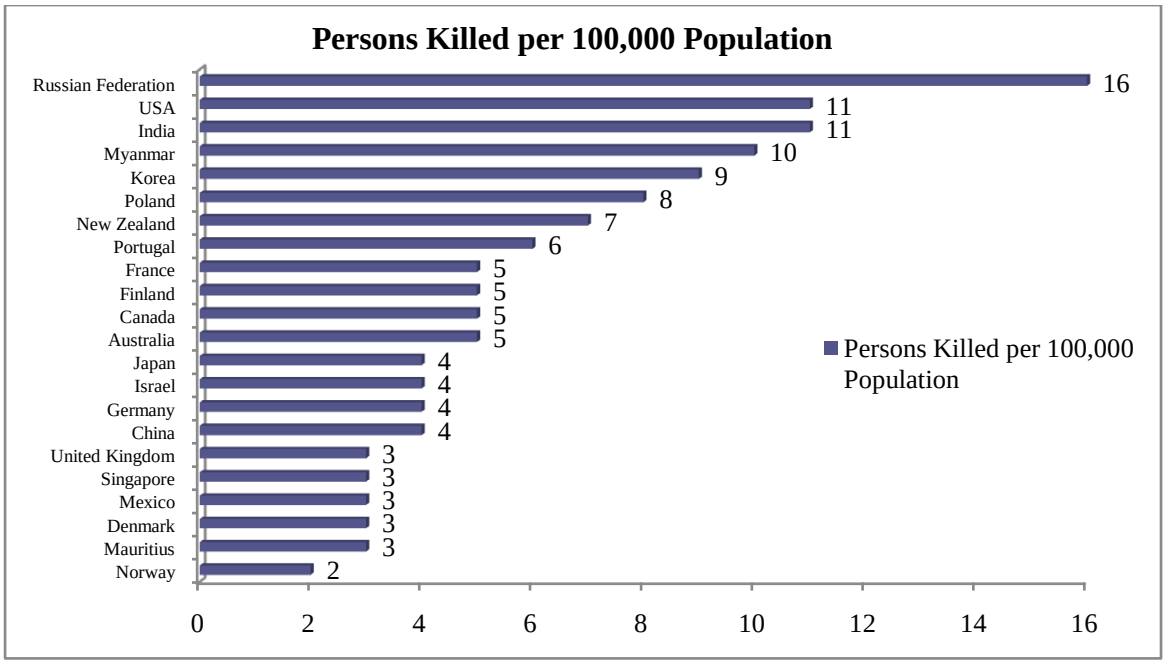


Figure 11. Country-wise number of persons killed per 1,00,000 population 2015

In order to compare present trend with respect to the road accident fatalities recent/ available road accident data is sourced from NHTSA[17], EU[18] , and MoRTH[19].

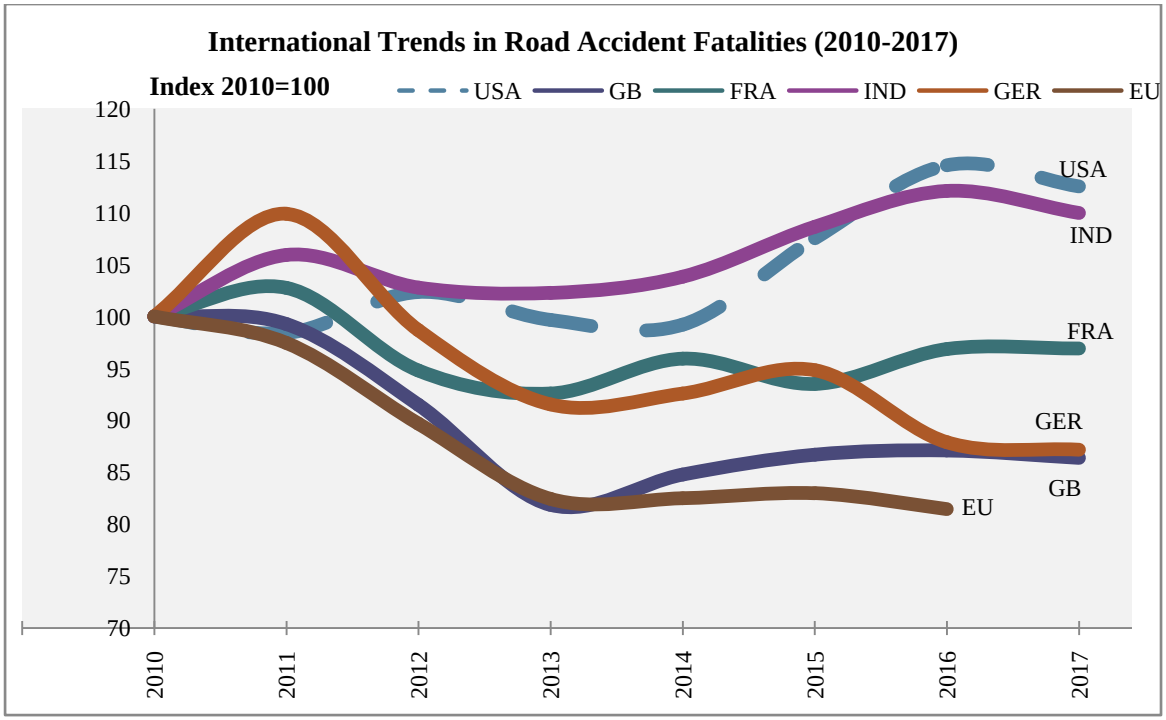


Figure 12. International Trends in Road Accident Fatalities (2010-2017)

The number of fatalities is collected from the year 2010 to 2017, on the roads of the USA, Great Britain (GB), France (FRA), Germany (GER), the EU and India (IND). The number of fatalities in all these countries/ regions is indexed to 100 for the year 2010,

[17] Traffic Safety Facts 2016, DOTHS812554, National Highway Traffic Safety Administration, US DOT
[18] Annual Accident Report 2018, European Road Safety Observatory, www.erso.eu
[19] Road Accidents in India – 2017, MoRTH Publication

which shows a recent trend in the deaths due to road accidents. Countries in the EU and the region as a whole have shown a consistent downward trend. Whereas, the USA and India experiences a slight increase from 2015 onwards. The consistent downward trend in road accident fatalities on EU roads can be attributed to various road safety initiatives and they are discussed in Chapter – 3 (Global Best Practices) of this report.

1.6. Need for NRSP

The Government of India is seriously concerned about the number of road accidents, injuries, and fatalities in recent years. Road safety has become a public health issue, which needs to be addressed with a robust approach. This involves a holistic view of the road transport system, the interactions among roads and roadsides, travel speeds, vehicles and road users and an effective enforcement mechanism. It is an inclusive approach that caters for all groups using the road system, including drivers, motorcyclists, passengers, pedestrians, cyclists, and commercial and heavy vehicle drivers.

The purpose of the present report is to examine the current scenario of Road Traffic Injuries (RTIs) and road safety in a comprehensive manner from a public health perspective. The report brings together available data on actions pertaining in reducing the road traffic accidents, and examine the progress made or to be made in the coming years so that suitable remedial measures can be taken by the policy makers, professionals, and political leaders to save lives.

From a public health perspective, it is essential to understand the pattern of road crashes with the available data to identify the gaps in our policies and to set the stage for further research, initiatives and future developments.

Data based on the type of roads reveals that about 66% of accidents and 52% of deaths are occurring on the national and state highways. Though immediate attention is the need-of-the-hour on all type of roads, a comprehensive national approach is missing at the national level and on National Highways. An approach, which has a potential of reducing accidents significantly, especially on the National Highways, by adopting recommendations of the National Road Safety Plan, proposed hereunder.

Achieving sustained reductions in road traffic injuries requires countries to have a long-term vision and policy for Road Safety, and to define the objectives to be attained within the Policy's time period. The process for developing such a Policy should involve a considerable degree of stakeholder engagement at the state level so that all relevant sectors –Transport, Police, Highways, Health, Education, Excise and Non-Governmental agencies – invest in a Policy that is itself based on the best possible evidence.

Chapter-2

Data Analysis

2. DATA ANALYSIS

2.1. Road Network

In the National Road Safety Policy, it is stated that

- *"the government will take measures to review standards pertaining to safety in the design of rural and urban roads and bring them in consonance with international best practices keeping in view Indian traffic conditions. Continuing application of Intelligent Transport Systems (ITS) under a national framework to establish a safe and efficient transport system will be encouraged"* **to ensure Safer Road Infrastructure.**
- *"The design and construction of all road facilities (rural and urban) will take into account the needs of non-motorized transport and the vulnerable and physically challenged in an appropriate manner. The Government will seek to disseminate 'best practices' in this regard to town planners, architects, and highway and traffic engineers"* **for the Safety of Vulnerable Road Users.**

Indian roads are categorized as national/ state highways, urban /municipal roads, non-highway, arterials, and non-arterials. Development, maintenance, operation, investment and certification of these roads rest with multiple agencies of central, state governments and authorities. These roads are constructed using different design standards and specifications which are invariably influenced by financial and right of way constraints. The following are the different categories of the roads in India facilitate day-to-day activities of the road users:

Table 9. Total and Surfaced Road Length By Categories in India (in km)[20]

Sl. No.	Category	Total
1	National Highways	1,01,011
2	State Highways	1,76,166
3	District roads	5,61,940
4	Rural Roads	30,35,337
5	Urban Roads	5,09,730
6	Project Roads	3,19,109
	Total	**56,03,293**

It is important to note that year 2000 marks the launch of two major road up-gradation/ network expansion national programs, they are:

1. Government of India launched major initiatives to upgrade and strengthen National Highways through various phases of the National Highways Development Project (NHDP).NHDP Phase I: CCEA on 12th January 2000 approved NHDP Phase-I
2. Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched on 25 December 2000 as a fully funded Centrally Sponsored Scheme to provide all-weather road connectivity in rural areas of the country.

[20] Basic Road Statistics of India 2015-16, MoRTH Publication

Marking this, year 2000 road lengths under each category are indexed as 100 and trend of up-gradation/ construction/ network expansion is shown in the following illustration:

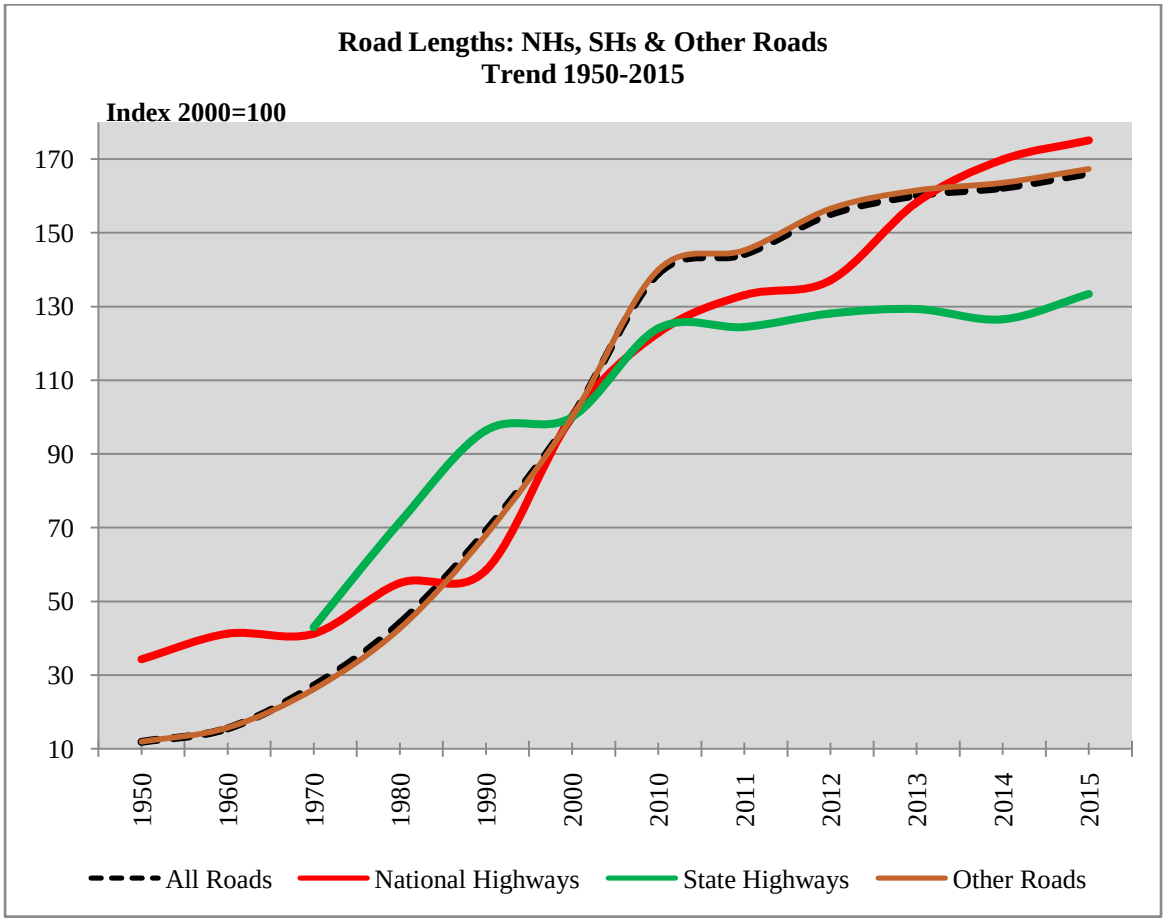


Figure 13. Road Lengths: NH's, SH's & Other Roads Trend 1950-2015

The two national programs NHDP and PMGSY contributed to significant growth of the road sector, as they are implemented across the States/ UTs with the Central Funds.

2.2. Registered Vehicles

Graphic representation of the vehicular composition on the following chart shows the linear movement of each category of vehicle's share in the total registered vehicle over the period from 1951 to 2016.

Apart from the sheer dominance of the total vehicular population in India by two-wheelers, this category of the vehicle has seen steady growth, though at a lower rate in recent years, whereas the share of buses has declined over the years. This preference of road users for personalized means of transport over public transport could be dictated, apart from convenience and economic considerations, by the failure of the public transport system in keeping up with the demand.

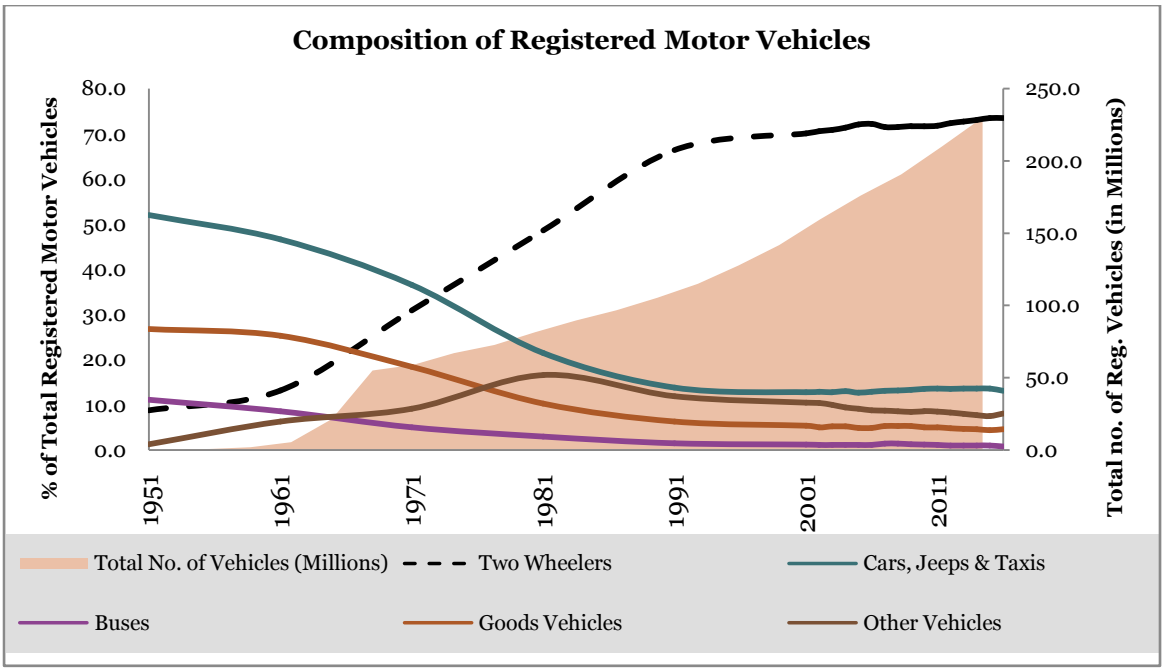


Figure 14. Composition of Registered Motor Vehicles (as on 31.03.16)

The distribution of registered motor vehicle across the 36 States and UTs has been uneven. Top 16 states in terms of the number of registered vehicles are shown below and they account for about 91% of the total registered vehicles in India.

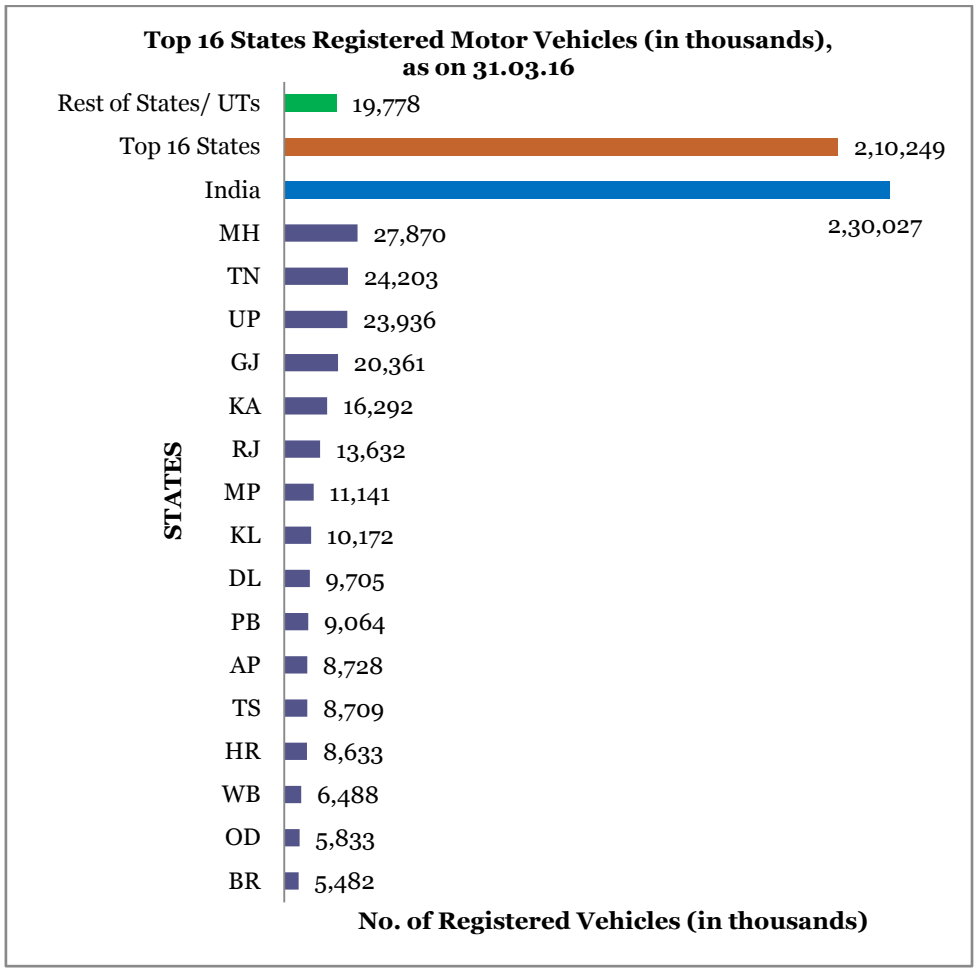


Figure 15. Top 16 States Registered Motor Vehicles (as on 31.03.16)

2.3. Road Accidents

2.3.1. Background

As discussed in the previous chapter, the road accidents are claiming more lives than various natural calamities, taking away around 1,50,000 lives in a year leading to 3% of GDP loss[21]. This section provides an overview of various causes of road accidents and talks about the facts and figures of road accidents.

A road accident refers to an accident involving at least one road vehicle, occurring on a road open to public circulation, and in which at least one person is injured or killed. A road accident may cause loss of life/ lives or grievous injury or minor injury or non-injury to road-users."Killed persons" are accident victims who die immediately or within thirty days following the accident. "Injured persons" are accident victims having suffered trauma requiring medical treatment (with or without hospitalization).

In order to get deep into the subject matter and to find out the critical aspects of the road safety, it is necessary to identify the core causes of the accidents, real victims of road accidents and most affected road users. The following are the different aspects to be studied;

- Road Accidents
    - Type of Road Accidents
    - Nature of Road Accidents
- Accidents by Road Category
- Type of vehicles involved in road accidents
- The age group of the persons involved in accidents and fatalities
- Accidents by Road Features
- Causes of road accidents
    - Top 5 contributory factors
- An urban-rural dividend of accidents
- Time of accidents etc.

2.3.2. Type of Road Accidents

The following are the various types of road accidents;

- Fatal Accidents - An accident, which resulted in the death of one or more person, is a fatal accident.
- Grievous Injury Accidents - Grievous injury accident is one in which one or more victims suffer a serious injury requiring hospitalization (not necessarily in terms of IPC definition of grievous injury)
- Minor Injury Accidents - Minor injury accident is when the victim(s) does not require hospitalization
- Non-Injury Accidents – Refers to no injury to the persons involved in the accidents.

[21] Dinesh Mohan, The Road Ahead: Traffic Injuries and Fatalities in India" (April 2004), Transportation Research and Injury Prevention Programme, WHO Collaborating Centre, IIT-Delhi

The number of accidents according to the type of road accidents in 2017[22] is presented in the following table.

Type of Accident	2017
Fatal Accidents	1,34,796
Grievous Injury Accidents	1,20,971
Minor Injury Accidents	1,74,400
Non-Injury Accidents	34,743
Total Accidents	**4,64,910**

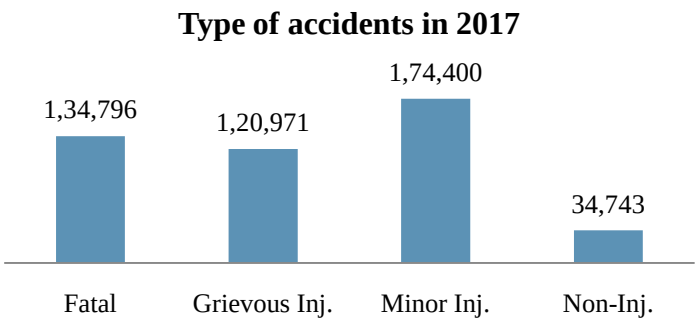


Figure 16. Type of Accidents in 2017

In 2017, out of 4,64,910 road accidents, 1,34,796 (29%) were fatal accidents, 2,95,371 (63.5%) accidents were injury-causing accidents (both grievous and minor injuries). Among injury-causing accidents, 1,20,971 (26%) were grievous and 1,74,400 (37.5) were minor injuries.

State	No. of Fatal Accidents
Uttar Pradesh	17706
Tamil Nadu	15061
Maharashtra	11220
Karnataka	9739
Rajasthan	9300

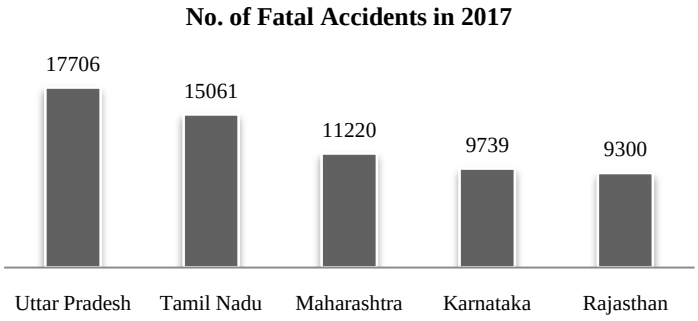


Figure 17. Top 5 states with more number of fatal accidents

2.3.3. Nature of Road Accidents

Table 10. Road accidents, fatalities and injuries by type of collision – 2017

Collision type	No of accidents	Persons Killed	Persons injured
Head on Collision	87068 (18.7)	24170 (16.3)	98452 (20.9)
Hit from Back	77540 (16.7)	22446 (15.2)	83287 (17.7)
Hit & Run	65186 (14.0)	25866 (17.5)	59544 (12.6)
Pedestrian	62344 (13.4)	18886 (12.8)	54090 (11.5)
Hit from side	42675 (9.2)	12071 (8.2)	44247 (9.4)
Vehicle Overturn	30037 (6.5)	9413 (6.4)	32420 (6.9)
Run Off Road	13209 (2.8)	5191 (3.5)	14976 (3.2)
Fixed Object	12085 (2.6)	4283 (2.9)	12156 (2.6)
With Parked Vehicle	7104 (1.5)	2317 (1.6)	7432 (1.6)
With Animal	3611 (0.8)	1360 (0.9)	3135 (0.7)
Others*	64051 (13.8)	21910 (14.8)	61238 (13.0)
	464910	**147913**	**470975**

[22] Road Accidents in India, 2017: MoRTH Publication

The principal physical characteristic(s) of the road accident by any vehicle, fixed objects, animal, equipment, collision types and other factors that were responsible for the injury or death incurred by the road user or that precipitated the event or exposure.

Head on Collision, Hit from Back, Hit & Run, Pedestrian Hit, Hit from the side, Vehicle Overturn, Runoff Road, Fixed Object, With Parked Vehicle, With Animal and other are some of the most common collision types/nature of road accidents.

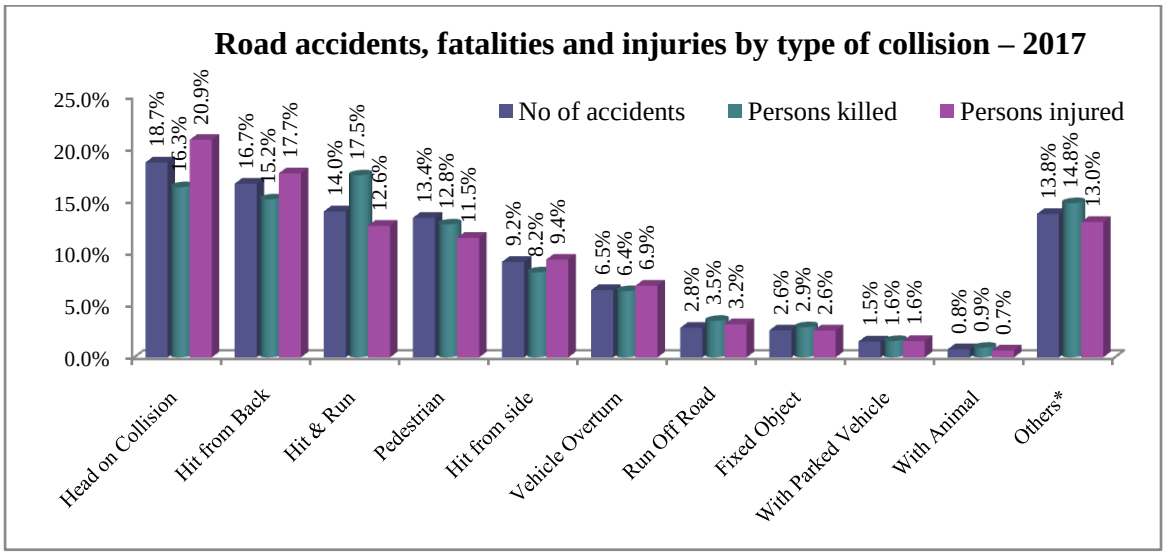


Figure 18. Road accidents, fatalities and injuries by type of collision - 2017

2.3.4. Accidents by Road Category

India has a road network of over 5,903,293 kilometers as of 31 January 2019, the second largest road network in the world at 1.70 km of roads per square kilometer of land. The quantitative density of India's road network is higher than that of Japan (0.91) and the United States (0.98) too, and far higher than that of China (0.46), Brazil (0.18) or Russia (0.08).

However, qualitatively India's roads are a mix of modern highways and narrow, unpaved roads, and are being improved. Different categories of roads were constructed in India to facilitate day-to-day activities of road users.

Table 11. Road accidents, fatalities and injuries by road category - 2016 & 2017

Road category	2016			2017		
	No. of Accidents	Persons Killed	Persons Injured	No. of Accidents	Persons Killed	Persons Injured
National Highways	1,42,359	52,075	1,46,286	1,41,466	53,181	1,42,622
State Highways	1,21,655	42,067	1,27,470	1,16,158	39,812	1,19,582
Other Roads	2,16,638	56,643	2,20,868	2,07,286	54,920	2,08,771
Total	**4,80,652**	**1,50,785**	**4,94,624**	**4,64,910**	**1,47,913**	**4,70,975**

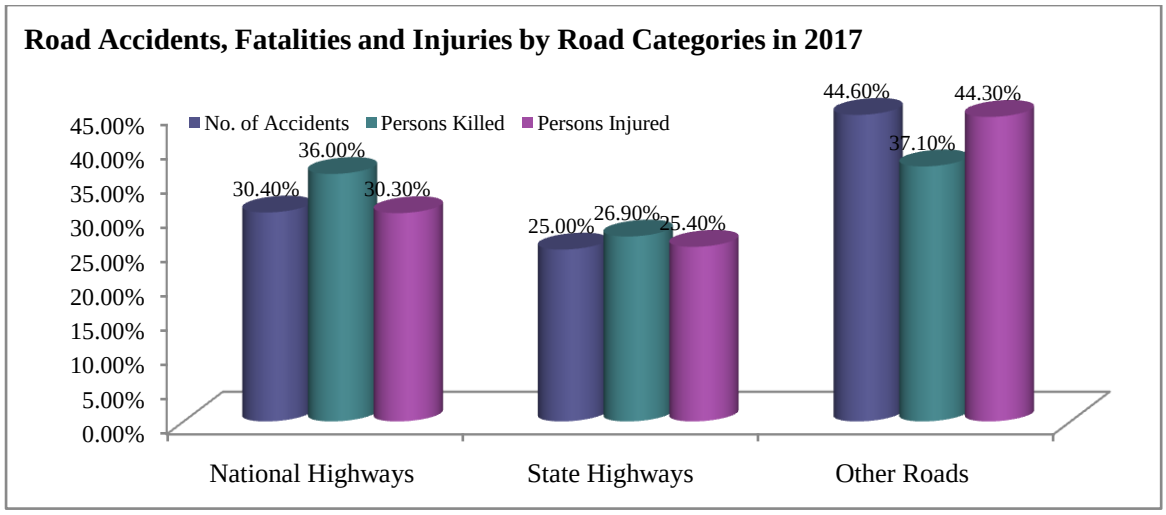


Figure 19. Road Accidents, Fatalities and Injuries on different Types of Roads

According to the MoRTH report 2017, the trend of road accidents and persons killed on national highways and state highways are as shown in the following graphs;

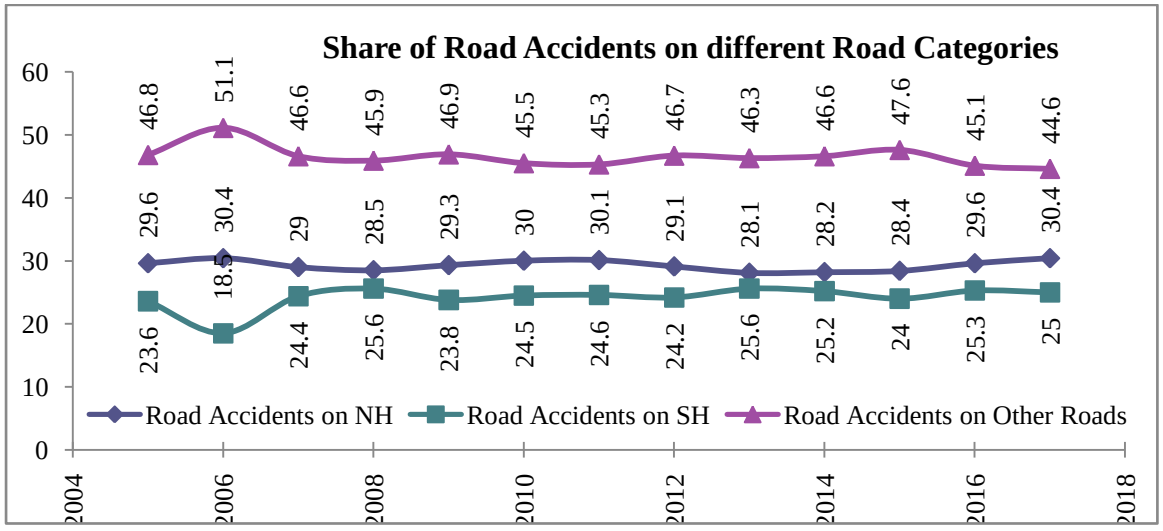


Figure 20. Shares of road accidents on different categories of roads

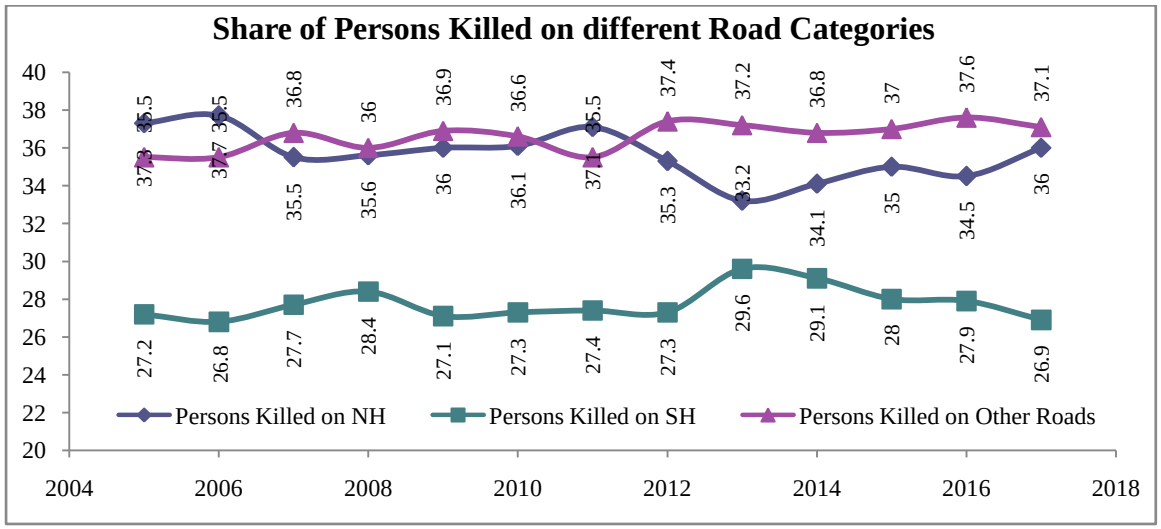


Figure 21. Shares of persons killed on different categories of roads

BOX-6: Road Accidents on NHs & SHs

- In 2017, out of the total 4,64,910 road accidents recorded in the country, 1,41,466 (30.4%) took place on the National Highways (NH) including Expressways, 1,16,158 (25.0%) on State Highways (SH) and 2,07,286 (44.6%) on other roads.
- In case of fatality, accidents on the NH accounted for 53,181 (36.0%) deaths, SH accounted for 39,812 (26.9%) and other roads 54,920 (37.1%).
- However, it is important to note that about 40 percent of the total road traffic in the country is carried by the National Highways.
- Combined lengths of all NHs (~2%) & SHs (~3%) in India constitute about 5% of the total road length. 55% of the total accidents and 63% of the fatalities are happening on the NHs & SHs.
- This is grave concern has to be dealt with a comprehensive national approach.
- National Highways traverses across all Indian States, a national approach has to be adopted. An imminent need of a comprehensive national approach is the one of the main objectives of the proposed National Road Safety Plan.

2.3.5. Type of vehicles involved in road accidents

Over 230 million registered vehicles in India and the number has been growing at about 10 percent from year 2006. Several types of vehicle of differing size, shape, engine capacity, technology, standards, are plying on Indian Roads. These could be categorized under 30-40 different types.

The level of vulnerability of road-users to accidents is high as the same road space is shared among a wide variety of motorized and non-motorized vehicles and pedestrians.

Among motorized vehicles, two-wheelers constitute 73.5 percent and light motor vehicles comprising of cars, jeeps and taxis constitute 13.1 percent. Non-motorized vehicles on the roads include cycles, cycle rickshaws, hand-drawn carts, animal-drawn carts.

Table 12. Road accidents, fatalities & injuries by vehicle type

Vehicle type	2016			2017		
	No. of Accidents	Persons Killed	Persons injured	No. of Accidents	Persons Killed	Persons injured
A. Motorized Vehicles						
Two-wheelers	1,62,280	44,366	1,53,060	1,57,723	44,092	1,48,907
Auto-rickshaws	31,440	6,767	39,680	29,351	6,762	35,682
Cars, Jeeps, Taxis	1,13,267	32,599	1,25,773	1,13,737	31,183	1,23,156
Buses	37,487	12,088	50,686	32,145	10,651	44,330
Trucks, Tempos, Tractors	1,01,085	39,504	91,784	92,818	37,505	87,453
Other motor vehicles	13,255	5,886	11,607	-	-	-
Sub-total of (A)	**4,58,814**	**1,41,210**	**4,72,590**	**4,25,774**	**1,30,193**	**4,39,528**
B. Non-motorized vehicles	4,255	1,728	3,799	6,376	2,798	4,992
C. Other*	17,583	7,847	18,235	32,760	14,922	26,455
Total (A+B+C)	**4,80,652**	**1,50,785**	**4,94,624**	**4,64,910**	**1,47,913**	**4,70,975**

** Includes pedestrian, animal, tree and other fixed objects*

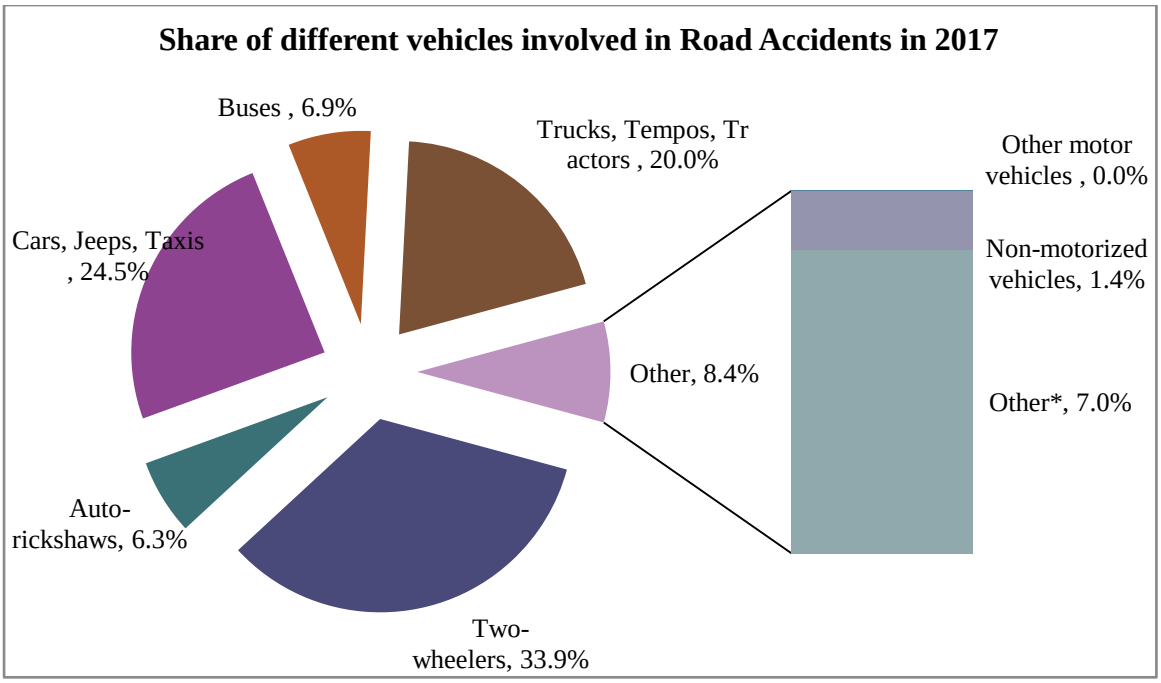


Figure 22. Shares of different vehicles involved in road accidents during 2017

Motorized vehicles accounted for 91.6 percent of the total road accidents during the calendar year 2017. Within motorized vehicle categories, two-wheelers accounted for the highest share in total road accidents (33.9%) followed by the combined cars, jeeps and taxis category of vehicles (24.5%), combined vehicle category comprising trucks, lorries, tempos, tractors, and other articulated vehicles as (20.0%), buses (6.9%) and auto-rickshaws (6.3%).

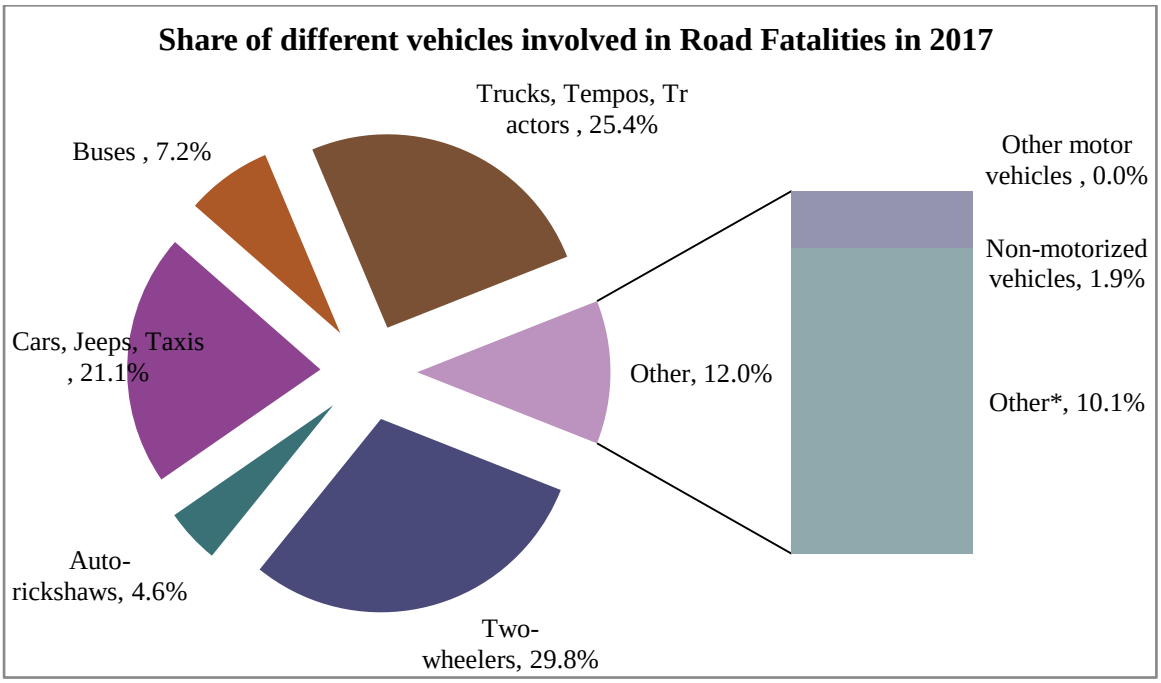


Figure 23. Shares of different vehicles involved in road Fatalities during 2017

In the case of fatalities, 88.0 percent of deaths reported due to road accidents involving motorized vehicles during 2017. Within motorized vehicle categories, two-wheelers accounted for the highest share in total road accidents (29.8%) followed by the combined

vehicle category comprising trucks, lorries, tempos, tractors and other articulated vehicles as (25.4%), combined cars, jeeps and taxis category of vehicles (21.1%), buses (7.2%) and auto-rickshaws (4.6%).

2.3.6. The urban-rural divide of accidents

Social and economic activities related travel patterns are different for urban and rural scenarios. Urban-rural scenarios affect road traffic volume and perhaps, incidences of accidents. The distribution of road accidents statistics of 2017 between rural areas and urban areas are presented in the following table;

Table 13. Urban-Rural Divide of Road Accidents

Distribution	2016			2017		
	Total Accidents	**Persons Killed**	**Person Injured**	**Total Accidents**	**Persons Killed**	**Persons Injured**
Urban Area	2,16,813 (45.1)	57,840 (38.4)	2,12,346 (42.9)	1,95,723 (42.1)	51,334 (34.7)	1,83,703 (39.0)
Rural Area	2,63,839 (54.9)	92,945 (61.6)	2,82,278 (57.1)	2,69,187 (57.9)	96,579 (65.3)	2,87,272 (61.0)
Total	**4,80,652**	**1,50,785**	**4,94,624**	**4,64,910**	**1,47,913**	**4,70,975**

Figures in parentheses indicate the percentage share in the total of the share of the total.

As per 2011 census, 67.8 percent of India's population lives in a rural area and 31.2 percent lives in urban areas. Urban areas have higher population density and more vehicular traffic and therefore more incidences of road accidents as compared to rural areas.

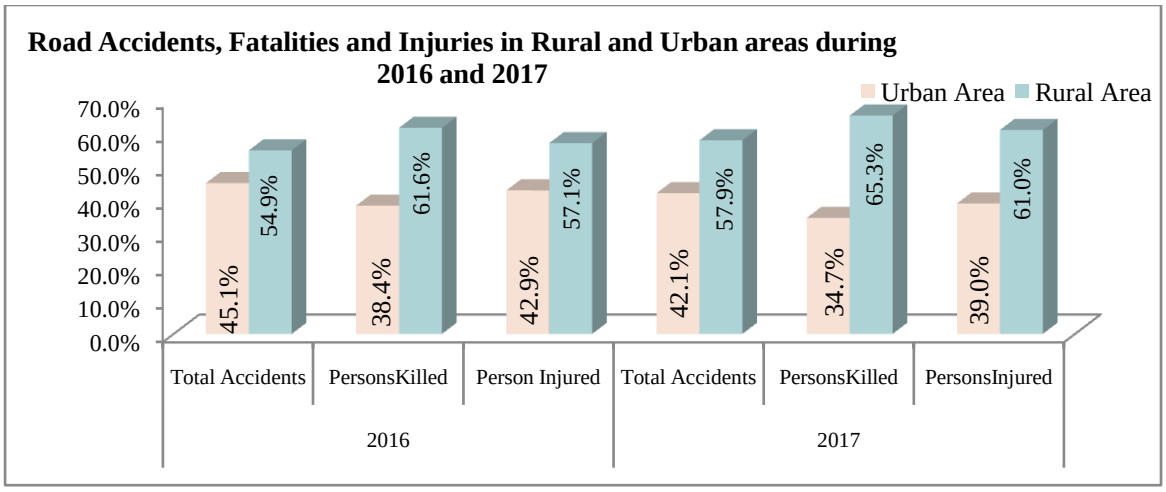


Figure 24. Road Accidents, Fatalities and Injuries in Rural and Urban areas

- In 2017, 42.1 percent of road accidents were recorded in urban areas and 57.9 percent were in rural areas.
- In the case of fatalities, 34.7 percent of the total persons killed in road accidents were in urban areas and 65.3 percent were in rural areas.

2.3.7. Time of Accidents

It is a globally accepted fact that most of the accidents occur during "rush hours". A rush hour or peak hour is a part of the day during which traffic congestion on roads and crowding on public transport is at its highest. Normally, this happens twice every

weekday; once in the morning and once in the afternoon or evening, the times during which most people commute. The term is often used for a period of peak congestion that may last for more than one hour. Most of the accidents occur either in the peak hours or during night times due to lack of visibility and lighting.

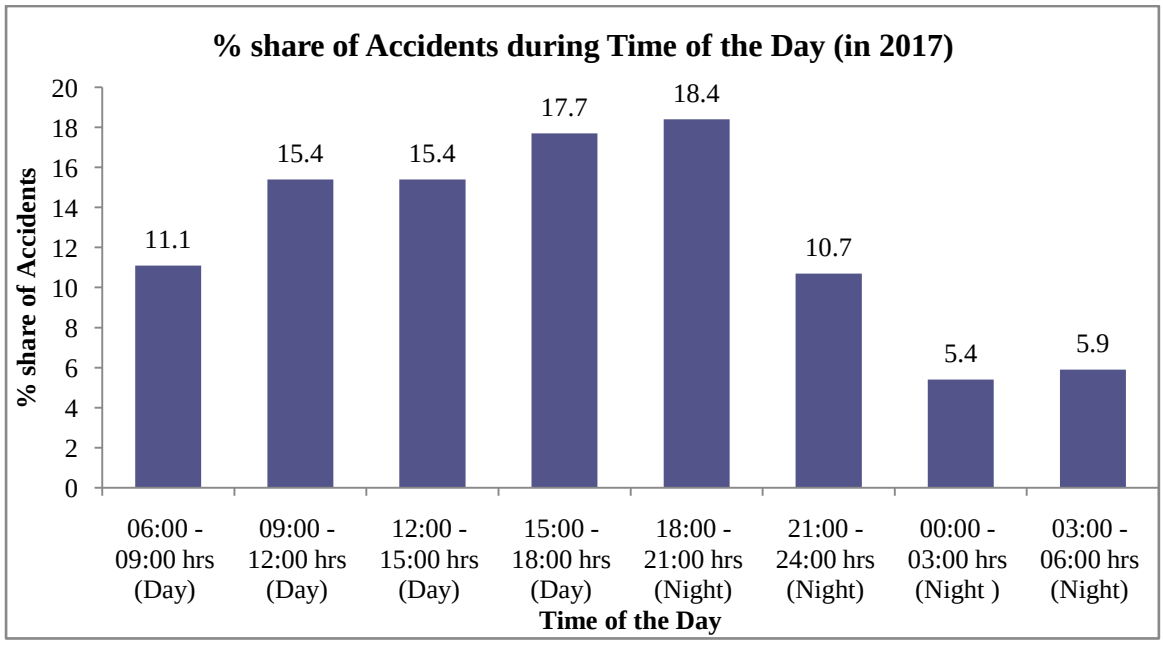


Figure 25. % share of Accidents during Time of the Day

2.3.8. Road-User Category and Profile of Fatal Victims

A road-user is one who uses a road for movement or transportation as a pedestrian or cyclist or motorist (driver and passenger). Road Accidents by Road-User Category and Profile of Fatal Victims examines the composition of victims of road accidents in India in terms of road-user categories.

Accidents pattern on road-user category-wise accident victims helps in highlighting high casualty/ vulnerable categories, which require special attention and treatment. The degree of vulnerability to the impact of road crash differs among different road user categories. Pedestrians and cyclists are considered more vulnerable road users.

Table 14. Road User Category and Profile of Accident Victims

Road-user category	Persons killed 2016	Persons killed in %	Persons killed in 2017	Persons killed in %
Pedestrian	15,746	10.4%	20,457	13.8%
Bicycles	2,585	1.7%	3,559	2.4%
Two-wheelers*	52,500	34.8%	48,746	33.0%
Auto-Rickshaws	7,150	4.7%	7,167	4.8%
Cars, Taxis, Vans & LMVs	26,923	17.9%	26,869	18.2%
Trucks/Lorries	16,876	11.2%	17,158	11.6%
Buses	9,969	6.6%	9,069	6.1%
Other Motor Vehicles (including e-rickshaw)	15,988	10.6%	11,410	7.7%
Others (Animals drawn vehicle, cycle rickshaws, hand carts, & other persons)	3,048	2.0%	3,479	2.4%
Total	**1,50,785**	**100%**	**1,47,914**	**100.0%**

**Two-wheelers include motorcycles, scooters, mopeds and scooty.*

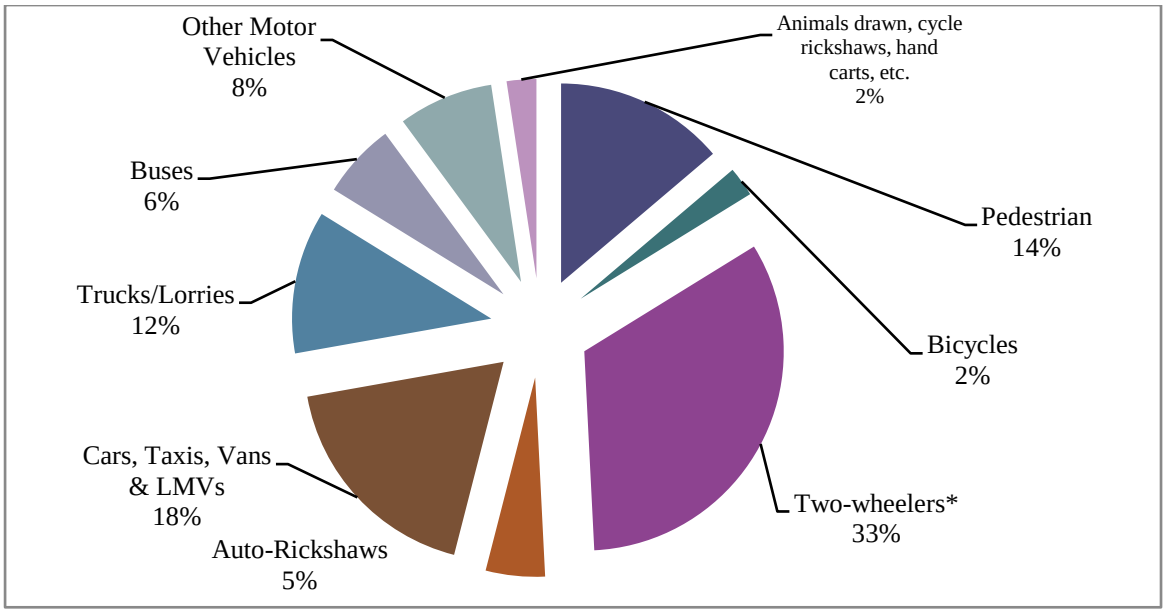


Figure 26. % share of fatalities by road user category

- Among road user categories, two-wheelers constitute the largest number (33%) of road accident fatalities in 2017.
- Pedestrians and cyclists together accounted for 16.2 % of persons killed in road accidents during 2017

2.3.9. The age profile of road accident victims

India is the second most populated country in the world with nearly a fifth of the world's population. Irrespective of the age groups, all road users use the roads to perform their day to day activities and to satisfy their travel demands like to go to schools/ colleges, workplace, daily routine activities, etc,. The following table gives the road accidents and fatalities;

Table 15. The age profile of fatal road accident victims during 2016 and 2017

Age-group	Persons killed in 2016		Persons killed in 2017	
	Numbers	%	Numbers	%
Less than 18	10,622	7.0%	9,408	6.4%
18-25	31,775	21.1%	34,244	23.2%
25-35	38,076	25.3%	39,549	26.7%
35-45	33,558	22.3%	32,788	22.2%
45-60	22,174	14.7%	22,462	15.2%
Above 60	8,814	5.8%	9,384	6.3%
Age not known	5,766	3.8%	79	0.1%
Total	**150785**		**147913**	

Road accident victims largely constitute young people in the productive age groups underscoring major implication on the economic cost of road accidents, apart from their emotional and psychological impact.

Young adults in the age group of 18 - 45 years accounted for the high share of 72.1 percent and working age group, 18 – 60 accounted for a share of 87.2 percent in the total road accident fatalities. 7% of the lives lost are in the age group of 0-18, which contains school children and college students (Future of India).

2.3.10. Accidents by road features

Road features such as sharp curves, potholes, and steep grade tend to be more vulnerable and accident prone because it takes skill, extra care and alertness to negotiate these road features. The following table gives the road accidents and fatalities due to various road features in 2017;

Table 16. Road Accidents, and Fatalities by Road Features in 2017

Road feature	No. of Accidents in 2017		No. of Persons Killed in 2017	
	in Numbers	in %	in Numbers	in %
Straight road	2,98,351	64.2%	91,203	61.7%
Curved road	54,077	11.6%	17,814	12.0%
Bridge	15,514	3.3%	5,543	3.7%
Culvert	11,600	2.5%	4,144	2.8%
Potholes	9,423	2.0%	3,597	2.4%
Steep grade	9,124	2.0%	3,248	2.2%
Under construction Roads	11,822	2.5%	4,250	2.9%
Others*	55,000	11.8%	18,115	12.2%
Total	**4,64,910**	**100.0%**	**1,47,913**	**100.0%**

** Any other feature not covered by the specified road features or not known.*

BOX-7: Road Accidents & Road Features

The data shown that **61.7** percent of fatalities occurred on straight roads, whereas fatalities on curved roads, bridges, pothole roads and at culverts together accounted for only 20.9 percent of the total fatalities.

Road sections where construction works were under-progress has accounted for **2.9** per cent of total fatalities in 2017.

On straight sections of the roads more number of fatal accidents are reported, indicating that the on straight roads, the road users tend to drive with higher speeds and aggressive driving which is one of the main causes for more number of fatal accidents on roads. Hence, the study of various types of causes for the road accidents is a prerequisite.

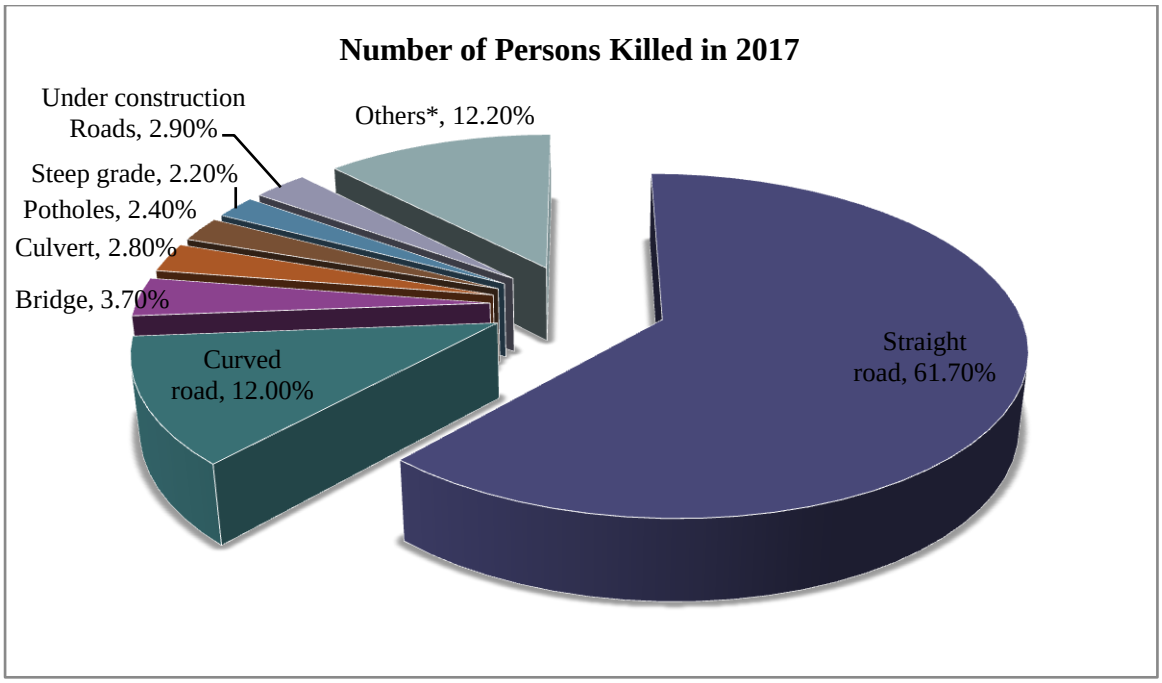


Figure 27. Number of Persons Killed in 2017 due to Different Road Features

2.4. Over Speeding & Other Causes of Road Accidents

Road accidents are multi-causal and are the result of the interplay of various factors, which can broadly be categorized into human errors, road condition/ environment, and vehicular condition. From the perspective of road safety strategy, an objective way to establish the factors responsible for a road accident would be to look into data pertaining to the circumstance under which it has occurred. The aggregate data on different types of traffic violations have been explained hereunder. The following are some of the major causes of road accidents in the Indian scenario.

- Aggressive driving
- Driving on the wrong side
- Drink and Drive
- Using Mobile phone while driving
- Not wearing Helmet
- Not wearing a Seat belt
- Overloading
- Use of Zebra crossing and footpath
- Reflectors on vehicles
- Wrong Overtaking
- Unauthorized parking

(1) Aggressive driving

It is a driving behavior where the driver deliberately places another person (driver/ rider/ passenger/ pedestrian) and/ or property in danger through voluntary actions without regard to safety. This is reflected by several actions of the driver, which can be reckless or dangerous in nature like:

- Over speeding
- Improper or erratic lane changing, zigzag driving
- Following the other vehicle too closely and improperly on a less congested road,
- Driving on a median/footpath,

- Driving too fast, racing,
- Unnecessarily horn honking
- Suddenly changing speeds without changing lanes in case of 4 lane and 6 lane road

(2) **Driving on the wrong side** – Any vehicle driving in the wrong direction

(3) **Not wearing Helmets** – Not wearing helmets among riders and pillion riders on a motorized two-wheeler vehicle

(4) **Overloading** – Excessive overhanging load or carrying passengers more than the permissible limit/capacity of a vehicle

(5) **Not using Proper reflector on vehicles** – Not using reflectors creating poor visibility of the vehicle particularly on trolleys, bull carts especially during nights.

(6) **Not wearing a Seat belt** – Not wearing Seat belt among four-wheeler, small passenger vehicles, buses and truck drivers and passengers on the front seat of the four-wheelers.

(7) **Drink and Drive** – Drink and drive is a serious concern in road accidents.

(8) **Using Mobile phone while driving** – Mobile phone usage while riding or driving a vehicle. It can be talking, texting or listening with earphones while driving/riding.

(9) **Not using zebra crossing and Footpath** – Pedestrians not using zebra crossing and footpath usage for crossing and walking. Use of unauthorized crossings will cause severe accidents

(10) **Wrong Overtaking** – Overtaking of the vehicle from left and across a solid lane marking and at areas with limited/ poor sight distance, curves, speeding vehicle, etc.

(11) **Unauthorized parking** – Parking of vehicles on the carriageway and on shoulders leads to the reduction of the width of the carriageway.

According to the report, "Road Accidents in India – 2017" by Ministry of Road Transport & Highways, Transport Research Wing (TRW, MoRTH), during the calendar year 2017; the causes of road accidents have been studied and a detailed summary of total accidents, persons killed and injured has been given. Based on these statistics and the ground reality in India, road accident statistics reveal that road accident deaths are significant in number and are increasing every year. Total accidents, persons killed and injured due to different causes are as follows;

2.4.1. Traffic Violations:

The number of road accidents, persons killed and injured due to traffic violations like over-speeding, drunk & drive/ consumption of alcohol & drug, driving on the wrong side, jumping red light, use of mobile Phones while driving is happening more and more. Over speeding and driving on the wrong side together accounted for 76.7 percent of total accidents and 73.1 percent of total deaths.

Table 17. Total Accidents, Persons Killed and Injured due to Traffic Violations

Traffic rules violation	No. of Accidents	Persons Killed	Persons Injured
Over speeding	3,27,448 *(70.4)*	98,613 *(66.7)*	34,3083 *(72.8)*
Driving on wrong side	29,148 *(6.3)*	9,527 *(6.4)*	30,124 *(6.4)*
Drunken driving/ consumption of alcohol & drug	14,071 *(3.0)*	4,776 *(3.2)*	11,776 *(2.5)*
Use of mobile phone	8,526 *(1.8)*	3,172 *(2.1)*	7,830 *(1.7)*
Jumping red light	6,324 *(1.4)*	1,826 *(1.2)*	5,977 *(1.3)*
No violation & not known	79,394 *(17.1)*	29,999 *(20.3)*	72,185 *(15.3)*
Total	**4,64,910**	**1,47,913**	**4,70,975**

Note: Figures in parentheses are percentage share in the total of respective columns.

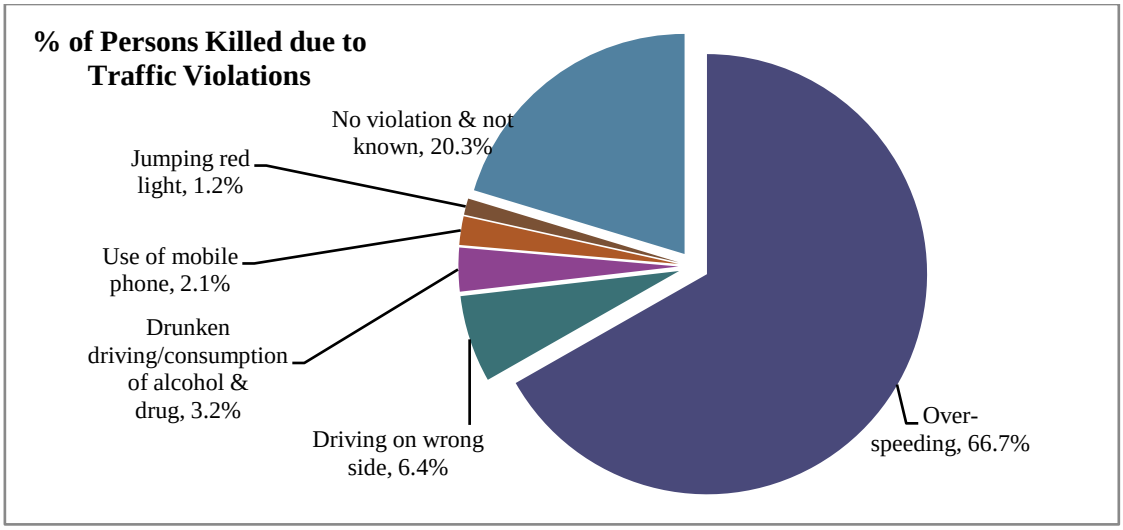


Figure 28. %Share of Persons Killed due to Traffic Violations in India

2.4.2. Load Condition of Vehicles (Overloading/ Hanging)

Overloaded vehicles and vehicles with loads protruding/ hanging are road traffic hazards, leading to high risk of accidents for self and also for other road users also. A total of 55,512 road accidents during 2017 involving overloaded vehicles. Following graph depicts the number of accidents, fatality, and injury in cases involving overloaded vehicles in India.

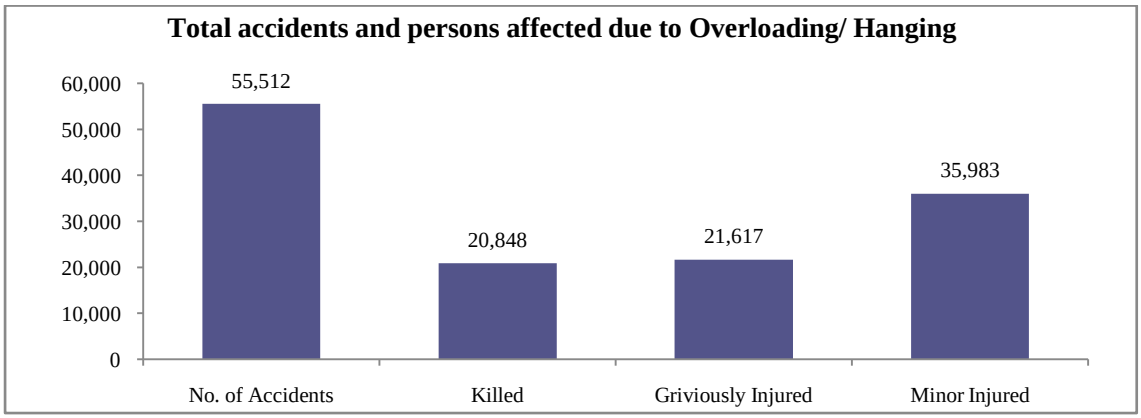


Figure 29. Accidents, persons killed & injured due to Overloading/Hanging

2.4.3. Non-Use of Safety Devices (Helmets and Seat Belts)

Safety devices such as helmets and seatbelts do not prevent accidents but are critical for averting fatal and grievous injuries in an event of road accidents. Helmets are mandatory for all motorists on two-wheelers, barring few exemptions. Seatbelts are mandatory for driver and the person seated in the front seat in vehicles other than two-wheelers and three-wheelers. Following table and graph depicts the number of accidents, fatality, and injury in cases involving overloaded vehicles in India as well as in Tamil Nadu State.

Table 18. Accident Victims due to non-use of safety devices

Non-Use of Safety Device	Non-Wearing of Helmets		Non-Wearing Seat Belt	
	Drivers	Passenger	Drivers	Passenger
Persons Killed	21095	14880	5749	6457
Grievously Injured	18334	18344	7203	15033
Minor Injured	38028	33939	10511	16391
Non-Injured	5498	3773	3348	1010

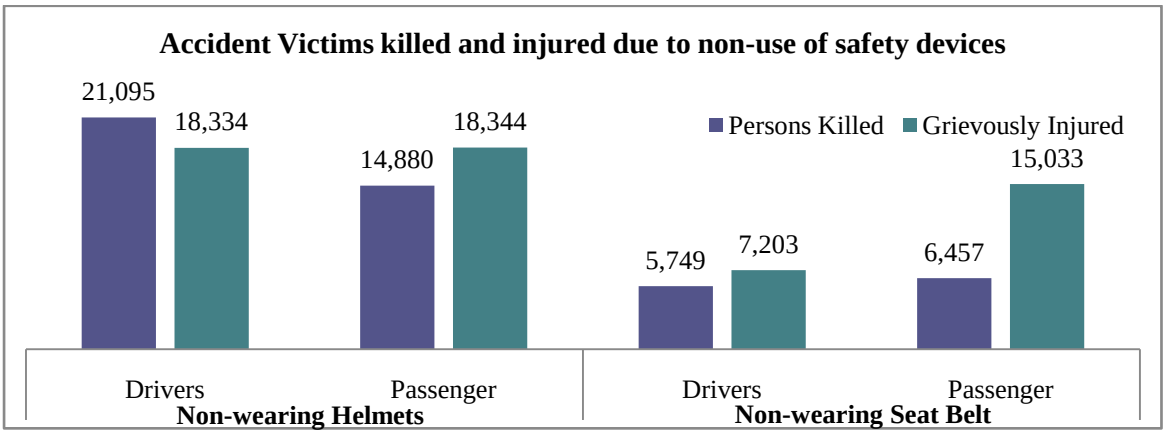


Figure 30. Accident Victims killed and injured due to non-use of safety devices

2.4.4. Drunk and Drive/ Driving under the influence of alcohol and Drugs

Consumption of alcohol affects the vision, coordination, reflexes, judgment of dangers on roads and also encourages associated unsafe practices like speeding, not using helmet and seat belt and traffic violations, thereby increasing the risk of accidents/injuries to self as well as to other road users. Based on these observations and studies, Drunk and Drive/ Driving under the influence of alcohol and Drugs is also considered as one of the main causes of road accidents.

According to the report ***"Advancing Road Safety in India, Implementation is the key, by National Institute of Mental Health and Neuro Sciences",*** an interview-based survey at hospitals has been carried out to find the number of cases recorded in hospitals and deaths caused due to driving under the influence of alcohol & Drugs.

In the report it is stated that;

- Among the 1,48,707 road deaths in 2015, driving under the influence of drug/alcohol contributed for 2% of deaths indicating poor documentation *[Accidental Deaths and Suicides in India [Internet]. National Crime Record Bureau, Ministry of Home Affairs, GOI; 2015.].*
- Nearly 1,46,059 accidents were caused due to dangerous/careless driving and 1.5% of such accidents were due to alcohol use, which resulted in injuries to 6,295 persons and 2,988 deaths *[Accidental Deaths and Suicides in India [Internet]. National Crime Record Bureau, Ministry of Home Affairs, GOI; 2015.]*

- According to MoRTH-2015 report, accidents and deaths caused due to "Intake of alcohol/drugs" accounted for 3.3% (16,298 out of 5,01,423) accidents and 4.6 % (6,755 out of 1,46,133) deaths, respectively *[Ministry of Road Transport & Highways. Transport research wing. Road Accidents in India in 2015.Government of India: 2015. New Delhi]*.
- Hospital-based studies in NIMHANS [Gururaj G, Girish N, Benegal V. Burden and Socio-Economic Impact of Alcohol, the Bangalore Study. Bangalore: WHO and NIMHANS; 2006. (Alcohol Control Series, No 1)."] reported that 28% of injured persons were under alcohol influence (40% of the above had consumed three large drinks).
- A review of 20 hospital-based studies revealed that among RTI victims, those under alcohol influence at the time of crash ranged from 3.3% to 62% as shown in the following Figure.

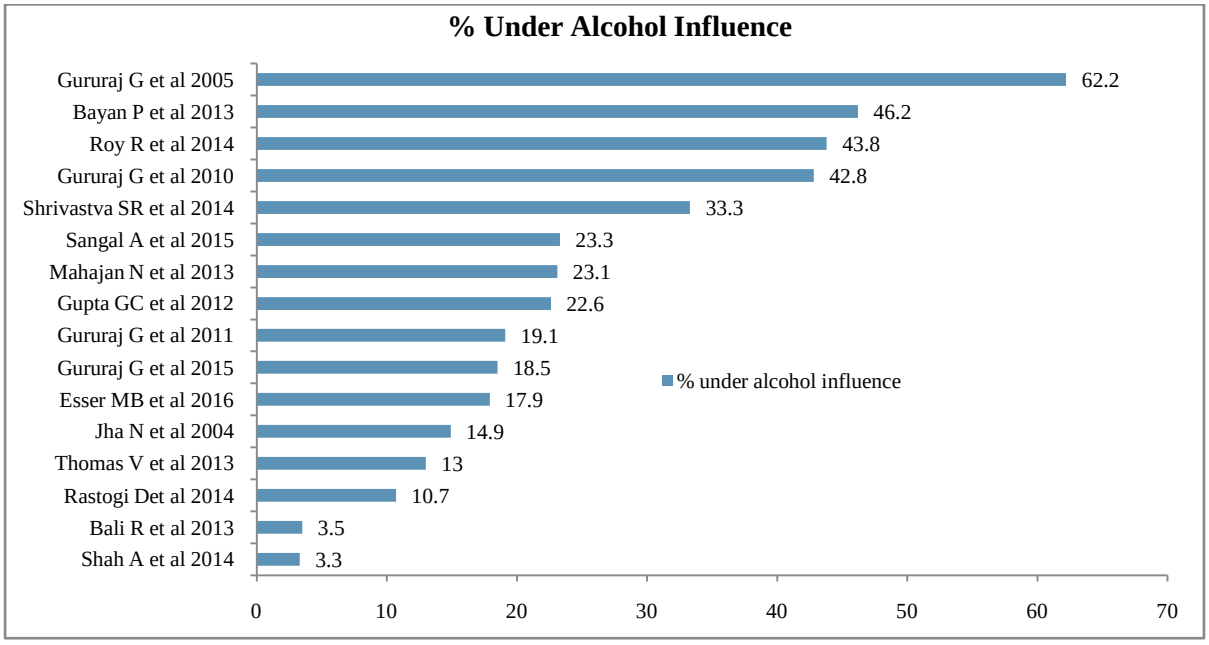


Figure 31. Alcohol use among RTIs: Hospital studies (%)

- Most studies clustered between 18 and 23%, much higher than the reported 3% by MoRTH.

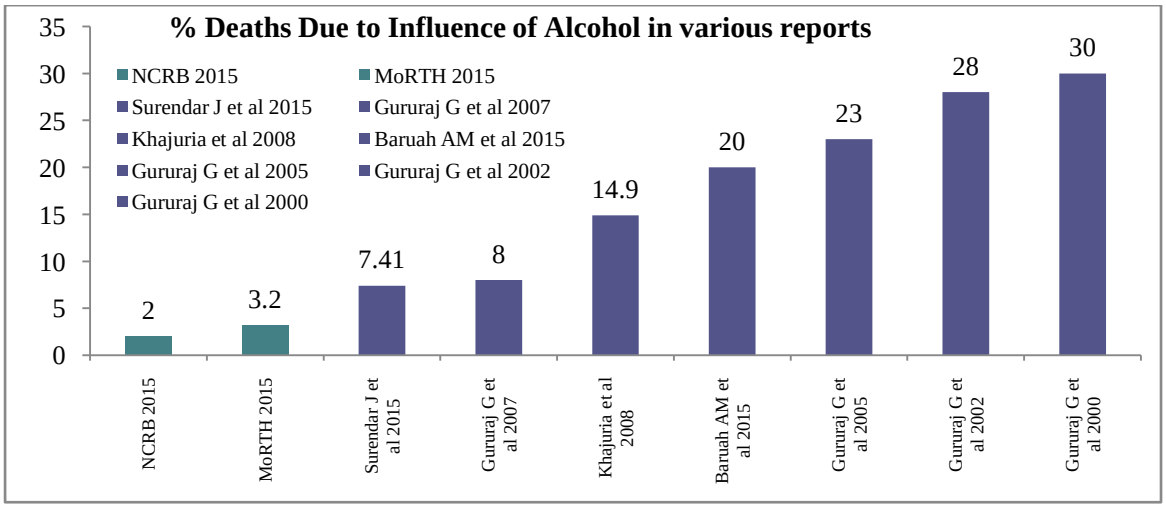


Figure 32. % Deaths Due to the Influence of Alcohol: Studies Vs National reports

2.4.5. Distracted driving

Increased usage of mobile phones into the lives of people coupled with ignorance about the hazardous effects of talking while driving is a risk factor for road crashes. The use of a mobile phone while driving leads to cognitive distraction and can result in accidents. Hence, irrespective of whether the person is using a hands-free (blue tooth, earphone) or handset, the risk of accidents is similar. Distracted cell phone users not only risk their own lives but also that of other road users.

Road Accidents in India 2017, MoRTH report notes that 3,172 persons killed and 7,830 persons injured in 8,526 accidents, due to use of mobile phone while driving. At present, usage of mobiles while driving is an offence and is punishable under the category of dangerous driving vide Section 184 of Motor Vehicles Act. As per the MV (Amendment) act 2019, talking on a mobile phone while driving will attract a fine of Rs 5,000, up from Rs 1,000.

National or local data on cell phone use while driving is not available and mechanism for capturing the data is also not available. However, enforcement is difficult and mechanisms are weak as reported by police authorities. Road side observations on a sample of 145,789 drivers under the BRSP showed that 6.5% of drivers were using cell phones while driving. This was found to be a common practice at traffic intersections as they awaited a change in signals. Many continued talking even after the lights turned green[23].

Studies on road accident victims by Srivastava et al in Kancheepuram reported that 10 % of RTI subjects were using cell phones at the time of crash[24], while Shah et al in Ahmedabad reported the same to be 33 %[25].

Distracted driving with the use of cell phones plug and play devices is also considered as one of the main causes of road accidents.

2.4.6. Conclusion

In conclusion, considering the number of accidents/ deaths attributed to a traffic rule violation, the violations are ranked and with due reference to various studies presented in this section, the top 6 major causes of road accidents and fatalities are listed below:

1. Over speeding
2. Non-use of helmets
3. Non-use of Seat belts
4. Overloading
5. Drunk and Drive/ Driving under the influence of alcohol and Drugs
6. Distracted driving with the use of cell phones plug and play devices

[23] Gururaj G and Bangalore Road safety and injury prevention collaborators. Road Safety and Injury Prevention Programme, Results and Learning, 2007-2010. Bangalore: NIMHANS; 2011. Report No.: 81

[24] Shrivastava SR, Pandain P, Shrivastava SP. Pre-hospital care among victims of road traffic accident in a rural area of Tamil Nadu: A crosssectional descriptive study. 5(1):S33–8

[25] Shah A, Jarwani B. Study of patients of road traffic accidents arriving in emergency department of VS hospital at Ahmedabad, single centre pilot study. NHL Journal of Medical Sciences. 2014 Jul;3(2):23–6.

2.5. Risk Factors for Road Crashes, Deaths, and Injuries

2.5.1. Road related risk factors

India has the second largest road network in the world, which is of different sizes, shapes, construction methods, quality, safety criteria, visibility, and other issues. Amongst these factors, it is acknowledged that safety performance, parameters, and criteria are not given adequate importance at the time of design and construction. Some of the commonly observed road related risks for RTIs in India are

- Faulty design of roads that don't recognize safety
- Poor maintenance of roads
- Absence of segregation of vehicles with different speeds and non-motorized and motorized travelers
- Non surfaced roads
- Potholes
- Slippery roads
- Narrow/steep roads
- Poor visibility of road surface
- Roads that are pedestrian-unfriendly without proper walking and crossing facilities, and most significantly
- Roads that promote speeding beyond limits, etc.

2.5.2. Vehicle-related risk factors

Assessment of vehicle safety is a specialized discipline and the contribution of vehicle-related factors can be delineated by crash investigation and analysis that is lacking in India. Some of the commonly observed road related risks for RTIs in India are:

- Defective brakes
- Defective steering
- Punctured/ bursting of tire
- Bald tire
- Other serious mechanical defects, etc.

2.5.3. Human-Related Risk Factors:

Different Human behaviors can be seen on Indian roads; some of which have proved to be fatal. Human behavior is closely linked to negative outcomes of mobility with respect to road traffic accidents. Human behavior refers to actions of people reactions in different situations and is a product of knowledge, attitude, and belief influenced largely by one's physical, social and knowledge on the safety regulations.

Human behavior is varied, unpredictable, difficult to understand and hard to change and is influenced by numerous factors like age, sex, education, residence, income, social status, values, nature of the product used, mindset, peer influence, and several others.

Human factors can be broadly examined under the categories of

- Modifiable Risk Factors – some biological factors like age are not modifiable and
- Non-modifiable Risk Factors – all other behaviors can be modified or modulated by a variety of approaches.

Some of the important human behaviors that are linked to road crashes are

- Helmet use
- Seat belt use
- Drinking and driving
- Child restraint use
- Speeding
- Distracted driving – cell phone use
- Pedestrian road use behaviors
- Driver Licensing issues
- Drugs and driving, and
- Fatigue and sleeplessness, etc.

Chapter-3

Global Best Practices

3. GLOBAL BEST PRACTICES

3.1. Institutions and Processes

3.1.1. United States of America

3.1.1.1. Statutory Authority

The Department of Transportation was established by an act of Congress on October 15, 1966. The Department's first official day of operation was April 1, 1967.

3.1.1.2. Operating Administrations

FAA - Federal Aviation Administration - Regulating civil aviation to promote safety.

FHWA - Federal Highway Administration - The Federal Highway Administration (FHWA) is an agency within the U.S. Department of Transportation that supports State and local governments in the design, construction, and maintenance of the Nation's highway system.

FMCSA - The Federal Motor Carrier Safety Administration - was established within the Department of Transportation on January 1, 2000, pursuant to the Motor Carrier Safety Improvement Act of 1999 (49 U.S.C. 113). Formerly a part of the Federal Highway Administration, the Federal Motor Carrier Safety Administration's primary mission is to prevent commercial motor vehicle-related fatalities and injuries.

FRA - The Federal Railroad Administration - to promulgate and enforce rail safety regulations, administer railroad assistance programs, conduct research and development in support of improved railroad safety and national rail transportation policy and consolidate government support of rail transportation activities.

FTA - Federal Transit Administration - provides financial and technical assistance to local public transportation systems. The FTA is one of ten modal administrations within the DOT.

NHTSA - National Highway Traffic Safety Administration - is an agency of the Executive Branch of the U.S. government, part of the Department of Transportation. It describes its mission as "Save lives, prevent injuries, reduce vehicle-related crashes". As part of its activities, NHTSA is charged with writing and enforcing Federal Motor Vehicle Safety Standards as well as regulations for motor vehicle theft resistance and fuel economy.

OIG - Office of Inspector General Investigations - complaints or allegations of wrongdoing or misconduct by employees or contractors that involve or give rise to fraud, waste or abuse within the programs or operations.

OST - The Office of the Secretary - oversees the formulation of national transportation policy and promotes intermodal transportation.

BTS - The Bureau of Transportation Statistics – is a part of the United States Department of Transportation, compiles, analyzes, and makes accessible information on the nation's transportation systems. Collects information on intermodal transportation and other areas as needed; and improves the quality and effectiveness of DOT's statistical programs through research, development of guidelines, and promotion of improvements in data acquisition and use. BTS is a principal agency of the U.S. Federal Statistical System.

VOLPE (The National Transportation Systems Center or simply Volpe - is a center of transportation and logistics expertise, operating under the United States Department of Transportation (U.S. DOT),

its work includes a broad mix of projects that cut across traditional transportation modes and technical disciplines including the Federal Aviation Administration's Enhanced Traffic Management System (ETMS) and Safety Performance Analysis System (SPAS), and the Federal Motor Carrier Safety Administration's SafeStat Online. The Center assists federal, state, and local governments, industry, and academia in a number of areas of consultation including human factors research, system design, implementation and assessment, global tracking, strategic investment and resource allocation, environmental preservation, and organizational effectiveness. Volpe is part of the U.S. DOT's Research and Innovative Technology Administration.

3.1.1.3. Motor Vehicle Safety Defects and Recalls

- The National Traffic and Motor Vehicle Safety Act give NHTSA the authority to issue vehicle safety standards and to require manufacturers ***to recall vehicles that have safety-related defects or do not meet Federal safety standards*.**
- Since the Act was enacted in 1966, NHTSA has recalled more than 390 million cars, trucks, buses, recreational vehicles, motorcycles, and mopeds, as well as 46 million tires, 66 million pieces of motor vehicle equipment, and 42 million car seats due to safety defects.
- Manufacturers voluntarily initiate many of these recalls, while others are either influenced by NHTSA investigations or ordered by NHTSA via the courts.
- If a safety defect is discovered, the manufacturer must notify NHTSA, as well as vehicle or equipment owners, dealers, and distributors.
- The manufacturer is then required to remedy the problem at no charge to the owner.
- NHTSA is responsible for monitoring the manufacturer’s corrective action to ensure successful completion of the recall campaign.

3.1.1.4. Commercial Vehicle Enforcement

The Commercial Vehicle Enforcement Division is responsible for enforcing both state and federal regulations (FMCSR’s) on all commercial motor vehicles. Major tasks include conducting Safety Inspections, New Entrant Safety Audits, and Compliance Reviews to ensure compliance with equipment and hours-of-service regulations. The division is also tasked with enforcing Indiana’s size and weight laws and ensure that commercial carriers are properly registered and paying their fair share of fuel tax dollars. The division assists in the investigation of commercial vehicle crashes (post-crash inspections) and manage the annual school bus inspection program.

3.1.1.5. Department of Motor Vehicles

State wise DMV’s issues secure identity documents, deliver the essential motor vehicle and driver-related services, and administer motor vehicle laws enacted to promote safety and protect consumers. In the United States, a department of motor vehicles (DMV) is a state-level government agency that administers vehicle registration and driver licensing. Similar departments exist in Canada under different names. The name "DMV" is not used in every state or area, nor are the traditional DMV functions handled by a single agency in every state, but the generic term is universally understood, particularly in the context of driver's license issuance and renewal.

3.1.2. United Kingdom – UK

3.1.2.1. Department for Transport (DfT)

DfT in the UK carries out driving tests, approves people to be driving instructors and MOT testers, carries out tests to make sure lorries and buses are safe to drive, carries out roadside checks on drivers and vehicles, and monitor vehicle recalls. The DfT Works with 23 agencies and public bodies, DfT's Road Sector related agencies are highlighted;

- **Non-ministerial department**
  - Office of Rail and Road
- **Executive agency**
  - Driver and Vehicle Licensing Agency
  - Driver and Vehicle Standards Agency
  - Maritime and Coastguard Agency
  - Vehicle Certification Agency
- **The executive non-departmental public body**
  - British Transport Police Authority
  - Directly Operated Railways Limited
  - High Speed Two (HS2) Limited
  - Northern Lighthouse Board
  - Transport Focus
  - Trinity House
- **An advisory non-departmental public body**
  - Independent Commission on Civil Aviation Noise
- **Tribunal non-departmental public body**
  - Traffic Commissioners for Great Britain
- **Public corporation**
  - Civil Aviation Authority
  - London and Continental Railways Limited
- **Other**
  - Air Accidents Investigation Branch
  - DfT OLR Holdings Limited
  - Disabled Persons Transport Advisory Committee
  - East-West Railway Company Limited
  - Highways England
  - Marine Accident Investigation Branch
  - Network Rail
  - Rail Accident Investigation Branch

3.1.2.2. DfT's Responsibilities

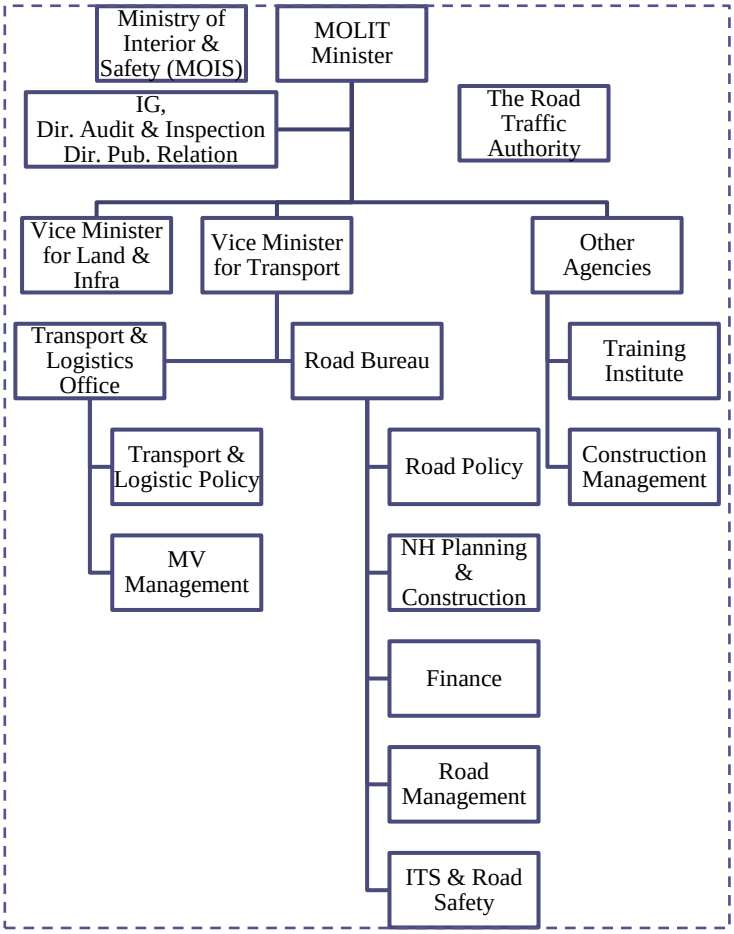
- carrying out theory tests and driving tests for people who want to drive cars, motorcycles, lorries, buses and coaches, and specialist vehicles
- approving people to be driving instructors and motorcycle trainers, and making sure they provide good-quality training
- approving people to be MOT testers, approving the centers they work in, and testing lorries, buses, and coaches ourselves
- carrying out roadside checks on commercial drivers to make sure they follow safety rules and keep their vehicles safe to drive
- monitoring recalls of vehicles, parts, and accessories to make sure that manufacturers fix problems quickly
- approving training courses for qualified drivers, such as Driver Certificate of Professional Competence courses for lorry, bus and coach drivers, and drink-drive rehabilitation courses
- supporting the Traffic Commissioners for Great Britain and the Northern Ireland transport regulator to license and monitor companies who operate lorries, buses, and coaches, and to register local bus services

3.1.3. Republic of Korea – ROK

The Ministry of Land, Infrastructure, and Transport (MOLIT) was first established in 1948 with the name of the Ministry of Transportation.

After, it was renamed as the Ministry of Construction, Ministry of Construction and Transportation and the Ministry of Land, Transport and Maritime Affairs.

In 2013, the Ministry was reorganized and newly named as the Ministry of Land, Infrastructure, and Transport.



3.1.3.1. MOLIT Statistics System

MOLIT Statistics System (http://stat.molit.go.kr) is Ministry of Land, Infrastructure, and Transport (MOLIT)'s one-stop statistics portal that provides major statistics of land and transport, including national territory, housing, land, water resources, **roads, transport**, aviation and railways. The Ministry has reorganized and expanded the English page of MOLIT Statistics System that was once a limited version of the system to contain all 48 approved statistics in the land and transport

BOX-8: Safety e-Report by MOIS-RoK

The MOIS is providing Safety e-Report services through smartphone application and Internet portal for the public to easily report risk factors in daily life and check the progress.

Items for safety report

It includes all the fields like the daily lives, transport, facility, school and children, as well as hardware and software including practices, laws and systems.

The report covers all the risk factors in the public safety like facilities, transport, schools, lives and maritime affairs and the reported contents are linked and processed with the e-people service. * Call 119 for emergency fire, rescue and saving lives and 112 for the security.

sectors, and to ensure better, faster access to the statistics with constant updates.

3.1.3.2. KoROAD

The Road Traffic Authority was established in 1954

- to protect people's precious lives and property from traffic accidents
- to reduce the number of traffic accidents in half by
    - providing traffic safety training,
    - constant traffic equipment and facility checks,
    - development of new and advanced traffic related technology,
    - providing traffic information through our broadcasting service, etc.

Since the beginning of 2011, the 26 nationally distributed driver's license branch offices have been integrated into KoROAD organization thus becoming the undisputable main authority on road traffic management.

3.1.4. Australia

3.1.4.1. Department of Infrastructure, Regional Development, and Cities

The Department provides policy advice, programs, and regulation across a wide range of areas including:

1. Infrastructure planning and coordination
2. Infrastructure and project financing
3. National policy on cities
4. Population policy
5. Transport safety
6. Land transport
7. Civil aviation and airports
8. Maritime transport
9. Major projects
10. Territory reforms and service delivery
11. Regional development policy coordination
12. Local government programs

3.1.4.2. Transport

The department provides strategic policy advice to assist the government to shape the framework underpinning road, rail, maritime and aviation transport in Australia. Through its central office located in Canberra and its regional office network, the department provides a diverse range of day-to-day services to the transport sector and the community.

- **National Transport Commission:** The National Transport Commission (NTC) was established in 2003 with ongoing responsibility to develop, monitor and maintain uniform or nationally consistent regulatory and operational reforms relating to road, rail and intermodal transport. It performs the role of an expert adviser to the Transport and Infrastructure Council (the Council) on national regulatory reform development, implementation, and evaluation in the Australian land transport sector.

- **Governance:** The Council, a ministerial council formed by the Council of Australian Governments **(COAG),** is responsible for the NTC. The NTC is established by **the** ***National Transport Commission Act 2003*** and is subject as an authority to the ***Public Governance, Performance and Accountability Act 2013*****.** The Department has portfolio responsibility for the NTC Act, and to conduct periodic reviews of that legislation within the context of the Intergovernmental Agreement.

- **Legislation & Regulation:**
  - **Heavy Vehicle Regulation:** On 10 February 2014, the Heavy Vehicle National Law, covering all heavy vehicles over 4.5 tones, commenced in Queensland, NSW, Victoria, Tasmania, SA, and the ACT.
  - **Australian Road Rules:** The Australian Road Rules were implemented in 1999 and have been regularly updated since then. Each state and territory adopts the Australian Road Rules in its own legislation.
  - **Austroads Registration and Licensing Task Force:** The Department of Infrastructure and Regional Development participates in the Austroads Registration and Licensing Task Force, which brings together state and territory vehicle registration and driver licensing authorities.

- **Driver Licensing:** Under Australia's federated system, transport responsibilities are distributed between the Commonwealth Government and state and territory governments. The responsibility for the regulation and enforcement of road use, including light vehicle driver licensing, rests with the state and territory governments
- **Dangerous Goods:** The Australian states and territories have responsibility for the road and rail transport of dangerous goods in Australia. For technical information on the transport of dangerous goods by road and rail in Australia,

3.1.4.3. Roads

The Department advises the Government on transport reform and innovations to improve road transport efficiency, productivity, safety, and environmental performance. The Department also provides a diverse range of day-to-day services to the road transport sector and the community.

3.1.4.4. Road Safety

- The Australian Government is responsible for regulating safety standards for new vehicles, and for allocating infrastructure resources, including for safety, across the national highway and local road networks.
- State and territory governments are responsible for funding, planning, designing and operating the road network; managing vehicle registration and driver licensing systems, and regulating and enforcing road user behavior.
- Local governments have responsibilities for funding, planning, designing and operating the road networks in their local areas.
- Department of Infrastructure, Regional Development and Cities has a range of functions that support the Australian Government's role in road safety. These include: administering vehicle safety standards for new vehicles, administering the National Black Spot Program and other road funding, administering the *keys2drive* program, producing national road safety statistics, and coordinating the *National Road Safety Strategy 2011–2020*.
- **National Road Safety Strategy:** The National Road Safety Strategy 2011–2020 represents the commitment of federal, state and territory governments to an agreed set of national goals, objectives and action priorities; setting out a path for action to reduce fatal and serious injury crashes on Australian roads.
- **National Road Safety Forum 2015:** The forum had a particular focus on technology's role in road safety; workplace safety and the importance of partnerships.
- **A decade of Action for Road Safety 2011–2020:** The Decade of Action for Road Safety 2011-2020 was launched on 11 May 2011 with rolling 24-hour events in each of the world's time zones, including an Australian launch at Parliament House, Canberra.
- **Driveway Safety:** Driveway safety was a focus of the 2012 National Road Safety Forum. The forum considered the role of vehicle safety technologies, driver education and awareness campaigns, parental awareness and closer supervision, and housing design measures, and concluded that all of these approaches are important. This page provides further information about a number of these activities.
- **Seatbelts on Regional School Buses**: In the May 2015 Budget, the Australian Government (the Government) announced that the Seatbelts on Regional School Buses program would terminate on 30 June 2015.
- **Keys2drive:** Keys2drive is a learner driver program run by the Australian Automobile Association (AAA) and funded by the Australian Government. It aims to

encourage learner drivers to get more, and better quality, on-the-road experience, and to assist their supervising drivers (mainly parents) to become better informed and more confident.

3.1.4.5. Vehicles

The Motor Vehicle Standards Act 1989 (the Act) controls the safety, the environmental and anti-theft performance of all vehicles entering the Australian market for the first time—both new and used.

- **The Road Vehicle Standards Act 2018 (RVSA**) introduces a Register of Approved Vehicles (RAV), which will be an online, publicly searchable, database of vehicles approved for use on Australian roads.
- **Vehicle Safety Standards (VSS)** Branch administers the Motor Vehicle Standards Act 1989 (MVSA), which sets vehicle standards for all new vehicles entering the Australian market and regulates the supply to the market of used vehicles.
- The Australian Government maintains jurisdiction over road vehicles up to the point of first supply to the Australian market (i.e. manufacture or importation). Once a vehicle has been supplied to the market, it is "in-service". State and Territory Governments are responsible for continued regulation after this point.
- The Road Vehicle Standards legislation has passed Parliament and received Royal Assent on 10 December 2018.
- **Australian Competition and Consumer Commission (ACCC**) in monitoring the progress of motor vehicle recalls.

Federal Interstate Registration Scheme

- The Federal Interstate Registration Scheme (FIRS) was established under the Interstate Road Transport Act 1985 and commenced in 1987 as an alternative to state-based registration for heavy vehicles weighing more than 4.5 tones. FIRS provides uniform charges and operating conditions for heavy vehicles engaged solely in the interstate carriage of passengers or goods, in trade or commerce, or for any purpose that is incidental to the carriage of that kind.

Heavy Vehicle Road Reform

- The Australian Government is working with state, territory and local governments, as well as industry and community stakeholders, to progress Heavy Vehicle Road Reform.
- The ultimate goal of heavy vehicle road reform is to turn the provision of heavy vehicle road infrastructure into an economic service where feasible.

3.1.5. Germany

3.1.5.1. Executive Team

- The Ministry is headed by the Federal Minister of Transport and Digital Infrastructure. He coordinates and is responsible for the work of the department. The directorates-general and their responsibilities.
    - The Executive Team at the Federal Ministry of Transport and Digital Infrastructure comprises three units: the Federal Minister, parliamentary state secretaries, and permanent state secretaries.
        - The Ministry is headed by the Minister. He is appointed by the Federal Government. The Federal Minister coordinates and is accountable for the work of the department, which comprises the Ministry and a total of 63 executive agencies. He is responsible for all aspects of German road, rail, and waterway and aviation policy and for the roll-out of digital infrastructure.

(Source: https://www.bmvi.de/EN/The-Ministry/Federal-Minister-State-Secretaries/federal-minister-and-state-secretaries.html)

3.1.5.2. The directorates-general and their responsibilities

1. **Federal Ministry of Transport and Digital Infrastructure**: The Policy Issues Directorate-General develops strategic policies to ensure that federal transport infrastructure planning is demand-responsive and projects to be delivered.
2. The Aviation Directorate-General deals with national and international aviation and aviation policy matters, airports and safety in air transport. With the help of the Federal Aviation Office (LBA),
    - Federal Supervisory Authority for Air Navigation Services (BAF),
    - the German Federal Bureau of Aircraft Accident Investigation (BFU) and the German Air Navigation Services (DFS),
    - the directorate-general facilitates the smooth flow of air traffic in Germany, provides for the safe operation of German air carriers and takes into account all environment-, noise- and consumer protection-related concerns
3. The Waterways and Shipping Directorate-General is the highest federal authority of the Federal Waterways and Shipping Administration, which is responsible for the maintenance and upgrading of the waterways.
4. The Land Transport Directorate-General is responsible for all issues relating to rail and road transport.
5. The Road Traffic and Transport Directorate: deals with subjects such as obtaining a driving license, road user behavior, the registration of vehicles including the technical requirements and commercial passenger and freight transport. At the same time, the Road Safety Programme is constantly updated.
6. The Road Construction Directorate-General is responsible for maintaining the structural integrity of the road network for which the Federal Government is responsible. This currently comprises around 12,800 km of federal motorways and approximately 40,000 km of federal highways.

7. **Roads:**
    - **Public Transport:** "The quality of local public transport is a benchmark for the quality of life in our cities and rural areas. Local public transport has to be attractive, safe, secure, reliable and affordable".
    - In **Germany, there are approximately 75 integrated transport authorities**; the **Association of German Transport Companies** (VDV) alone comprises about 450 local public transport companies. Calculations indicate that just under 400,000 permanently secure jobs result directly or indirectly from local public transport services.
    - **Federal Government's transport policy on Safety in 2011** is to facilitate safe mobility for all citizens
    - Driving Licenses: In this deals with Schedule of fines and penalties, New Driver Fitness assessment system, foreign driving licenses in the federal republic of Germany.
8. **Road Safety:** The Federal Government, in cooperation with numerous groups and institutions engaged in road safety, has been conducting intensive and successful road safety activities.
    - New road safety campaign launched by the Federal Ministry of Transport and Digital Infrastructure (BMVI) and the German Road Safety Council (DVR)
    - The "Runter vom Gas" campaign was launched by the Federal Ministry of Transport and digital infrastructure (BMVI) and the German Road Safety Council (DVR).
    - Since 2008, "Kill your speed" has been addressing road users in an emotional way, raising awareness for the risks in road transport and numerous reasons for accidents. Their aim is to make roads in Germany safer. 3,180 persons were killed in road accidents in 2017. In 2011, there were 4,009 fatalities. The same year, the objective of 40 percent fewer road deaths by 2020 was defined in the **National Road Safety Programme.**
9. **Vehicles:** Appointed President of Federal Motor Transport Authority (in German: Kraftfahrt-Bundesamt (KBA)) on June 15th, 2004.
    - Kraftfahrt-Bundesamt (KBA) - Federal Motor Transport Authority will develop the necessary technical and organizational structures. This includes, in particular, the establishment and operation of the infrastructure charge register
    - Type of Approvals: Safe and environmentally friendly road traffic requires safe and clean vehicles. Type-approvals confirm that legal safety and environmental standards are fulfilled.
    - Test laboratories: Under KBA
    - Certification bodies and vehicle registrations, Vehicle inspections and all related to Motor vehicles under KBA
    - German Road Traffic Licensing Regulations) and of individual approvals and assessments of road, vehicles are statistically evaluated by the KBA.
    - These tasks are allocated to the Kraftfahrt-Bundesamt by laws and ordinances
    - The Federal Office for Goods Transport (BAG) will cooperate with the private operator to establish the enforcement infrastructure, procure the needed enforcement vehicles and employ and train the necessary personnel.

Refer https://www.kba.de/EN/Home/home_node.html

10. Highway:

The Federal Highway Research Institute (BASt) is the practice-oriented, technical-scientific research institute of the German Government in the field of road engineering. It is dedicated to a wide range of tasks, which result from the relationships between roads, humans and the environment.

Its mission is the improvement of safety, environmental compatibility, efficiency and performance relating to roads.

- The BASt provides the Federal Ministry of Transport and Digital Infrastructure (BMVI) with scientifically valid aids as decision support in technical and transport policy issues.
- BASt also includes consultancy, attestation and inspection, and certification activities as well as functioning as the driving license procedure assessment center.
- It was established in 1951 and has been based in Bergisch Gladbach since 1983. Since 1970, the BASt has been the central point for road traffic accident research in Germany.
- High authority President of the Federal Highway Research Institute

Referhttps://www.bast.de/BASt_2017/EN/Home/home_node.html

11. Legislation:

- The road haulage law is characterized by national and European regulations as well as intergovernmental agreements.
- on the national level, the road haulage law (GüKG), the regulation on the border of goods by road and cabotage (GüKGrKabotageV), the Job Access Regulation for road haulage (GBZugV), the regulation for the implementation of the transport companies file for the road transport law(VUDat-DV), the cost of regulation for the road haulage and
- At European level: Regulation (EC) 1071/2009 laying down common rules on admission to the occupation of road transport operator and repealing Council Directive 96/26 / EC, Regulation (EC) 1072/2009 on common rules for access on the international road haulage market and Directive 2006/1 / EC on the use of non-driver hired transport vehicles.
- There are numerous bilateral transport agreements between Germany and other states, as well as the CEMT resolution (Resolution of the Council of Ministers of the European Conference of Transport Ministers (CEMT)) for government officials and transport operators on the use of the Multilateral CEMT Contingent of 01 January 2009 (BGBl 2010 II, page 297).
- Authorization and licensing authorities are the authorities authorized by the respective state governments of the federal states at the seat of the applicant. Bilateral permits for Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Ukraine, Uzbekistan, Switzerland, Belgium, Estonia, Finland, Latvia, Lithuania, and the Netherlands and CEMT permits are issued by the permit issuance of the Federal Office in Berlin

Refer: https://www.bag.bund.de/SharedDocs/Kurzmeldungen/DE/2019/CEMT_GB.html
(Source: https://www.bmvi.de/EN/The-Ministry/Responsibilities-Structure/responsibilities-and-structure.html)

3.2. Comparison with international best practices

*In most of the developed countries, focused and scientific research is carried out on road safety and road crash injury prevention. These countries have specialized bodies to plan adequate resources and administer the activities required to improve road safety. However, there is no such **full-time dedicated agency** in India to deal with road safety issues.*

- *In most of the developed countries,* have specialized bodies to plan adequate resources and administer the activities required to improve road safety. *Focus and scientific research is carried out on road safety and road crash injury prevention.*
- *such a dedicated agency in India to deal with the road safety issues is not established*
- Though Ministry of Road Transport and Highways is the administrative ministry responsible for road safety efforts in the country, it does not have enforcement machinery of its own and other technical resources required to ensure better road safety activities.
- In India. Government bodies concerned for road safety issues which are
    - Transport Department of the State Governments,
    - Automobile testing agencies,
    - Highway construction and maintenance agencies, etc.
- In India, it is necessary to check whether the design, construction and maintenance standards of highways are being thoroughly followed by both the Government and concessionaires.

Table 19. Comparison of Institutional Set-Up

#	Description	USA	UK	ROK	AUS	IND
	National/ Federal/ Central Department or Ministry	U.S. Department of Transportation (US DOT)	Department for Transport (DfT)	Ministry of Land, Infrastructure, and Transport (MOLIT)	Department of Infrastructure, Regional Development, and Cities	Ministry of Road Transport and Highways (MoRTH)
Safer Roads	National/ Federal Highway Agency or Department Audits Operations	• Federal Highway Administration (FHWA)	• Highways England • Transport Scotland • The Welsh Govt.	• Road Bureau: NH Planning, Construction & Management		• National Highways Authority of India
Safer Vehicles	Vehicle Standardization/ Certification etc…	• National Highway Traffic Safety Administration (NHTSA) • States' Department of Motor Vehicles (DMV)	• Department for Transport (DfT) ▪ Driver and Vehicle Standards Agency ▪ Vehicle Certification Agency	• Transport & Logistics Office: Motor Vehicles Management	• Vehicle Safety Standards (VSS) Branch	• Bureau of Indian Standards (BIS) • Automotive Industry Standards Committee (AISC) • Vehicle Research Development & Establishment (VRDE) • Central Institute of Road Transport (CIRT)
	Vehicle Registration & Fitness	• States' Department of Motor Vehicles (DMV)	• Department for Transport (DfT)	• Transport & Logistics Office: Motor Vehicles Management		• States' Regional Transport Authorities
Safer Road User	Driver's License	• States' Department of Motor Vehicles (DMV)	• Department for Transport (DfT)	• KoROAD: The Road Traffic Authority		• States' Regional Transport Authorities

#	Description	USA	UK	ROK	AUS	IND
Enforcement	Traffic Law Enforcement	• State Troopers • Highway Patrol • DMV • Traffic Police • Office of Inspector General Investigations (OIG) • Commercial Vehicle Enforcement Division • Local Enforcement Agencies etc.	In the United Kingdom, traffic policing on highways is the responsibility of the road policing unit of the territorial police force. In addition to which, Traffic Officers of Highways England, also enforce traffic laws on the Highways England's **Motorways & A-Roads.**	• Ministry of Interior & Safety (MOIS) • Traffic Police	In Australia, traffic policing is the responsibility of the state police forces. Each force has its own traffic sections, often a local section in each area and a statewide section. There are dedicated highway patrols.	In India, traffic policing on highways are carried out by state police forces. However, they are not dedicated to traffic law enforcement only.

3.3. Global Practices with respect to 4 pillars of Road Safety

The European Union has come a long way in road safety and achieved incredible results: over the last 15 years, they have cut down the fatality rates by more than 50 %. However, despite this progress, there are still 70 people a day who lose their lives on roads but more work needs to be done to make safer roads and no fatalities. Safer roads for all the EU Good Practice Guide, European Union, 2017, discusses a mix of measures like education and enforcement; as well as new and innovative solutions, especially when it comes to vehicles and infrastructure.

Education is a crucial contrivance in promoting road safety. Human errors contribute around 90 % of fatal crashes. Improvement of road users' behavior, at the same time, effective enforcement is the key to tackling the reckless minority who risks others' and their own lives on the roads.

Another critical component of road safety is making sure that the infrastructure and vehicles are forgiving to human mistakes.

Safer vehicles have played a significant role in reducing the casualty toll. Research is still continuing to identify new safety features that will save even more lives. The real game changer in the medium run will be innovation, especially in automation.

3.3.1. Global Responses to a Global Challenge

The United Nations' Decade of Action for Road Safety, launched in 2011, addresses global road death and injury as a major public health problem with a broad range of social and economic consequences, closely linked to the UN development objectives. Today's sustainable development goals include the objective to halve the number of global deaths and injuries from road traffic accidents by 2020.

3.3.2. Road Safety in the EU

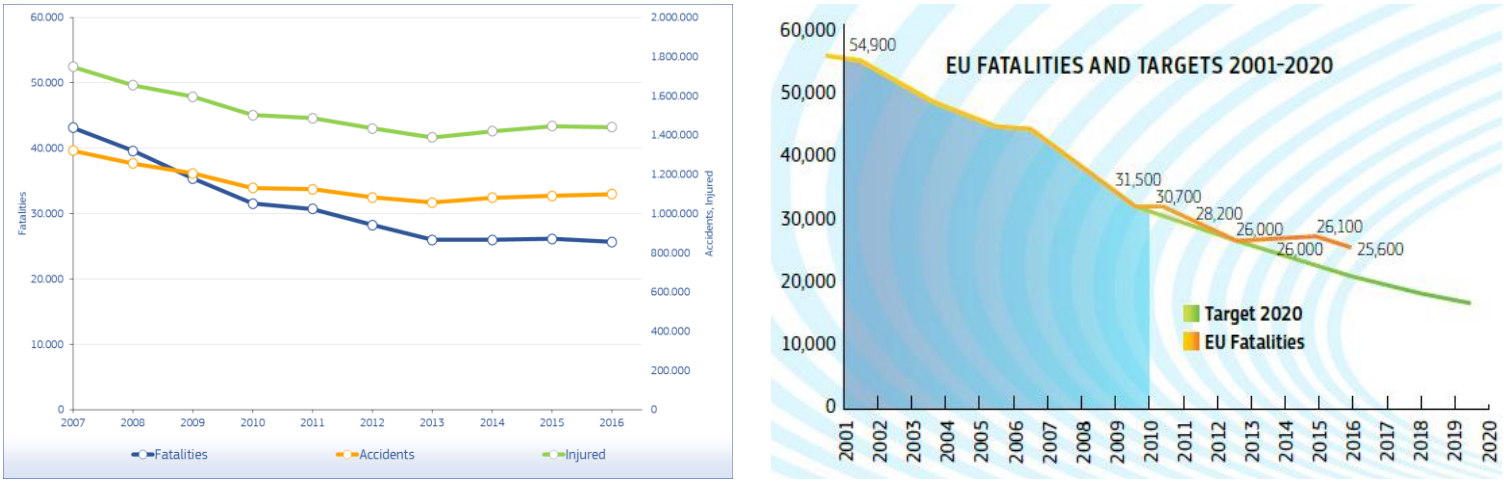


Figure 33. EU Road Accidents, Fatalities & Injuries

European roads remain the safest in the world: with 50 road fatalities per one million inhabitants – this is the lowest fatality rate out of all world regions. Between 2001 and 2010, the EU cut the number of road deaths by 43 % and between 2010 and 2016 by another 19 %. In 2016, 25,600 people lost their lives on EU roads, 500 fewer than in 2015

and 5,900 fewer than in 2010. In 2016, after two years of stagnation, the data suggests that Europe is getting back on track showing a 2 % decrease in fatalities. While this is encouraging, it is unlikely to be sufficient to meet the target of halving road fatalities between 2010 and 2020. This calls for further efforts from the national and local authorities, which deliver most of the day-to-day actions, such as enforcement and awareness-raising.

3.3.3. What is EU Doing for Safer Roads?

The EU success story is the result of many contributing factors: making road safety a political priority; broad cooperation across borders for a true European road safety area; adoption of the 'safe system' approach and the 'vision zero' perspective; target setting, data collection and continuous monitoring of results; and dedicated actions ranging from education and awareness campaigns to legislative action and safety focused technical vehicle regulations.

The EU has created a framework for improved road safety with legislation and recommendations:

- minimum requirements for the safety management on the Trans-European Transport Networks;
- technical requirements for the safe transport of dangerous goods;
- the Cross-Border Enforcement Directive tackling driving offenses committed abroad;
- common rules on roadworthiness testing to decrease the number of traffic accidents caused by technical failures;
- training requirements for professional drivers contributing to higher road safety standards and facilitating the mobility of professional drivers (and a new proposal on the way);
- the infrastructure safety and tunnel safety directives (reviews also underway);
- vehicle safety rules which are also being updated and which will soon integrate new life-saving technologies.

3.3.4. EU's Good practices in Road Safety[26]

3.3.4.1. In countries with different performance levels

Sweden: The Vision Zero Approach: The most remarkable road safety policy in Sweden is Vision Zero, a strategic approach towards a safe system, which envisages no one being at risk of fatal or severe injury while using road transport. The Vision Zero approach is based on an ethical foundation, creating and supporting a totally new perspective on the road safety problem and the approach to solving it.

The Vision Zero approach aims at a more forgiving road system that takes human fallibility and vulnerability into account: the whole transport system is designed to protect people from death and serious injury. It accepts that people make mistakes and that they are vulnerable. Those who design the road system and those who use the roads must share

[26] Safer Roads for All, The EU Good Practice Guide-2017, EU Commission

responsibility for creating a road system where crash forces do not result in death or serious injury.

Lithuania: Implementing EU Best Practices: Lithuania has adopted a national road safety program for the period 2011-2017, a long-term 'Vision Zero' perspective and a strategic target for 2017: to reach a fatality rate of no more than 60 per million inhabitants. Lithuania has tried to catch up with better-performing countries, mainly by improving road users' behavior, introducing safer vehicles and developing safer infrastructure. It introduced stricter rules for drink-driving than most other EU countries: a maximum level of 0.2 ‰ of blood alcohol content for novice and professional drivers and 0.4 ‰ for all other drivers; and the compulsory use of helmets for cyclists under the age of 18. In parallel, Lithuania has paid particular attention to the proper enforcement of traffic rules (speeding, seat belt use, and drink-driving) as well as to education. However, there remains a lot to do for the safety of vulnerable road users, such as pedestrians who are disproportionately affected in fatal crashes.

Spain: Education and Enforcement: Spain recorded 64 % fewer road deaths in 2013 than in 2004 and 69 % fewer road deaths on motorways. These impressive results followed a comprehensive set of measures, including the introduction of a penalty point system, the deployment of an extensive network of safety cameras and stricter sanctions for traffic offenses. Because the evidence showed a substantial drug-driving problem, Spain has implemented changes in legislation and introduced a new surveillance program for drug use. In 2014, nearly 70,000 drug tests were carried out on drivers.

After the publication of the preliminary 2016 figures showing no decrease in the number of road deaths, Spain has announced in January 2017 an urgent action plan with concrete measures to increase safety on the roads, including better signing and the introduction of new safety cameras on the Spanish roads.

3.3.4.2. Implementing new ideas for vehicle safety

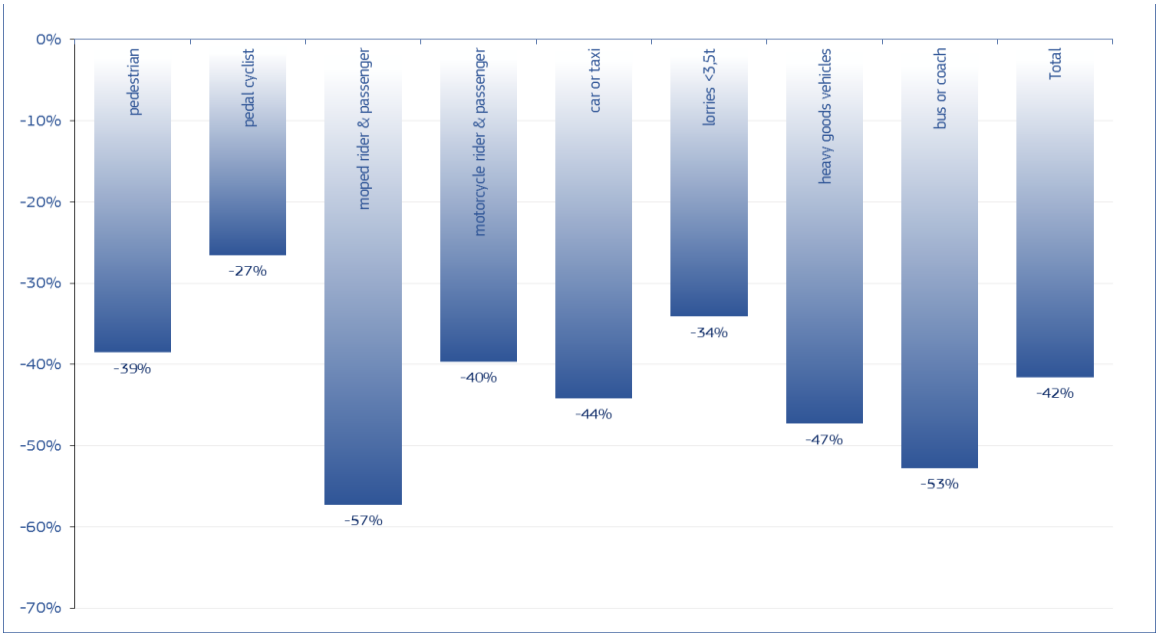
The Euro: NCAP (New Car Assessment Programme) Rating: The European New Car Assessment Programme is a European car safety performance assessment program based in Brussels, founded in 1997 by the Transport Research Laboratory for the UK Department for Transport, and backed by several European governments, as well as by the European Union.

More than 78,000 lives have been saved since Euro NCAP's crash safety tests were launched 20 years ago. Euro NCAP has published over 630 safety ratings, crash-tested some 1,800 cars and collectively spent over 160 million Euro to make cars safer. Backed by international federations, European governments, and the EU, the first Euro NCAP crash test results were revealed in February 1997.

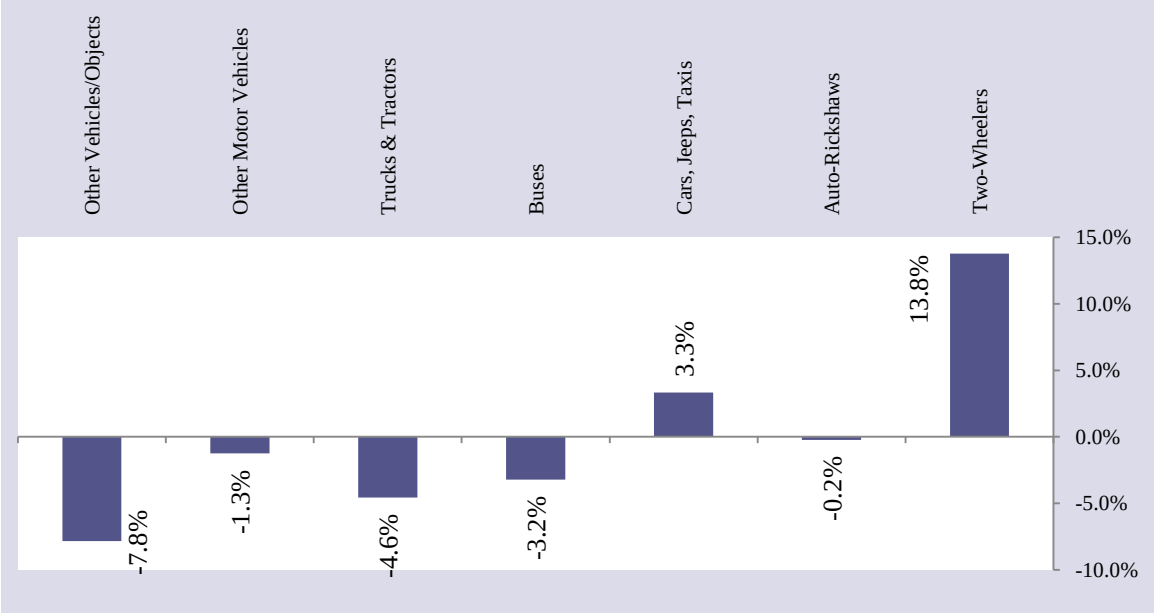
It was the first time that realistic; like-for-like tests were conducted in Europe by independent experts. The first tests exposed safety failings in top-selling family cars, forcing a fundamental rethink in the way vehicles were designed to prevent accidents and save lives. Twenty years on, 9 out of 10 cars sold on the European market hold a Euro

NCAP rating, and the motor industry actively supports the development of new requirements for the top safety ratings.

BOX-9: Fatalities by Mode of Transport EU v IND



Percentage change in number of fatalities by mode of transport in the EU, 2016 and 2007



Percentage change in number of fatalities by mode of transport in IND, 2017 and 2008

New Life-Saving Technologies in Cars: Safety technologies that were non-existent or optional in the past – such as driver and passenger airbags, side protection airbags, seat belt reminders, and electronic stability control – are now standard in all cars sold in Europe.

The European type-approval rules establish the safety features and systems that vehicles need to have in order to be sold on the EU market. In particular, three new technologies that have a high potential for saving lives are likely to be part of these rules in the near future:

- ✓ **Automated Emergency Braking** automatically slows down and stops the vehicle if it detects a vehicle in front. Some versions already available on the market can detect pedestrians and cyclists. Advanced Emergency Braking System (AEBS) and Lane Departure Warning System (LDWS) are mandatory for new trucks and buses registered since 1 November 2015.
- ✓ **Intelligent Speed Assistance (ISA)** is an overridable system that communicates the current speed limit to the driver using digital maps and speed sign recognition and helps them keep within the limit. It is already available as standard in some vehicles. ISA could be made compulsory in the future not only for commercial vehicles but also for passenger cars.
- ✓ **Seat-belt reminders** are already mandatory on driver seats and can be extended to all passenger seats. The failure to wear a seatbelt is still a leading cause of death on Europe's roads.

3.3.4.3. Infrastructure Safety

Upgrading Motorways in Slovakia (The Sensor Project): Slovakia has undertaken to prevent an estimated 355 deaths and serious injuries over the next 20 years on a 327 km sample of motorways and expressways. The total cost of investment was about EUR 40 million. A report by EuroRAP Slovakia has revealed that 77% of the improved sections are now rated as 3-star, with 1-star sections having disappeared completely. In December 2013, before improvement works began, almost 75% of the road sections were rated 1-2-star.

The wide-ranging package of improvements – including shoulder rumble strips and barriers with energy absorbing ends – was undertaken in 2014 and 2015. It was prompted in part by the findings of the SENSoR (South East Neighborhood Safe Routes) project. The improved roads were reassessed by EuroRAP Slovakia in February 2017.

Austria: Focus on High-Risk Sites: The EU Infrastructure Safety Management Directive has been fully implemented on the Trans-European Network of Austrian motorways and has helped put in place a culture of providing and maintaining safe motorways. It has contributed greatly to reduced motorway deaths – e.g. in Austria where the number of people killed on motorways decreased by 73% from 116 in 2004 to 31 in 2013.

In 2010, the Austrian motorway agency set up an integrated road safety program with the help of the Austrian Road Safety Board, aiming at making Austrian motorways the safest in Europe. In order to reach the target of halving the number of deaths per billion vehicle-km by 2020, the plan prioritizes reducing the number of high-risk sites, increasing compliance with speed limits, raising awareness about the danger of not wearing seat belts, driving fatigued or distracted and making better use of Intelligent Transport Systems.

UK: Safer Roads Fund: Britain has some of the safest roads in the world. Despite this achievement, an average of 57 people is killed and seriously injured on England's roads every day. To ensure that the road network is inherently safer, a roads investment package was announced in 2016. Part of this comprehensive package, funding of £175m will be targeted at upgrading 50 of England's most dangerous local 'A' road sections where the risk of collisions causing death and serious injury is highest. The Safer Roads Fund is open to local highway authorities with responsibility for the 50 highest risk road sections that have been identified by the Road Safety Foundation in their most recent analysis.

30km/h Zones in Germany: German state transport ministers have approved legal changes that will allow for easier application of 30 km/h limits near schools and hospitals. So far, the limits have been restricted to residential areas. The changes should make it easier for local authorities to set 30 km/h zones along main roads where schools and kindergartens are situated. Up to now, this has only been possible in proven high-risk sites.

The new measure comes in response to pressure from state transport ministers, the German association of cities and the scientific advisory board of the German transport ministry to use more 30 km/h zones for safety reasons and also to reduce noise levels in urban areas. In parallel, 30 km/h zones have been gaining popularity across Europe.

3.3.4.4. For the Safety of Road Users

Education of Professional Drivers in Greece: Winner of the Excellence in Road Safety Award in 2017, the HERACLES Group, launched a successful corporate social responsibility program, the 'Good driver' project, specifically designed for professional drivers of heavy goods vehicles and buses. The initiative aims to improve drivers' behavior and encourage them to be personally accountable for their safety record via an interactive campaign. Through a series of 'webisodes', projected to the company's 600 drivers through a digital platform, the program gives useful tips and covers in a simple manner a wide range of road safety related topics that professional drivers face in their daily routine.

Education of Young People in The United Kingdom: Lockerbie Academy in the United Kingdom won the Excellence in Road Safety Award in 2016 by organizing a successful educational program to improve the behavior of students on the roads. The 'Road Safety through Physics' initiative introduced a variety of road safety concepts, such as speed, velocity, distance, displacement, and braking, within the framework of school physics lessons. Together with Police Scotland, road crashes were simulated, and students could complete their own investigation of a more complicated incident. Students also surveyed parents and teachers about their awareness of driving in bad conditions. They also developed a plan to provide resources and education to help drivers feel more confident and drive more safely.

The initiative raises awareness of road safety while progressing in the normal school curricula. The entertaining nature of some activities increases the efficiency of the program. It also creates a link between generations with a well-drafted educational material. The program is easily transferrable to other schools.

Europe-Wide Awareness rising: (The Edward Project): In 2017, for the second year in a row, project EDWARD – the European Day without a Road Death, took place on 21 September during the European Mobility Week. The objective of the initiative, launched by the European Traffic Police Network (TISPOL) and supported by the European Commission is that no one should die on the roads of Europe on 21 September.

In the days leading up to EDWARD, road users are asked to think – even for just a few minutes – about the risks they face, the risks they may pose to others and how they can go about reducing those risks. National governments, private organizations, public agencies, charities, schools, colleges, and universities, as well as individuals are asked to join the campaign and organize Road Safety Days across Europe and register them on an interactive map. Furthermore, one can make a commitment by signing a pledge or being part of a social media campaign.

The second edition of Project EDWARD was again a great success. As part of the campaign, private and public entities, as well as the civil society, were mobilized to contribute by sharing the messages, by making a pledge on TISPOL's website, by recording a video message. More than 120 road safety events were organized across Europe, including information and awareness-raising activities in schools and companies, workshops, conferences, and competitions. In addition, Project EDWARD made a great impact on social media too with a Twitter reach of more than 25 million.

3.3.4.5. Enforcement

Alco-Gates in Sweden: The Swedish Abstaining Motorists' Association believes that no one should die because of drink-driving. Statistics show that the drink-driving rate around maritime ports is three times higher than the national average. Therefore, the Alco-Gates project aims to prevent drunk drivers from leaving the ports. Automatic checkpoints were installed, where drivers take an instant sobriety test. A traffic control center provides remote support and alerts the police, customs or the coast guard when a drunk driver is detected. First implemented in Gothenburg and Stockholm, the project is being gradually extended to other Swedish ports.

The initiative represents an innovative practice in enforcement, the key to any successful road safety policy. Alco-Gates can help the police become more effective. As the entire operation is well documented, the system can be easily introduced elsewhere. There is currently an 'Alco-Gates' trial in a Finnish city. The Australian state of Victoria has also picked up the idea. The initiative was one of the winners of the Excellence in Road Safety Awards 2017, launched by the **European Road Safety Charter**.

Safety Cameras in France: France has begun a major program to triple the number of 'safety zones' covered by its speed camera program. It is one of a number of measures introduced to improve the country's road safety records. France has increased the number of its 4,200 active speed cameras by 500, taking the total to 4,700. In addition, between 10,000 and 12,000 decoy units have also been installed – with the potential for cameras to be moved between units.

The intention is to make it difficult for drivers to know whether the camera is activated or not and thus keep to an appropriate speed in all cases. France has a policy of warning drivers of the presence of cameras using road signs – this has not changed. The installation of the 10,000 dummy units see the number of zones covered increase to 15,000.

Automatic Speed Enforcement: Saving Lives and Money: Under automatic speed enforcement systems, the registration number of the speeding vehicle is captured by a camera and the license holder subsequently receives a fine through the post. In places where they have been implemented, such systems have had a considerable impact in terms of the reduction of road deaths.

Reports from Member States show that automatic speed enforcement systems are very cost-effective. It is estimated that, for every Euro spent on the installation of such systems, at least three Euros are recouped. Another important characteristic of speed cameras is their adaptability. They can be a useful means of enforcement on any type of road. As regards issuing fines, the recommendation is to ensure that the fine is issued as soon as possible after the offence to maximize the educational effect of the sanction.

3.3.4.6. To Protect Vulnerable Road Users

National Reflector Day in Denmark: A partnership of the Danish Children Accident Prevention Foundation and an insurance company is responsible for Denmark's annual National Reflector Day. The 'National Reflector Day' focuses on the protection of vulnerable road users, such as cyclists and pedestrians. The highly mobilizing character of the campaign, its popularity amongst youngsters as well as the wide media coverage it receives are equally important parts of its success knowing that the use of a reflector reduces the risk of being involved in an accident by up to 85 %. The initiative was one of the winners of the Excellence in Road Safety Awards 2016, launched by the European Road Safety Charter.

Thousands of reflectors and reflective vests are handed out all over the country. A special running event, 'The Reflectors Run', sees children and adults running covered in reflectors, and kindergarten teachers deliver fun lessons about reflectors. The campaign includes TV and cinema spots and ads on trains and in newspapers. In 2015, partners launched a reflective clothing line and a kit for running clubs.

Protection of Senior Road Users in France: With its 'Street code for seniors' campaign, the southern French city of Martigues is raising awareness for traffic dangers among a particularly vulnerable group of road users – the elderly – because 30 % of road accidents in the city involved seniors in 2010. Outreach includes popular workshops that raise awareness of the rules of the road and update older members of the community about changes to traffic laws.

The initiative also aims to gather statistics and information on accidents specific to the elderly. It focuses on sustained mobility and improving the quality of life for seniors through, for example, free shuttles and the extension of pedestrian zones. The initiative

was one of the winners of the Excellence in Road Safety Awards 2017, launched by the European Road Safety Charter.

Cycling Streets in the Netherlands: A cycling street in the Netherlands is a street designed as a bicycle route but on which cars are also allowed. The car use is usually limited by the character and layout of the bicycle street – in many cases the speed limit is 30 km/h.

In the Netherlands, cycling streets are colored red, just like bike paths. Bicycle streets form an alternative to traditional cycle routes along main roads. The cycle streets are mostly located in residential areas that generally have less car traffic. This is a good example to be promoted across Europe to ensure safer infrastructure for this vulnerable category of road users.

3.4. Lessons Learned & Conclusions

Need for a national agency to perform the following functions, namely:—

- need for application of traffic management techniques using advanced ITS/ AI technologies for the purposes of ensuring road safety;
- in relation to the national highways,
  - recommend minimum design, construction, operation and maintenance standards for the national highways;
  - recommend minimum standards for establishing and operating trauma facilities and para-medical facilities for dealing with traffic-related injuries on the national highways;
  - conduct or cause to be conducted safety audits to monitor compliance with the standards notified by the authority;
  - make recommendations or issue guidelines relating to design, construction, operation and maintenance standards for the national highways;
- in relation to vehicles,
  - recommend minimum safety requirements and standards for the design and manufacture of vehicles;
  - recommend minimum conditions for safe usage of vehicles including specifying the maximum load bearing and capacity limits;
  - conduct or cause to be conducted safety audits to monitor compliance with the standards notified by the authority;
  - recommend standards for vehicular traffic on the national highways including the schemes for segregation of various classes of vehicles in separate speed lanes and their right of way;
- establishment procedures and centers for multidisciplinary crash investigation;
- promote relevant practices in road safety and traffic management, undertake road safety and traffic education programs, and conduct campaigns to create awareness amongst all sections of road users, children and students on matters relating to road safety;
- involve non-government organizations working in the area of road safety and traffic management, and assist them in the promotion of efficient traffic management and road safety;
- special requirements for women, children, senior citizens, disabled persons and pedestrians relating to road safety and traffic management;
- data collection and analysis, accident investigation, research, finance or administration;
- traffic management, road user behavior strategies or road safety education;
- trauma care and rehabilitation

An integrated and dedicated national agency is necessary to provide for continuity, expertise, and credibility to combat the rising menace of road accidents and fatalities in the country

To achieve this, the National Road Safety Plan is proposed in **Chapter-8** of this report.

Chapter-4

Operational aspects of National Highways Authority of India

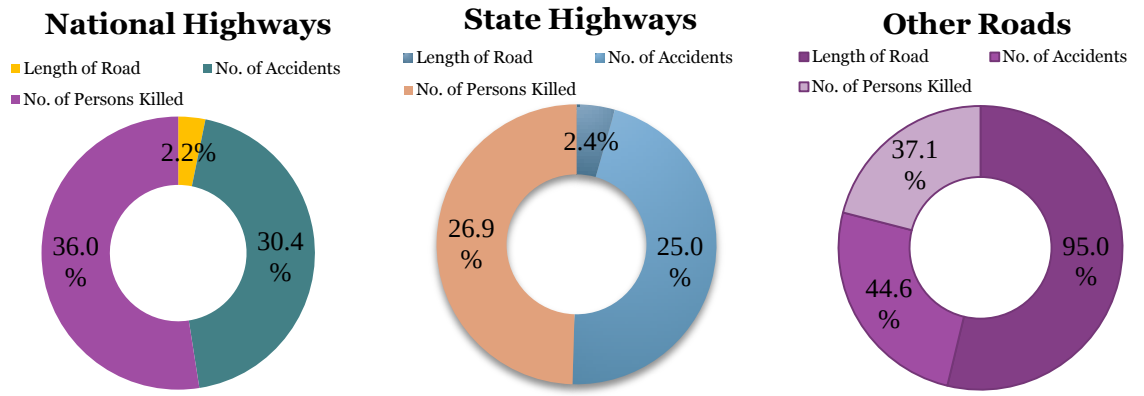
4. Operational Aspects of National Highways Authority of India

4.1. Introduction

As discussed in the previous chapters, it is evident that road accidents and fatalities are more on National and State Highways which is cumulatively about 55% (accidents) and 63% (fatalities) respectively. About 30% of road accidents and 36% of deaths are happening on National Highways.

Table 20. Distribution of Traffic Accidents according to the type of road

Road Type	Length of Road	No. of Accidents	No. of Persons Killed
National Highways	2.20%	30.40%	36.00%
State Highways	2.40%	25.00%	26.90%
Other Roads	95.00%	44.60%	37.10%



This is an alarming situation and giving an impression that even though the national highways are very useful in achieving swift mobility and are nation's pride, the high number of road accidents and fatalities on the National Highways require integrated and analytical approach towards safety for all road users.

In order to see the root causes of the accidents and to find out the critical aspects of the road safety, it is necessary to know the procedures and the operations followed by the MoRTH and especially the NHAI in implementing the project with respect to the design, construction, audits, operations maintenance, etc. This chapter describes the different aspects of the activities performing by the NHAI. For this purpose, the operations manual of NHAI has been reviewed.

4.2. Ministry of Road Transport & Highways (MoRTH)[27]

An apex organization under the Central Government is entrusted with the task of formulating and administering, in consultation with other Central Ministries/Departments, State Governments/UT Administrations, organizations and individuals, policies for Road Transport, National Highways and Transport Research to increase the mobility and efficiency of the road transport system in the country.

[27] MoRTH's Manual of Organisational History & Functions (as on 14.03.2018), Document Accessed from MoRTH website: http://morth.nic.in/showfile.asp?lid=1289

The Ministry is responsible for development and maintenance of National Highways, administration of the Central Road Fund and formulation and implementation of policies relating to road transport.

4.2.1. Organizational History

The Ministry has been through many changes with respect to departmental set-up, it was envisaged as the Department of War Transport was formed in July, 1942 by the bifurcation of the then Department of Communications into two Department viz., (i) the Department of Posts and (ii) the Department of War Transport.

The functions allocated to the Department of War Transport included major ports, railway priorities, utilization of road & water transport, petrol rationing & producer gas, coastal shipping and the administration and development of major ports. Broadly speaking, the functions of the War Transport Department were to coordinate the demands for transport in war time. Later, the planning of exports was undertaken as a corollary to the Department's control of transport priorities. Subsequent to this the Department/ Ministry has been through following significant changes:

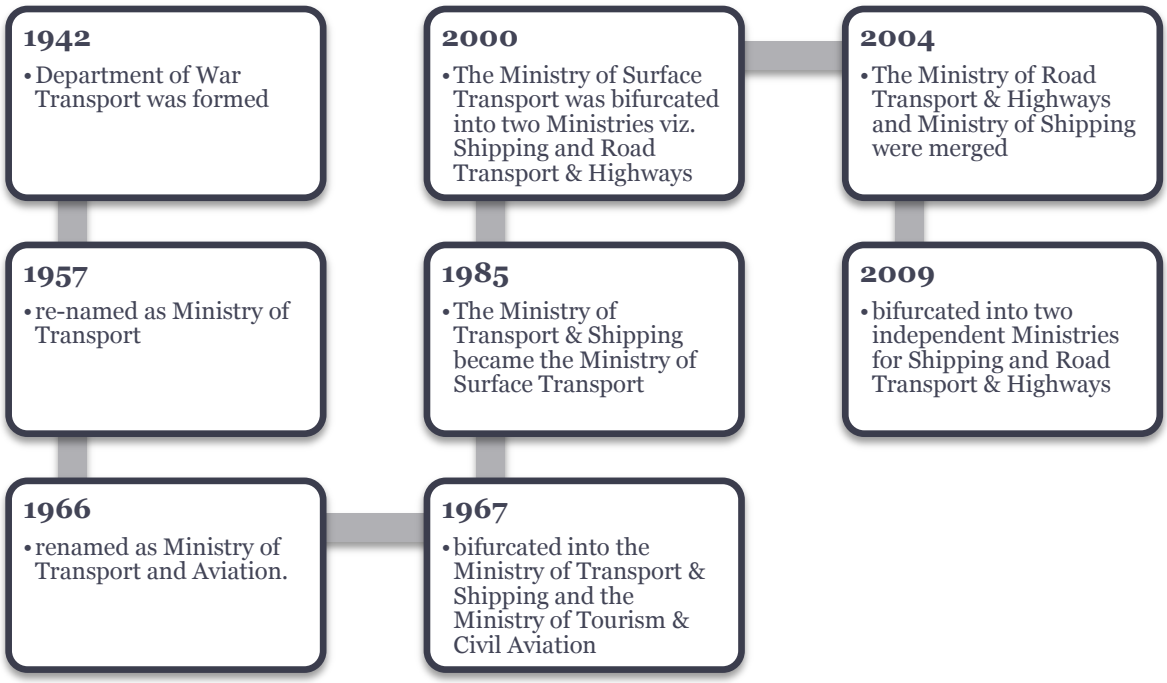


Figure 34. MoRTH Organizational History

4.2.2. Allocation of Business

Certain highways passing through various States were being maintained by the respective States within which the particular highway was situated. Some of the states are maintaining the national highways of their jurisdiction per required standards & desired levels and some are not. With the increase of movement of traffic on account of industrial advancement and increased tourist traffic, it was found necessary that important highways of the country be developed and maintained by the Central Government. To achieve this objective the National Highways Bill, 1956 was introduced in the Parliament.

The bill having been passed by both the Houses of Parliament received the assent of the President on 11 September 1956. It came into force on 15 April 1957 as THE NATIONAL HIGHWAYS ACT, 1956 (48 OF 1956)

The subjects allocated to the Ministry of Road Transport & Highways, at present, as per the Govt. of India (Allocation of Business) Rules, 1961 framed and issued by Cabinet Secretariat.

I. The following subjects which fall within the **List 1** of the **Seventh Schedule** to the **Constitution of India**:
   (1) Compulsory insurance of motor vehicles.
   (2) Administration of the Road Transport Corporations Act, 1950 (64 of 1950).
   (3) Highways declared by or under law made by Parliament to be National Highways.
   (4) Issuance of notifications under clause (a) of section 3 and sections 3A, 3D, 7 and section 8A of the National Highways Act, 1956 (48 of 1956) without being scrutinized and vetted by the Legislative Department.

II. In respect of the Union Territories:
   (5) Roads other than National Highways.
   (6) Administration of the Motor Vehicles Act, 1988 (59 of 1988) and taxation of motor vehicles.
   (7) Vehicles other than mechanically propelled vehicles.

III. Other subjects which have not been included under the Previous Parts:
   (8) Central Road Fund.
   (9) Coordination and Research pertaining to Road Works.
   (10) Road works financed in whole or in part by the Central Government.
   (11) Motor vehicles legislation.
   (12) Promotion of Transport Co-operatives in the field of motor transport.
   (13) Formulation of the privatization policy in the infrastructure areas of roads.

IV. Autonomous Bodies.
   (14) National Highways Authority of India (NHAI).

V. Societies/ Associations
   (15) Indian Academy of Highway Engineers (IAHE).

VI. Public Sector Undertakings
   (16) National Highways and Infrastructure Development Corporation Ltd. (NHIDCL)

VII. Acts:*
   (17) The Road Transport Corporations Act, 1950 (64 of 1950).
   (18) The National Highway Act, 1956 (48 of 1956).
   (19) The Motor Vehicles Act, 1988 (59 of 1988).
   (20) The National Highways Authority of India Act, 1988 (68 of 1988).

*In addition, the Ministry also administers the following three Acts, which do not figure in AOB Rules:

- The Carriage by Road Act. 2007
- The Central Road Fund Act, 2000
- The Control of National Highways (Land & Traffic) Act, 2002

Note: The subjects given are as per the Allocation of Business Rules 1961, as in force on date.

4.2.3. Organizational Set Up

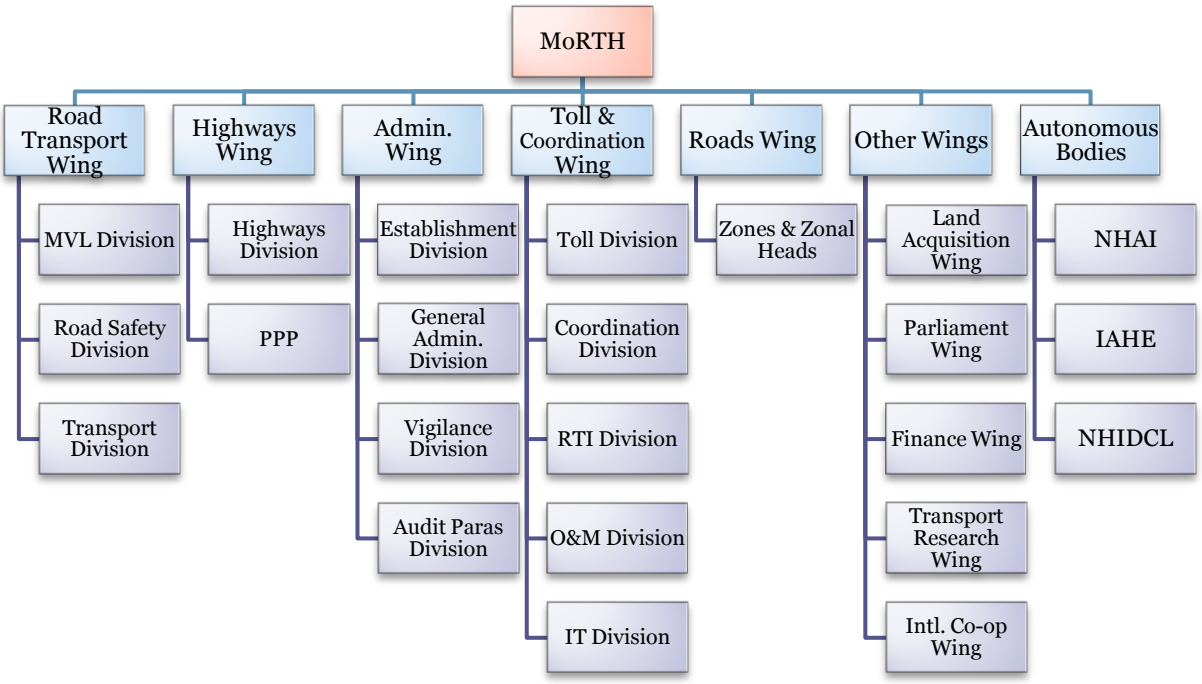


Figure 35. MoRTH Wings/ Divisions

BOX-10: Design, Construction & Maintenance of NHs in India

- **National Highways Authority of India** was set up by an act of the Parliament, NHAI Act, 1988, it has been entrusted with National Highways Development Project, which along with other minor projects, has vested in it **50,329 kms** of National Highways for development, maintenance and management.
- The **National Highways & Infrastructure Development Corporation Limited** (NHIDCL) is a Public Sector Undertaking under the Ministry of Road Transport and Highways, Govt. of India. NHIDCL started functioning in September 2014 with the objective to develop National Highways and other infrastructure at fast pace in the North East and Strategic areas of the country sharing International Borders. NHIDCL is developing more than 270 projects for development of about **13,000 km** length of national highways.
- The Ministry of Road Transport & Highways (MoRTH) develops rest of the national highways under various schemes and also funds the projects which are executed by State's road agencies.
- NH Length as on 01.03.2019 is **1,32,500 km** as per https://nhai.gov.in/writereaddata/Portal/Images/pdf/NationalHighwaySummary.pdf, accessed on 01 August, 2019.

4.3. National Highways Authority of India (NHAI)

National Highways (NH) traverse the length and width of the country connecting the National and State capitals, major ports and rail junctions and link up with border roads and Asian/ International highways and serve as arterial roads for movement of passengers and goods. The total length of NH (including expressways) in the country is 115,235 kms. While National Highways constitute only about 2% of the length of the country's road network, they carry about 40% of the road traffic.

As on March 31, 2017[28], out of the total 55,886 Km (7,097Km with Ministry of Road Transport & Highways) of National Highways that are planned to be developed and upgraded by NHAI, 39,581 Km of National Highways contracts have been awarded. Out of this 28,479 Km have been completed and work on 11,102 Km is in progress. Projects with a length of 9,208 Km is yet to be awarded for which the project preparations are in progress.

4.3.1. NHAI's Inception

For the development, maintenance and management of national highways the National Highways Act, 1956 (48 of 1956) was enacted. Under the provisions of the Act the Central Government had faced certain difficulties in developing, maintaining the national highways mentioned in the Schedule of the said Act, and it was felt necessary to constitute a separate authority with statutory powers for the development, maintenance and management of national highways. To achieve this objective the National Highways Authority of India Bill, 1988 was introduced in the Parliament.[29]

The National Highways Authority of India Bill, 1988 having been passed by both the Houses of Parliament received the assent of the President on 16 December 1988. It came into force on 15 June 1989 as THE NATIONAL HIGHWAYS AUTHORITY OF INDIA ACT, 1988 (68 of 1988).

The Ministry of Road Transport and Highways, Government of India, is the nodal ministry for development and maintenance of the National Highways (NHs) across the country. The NH projects initially were executed through the State PWDs, with establishment of dedicated National Highway wings within the state works Departments. Over time, as the network of National Highways expanded, the NHAI was established primarily as a project execution arm of the Ministry. As on today, almost all the four-lane, six-lane and eight –lane projects are being executed through the NHAI though its continues to execute some of two-lane projects as well. Bulk of the two-lane (with paved shoulders) projects continue to be executed by the Ministry through the state agencies.

4.3.2. Core Processes & Procedures of NHAI

NHAI has been set-up as an authority, which is an autonomous corporate body of Government of India in the Ministry of Shipping, Road Transport, and Highways. The National Highway Authority of India (NHAI) has a responsibility of implementing

[28] Annual Report, NHAI, MoRTH, www.nhai.gov.in
[29] Introduction to the National Highways Authority of India Act, 1988 (68 of 1988)

National Highways to have a world-class road infrastructure and to handle the time-bound projects.

4.3.2.1. Act/ Policy Framework

NHAI will follow virtue of the powers conferred by the National Highways Act, 1956 that came into force from April 15, 1957, declared certain highways as National Highways and vested all National Highways in the Central Government. The Act also empowered the Central Government to declare any other highway as a National Highway or omit certain highways from the list of National Highways. Further, this Act makes the Central Government responsible for developing all National Highways and maintaining them in proper repair.

4.3.2.2. Organizational Set-Up

NHAI is a lean organization to facilitate faster decision-making. The provisions of National Highways Authority of India (Recruitment, Seniority and Promotion) Regulations, 1996 were amended to attract competent professionals from various sectors to work in NHAI on deputation. As per The National Highways Authority of India Act 1988 and its amendment in 2013 [No. 19 of 2013], under sub-section 3 of section 3 the Authority shall consist of—

- A chairman;
- Not more than six full-time members and
- Not more than six part-time members, to be appointed by the Central Government by notification in the Official Gazette

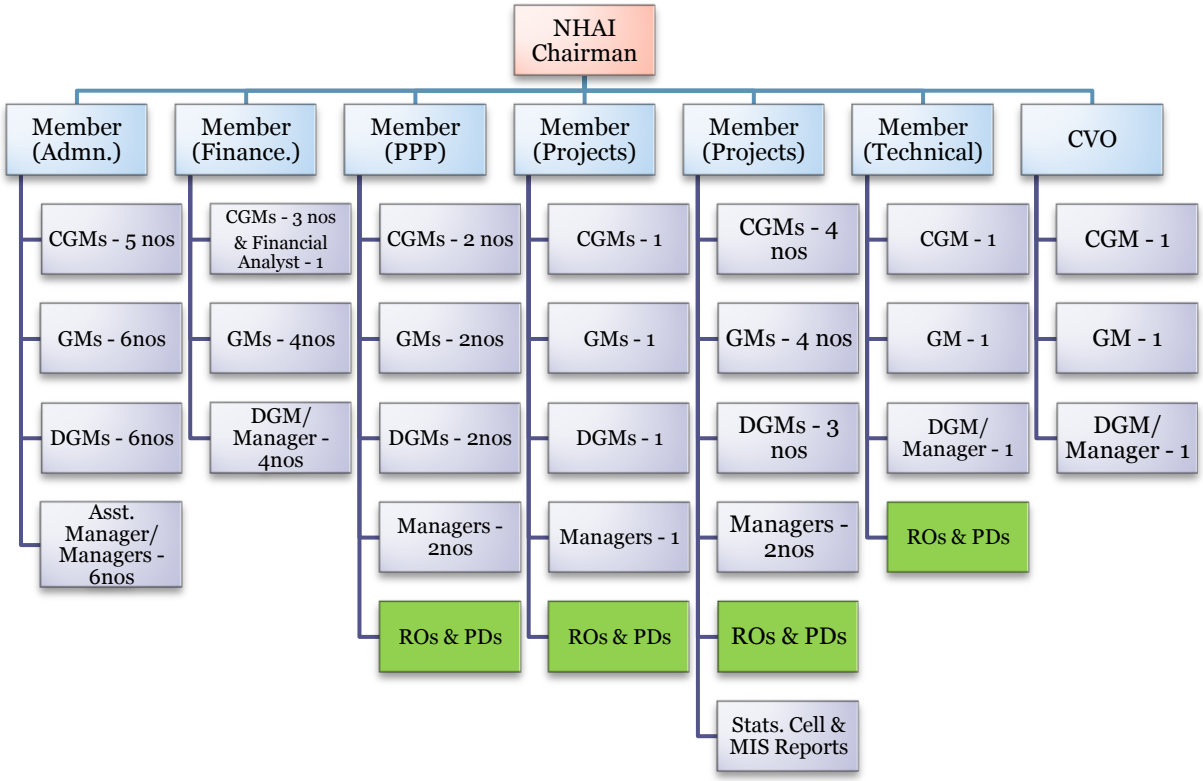


Figure 36. NHAI Organogram

4.3.2.3. Staffing

NHAI obtains staff primarily from two sources:

- by recruiting from the open market, and
- by borrowing from various departments and undertakings of Government of India and various State Governments.

Table 21. Total Manpower of the NHAI (as on 31.03.2017)

Group of Post	Present strength of the Employees	Regular	Deputation	Contract
A	556	286	260	10
B	259	21	6	232
C	161	11	0	150
D	1	1	0	0
Total	**977**	**319**	**266**	**392**

4.3.2.4. Divisions

The three main divisions of NHAI are **Administration, Finance and Technical**. The other associated functional areas are:

- Information Technology,
- Corridor Management,
- Environment and Social Development,
- Planning,
- Land Acquisition and Estate Management,
- Standardization, Quality Assurance and
- Vigilance.

21 Regional Offices and 130 PIUs in the country for expediting the execution of projects

- **Board** (Chairman + 6 Members)
- **Head Quarters** at New Delhi
- **Regional Offices** at 21 Locations across India
- **Project Implementing Units (PIUs)** at 130 Locations across India
  - The principal role of PIU will be to ensure that the project is effectively developed and implemented.
  - PIU will be headed by a Project Director (PD), assisted by one or two engineers
  - PD will be assisted by Accounts Officer (AO) and supporting staff for accounts & secretarial functions.
- **Corridor Management Units (CMUs)**
  - National Highways are spread over the whole of India. To manage the network after development, NHAI is to have Corridor Management Units, with focus on corridor management.

4.3.3. Functions of NHAI

In general, the main functions of the NHAI are to develop, maintain, and manage the National Highways and any other highways vested in, or assigned to it by the Government. National Highway Authority of India has to discharge the functions as mentioned under Section 16 of the NHAI Act, the following are the functions prescribed in the Act;

- *The survey, develop, maintain and manage highways vested in, or entrusted to, it;*
- *Construct offices or workshops and establish and maintain hotels, motels, restaurants, and restrooms at or near the highways vested in, or entrusted to, it;*
- *Construct residential buildings and townships for its employees;*
- *Regulate and control the plying of vehicles on the highways vested in, or entrusted to, it for proper management thereof;*
- *Develop and provide consultancy and construction services in India and abroad and carry on research activities in relation to the development, maintenance and management of highways or any facilities thereat;*
- *Provide such facilities and amenities for the users of the highways vested in or entrusted to it as are, in its opinion necessary for smooth flow of traffic on such highways;*
- *Form one or more companies under the Companies Act, 1956 to further the efficient discharge of the functions imposed on it by the NHAI Act;*
- *Engage, or entrust any of its functions to, any corporation and body corporate owned or controlled by the Government;*
- *Advise the Central Government on matters relating to highways;*
- *Assist, on mutually agreed terms and conditions, any State Government in the formulation and implementation of schemes for highway development;*
- *Collect fees on behalf of the Central Government for services or benefits rendered under section 7 of the National Highways Act, 1956, as amended from time to time, and such other fees on behalf of the State Governments on such terms and conditions as may be specified by such State Government; and*
- *Take all steps as may be necessary or convenient for, or may be incidental to, the exercise of any power or discharge any of functions conferred or imposed on it.*

4.3.4. Funding & Project Approvals

- capital grant or loan provided by the Government of India, including dedicated accruals from the corpus formed by the levy of cess on petrol and diesel;
- assistance from external funding agencies like World Bank, Asian Development Bank, JBIC, etc;
- borrowings from the market by the issue of bonds, debentures, and other such instruments and by setting up its own companies/Special Purpose Vehicles (SPVs);
- private funds through Build, Operate and Transfer schemes and other variations thereof;
- toll collections;
- lease of roadside land;
- charges for advertisements and hoardings, and
- income from investments in the securities of the Central Government or other appropriate instruments.

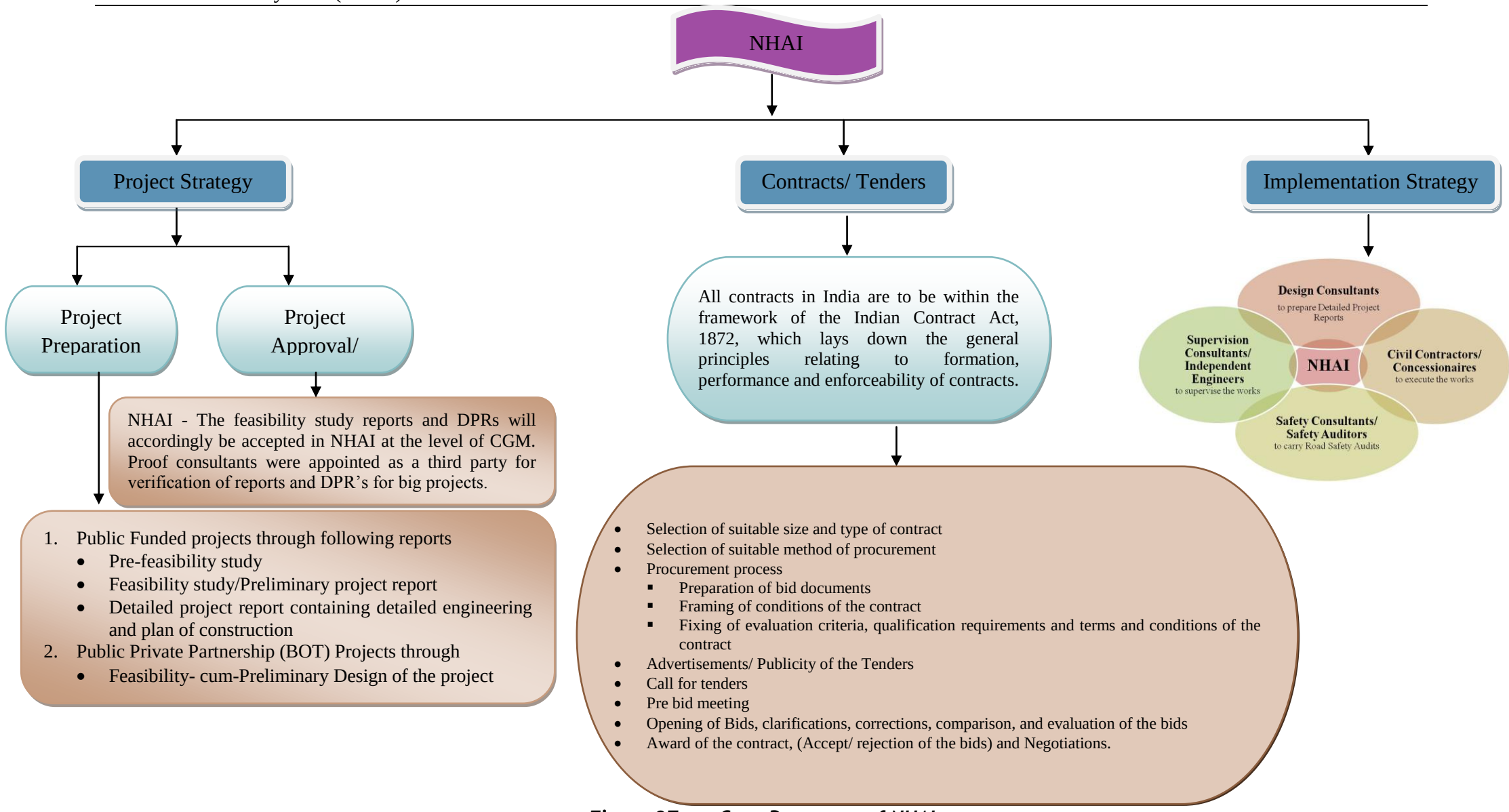


Figure 37. Core Processes of NHAI

4.3.5. Approval of Schemes

Earlier, NHAI will obtain approval of the schemes form the Central Government as per the limits of delegated powers set down therein. The approval may be for individual schemes, based on a proper feasibility study and cost estimate or, if the circumstances so warrant, for a package of schemes/programs using normative costs. Later, the NHAI Board will approve investment proposals of individual sub-projects only on the basis of detailed project reports and detailed estimates. While doing so, it will lay down the implementation and monitoring mechanism, including the areas of responsibilities of concerned agencies/persons. The Board will periodically review the progress of important works, identify slippages if any, suggest corrective interventions and fix responsibility where due for any cost or time overrun.

4.4. Enforcement on National Highways

Enforcement will require action by PIU's/CMUs on several fronts including:

- Detection, prevention, and removal of encroachment
- Protection of highway assets and prevention of vandalism
- Access control and removal of unauthorized access ways
- Regulation of overloading
- Enforcement of traffic rules and regulation
- Prevention of unplanned/unapproved activities on/along the highway (such as work by utility organizations).
- Prevention/removal of unauthorized billboards and advertisements.

Several of these works will require the assistance of State Government authorities, at the District or Headquarters level, which will be sought at the appropriate senior level, such as CGM or Member. In special circumstances, Chairman NHAI may take up issues of policy with the State Authorities.

4.4.1. Control of National Highways

The Control of National Highways (Land and Traffic) Act, 2002 has been enacted by the Govt. of India. The Government has also notified the procedural rules for the National Highways Administration set up under the Act. The Highway Administration (HA) shall be empowered body to exercise the powers and discharge the functions conferred on it under the Act. The HA shall be empowered and to prevent

- Encroachments
- Preservation of Assets
- Overloading
- Access Control
- Unauthorized median cuts
- Utilities
- Advertisements
- Land Management
- Maintenance and upkeep of Wayside Amenities, Highway Buildings, Equipment, and Machinery

- Arboriculture
- **Road Safety measures** which include:
    - Provisions of safety guidelines given in the following publications of Indian Roads Congress shall be observed; through IRC: SP: 44 – 'Highway Safety Code', IRC: SP: 55 – 'Guidelines for Safety in Construction Zones' & IRC: SP:88 – 'Manual on Road Safety Audit'
    - All hazardous locations, elements of surprise to the driver, impaired visibility, shall be improved and rest areas for the fatigued drivers planned;
    - Coordination with State Transport Authorities and Police Departments shall be kept to enforce traffic rules, avoid over-speeding and overloading; and
    - Training courses shall be arranged to train drivers and educate road users about safety on roads.
- Levy and Collection of User Fee
- unauthorized occupation of the National Highways land,
- control of access points and regulate traffic on National Highways and
- the imposition of the penalty for unauthorized occupation.

The Act also empowers summary removal of unauthorized occupation by the Highways Administration. The various sections of the Act empower the HA to take legal steps as may be necessary to ensure that the National Highways are free from encroachments and flow of traffic is smooth without obstruction and other hindrances.

4.4.2. Comparison of Procedures Adopted in India and US.

As discussed early, in the United States,

- **The Department of Transportation (DOT)** is a cabinet-level federal government's lead agency helping to maintain and develop the nation's transportation systems and infrastructure, also responsible for planning and support of the nation's land, air, and sea-based travel systems.
- DOT develops implements and enforces federal regulations governing the use of America's roads and highways, airports and air corridors, railways and seaports. The department also makes available billions of dollars in federal grants each year to state and local authorities to help improve transportation programs throughout the country.
- Under DOT, Federal Highway Administration (FHWA) helps maintain the nation's system of interstate highways. Responsibility for building and maintaining highways is the charge of state and local governments, but the FHWA provides enormous support in the form of funding.
- Using monies collected from fuel and motor vehicle excise taxes, FHWA disperses federal highway funds to cities, counties, state agencies and tribal governments through two programs: Federal-aid Highway Program (to state and local governments); and Federal Lands Highways Program (for roads in national parks, national forests, Indian lands and other land under federal stewardship).
- The agency also establishes rules for building safe roads, overpasses, and bridges that governments and contractors must follow.

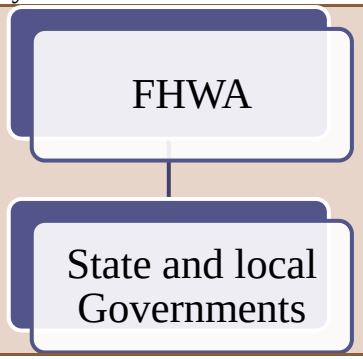
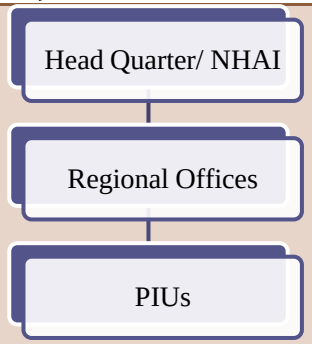
In India MoRTH will act as a central/ federal agency as that of DOT in US.

- In India, MoRTH is an apex organization under the Central Government, which is entrusted with the task of formulating and administering, in consultation with other Central Ministries/ Departments, State Governments/ UT Administrations, organizations and individuals, policies for Road Transport, National Highways and Transport Research with a view to increasing the mobility and efficiency of the road transport system in the country.
- The Ministry has two wings: Roads wing and Transport wing.
    - Roads Wing deals with development and maintenance of National Highway in the country and
    - Transport wing deals with the mater related to Road Transport.

The following are the major comparison between the system in US as well as India.

Table 22. Comparison between the system in US and India

Sl. No.	Description	In US	In India
1	Cabinet/ Ministry	Department of Transportation (DoT)	The Ministry of Road Transport and Highways (MoRTH)
2	Operating Administrations/ Departments under the Cabinet	**Major DOT offices and programs**: • **Roads and Motor Vehicles** ○ Federal Highway Administration (FHWA) ○ National Highway Traffic Safety Administration (NHTSA) ○ Federal Motor Carrier Safety Administration (FMCSA) • **Air Traffic** ○ Federal Aviation Administration (FAA) • **Railroads** ○ Federal Railroad Administration (FRA) ○ Surface Transportation Board (STB) • **Water Transportation** ○ Maritime Administration (MARAD) ○ Saint Lawrence Seaway Development Corporation (SLSDC) • **General** ○ Federal Transit Administration (FTA) ○ Pipeline and Hazardous Materials Safety Administration (PHMSA) ○ Office of the Inspector General (OIG) ○ Research and Innovative Technology Administration (RITA) ○ Office of the Secretary (OST) ○ Bureau of Transportation Statistics (BTS)	• **Roads wing and** ○ Planning, development, and maintenance of National Highways in the country. ○ Extends technical and financial support to State Governments for the development of state roads and the roads of inter-state connectivity and economic importance ○ Evolves standard specifications for roads and bridges in the country. ○ Serves as a repository of technical knowledge on roads and bridges. • **Transport wing** ○ Motor Vehicle legislation. ○ Administration of the Motor Vehicles Act, 1988. ○ Taxation of motor vehicles. ○ Compulsory insurance for motor vehicles. ○ Administration of the Road Transport Corporations Act, 1950. ○ In addition, the promotion of Transport co-operatives in the field of motor transport. ○ Evolves road safety standards in the form of a National Policy on Road Safety and by preparing and implementing the Annual Road Safety Plan. ○ Collects compiles and analyses road accident statistics and takes steps for developing a Road Safety Culture in the country by involving the members of public and organizing various awareness

Sl. No.	Description	In US	In India
			campaigns. o Provides grants-in-aid to Non-Governmental Organizations in accordance with the laid down guidelines.
3	Central/ Federal Agency for Highways	FHWA	NHAI
4	Legal Support/ Establishment	**Federal-Aid Highway Act of 1956;** to authorize appropriations for continuing the construction of highways	To develop, maintain and manage the National Highways, the Parliament enacted the **National Highways Authority of India Act, 1988.**
5	Chain of organization		

In-depth comparison of procedures followed by FHWA and NHAI

Table 23. Comparison of FHWA and NHAI procedures

Sl. No.	Parameter/ Aspects	FHWA	NHAI
1	Project Approvals	Submission of plans, specifications, and estimates. Each State transportation department shall submit to the DoT/ FHWA for approval such plans, specifications, and estimates.	The Central Government is authorized to entrust this function to any authority subordinate to the Central Government, or the Government of the State within which the highway passes. The Central Government can also lay down rules to provide for the manner in which any function in relation to development or maintenance of these highways is to be exercised as also to provide for any other matter.

Sl. No.	Parameter/ Aspects	FHWA	NHAI
2	Oversight of the Project	FHWA through State Transportation Departments	NHAI/ Regional Offices (ROs)
3	Standards	**Federal Highway Administration (FHWA)** The DOT/ FHWA shall ensure that the plans and specifications for each proposed highway project, and provide for a facility that will- • adequately serve the existing and planned future traffic of the highway in a manner that is conducive to safety, durability, and economy of maintenance; and • be designed and constructed in accordance with criteria best suited and to conform to the particular needs of each locality **American Association of State Highway and Transportation Officials (AASHTO)** is a standards setting body, which publishes specifications, test protocols and guidelines, which are used in highway design and construction throughout the United States. Despite its name, the association represents not only highways but air, rail, water, and public transportation as well. • Although AASHTO sets transportation standards and policy for the United States as a whole, AASHTO is not an agency of the federal government; rather it is an organization of the states themselves. Policies of AASHTO are not federal laws or policies, but rather are ways to coordinate state laws and policies in the field of transportation.	• NHAI/ MoRTH Manuals and Guidelines with Specifications and Standards • Indian Roads Congress (IRC) Codes and Manuals • Bureau of Indian Standards
4	Construction	Respective State Transportation Departments or under their direct supervision. The DOT/ FHWA shall have the right to conduct such inspections and take such corrective action as the DOT/ FHWA determines to be appropriate.	Through Contractors/ Concessionaries appointed by NHAI in EPC/ PPP/ HAM etc., modes.
5	Supervision	Federal Highway Administration (FHWA)	Through Supervision consultants appointed by NHAI
6	Road Safety Audits (RSA)	The FHWA works with State and local jurisdictions and Tribal Governments to integrate RSAs into the project development process for new roads and intersections, and also encourages RSAs on existing roads and intersections. It qualitatively estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users. The aim of an RSA is to answer the following questions: • What elements of the road may present a safety concern: to what extent, to which road users, and under what circumstances? • What opportunities exist to eliminate or mitigate identified safety concerns?	On National Highways, Road Safety Audits were conducted by Safety Consultants appointed by NHAI

Sl. No.	Parameter/ Aspects	FHWA	NHAI
7	Operation	Federal Highway Administration (FHWA) will oversee the following activities related to operations; • Emergency Response • Freight/Goods Movement • Manual on Uniform Traffic Control Devices (MUTCD) • National Traffic and Road Closure Information • Real-Time Traveler Information • Security • Speed Management • Tolling and Pricing Program • Transportation Management	Contractors/ Concessionaries along with NHAI
8	Maintenance	It shall be the duty of the State Transportation Department or another direct recipient to maintain, or cause to be maintained, any project constructed under the provisions of this chapter or constructed under the provisions of prior Acts.	Contractors/ Concessionaries who constructed the road are responsible for the maintenance of the same for a period of 3 or 5 years or as specified in the contract. NHAI will take over the maintenance of roads after completion of the contract period.
9	Safety	Federal Highway Administration (FHWA) will oversee the following activities related to safety; • Construction Safety • Data and Analysis Tools • Highway-Railroad Grade Crossing • Highway Safety Improvement Program (HSIP) / Strategic Highway Safety Plan (SHSP) • High-Risk Rural Roads Program • Intersection, Local & Rural Road Safety • Motor coach Roadway Safety Assessment Tool (RSAT) • Motorcycle Safety • NCHRP Report 350 - Roadside Hardware • Older Road User • Pedestrian & Bicycle Safety • Road Diets and Road Safety Audits • Roadway Departure Safety • Rumble Strips Community of Practice	Safety Consultants along with NHAI

Sl. No.	Parameter/ Aspects	FHWA	NHAI
		• Safe Routes to School • Safety Strategic Plan (SSP) • Speed Management • Stop Red Light Running Program • Transparency Reports (5 Percent) • Transportation Safety Planning (TSP) • Visibility and Retro-reflectivity • Work Zone Management	
10	Highway safety improvement program	The DoT/ FHWA shall carry out a highway safety improvement program. The purpose of the highway safety improvement program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal land.	NHAI
11	High-visibility enforcement program	The DoT/ FHWA establish and administer a program under which not less than 3 campaigns will be carried out in each of fiscal years. The purpose of each campaign is to achieve outcomes related to not less than 1 of the following objectives: • Reduce alcohol-impaired or drug-impaired operation of motor vehicles. • Increase the use of seatbelts by occupants of motor vehicles.	-
12	Agency accountability	The DoT/ FHWA shall conduct a review of each State highway safety program at least once every 3 years.	-
13	Penalties	**Penalties:** In order to enforce certain national priorities, Congress has established a number of statutory penalties. If a State fails to comply with a required provision of law, these penalties allow, and in some cases require, the DoT/FHWA to take action that prevents a State from receiving or using its full apportionment. Potential penalties include the following: • Withholding of apportionments. • Transfer of apportionments. • Dedication of apportionments. • Suspending the use of apportionments or project approval.	In NHAI, penalties were specified in the contract document for that project.

Table 24. Summary Comparison

Parameter/ Aspects	FHWA	NHAI
Project Approvals	DoT/ FHWA	Central Government (MoRTH)
Oversight of the Project	FHWA through State Transportation Departments	NHAI/ Regional Offices (ROs)
Standards	• The DOT/ FHWA shall ensure standards and specifications for each proposed highway project • American Association of State Highway and Transportation Officials (AASHTO) is a standards setting body which publishes specifications, test protocols and guidelines which are used in highway design and construction throughout the United States.	• NHAI/ MoRTH Manuals and Guidelines with Specifications and Standards • Indian Roads Congress (IRC) Codes and Manuals • Bureau of Indian Standards
Construction	• Respective State Transportation Departments or under their direct supervision. • The DOT/ FHWA shall have the right to conduct such inspections and take such corrective action as the DOT/ FHWA determines to be appropriate.	Through Contractors/ Concessionaries appointed by NHAI in EPC/ PPP/ HAM etc., modes.
Supervision	Federal Highway Administration (FHWA)	Through Supervision consultants appointed by NHAI
Road Safety Audits (RSA)	The FHWA works with State and local jurisdictions and Tribal Governments to integrate RSAs into the project development process for new roads and intersections, and encourages RSAs on existing roads and intersections.	On National Highways, Road Safety Audits were conducted by Safety Consultants appointed by NHAI
Operation	Federal Highway Administration (FHWA) will oversee the various activities related to operations;	Contractors/ Concessionaries along with NHAI
Maintenance	State Transportation Department or another direct recipient to maintain, or cause to be maintained, any project constructed under the provisions of this chapter or constructed under the provisions of prior Acts.	Contractors/ Concessionaries who constructed the road are responsible for the maintenance of the same for a period of 3 or 5 years or as specified in the contract and NHAI after the contract period
Agency accountability	The DoT/ FHWA shall conduct a review of each State highway safety program at least once every 3 years.	-
Penalties	Penalties: If a State fails to comply with a required provision of law, penalties allow, and in some cases require, the DoT/FHWA to take action that prevents a State from receiving or using its full apportionment. Potential penalties include the following: • Withholding of apportionments. • Transfer of apportionments. • Dedication of apportionments. • Suspending the use of apportionments or project approval. Details of Penalties applicable to the Federal-Aid Highway program, attached as **Annexure-A**	In NHAI, penalties were specified in the contract document for that project.

4.5. Gaps in Existing Operations & Services

After reviewing the procedures and process of the NHAI, the following interpretations are to be noted;

- The NHAI is as an autonomous body for the development, maintenance, and management of National Highways. NHAI is dealing with the multi discipline activities like approval of projects, tendering of projects, construction supervision, safety, maintenance, etc.
- Supervision of construction, operations, maintenance and tendering process everything is being done by NHAI or through the Concessionaire/ Contractors/ Consultants who are appointed by the NHAI itself. Whereas, in the US, the FHWA funds the Interstate/ Federal Highways and acts as a supervisory authority, while the State DOTs implement the projects. This provides requisite distance and birds-eye view of the overall project implementation.
- As National Highways are predominantly designed for a speed of 100 km/hr and to achieve higher mobility, accesses to the NHs are limited and controlled. Over speeding is one of the major contributing factors for road accidents. Speed management systems/ effective enforcement infrastructure are not in place to curtail of over speeding on the National Highways. Whereas, in the US and other developed countries, enforcement on the Interstate/ Federal Highways is effectively done by the agencies like State Troopers or Highway Patrol Officers.
- Standard operating procedures (NHAI works manual) do not have clear information regarding enforcement teams and enforcement procedures on National Highways and penalizing of traffic violators.
- On the Tolled National Highways in India, the Toll operator/ the Highway's Concessionaire are contractually obligated to provide Patrol Vehicles, Ambulances and Cranes for respective highway sections. They attend to road accidents; connect with local Police and Medical facilities to provide emergency care services. These patrol vehicles on the NHs are manned by private security agencies/ contract workers and they cannot enforce the traffic rules and penalize the violators. Lack of dedicated traffic law enforcement on National Highways causing the violations goes un-checked.

Considering the above, a review of institutional and legal framework related aspects are necessary. The National Road Safety Plan discussed in the report will address all these issues some of which are as follows;

- Standardization and Streamlining Enforcement (Contact-less) practices on National Highways and Expressways is necessary to care for the enforcement related issues on National Highways.
- Enhanced enforcement mechanism
- Strengthening of the policy in terms of enforcement and the penalties to be imposed on the traffic violators.

4.6. Mechanism to Monitor

Any violation, which is likely to lead to road accidents more particularly to death, should not go slothfully. In other words, the certainty of apprehending/ booking/ challenges, bringing it to low should be very high.

It is in the interest of the road safety that more than one agency can operate under the same jurisdiction for **comprehensive enforcement**. All enforcement should be contact-free, IT-enabled, and evidence-based systems in place. With respect to National Highways, there is a need for more than one agency to operate and accomplish enforcement on National Highways, so that;

- No violation should go un-checked.
- Algorithm-based violation tracking and revenue generation systems.
- Cash free collection of penalties etc.

In 2017, out of the total 4,64,910 road accidents recorded in the country, 1,41,466 (30.4%) and out of the total 1,47,913 fatalities due to road accidents in the country, 53,181 (36.0%) deaths are on the national highways. As stated in previous chapters, traffic violations viz., over-speeding, drunken driving, wrong side driving etc., are the leading causes for road accidents. In India, enforcement of MV Act rules is predominantly visible on urban roads and they are done by the City's Traffic Police. Such enforcement activities are scant to none on the highways especially in the rural areas. Further, it can be stated that the State enforcement agencies are not adequately equipped and lack of dedicated traffic law enforcement resources, it is not realistic to achieve any significant reduction in the violations.

BOX-11: <u>Dedicated Enforcement Agency for NHs</u>

- Traffic law enforcement is not taking place comprehensively, especially on the national highways, which are carrying more than 40% of the traffic. In order to achieve the objective; which is to bring in a positive culture and evolution of SAFE DRIVER BEHAVIOR on the Indian roads;
  - ✓ comprehensive
  - ✓ extensive
  - ✓ uniform
  - ✓ continuous
  - ✓ omnipresent

  Enforcement approach has to be adopted on the national highways.
- So that, within a period of 5 years, fatalities due to accidents on national highways are reduced by at least 50%.
- This is achievable only by, in addition to State agencies, one
  - ➢ dedicated
  - ➢ committed
  - ➢ pan-India
  - ➢ pan-NHs across all States/ UTs

  Enforcement agency is on the job with suitable Standard Operating Procedures and Legal Provisions.

Chapter-5

Legal Framework

5. LEGAL FRAMEWORK

5.1. Background

Road traffic accidents injuries and death rate is alarming and is a real public health challenge for all the concerned agencies to prevent it. It is clear that present approach to implement available rules and regulations to prevent road accidents is not effective. In this context, existing government policies, frameworks, action plans, etc, related to road safety have to be studied. For this purpose, the following reports, policies, bills, etc, which have direct bearing on road safety were studied;

(a) Report of the Committee on Road Safety and Traffic Management - 2007
(b) Legal Reforms to Combat Road Accidents Report No. 234 By Law Commission of India - 2009.
(c) The National Road Safety and Traffic Management Board Bill, 2010
(d) National Road Safety Policy - 2010
(e) Road Safety Action Plan
(f) Schemes and initiatives conducted/ started/ planned by MoRTH related to Road Safety
(g) Working Groups to Recommend 4 E's of Road Safety
(h) Motor vehicles (Amendment) Bill 2019

5.2. The Constitution of India

Article 246 of the Constitution of India[30] prescribes Subject matter of laws made by Parliament and by the Legislatures of States.

- Parliament has exclusive power to make laws with respect to any of the matters enumerated in List I in the Seventh Schedule (in this Constitution referred to as the "Union List").
- The Legislature of any State has exclusive power to make laws for such State or any part thereof with respect to any of the matters enumerated in List II in the Seventh Schedule (in this Constitution referred to as the "State List").
- Parliament and the Legislature of any State also, have power to make laws with respect to any of the matters enumerated in List III in the Seventh Schedule (in this Constitution referred to as the "Concurrent List").

In Road Safety perspective, the various legislative powers of the Parliament and the State Legislatures are grouped with respect to four Road Safety Pillars, i.e., Engineering, Enforcement, Emergency Care and Education:

Table 25. List I—Union List of Seventh Schedule

Relevant Items	Clause No	
Engineering	23	Highways declared by or under law made by Parliament to be national

[30] The Constitution of India is accessed from the public domain weblink: https://www.india.gov.in/sites/upload_files/npi/files/coi_part_full.pdf

Relevant Items	Clause No	
		highways.
	64	Institutions for scientific or technical education financed by the Government of India wholly or in part and declared by Parliament by law to be institutions of national importance.
Enforcement	2 & 2A	Naval, military and air forces; any other armed forces of the Union. Deployment of any armed force of the Union or any other force subject to the control of the Union or any contingent or unit thereof in any State in aid of the civil power; powers, jurisdiction, privileges and liabilities of the members of such forces while on such deployment.
	65.	Union agencies and institutions for— a) professional, vocational or technical training, including the training of police officers; or b) the promotion of special studies or research; or c) Scientific or technical assistance in the investigation or detection of crime.
	80.	Extension of the powers and jurisdiction of members of a police force belonging to any State to any area outside that State, but not so as to enable the police of one State to exercise powers and jurisdiction in any area outside that State without the consent of the Government of the State in which such area is situated;
	93.	Offences against laws with respect to any of the matters in this List.
	94.	Inquires, surveys and statistics for the purpose of any of the matters in this List
	97.	Any other matter not enumerated in List II or List III including any tax not mentioned in of those Lists.
Education	66.	Co-ordination and determination of standards in institutions for higher education or research and scientific and technical institutions.

Table 26. List II—State List of Seventh Schedule

Relevant Items	Clause No	
Engineering		
Enforcement	13.	Communications, that is to say, roads, bridges, ferries, and other means of communication not specified in List I; municipal tramways; ropeways; inland waterways and traffic thereon subject to the provisions of List I and List III with regard to such waterways; vehicles other than mechanically propelled vehicles.
	1.	Public order (but not including 5[the use of any naval, military or air force or any other armed force of the Union or of any other force subject to the control of the Union or of any contingent or unit thereof] in aid of the civil power).
	2	Police (including railway and village police) subject to the provisions of entry 2A of List I.
	8	Intoxicating liquors, that is to say, the production, manufacture, possession, transport, purchase and sale of intoxicating liquors.
	39	Powers, privileges and immunities of the Legislative Assembly and of the members and the committees thereof, and, if there is a Legislative Council, of that Council and of the members and the committees thereof; enforcement of attendance of persons for giving evidence or producing

Relevant Items	Clause No	
		documents before committees of the Legislature of the State.
	64	Offences against laws with respect to any of the matters in this List.
Emergency	6	Public health and sanitation; hospitals and dispensaries.
Education		

Table 27. List III- Concurrent List of Seventh Schedule

Relevant Items	Clause No	
Engineering	1	Criminal law, including all matters included in the Indian Penal Code at the commencement of this Constitution but excluding offences against laws with respect to any of the matters specified in List I or List II and excluding the use of naval, military or air forces or any other armed forces of the Union in aid of the civil power.
Enforcement	2	Criminal procedure, including all matters included in the Code of Criminal Procedure at the commencement of this Constitution.
	3	Preventive detention for reasons connected with the security of a State, the maintenance of public order, or the maintenance of supplies and services essential to the community; persons subjected to such detention.
	8	Actionable wrongs.
	13	Civil procedure, including all matters included in the Code of Civil Procedure at the commencement of this Constitution, limitation and arbitration.
	35	Mechanically propelled vehicles including the principles on which taxes on such vehicles are to be levied.
Emergency		
Education	25	Education, including technical education, medical education and universities, subject to the provisions of entries 63, 64, 65 and 66 of List I; vocational and technical training of labour.

The Motor Vehicles Act, 1988 is relatable to Entry 35 of the Concurrent List and the National Highways Act, 1956 is relatable to Entry 23 of the Union List.

5.3. Report of the Committee on Road Safety & Traffic Management - 2007

5.3.1. Background and Formation of the committee

Of all the systems that people have to deal with on a day-to-day basis, road transport is the most complex and the most unsafe mode of transportation. The World Report on Road Traffic Injury Prevention of the World Bank and World Health Organization (WHO) in the year 2004 stated that road traffic injuries are a major but neglected global public health problem requiring concerted efforts for effective and sustainable prevention.

At a plenary meeting of the United Nations General Assembly on 14 April 2004, a resolution co-sponsored by India expressed grave concern about a large number of fatalities in road crashes. The World Health Organization also declared the year 2004 as

the Year of Road Safety and launched World Health Day in April 2004 with the slogan – **"Road safety is no accident".**

The concern about the detrimental impact of an unsafe road transport system on public health and global development, the level of road deaths and injuries is unacceptable and to a large extent avoidable. Thus, there is an urgent need to recognize the worsening road safety situation in order to take appropriate action. Road traffic injury prevention and mitigation should be given the same attention and scale of resources that are currently being channeled towards other predominant health issues, if increasing human loss and injury on the roads, with their devastating human impact and large economic cost to society, are to be avoided.

Road Safety is a multi-sectoral and multi-dimensional issue. It incorporates the development and management of road infrastructure, provision of safer vehicles, legislation and law enforcement, mobility planning, provision of health and hospital services, child safety, urban land use planning, etc. Road safety is a shared, multi-sectoral, responsibility of the government and a range of civil society stakeholders. The success of road safety strategies in all countries depends upon a broad base of support and common action from all stakeholders.

With massive investment in roads and the exponential growth in the number of vehicles it has become necessary to have a system, which integrates all disciplines that influence road safety and which at the same time would have linkages with established institutions that cater to the different aspects of road safety viz. engineering, education, enforcement, medical and behavioral sciences.

5.3.2. Constitution of the Committee

On 13 January 2005, the Cabinet Committee on Infrastructure headed by the Prime Minister directed the Ministry of Road Transport and Highways to present a note to the Empowered Committee of Secretaries for the creation of a Directorate of Road Safety and Traffic Management and the amendment of traffic laws as required.

Later, an Expert Committee under the Chairmanship of Shri S. Sundar, Distinguished Fellow, The Energy and Resources Institute (TERI) and former Secretary of the then Ministry of Surface Transport, Government of India was constituted to recommend a structure for the organization and advise on its role and functions.

The defined objectives, duties, roles, and responsibilities of the Committee constitute;

- To assess the magnitude of road traffic injuries and fatalities in India as a public health and economic problem;
- To study international examples of organizations for road safety and traffic regulation with a view to drawing lessons for India;
- To propose a Road Safety Organization at the Central Government level and recommend the functions and responsibilities of the proposed organization;
- To suggest amendment of relevant traffic laws;

- To suggest the financing mechanisms for such an organization;
- To suggest measures for rescue and relief of accident victims

In order to achieve the defined objectives, the committee in it's "report on Road Safety and Traffic Management, 2007[31], presented certain suggestions and recommendations and are presented as follows;

- **Existing institutional set up for Road Safety in India;** Road safety in the country has been managed by the Government at Central as well as State levels supported by efforts of academia and the private sector including industry and non-governmental organizations (NGOs). By reviewing the institutional framework in the country to deal with road safety, during the period of project preparation, the following conclusions emerge:
  - Existing institutions are not fully equipped to deal with the increasing traffic on the roads or to adopt the advancements made in the techniques and technology that would promote road safety.
  - Responsibility for road safety is diffused and there is no single agency to deal with a range of problems associated with road safety. There is also no effective mechanism for coordinating the activities of the different agencies dealing with road safety.
    The role of key ministries and public sector agencies in improving road safety is peripheral. It is not a priority area in their agenda for development.
  - The NRSC does not have adequate statutory backing, budgetary resources or the mandate to be an effective organization for executing road safety plans in a missionary mode.
- International Review of Road Safety Practices; by reviewing the international best practices, the committee observed that most countries had a stated policy to reduce road accidents, injuries, and fatalities, and had set themselves targets. However, in India National Road Safety Policy has not yet formulated.
  - A draft National Road Safety Policy, which has been under the consideration of the Ministry, was referred to the Committee for its consideration. The Committee reviewed the draft policy and suggested certain amendments to the National Road Safety Policy for adoption by the Government of India. The Committee was of the considered view that the Government of India, as part of the Road Safety Policy, should make a commitment to bring about a significant reduction in morbidity and mortality from road accidents.
- The Committee noted that resolution 60/5 adopted by the 60th session of the United Nations General Assembly invited member states to "**establish a lead agency, on a national level**", on road safety to develop a national action plan. This helps to reduce road traffic injuries, bypassing and enforcing legislation,

[31] The report of the Committee on Road Safety and Traffic Management is from the public domain weblink: http://morth.nic.in/presentationsreports12-15

conducting necessary awareness-raising campaigns and putting in place appropriate methods to monitor and evaluate interventions that are been implemented.

- The Committee recommends that the proposed Agency be called the National Road Safety and Traffic Management Board.
- The Committee recognized that the functions of the Agency would not include matters like tariff setting and rationalization, regulating incumbent service providers, creating a level playing field for new entrants, etc. and that the role of the Agency would be largely promotional.
- It also recognized that without political support it would not be possible for the Agency to discharge its functions effectively and network with other relevant ministries and the state governments.
- The Committee, therefore, felt that the Agency should be an arm of the Ministry of Shipping, Road Transport and Highways and that its role should be to aid and advise the Ministry on all matters relating to road safety.
- The Committee, however, felt that the Agency should have the freedom to set safety standards with regard to the design, construction and maintenance of national highways and in respect of Mechanically Propelled Vehicles.
- In addition, the Agency should have the necessary powers to monitor compliance, issue directions regarding compliance and levy, where necessary, penalties. Clearly, the powers to set standards and follow up on their compliance cannot be vested in the same department or Ministry, which is also responsible for the construction and maintenance of roads.
- The Committee made its recommendations in regard to the structure of the Agency, its jurisdiction, scope, and powers, including the arrangements for its funding and funding of road safety activities.
- The Committee also felt that in order to facilitate speedy consideration and implementation of its recommendations it would be useful to provide a draft of the required legislation. A comprehensive National Road Safety and Traffic Management bill has been reviewed and approved by the committee.
- The National Road Safety and Traffic Management Board should consist of a chairperson and three to five members. Each of the members should be responsible for one or more of the functions listed hereafter. The members should have expertise in one of the following areas:
    - Road engineering, construction and management, and traffic engineering
    - Automobile engineering
    - Traffic laws, operations, management, and enforcement, developing/ implementing strategies for influencing road user behavior, capacity building and education in the area of road safety

- Data collection, reporting and analyses, accident investigation, statistics and research, finance and state relations
- Accident related to medical care, trauma management, and rehabilitation.

- The primary objective of this Board would be to promote road safety and improve traffic management in India. It would be responsible for the following functions:
  - Road related measures- designing, setting standards and conducting audits
  - Vehicle-related measures- prescribing safety features
  - Road safety research – institutional linkages and training
  - Traffic laws, operations, and management, to recommend guidelines to state governments for computerizing information regarding vehicle and driver licensing; and recommend guidelines for training, testing and licensing of drivers;
  - Capacity Building: Lay down guidelines for building capacity and skills amongst personnel of traffic police, hospitals, highway authorities, NGOs and other relevant organizations dealing with road safety, and for the training of trainers.
  - Road user behavior strategies, public awareness, and education by promoting best practices in road safety and traffic management, undertake road safety and traffic management education programs, and conduct campaigns to create awareness on matters relating to road safety. Identify/recognize NGOs working in the area of road safety, and assist them in promoting road safety.
  - Medical care and rehabilitation: Lay down guidelines for establishing and upgrading trauma care systems at all levels including district hospitals and tertiary care medical college hospitals and creating a grid of medical, allied medical and rehabilitation facilities to provide first aid, care during transportation, emergency care in the hospital and rehabilitation.
  - The Board should advise the Central Government on road safety and on the administration of the provisions relating to safety as contained in the Central Motor Vehicles Act 1988 and rules there under.
  - Provide technical assistance to State Boards and other agencies engaged in road safety.
  - Enter into agreements with the state governments on behalf of the Minister for Road Transport and Highways in the Government of India for the promotion of road safety and traffic management, monitor compliance and recommend the grants to be paid to / withheld from the states;

        - Liaise with other agencies like education boards and institutions, health service providers, NGOs, etc. who play an active role in matters relating to road safety;
        - Liaise with international agencies and organizations in other countries working in any area related to road safety and traffic management.
    - The Board should not only set standards but also monitor their adoption and implementation. For this purpose, the Board would empanel auditors to do spot checks and audits on national highways under design, construction or operation to ensure that safety standards are adhered to. If standards were not adhered to, the Board would have powers to issue suitable directions with regard to corrective measures. Further, The Board should have powers to seek information and reports and access records and documents. Where the standards set or directions issued by the Board have not adhered to the Board should have the power to levy penalties. There should be a provision for appeal against the orders of the Board.
    - The Board should consult with all stakeholders before setting standards or issuing directions and ensure total transparency in its process.
    - The budget of the Board should be approved by Parliament and should be funded by grants from the Road Safety Fund. The Board should also be free to receive contributions, with the approval of the government, from national and international organizations supporting road safety.
- The committee noted that the need for the dedicated fund for road safety to take up the road safety initiatives and improve traffic management. Hence the committee proposed a National Road Safety Fund and the fund to be contributed through various resources as described below;
    - Committee on Infrastructure has decided that one percent of the cess accruing to the National highways should be employed to create a National Road Safety Fund.
    - The Committee was of the considered view that a minimum of one percent of the total proceeds of the cess on diesel and petrol should be available to the Road Safety Fund. Both Centre and the States have to contribute, as road safety is a matter of concern not only on national highways but also on the state roads, village roads and railway level crossings.
    - In addition, at least 50 percent of the amount retained by the Government of India by way of the share of the national highways and the Railways should be allocated to accident-prone urban conglomerations and States in addition to their entitlement.
- The legislation should also contain an enabling chapter for the states to set up Road Safety and Traffic Management Boards, which the states could adopt. The powers and obligations of the State Boards would be similar to those of the National Board.

- There should be Advisory Committees to advise the National Board and the State Boards on matters of policy and approaches. This would provide for better stakeholder consultation and participation in the policy-making process.
- The draft of the National Road Safety and Traffic Management Act is provided. The Act provides for the establishment of the National and State Road Safety and Traffic Management Boards, deals with their structure and lists their functions and powers as discussed above. The Act also provides for the establishment of the Road Safety Fund both at the national and state level.
- The Committee noted that the Ministry was already in the process of making comprehensive amendments to the Motor Vehicles Act, 1988 including strengthening the provisions aimed at improving road safety in the country. The amendments were at different stages of consideration.
- The Committee noted that traffic accidents were essentially registered as medico-legal cases and as a result of this, the administration of medical aid to road accident victims was often delayed. Private hospitals were reluctant to accept accident victims who were considered as medico-legal cases. The problem was further exacerbated due to the requirement that the attending doctors have to spend considerable time in appearing in the courts/tribunal when these cases come up for hearing.
    - The Committee recommended how medical care could be de-linked from the legal/criminal aspects of the case. At the same time, it was essential to ensure that there were no delays or reluctance in providing immediate and adequate medical attention.
    - The Committee recommended that the Ministry in consultation with the other relevant ministries/departments should examine this issue in depth. It also recommended changes to law or procedures be introduced wherever necessary in order to de-link the provision of medical care from the legal/criminal aspects of the case.
    - The Committee was also of the view that if the attending doctor in the first instance prepares detailed case records of the relevant treatment of accident victims in a standardized format, the presence of that doctor in the courts/tribunal's could be avoided.
    - The Committee felt that the Ministry in consultation with other relevant ministries should also consider this matter in detail and a standardized format for reporting the treatment of road traffic accidents should be introduced.
- The Committee noted that in a large number of cases, medical attention, especially in private hospitals, was being denied due to the inability of the injured person to establish his ability to defray the hospital charges. Adequate insurance cover was not available either for the vehicle or the affected party to cover the medical expenses.
- The Committee noted that the Ministry of Shipping, Road Transport and Highways had taken up this issue with Department of Banking and Insurance to see whether a dedicated fund can be created to provide immediate assistance to

the needy road accident victim, with the payment being eventually adjusted against an insurance claim. The Committee was of the view that it is necessary to ensure that on no account should provision of medical attention be delayed simply because an injured person is not in a position to provide the necessary funds. It suggested that the Government should establish an appropriate fund and scheme to facilitate this. It also suggested that insurance companies should link insurance premium with the accident record of the driver in order to provide an incentive for safe driving.

- The Committee also discussed the need for constituting a dedicated highway police force to enforce road safety on the National Highways (NH). The Committee noted that since law and order was a state subject, an NH police force would not be in a position to register crimes on the National Highways. The Committee also recognized that any move to create a dedicated highway police force could be resisted by the State governments.
- Nevertheless, the Committee felt that it was necessary to have a dedicated force capable of policing the National Highways using modern technology and equipment. Borrowing personnel from the State governments was not a satisfactory arrangement as there was no guarantee of continuity, capacity or uniformity in dealing with traffic management and road safety issues on the National Highways. The Committee noted that Government was examining the possibility of employing the Central Industrial Security Force (CISF) for this purpose.
- The Committee was of the view that the Government should examine this further with a view to constituting a dedicated force for patrolling and managing traffic on the National Highways.

5.3.3. Conclusions made by the committee

Road safety forms an integral part of road engineering, traffic management, vehicle regulation, environment protection as well as the laws that govern these areas. While road and traffic engineering should be the responsibility of the municipal and highway authorities, traffic control, traffic enforcement, and accident investigation should be the responsibility of the police; responsibility for post-accident management should rest with the police and health authorities jointly.

Responsibility of the Transport Department should not be limited to driver and vehicle regulation and licensing, but should also include the overall coordination of road safety management including regularly updating the legislation. Education and promoting awareness should be the combined responsibility of all stakeholders including the automobile and insurance industries, other members of the civil society, as well as the police and transport departments.

Presently, the responsibility for road safety management is highly fragmented and diffused. With hardly any coordination among agencies, much of the traffic control strategies adopted in India are far below international standards.

The Committee recognized that the promotion of road safety is an integrated activity involving multiple interventions. These interventions need to be combined and implemented in an integrated manner to derive the maximum benefits of each intervention. The Committee was also of the view that the programs to promote road safety should be developed and implemented using the public health approach of identifying the problem and the risks, identifying the appropriate interventions based on cost-effectiveness, sustainability and culture specificity, and finally evaluating these interventions by the actual reduction in injuries and deaths.

5.4. Legal Reforms to Combat Road Accidents

Law Commission of India prepared a report "Legal Reforms to Combat Road Accidents Report No. 234[32]" by studying, considering and focusing on the following aspects;

(a) Perspective of road accidents in India
(b) Present law in India
  (i) Indian Penal Code, 1860
  (ii) Motor Vehicles Act, 1988
(c) Position in UK
(d) Previous Reports of the Law Commission of India and its recommendations
(e) Pending Motor Vehicles (Amendment) Bill, 2007
(f) Proposed Road Safety and Traffic Management Boards and National Road Safety Policy
(g) Pedestrians and Non-motorized Traffic
(h) Recommendations

5.4.1. Present Laws in India

5.4.1.1. Indian Penal Code, 1860

Sections 279, 304A, 336, 337, 338, IPC are relevant

- Section 279. Rash driving or riding on a public way.
- Section 304A. Causing death by negligence.
- Section 336. Act endangering life or personal safety of others
- Section 337. Causing hurt by act endangering life or personal safety of others
- Section 338. Causing grievous hurt by act endangering life or personal safety of others

5.4.1.2. The Motor Vehicles Act

The Motor Vehicles Act, 1988 (MV Act) is the principal instrument for regulating motor vehicles.

[32] The Report No. 234 "Legal Reforms to Combat Road Accidents" is accessed from the public domain weblink: http://lawcommissionofindia.nic.in/reports/report234.pdf

- Chapter II relates to licensing of drivers of motor vehicles,
    - wherein section 19 confers power on the licensing authority to disqualify any person from holding a driving license or revoke such license
    - Section 21 refers to Suspension of driving license in certain cases
    - Section 22 refers to Suspension or cancellation of driving license on conviction
- Chapter VIII of the MV Act deals with the control of traffic.
    - Section 112 pertains to limits of speed and prohibits driving of a motor vehicle or it being allowed to be driven in any public place at a speed exceeding the maximum permissible speed.
    - Section 113 provides for limits of weight and limitations on use
    - Section 118 confers power on the Central Government to make regulations for the driving of motor vehicles.
    - Section 119 provides for the duty to obey traffic signs.
    - Section 129 provides for the wearing of helmets. Various other provisions are contained in Chapter VIII for regulation of traffic.
- Chapter XIII of the MV Act relates to offences, penalties and procedure.
    - Section 177 contains the general provision for punishment of offences, which is available in the absence of any specific provision for punishment applicable in a given case; the punishment is a maximum fine of Rs. 100/- for the first offence and for the subsequent offence it is only Rs. 300/-.
    - Section 183 provides the punishment for contravention of the speed limits referred to in section 112.
    - Section 184 provides for punishment for dangerous driving and Section 185 for driving by a drunken person or a person under the influence of drugs.
    - Section 184 deals with reckless driving dangerous to the public having regard to all the circumstances of the case. Offence defined under section 184 and the offence under section 279, IPC are essentially the same.
- Certain other provisions of Chapter XIII providing punishments are:
    - Section 180: allowing unauthorized persons to drive vehicles;
    - Section 181: driving vehicles in contravention of section 3 (necessity for driving license) or section 4 (age limit in connection with driving of motor vehicles);
    - Section 182: offences relating to licenses; section 182A: offences relating to construction and maintenance of vehicles;
    - Section 186: driving when mentally or physically unfit to drive;
    - Section 187: offences relating to accident;
    - Section 188: abetment of offence under section 184, 185 or 186;
    - Section 189: racing and trials of speed;
    - Section 190: using vehicle in unsafe condition;

- Section 191: sale of vehicle in, or alteration of vehicle to, a condition contravening the Act;
- Section 192: using vehicle without registration;
- Section 192A: using vehicle without permit;
- Section 193: agents and canvassers acting without proper authority;
- Section 194: driving vehicle exceeding permissible weight;
- Section 196: driving uninsured vehicle;
- Section 197: taking vehicle without authority;
- Section 198: unauthorized interference with vehicle;
- Section 201: causing obstruction to free flow of traffic.
- Section 207 confers power on any police officer or other person authorized in this behalf to seize and detain a motor vehicle, if he has reason to believe that it has been or is being used in contravention of the specified provisions, posing a serious threat to the public.

- Section 8B of the National Highways Act, 1956, which provides that whoever commits mischief by doing any act which renders or which he knows to be likely to render a national highway in relation to whose development and maintenance there is an agreement, impassable or less safe for travelling or conveying property, shall be punished with imprisonment of either description for a term which may extend to five years, or with a fine, or with both.

Further, the Law Commission, opined on

- Position in UK,
- Previous Reports of the Law Commission of India and its recommendations,
- Pending Motor Vehicles (Amendment) Bill, 2007,
- Proposed Road Safety and Traffic Management Proposed Road Safety and Traffic Management
- Pedestrians and Non-motorized Traffic

5.4.2. Recommendations

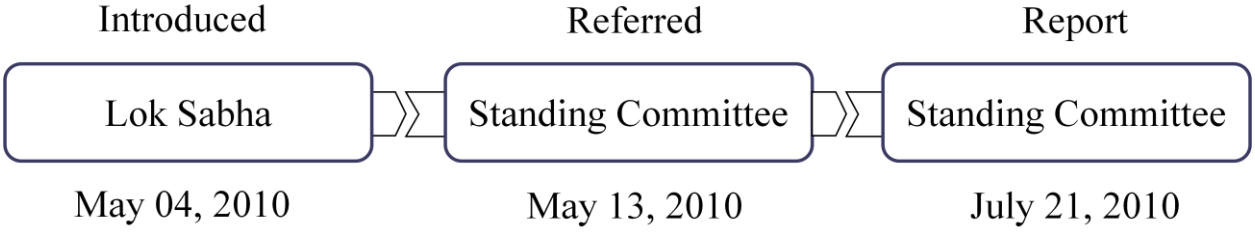
In view of the above, the Law Commission's recommendations are presented herein:

- The Law Commission has recommended amendment in section 304A: "**Causing death by negligence**" of the Indian Penal Code to make the offence of rash and negligent driving punishable with the maximum term of imprisonment of ten years, instead of two years as at present provided. It has also been recommended that causing death of any person through driving under the influence of drink or drugs should be punishable with the minimum term of imprisonment of two years.
- The maximum term of imprisonment in section 279: "**Rash driving or riding on a public way**", IPC should be increased to five years and any second or subsequent offence thereunder should be punishable with the minimum term of imprisonment of six months.

- Any second or subsequent offence under section 336: "**Act endangering life or personal safety of others**", IPC, if committed within three years of the commission of the previous similar offence and the rash or negligent act involved is the act of driving, should be punishable with the maximum term of imprisonment of two years.
- Any second or subsequent offence under section 337: "**Causing hurt by act endangering life or personal safety of others**", IPC, if committed within three years of the commission of the previous similar offence and the rash or negligent act involved is the act of driving, should be punishable with the maximum term of imprisonment of three years.
- Any second or subsequent offence under section 338: "**Causing grievous hurt by act endangering life or personal safety of others**", IPC, if the rash or negligent act involved is the act of driving, should be punishable with the maximum term of imprisonment of five years.
- The maximum term of imprisonment in section 184: "**Driving Dangerously**", MV Act should be increased to five years and that any second or subsequent offence thereunder should be punishable with the minimum term of imprisonment of six months.
- As an important part of the enforcement measures, there should be compulsorily installed weighbridges at all points of entry and exit to and from a city as well as toll collection centres to keep in check overloaded vehicles.
- As an important part of the enforcement measures, there should be compulsorily installed CCTV Cameras at all vulnerable points, to be determined by an expert committee, to curb traffic violations.
- As an important part of the enforcement measures, there should be a vigorous campaign on the electronic media, including Doordarshan, All India Radio and private TV channels, through regular programmes and debates so as to create awareness amongst the general public about the imperative necessity to strictly follow traffic rules and regulations as well as highlight the impact and consequences of rash and negligent driving.

5.5. The National Road Safety and Traffic Management Board Bill, 2010

5.5.1. History of the Bill



5.5.2. Bill Summary

The National Road Safety and Traffic Management Board Bill, 2010[33] was introduced in the Lok Sabha on May 4, 2010, by the Minister of Road Transport and Highways, Shri Kamal Nath. The Bill was referred to the Standing Committee on Transport, Tourism, and Culture, which is scheduled to submit its report within two months.

The Bill seeks to establish a National Road Safety and Traffic Management Board for the development and regulation of road safety, traffic management system and safety standards in highway design and construction.

The Board shall consist of a Chairperson and five members appointed by the central government on the recommendation of a Selection Committee. The term shall be five years. The Chairperson shall have professional knowledge of administration and road transport. Members shall have experience in road design, automobile engineering, accident investigation, traffic management, and trauma care.

The functions of the Board include

- recommending minimum standards for design, construction, and maintenance of national highways,
- recommending minimum standards for trauma and para-medical facilities for traffic-related injuries on the national highway, and
- conduct safety audits to monitor compliance with the standards notified by the central government.
- It shall also recommend minimum safety standards for the manufacture of mechanically propelled vehicles and other types of vehicles,
- recommend minimum conditions of safety such as specifying the maximum load bearing and capacity limits,
- recommend standards for vehicular traffic on the national highways (speed lanes, right of way),
- conduct research on road safety and management, establish a procedure for data collection, involve non-government organizations in the promotion of road safety, and provide for special requirement of women, children, and senior citizens.

The Board may constitute an Advisory Committee of a maximum of 31 members in order to represent the interests of road users, construction industry, transport industry, and automobile manufacturers. The Committee shall advise the Board on questions of policy, road safety, and protection of road user's interest.

The National Road Safety and Traffic Management Fund shall be created by crediting one percent of the cess on diesel and gasoline under the Central Road Fund Act, 2000; any grants and loans made by the central government; and any sum received by the Board from other sources to be prescribed by the central government.

[33] The National Road Safety and Traffic Management Board Bill, 2010 is accessed from the weblink: http://www.prsindia.org/sites/default/files/bill_files/Road_Safety_Bill_2010.pdf, courtesy PRS Legislative Research

Any person who fails to comply with the standards of design or construction of a highway or mechanically propelled vehicles as notified by the central government shall be liable to a fine of up to Rs 10 lakh, with an additional penalty if the person continues to commit the offense. Any person who willfully fails to furnish information or furnishes false information shall be liable to be fined up to Rs 1,000 and an additional penalty on subsequent offense.

A court can take cognizance of an offense only on a complaint made by the Board. Only a Chief Metropolitan Magistrate or a Chief Judicial Magistrate can try an offense under this Act.

The central government has the power to supersede the Board under prescribed conditions for a maximum period of six months.

5.5.3. Standing Committee Report Summary on the Bill

A summary of Standing Committee's Report on the National Road Safety and Traffic Management Board Bill, 2010[34] is presented herein:

As the Bill was referred to the Standing Committee on Transport, Tourism, and Culture, which is scheduled to submit its report within two months based on which the further action on the bill was processed. The following are the summary of comments given by the standing committee;

- The Committee recommended that the Bill to create the Board for road safety and traffic management needed to be made comprehensive so that all aspects of road safety are incorporated.
- According to the Sundar Committee report, the basic problem was the existence of a large number of agencies at the center and state with little coordination among them. The Bill, however, does not do away with the existing agencies and the role of the Board is to aid and advise the Ministry. The Committee observed that the Bill is only adding yet another institution to the existing ones. It does not empower the Board to act as a coordinator among existing bodies.
- Since the Board can make recommendations on road safety only with relation to national highways, its mandate is limited
- The Committee noted that the Motor Vehicles (Amendment) Bill, 2007 has not been passed, which would have taken care of many road safety issues instead of introducing another Bill.
- The Committee showed its disapproval at the idea of bringing legislative proposals to the Parliament in piecemeal.
- The Committee asked the government to expedite the formulation of a National Road Safety Policy.

[34] Standing Committee's Report on the National Road Safety and Traffic Management Board Bill, 2010 is accessed from the weblink: http://www.prsindia.org/uploads/media/National%20Road%20Safety%20and%20traffic%20management%20SCRS.pdf courtesy PRS Legislative Research

- The Committee pointed out that the qualification required of the Chairperson of the Board has been diluted from what was recommended in the Sundar Committee.
- The Committee stated that any measure for improving road safety and traffic management would not be successful unless the menace of corruption is taken care of.
- The Committee felt that instead of looking at the examples of US and Sweden to formulate Indian road safety policy, it will be better to look at Brazil or China since they would be of greater relevance.
- The Committee recommended that the Bill be withdrawn and the government should come out with comprehensive legislation that addresses the entire gamut of road safety.

Based on the report from the standing committee report and the points mentioned in the report, after two years, the bill was rejected by a parliamentary standing committee with a stinging critique.

5.6. National Road Safety Policy - 2010

A comprehensive national road safety policy has been prepared by the government based on the recommendations of Sunder Committee and globally accepted multi-pronged strategy and the safe-system approach for improving road safety, the National Road Safety Policy[35] outlines the initiatives to be taken by the Government at all levels. The policy is outlined as under: -

Policy Statements

In order to achieve a significant improvement in road safety, the Government of India is committed to:

(i) Raise Awareness about Road Safety Issues

The Government would increase its efforts to promote awareness about the various aspects of road safety, the social and economic implications of road accidents and what needs to be done to curb the rising menace of road accidents. This would enable and empower the different stakeholders to play a meaningful role in promoting road safety.

(ii) Establish a Road Safety Information Database

The Government will provide assistance to local bodies, Union Territories and States to improve the quality of crash investigation and of data collection, transmission, and analysis. A National Road Safety Information System will be established for providing continuity and policy guidelines to this activity.

(iii)Ensure Safer Road Infrastructure

[35] The National Road Safety Policy – 2010 is accessed from the public domain website: http://www.morth.nic.in

The Government will take measures to review standards pertaining to safety in the design of rural and urban roads and bring them in consonance with international best practices keeping in view Indian traffic conditions. Continuing application of Intelligent Transport Systems (ITS) under a national framework to establish a safe and efficient transport system will be encouraged.

(iv) Safer Vehicles

The Government will take steps to ensure that safety features are built in at the stage of design, manufacture, usage, operation, and maintenance of both motorized and non-motorized vehicles in line with international standards and practices in order to minimize adverse safety and environmental effects of vehicle operation on road users (including pedestrians and bicyclists) and infrastructure.

(v) Safer Drivers

The Government will strengthen the system of driver licensing and training to improve the competence and capability of drivers.

(vi) Safety of Vulnerable Road Users

The design and construction of all road facilities (rural and urban) will take into account the needs of non-motorized transport and the vulnerable and physically challenged in an appropriate manner. The Government will seek to disseminate 'best practices' in this regard to town planners, architects, and highway and traffic engineers.

(vii) Road Traffic Safety Education and Training

Road safety knowledge and awareness will be created amongst the population through education, training and publicity campaigns. Road safety education will also focus on schoolchildren and college going students, while road safety publicity campaigns will be used to propagate good road safety practices among the community. The Government will encourage all professionals associated with road design, road construction, road network management, traffic management, and law enforcement to attain adequate knowledge of road safety issues.

(viii) Enforcement of Safety Laws

The Government will take appropriate measures to assist various state and other governments to strengthen and improve the quality of enforcement in order to ensure effective and uniform implementation of safety laws. The Government will actively encourage the establishment and strengthening of highway Patrolling on National and State Highways in cooperation with State Governments and Union Territories as appropriate.

(ix) Emergency Medical Services for Road Accidents

The Government will strive to ensure that all persons involved in road accidents benefit from speedy and effective trauma care and management. The essential functions of such a service would include the provision of the rescue operation and administration of first aid at the site of an accident and the transport of the victim from the accident site to a nearby hospital. Hospitals alongside the National Highways and State Highways would be adequately equipped to provide for trauma care and rehabilitation.

(x) HRD & Research for Road Safety

The Government will encourage increased activity in programs of road safety research by identifying priority areas, funding research in those areas adequately and establishing centers of excellence in research and academic institutions. The Government will facilitate dissemination of the result of research and identified examples of good practices through publication, training, conferences, workshops, and websites.

(xi) Strengthening Enabling Legal, Institutional and Financial Environment for Road Safety

The Government will take appropriate measures to ensure that the required legal, institutional and financial environment for road safety is further strengthened and a mechanism for effective coordination of various stakeholders is put in place. The reforms in these areas would provide for the active and extensive participation of the community at large, of the private sector, academia and NGOs.

(xii) Implementation Strategy

The Government has decided to establish a dedicated agency viz. a National Road Safety and Traffic Management Board (NRSTMB) to oversee the issues related to road safety and evolve effective strategies for implementation of the Road Safety Policy.

5.7. Schemes Implemented by MoRTH to Improve Road Safety[36]

5.7.1. Refresher Training for Heavy Vehicle Drivers

Ministry has implemented a scheme titled "Two days refresher training to heavy motor vehicle drivers in the unorganized sector" to inculcate safe driving habits and to acquaint the drivers with the rules on roads. The following are the number of drivers benefited from the scheme;

- 15,740 drivers trained during the Ninth Five year Plan,
- 1,92,218 drivers have been trained during the Tenth Five Year Plan.
- 1,28,550 HMV drivers were trained during the Eleventh Five Year Plan.
- During 2013-14, around 40,000 HMV drivers of the unorganized sector were imparted refresher training.

[36] The Schemes and initiatives conducted/ started/ planned by MoRTH related to Road Safety is accessed from the public domain website: http://morth.nic.in/schemes-projects

5.7.2. Setting Up of Institutes of Driving Training & Research (IDTR)

The Ministry has felt the need for developing an institutional mechanism to provide training to trainers to impart quality training to the drivers, as nearly 78% of all road accident is caused due to drivers' fault. A scheme for setting up of model driving training institute has been formulated by the Ministry. During 10th and 11th plan

21 number of IDTR institutes has been sanctioned out of which 14 are functional. The DTI / IDTRs are playing a very important role in imparting the training to drivers or refresher training at the time of renewal of the driving license. As per available information, around 3,00,000 HMV drivers have been imparted refresher training to inculcate the road safety.

Before implementing the scheme of setting up of IDTR during the 12th Five Year plan, the ministry has appraised the scheme. The ministry proposes to set up 10 IDTR and 25 Regional Training Driving Centre (RTDC) during the 12th Five Year Plan. During 12th Five Year Plan, preference will be given to those projects, which are proposed to be executed on Public-Private Partnerships (PPP) Model and to the proposal from states where no IDTR/DTI was sanctioned during 10th & 11th Plan. Cases for up gradation of driving tracks by way of automation and for provision of driving simulators, if not provided earlier, will also be considered. However, this will be subject to the satisfactory capacity utilization of the institute. In the case of RDTCs, proposals for setting up of driving training centers will also be considered. Preference will be given for proposals for all women driving training centers. While evaluating the proposals, the capacity utilization of training centers sanctioned earlier in the State will also be considered.

5.7.3. National Highway Accident Relief Service Scheme (NHARSS)

National Highway Accident Relief Service Scheme (NHARSS) entails providing cranes and ambulances to States / UTs / NGOs for relief and rescue measures in the aftermath of accidents by way of evacuating road accident victims to nearest medical aid center and for clearing the accident site. Under this scheme as per available data,

- 347 ten-ton cranes and 106 small/medium size cranes have been provided under the scheme.
- 579 ambulances have been provided to States / UTs / NGOs under the scheme.
- During 2012-13, Ministry of Road Transport & Highways has provided 134 advanced life support ambulances to 134 identified State Government hospitals upgraded under the Ministry of Health Highways and Family Welfare's Scheme establishment of an integrated network of Trauma Centers' along the Golden Quadrilateral, North-South and East-West Corridors of the National Highways.
- Apart from above, during 2013-14, Ministry also issued a work order to provide 20 small hilly cranes and 17 no. of 10-ton cranes to the states.

5.7.4. Road Safety Equipment

The Ministry has implemented a scheme under which road safety equipment is provided to States/ UTs for enforcement and implementation of various rules & regulations relating to road safety. Under this scheme as per available data,

24 Interceptors have been sanctioned with various equipment for the purpose of detection of violation of rules by the road users such as over-speeding, drunken driving, lane - jumping, dangerous driving, etc.

5.7.5. Publicity Measures and Awareness Campaign on Road Safety

With a view of spreading road safety awareness among the general public, the Government has been undertaking various publicity measures through following medium containing road safety messages for various segments of road users viz. Pedestrians, cyclists, school children, heavy vehicle drivers, etc.

- telecast/broadcast of T.V.
- spots/Radio jingles,
- organizing Road Safety Week, seminars, exhibitions,
- all India essay competition on road safety,
- printing of calendars,
- Children activity books,
- book on signage and sign, posters, etc.,

A massive public awareness campaign was carried out in the electronic/print media through the Directorate of Advertising and Visual Publicity (DAVP), Doordarshan and All India Radio.

Publicity material like calendars, posters, book on road signs, children activity book, cloth bags, etc. was also supplied to Transport and Police Authorities in States/Union Territories and selected schools for widespread distribution.

Calendars containing the road safety messages were also sent to different departments/ministries, autonomous bodies like UPSC, SSC, CVC and all the Members of Parliament.

A road safety walk was also organized during road safety week in association with Delhi Police and SIAM. Schools and college students were involved in the road safety walk. Similarly to create awareness amongst cyclist, a cyclothon was organized involving school and college students. In the cyclothon, importance of reflective tapes for road users especially cyclist were highlighted.

5.7.6. Setting up Model Inspection and Certification Centers for Vehicles

The fitness tests of motor vehicles, being carried out presently are a visual and subjective evaluation by the inspecting officer. In order to have an effective system for inspection

and certification of motor vehicles from safety and emission angles, the Ministry intends to put in place a suitably designed automated system throughout the country for rigorous and objective inspection of motor vehicles and to remove the defects before they are allowed to ply on road.

During 11th Plan, the Government sanctioned ten (10) I&C Centers has to be set up one each in the States of Andhra Pradesh, Karnataka, Gujarat, Maharashtra, Rajasthan, Himachal Pradesh, Madhya Pradesh, U.P., and Delhi. It is expected that around six (6) centers will be functional by September 2014 and remaining will be functional by the end of the current financial year.

During the 12th Five Year Plan, the Government has decided to set up 10 more I&C Centre one each in the states where I&C Centre was not sanctioned during the 11th Five Year Plan.

5.8. Working Groups on 4 E's of Road Safety

The Ministry of Road Transport & Highways (MoRTH) formed 4 separate working groups on 4 E's of Road Safety viz. (i) Education; (ii) Enforcement; (iii) Engineering (roads as well as vehicles); and (iv) Emergency care, as per the deliberations in the meeting of the National Road Safety Council.

These groups would submit their recommendations on short term and long term measures for immediate implementation so as to curb road accidents in the country. These groups have to submit their report and deliberations has to be made on various aspects of road safety.

5.8.1. Education :-

Awareness is generated through various Road Safety Campaigns utilizing audio-visual and other print media and through NGOs. With the view to raise road safety awareness among the general public, the Government have been undertaking various publicity measures through DAVP and professional agencies in the form of telecasting/broadcasting of TV spots/Radio spots, display of cinema slides, distribution of posters, books on road safety signage & signs, organizing Road Safety Week, Seminars, Exhibitions. All India Essay Competition on Road Safety, etc., containing road safety messages for various segments of road users viz. Pedestrians, cyclists, school children, heavy vehicle drivers, etc. painting on road railings on themes of road safety, road safety games, calendars depicting road safety messages, etc.

The following are summary of major points, discussions and recommendation suggested by the working group committee through its report, with respect to Education.

5.8.1.1. Working Group on Road Safety Education (RSE)

The working group committee discussed 11 major strategic issues that need immediate attention of the government to make people safer on roads. There can be other issues as

well, but even if the country is able achieve progress on this list it would be able to make an effective contribution to the road safety scenario in India. The list has not prioritized but represents a bunch of issues and action needed on all of them simultaneously, with a view to achieve 50 percent reduction in road accidents by 2020, it is imperative to prioritize an Action Plan encompassing the following 11 strategic issues need immediate attention by the government to launch the campaign.

- ❑ Formulation of a National Road Safety Policy
- ❑ Targeting drivers
- ❑ Improving data reporting system
- ❑ Imparting safety education to children
- ❑ Broadening ambit of RSE
- ❑ Outreach and awareness generation
- ❑ Rural-urban divide
- ❑ Mobilizing resources
- ❑ Strengthening laws and their enforcement
- ❑ Education to be accompanied with enforcement
- ❑ Examples of good practices and rewarding them
- ❑ Political will and support

In the report, the Working Group also presented a Time Bound Action Plan on the pattern of the Millennium Development Goals to reduce accidents in India by half by the end of the Road Safety Decade in 2020. This Plan will need to incorporate the recommendations of the other three Working Groups to be turned into a coherent National Action Plan.

The report also highlights the Road Safety Education and Problematic Areas and the draft National Road Safety Policy has emphasized the importance and necessity of RSE as recommended by Sundar Committee.

BOX-12: Road Safety Education and Problematic Areas

- Road safety education/ knowledge and awareness will be created amongst the population through education, training and publicity campaigns.
- RSE will also focus on schoolchildren and college going students, while road safety publicity campaigns, will be used to propagate good road safety practices among the community.
- The Government will encourage all professionals associated with road design, road construction, road network management, traffic management and law enforcement to attain adequate knowledge of road safety issues.

The following are some of the issues brought forward by the working group committee;

- ❑ Absence of Road Safety Policy and Law
- ❑ Lack of coordination among departments whose work relates to road safety issues.

- Lack of political will/ low priority on government agenda and Inter-Ministerial Coordination
- Lack of financial support/ Paucity of Funds
- Absence of Nodal agency/ Monitoring Committee/ Road Safety Councils at state or regional levels
- Dodgy Data Reporting System and lack of Systemic data generation and interpretation
- Poor condition of roads
- Poor implementation of Road Safety Standards
- Unsafe Vehicle Design and Speed
- Lack of Prioritization and Ignorance in the enforcement and engineering team (Prioritizing road safety)
- Information dissemination
- Attitudinal Problems
- Absence of routine training programs for traffic police/ drivers
- Rural Urban Divide
- Absence of space for participation
- Lack of ownership:

The report also describes Road Safety Policy 2011-2020 to achieve the following goals;

- Reduction of accidents
- Adoption of Road Accident Data Management System by all States to improve the dodgy Data Reporting System
- Develop a Road Safety Communication Strategy to promote road safety awareness among children, students, public and focused groups
- Provide emergency care in Golden Hour
- Reduce fatal accidents
- Identification and improvement of all black spots
- Provide quality training to drivers
- Ensure all categories of drivers to have refresher training and promote quality driving parameter among drivers
- Address rural-urban divide
- Innovate methods for funding of road safety activities
- Develop public private partnership in securing the goals of road safety
- Strengthen institutional mechanism, laws and their enforcement

In the report, the committee describes the Roadmap to achieve the defined Goals, Targets and Indicators for Road Safety Education: 2011-2020.

In this report the RSE goals and targets to be achieved by 2020 was identified and chalked out the milestones, and the detailed recommendations elaborate on how to achieve the target through short term and long-term plans by the road map

The road map provides the milestones, and the detailed recommendations elaborate on how to achieve the target through short term and long-term plans. The problematic issues, which hinder RSE, have also been presented.

The Working Group believes that even if these targets/milestones are achieved, some of the expected results are:

1. **Awareness and Behavioral Changes**
   - increased awareness and knowledge of the traffic environment.
   - appropriate survival skills necessary for the safe use of the road environment.
   - better understanding of the behavior and attitudes that have influence on road safety.
   - increased knowledge and understanding of how humans, vehicles, and systems interact and work.
2. **Drivers-related**
   - extremely helpful to recognize the fast developments taking place in vehicle technologies, which would require a paradigm shift in the driver training approach and teaching methods in times to come.
   - greater strictness in issue of licenses would come into force.
   - improvements in pre-test training methods incorporating all relevant aspects related to driver, vehicle and environment.
   - introduction of post-test training, particularly for novice drivers.
3. **Outcomes**
   - decision-making skills that will enable citizens to make choices and to take responsibility for their own safety and that of others.
   - reduction in accident numbers.
   - respect and care for other road users.
   - knowledge and understanding of the causes and consequences of road accidents.
   - necessary knowledge, understanding and skills to travel safely in or on a vehicle, while showing consideration for others.
   - beneficial to society in aspects such as skills for self-assessment and evaluation, driver attitudes and overconfidence, motivation, individual needs and lifestyle, etc.

5.8.2. Enforcement

The Motor Vehicles Act 1988 and Central Motor Vehicles Rules 1989 contain a number of provisions, which if enforced correctly, would curb traffic violations by drivers. The enforcement of these provisions is primarily the responsibility of the concerned State Government. The States have been advised from time to time to enforce various provisions of the Motor Vehicles Act 1988 in the right earnest to improve road safety scenario in the country.

The control of National Highways (Land and Traffic) Act, 2002 provides powers to Highway Administration for control of land within the National highways, Right of Way

and traffic moving on the National Highways also for removal of unauthorized occupation of land within the national highways.

The following are summary of major points, discussions and recommendation suggested by the working group committee through its report, with respect to Enforcement. The detailed working group report on Road Safety pertaining to Enforcement can be accessed using the link: *http://morth.nic.in/presentationsreports12-15*

I. Measures which are urgently required to improve road safety scene:

- Amendment of Motor Vehicles Act 1988
- Overloading of Commercial Vehicles
- Use of Road Safety Devices like Helmet, Seat Belt
- Drunken Driving
- Database of all Traffic Violations
- Strict checking of overcrowded passenger vehicles
- Improvement of Road Engineering
- Use of Technology for interacting with road users

II. Institutional changes required to enhance road safety

- Issuance of driving licenses
- Digitization of Driving Licenses
- Issuance of fitness certificate by Transport Authorities
- Modernization of Traffic Management System in cities
- Speed Calming measures on Highways near inhabited areas
- Wayside amenities for long distance drivers
- Compulsory installation of GPS in Commercial Vehicles
- Part of fine being made available for Road Safety
- Apex Road Safety Body at the State and District Level

5.8.3. Engineering

Specification/designs are constantly under review by the Roads Wing of the Ministry. The States are constantly being advised on these issues. The Ministry had issued detailed guidelines regarding engineering measures to be taken by all concerned to ensure road safety vide a circular last year. As per this circular the following engineering measures are considered essential for adoption so as to help in improving road safety leading to reduction of accidents:- Geometry of the road; Separation of local traffic; Pedestrian facility; Bus bays; Illuminations; Development of Junction; Signages; Traffic calming & Safety Management Measures; Bridges/CD Structures: and Road Safety Audit.

5.8.3.1. Working Group on Engineering (Roads)

In the report, the following points were highlighted;

- Road accidents and fatalities and the accident data for the past 10 years;

- Procedure for road accident data collection; and mentioned that at present there is no system of scientific investigation, recording, analysis and maintaining of database in the country.
- Various causes of accidents;
- Cost of Accidents; which constituted 3% of the GDP for the year. At present, the estimated loss to the Nation because of road accidents may be of the order of about Rs. 100,000 crore and;
- Various Engineering Measures to control accidents and Major Challenges pertaining to Engineering Measures
- Discussed Present Policy regarding Engineering Measures for Road Safety which also highlights;
    - Specifications and designs are constantly under review by the Ministry of Road Transport & Highways
    - Present Scenario of conducting Road Safety Audits;
    - Requirement vis-a-vis available resources for the National Highways Network and the Resources available for the development of National Highways, Resources for Maintenance & Repair of National Highways;

Based on these points highlighted and discussed in the report, the following are the recommendations given by the working group committee on Engineering (Roads);

- Review of existing Standards and Guidelines for Highways, Urban Roads, and improving new standards and manuals by filling the gaps in the current standards, requirement of new initiatives and need for ensuring the construction zone safety for traffic operation.
- Monitoring and evaluation of road designs and traffic management strategies though road safety audits including national highways and state highways. Encourage Institutionalization of conducting Road Safety Audits by certified Road Safety Auditors. Further, it also mentioned that no projects should be sanctioned / approved unless the report entirely complies with the Safety Audit Report and the Capacity for Road Safety Audit works in the country is to be enhanced by providing proper training and conducting certifications courses for Road Safety Auditors.
- There should be proper accident investigation and the accident data recording system is to be adopted uniformly across all States for roads in urban and non-urban areas in a standard format by tech-savy with hand-held GPS and computer interface to collect all data with highest precision. Standard accident analysis module for accident investigation and adjudication uniformly to be used across the country without any exception and need for the Institutionalized System of Database storage.
- Need for training, research and development related to road safety.
- Need for Capacity Building in Safety Administrations, Institutional Arrangements for planning, delivery, evaluation, monitoring and improvement, Inter-Disciplinary Coordination, and Availability of Resources.

In this section, summary of major points, discussions and recommendation suggested by the working group committee through its report, with respect to Engineering (Roads) were discussed. The detailed working group report on Engineering (Roads) can be accessed using the link: *http://morth.nic.in/presentationsreports12-15*

5.8.3.2. Working Group on Engineering (Vehicles)

The members of the committee examined the overall extent of vehicular and occupant safety and following parameters have been studied and considered;

- Safety rules for Vehicle Construction and its approval (Present and future) - Comprehensive plan for various categories (2 W, 3 W, small passenger vehicles, large passenger vehicles, goods vehicles, agriculture tractors, CEVs and other special purpose vehicles should be outlined.
- Safety aspects during complete life cycle of vehicles to be addressed
- Vehicle technology for sustainable mobility should be captured – Eco-friendly vehicles, multi - modal transport approvals, ITS, state/ city specific plans, etc.
- Establishing close link of following:
    - Linkage of TA data with vehicle registration, inspection and end of life
    - Accident data, analysis and its link to regulations
    - International harmonization of safety regulations

The Working Group has consolidated its study on 5 major topics, namely:

- **Safety Vision and Goals -** This aims at conceiving an overall picture of vehicular and occupant safety as a short term as well as long-term plan. While considerable ideas are drawn from other developed countries, their specific relevance in Indian scenario is thoroughly examined. Working Group also proposes specific long-term and short-term goals towards road safety.
- **Safety Standards - Roadmap -** India has adopted step-wise approach to introduce mandatory safety standards for various categories of vehicles. Safety roadmap is also drawn in order to achieve harmonization with international safety regulations related to vehicle testing and approval. All the details regarding past, present and future implementation, are captured in the report. Specific recommendations are also made to cover the existing gaps effectively.
- **Safety in vehicles - on road through Inspection and Certification (I & C) -** As a comprehensive plan for vehicular safety it is essential to effectively implement Inspection and Certification (I&C) program for all categories of vehicles. Proposed plan for country-wide implementation is detailed out. At a later date, the I&C program should also be also integrated with End of Life Vehicle
- **Accident Investigation -** Accident data assumes vital importance in matters involving future policies, expansion plans, safety regulations, vehicle designs, etc. A structured and scientific approach is proposed to achieve the objectives.
- **Intelligent Transport System (ITS) -** It is envisaged that there would be large penetration of electronics and IT in transportation. Summary of global scenario is captured and its potential in India is examined.

The Working Group has given its suggestions and recommendations on the identified specific action areas at the macro level as under. Further, it would be necessary to develop detailed action plan and estimate funding requirements for necessary allocation. Recommendations suggest that vision and goals for next 20 years need to be adopted and established for further drawing up definite action plan.

In this section, summary of major points, discussions and recommendation suggested by the working group committee through its report, with respect to Engineering (Vehicles) were discussed. The details and technical inputs, which would be useful in developing detailed action plans and detailed working group report on Engineering (Vehicles) can be accessed using the link: *http://morth.nic.in/presentationsreports12-15*

1. **Establishing Safety Vision and Goals**
    a. **Vision:** To reduce the fatalities and injuries due to road traffic accidents by 4 Es (Engineering, Enforcement, Education and Emergency Medical Services)
    b. **Goals:**
        i. **Stage-1 (2011-2020) Reduce the increasing rate of fatalities:** Current situation shows that the rate of road fatalities is increasing annually. The first immediate objective should be to reduce this rate.
        ii. **Stage-2 (2020-30) Reverse the trend of fatalities and injuries:** Reversing the trend would require comprehensive action plan.
        iii. **Stage-3 (2030 and beyond) "Vision zero":** to pursue no road injuries or fatalities Sweden adopted "Vision Zero" in year 1997 and they have taken several steps to work towards the goal.
    c. Accordingly specific targets should be given to each of the 4'E's.

2. **Implementing vehicle engineering solutions through mandatory safety rules**
    a. Requirements related to passive safety, active safety and general safety are to be introduced in a planned manner viz;,
        i. **Short-term (3-5years):** Major improvements in vehicle designs are expected with introduction of full vehicle crash tests, EMC and high technology solutions for better visibility. Enhancement of standards related to vehicle stability and braking should be implemented. Standardization of bus bodies, truck bodies and trailers would greatly enhance road safety.
        ii. **Intermediate (5-10 years):** Discussions should be initiated in CMVR-Technical Standing Committee on the new subjects like pedestrian safety, crash avoidance systems, Electronic Stability Control. Safety standards for vehicle categories like Construction Equipments should be upgraded.
        iii. Long term (beyond 10 years): Work should be initiated in next 1-2 years. Vehicle to vehicle crash compatibility, advanced restraint systems, vehicle to road furniture interaction are some of the future

areas of work. Additional safety enhancement would be possible through advanced technologies for driver assistance systems**.**

b. Take up formulation of new safety standards for Intermediate and Long Term phases as above. In addition, existing standards should be upgraded from time to time to address new technology and stringency requirements.
c. Also, address other areas like construction equipment vehicles, hydraulic trailers, ITS, inspection and testing rules for in-use vehicles, End of Life Vehicle, etc. Standards should be developed for mandating these requirements in future.

3. Establishing effective mechanism for control of in-use vehicle

a. Introduce mandatory Inspection and Certification (I&C) requirements for all categories of vehicle (Transport vehicles as well as non-transport vehicles, including 2-wheelers).This should be done in phased manner.
b. Establish computerized I&C Centers all across the country. These centers should diligently work independently but should be under the guidance and supervision of government authorities.
c. Define policies and procedures for End of Life and scrapping of un-usable vehicles. Encourage investments by private sector in order to develop sustainable centers.
d. Establish control mechanism for use of spurious parts in the aftermarket by covering more and more components under mandatory marking scheme. Independent/ third party testing agencies should be involved in auditing and testing of samples collected from market.

4. Establish comprehensive Road Accident Data Analysis

a. Develop strategic alliances with international organizations/ experts
b. For effective planning and execution, there should be National Accident Research Center (mother organization) and data collection at State Accident Research Centers (daughter organizations). Department of Heavy Industry has already planned Accident Research Center under NATRiP. Center under NAIRiP needs to be considered while making future plans.
c. Develop human resources, formulate Accident Investigation Teams, and empower them for scientific data collection. Involve other stakeholders for accident data collection and dissemination.

5. Effective use of IT & Electronics for vehicle-road interfaces and transport management

a. Establish long-term strategy for use of ITS in India.
b. ITS solutions are expected to lead to better road safety. One should not wait for the market forces to usher-in the technology and ITS needs to be driven by the Government efforts. Government should review globally available options and announce action plan for India.
c. ITS being an inter-disciplinary subject, a task force should be appointed to establish a comprehensive action plan based on the government policy.

d. Identify priority areas where immediate penetration would be easy. Some such areas would be Real Time Traffic Information System, Electronic Toll Collection, Automatic Vehicle Tracking and Fleet Management, Incidence Management, etc.

6. Support research activity in vehicle engineering and regulations

a. Undertake or support projects such as standardization of bus designs, truck bodies, trailer designs, Under-run protection Devices, etc. This will help the un-organized sector of the industry to bump-less transition to new safety regulations.

b. Evolve India specific vehicle and laboratory test data to support our endeavor of harmonization of standards with international regulations

c. Undertake feasibility studies for advance technology safety requirements (like Electronic Stability Control, rear collision, frontal impact for buses, etc. Also, undertake benefit to cost analysis studies in order to mandate specific standards for approval of vehicles.

5.8.4. Environment and Emergency care of road accident victims

Few events are more distressing than an unexpected loss of life or permanent disability caused by physical violence or accidental injury. Particularly tragic is the injured, potentially salvageable patient who dies needlessly through delay in retrieval, inadequate assessment or ineffective treatment. This not only maims many young lives but also deprives all affected of the 'Right to Life' guaranteed to them vide Article 21 of the Constitution of India.

Trauma – defined as a physical injury sustained by a person; requiring timely diagnosis and treatment by a multidisciplinary team of health care professionals, supported by the appropriate resources, to diminish or eliminate the risk of death or permanent disability – has been often termed as the "neglected disease of modern society." Trauma is now the leading killer of young persons in their productive years. The National Health Profile of India 2009 lists injury as the 3rd leading cause of death in India.

In the report, the committee discussed the prevailing problems in the Accident & Emergency Care Delivery in India. The following are the some of the problems associated with the accident and emergency care;

Table 28. Difficulties in each stages of Emergency Care

Description	Related Consciences
At the site of Impact	• There is lack of awareness about the Emergency Medical Service (EMS) System • The general public doesn't possess basic first aid skills • There is no standardized toll free national access number to call for emergency medical help • Adequate number of First Responders/Ambulances are not there • There are no standardized protocols & medical directives for EMS
In Transit to a	• Non-availability of **appropriate & safe transport** for the injured

Description	Related Consciences
definitive care health facility	patient in the form of road ambulances, air ambulances, etc • The real concept of an Ambulance is missing in India. Existing ambulances are more like transport vehicles without consideration to the overall ambulance design w.r.t. patient care, comfort & ergonomics. • Currently there is no 'National Ambulance Code' in the country, which specifies the minimum National Specifications for various types of Ambulances, viz ALS, BLS, First Responder, etc. • The ambulances are inappropriately/inadequately equipped • In-adequate care during transportation due to lack of trained Emergency Medical Technicians (EMT's) in the country & unskilled existing manpower • Lack of Standard Operating Procedures (SOP's) for pre-hospital • triage and transport to appropriately designated hospitals in sync with the type and gravity of their injury • Remuneration of paramedics and drivers are not in sync with their skills
At the Healthcare Facility	• Appropriate healthcare facilities are not available within reasonable distances • There is a mismatch between the healthcare facility capacity vis a vis the catchment area resulting in overcrowding at the limited number of available facilities • Infrastructure at the existing healthcare facilities is deficient due to lack of funds or poor planning • Inadequately equipped healthcare facilities due to lack of National Standards and Guidelines regarding the same • Sub-optimal quality care at the existing health facilities due to inadequately skilled manpower • Lack of SOP"s regarding the handling of a patient on his arrival at the healthcare facility • Lack of accountability and monitoring mechanisms to ensure timely and optimal care
Miscellaneous	• Lack of documentation and a foolproof reporting mechanism due to which majority of the Road Traffic Accidents (RTA"s) go unreported and the real magnitude of the problem is not known. • Laws like Motor Vehicles Act 1988 and CMVR 1989 which have been in vogue since 1980"s and have not been updated since then • Lack of co-ordination between agencies resulting in a mismatch between the existing resources • There is no appropriate database for further evaluation and enhancement of the services being rendered • Post Trauma Rehabilitation Facilities for the injured are deficient • Research into post crash response and emergency care is not there • There is lack of awareness regarding Hon'ble Supreme Court of India's directives regarding the Right to Emergency Care for RTA victims & the legal protection available to good Samaritans who offer help to a RTA victim.

Description	Related Consciences
	• There is no provision to ensure adequate compensation to an RTA victim in case the accident causing vehicle doesn't have a third party Insurance • Majority of the drivers do not have a personal medi-claim policy to cater to their emergency medical needs in case of an accident

Trauma care includes multifarious activities from the time of occurrence of injury until the injured returns to optimum functioning. Availability, Accessibility and Affordability of emergency care play crucial role in accessing emergency services and pre-hospital care. EMS in India is at crossroads and a lot needs to be done to achieve global standards and provide timely optimal care to victims. This working group after due deliberations propose the following recommendations to provide India a resilient and contemporary EMS system after reviewing the existing schemes;

1. The scope of the existing scheme should be expanded to cover all the national highways in all the states with initial emphasis on states with difficult terrains.
2. State Governments should be encouraged to replicate similar schemes on the state highways
3. A periodic audit for the already supplied Ambulances & Cranes should be done w.r.t. their location, availability, utilization, efficacy, manpower, uptime, etc.
4. A monitoring mechanism to ensure proper implementation of the existing scheme should be institutionalized
5. **Short term Measures (one – two years for realization)**
    a. Enunciate a National Accident Relief Policy & a National Trauma System Plan
    b. Ensure a primary crash response time of 8 – 10 mins by deploying a Pan-India Pre-Hospital Emergency Medical Care Network. A unified toll free number, for seamless communication, centralized dispatch, medical direction, triage protocols & crash rescue units should adequately support this network.
    c. To verify & designate the existing healthcare facilities along the Highways and upgrade those found deficient to minimum defined levels & to plan for new facilities where there is a deficit so as to ensure the availability of one emergency care facility at every 50km along the national highways.
    d. Plan for seamless networking amongst health facilities, rescue services, existing fleet of ambulances, etc.,
    e. Capacity building and regular training in EMS to all involved in trauma care supplemented by training in First Aid to the public
    f. Encourage research & development into post-crash response.
    g. Appropriate changes in the Motor Vehicles Act 1988 & CMVR 1989
6. **Long Term Measures (three – five years for realization)**
    a. Assured essential emergency care to all citizens of India

b. Augmentation in capacity and resources of available Medical establishments
c. Setting up of Regional Referral Trauma Centers across the country supported by a Heli-Ambulance network to ensure speedy care to the severely injured
d. Plan for rehabilitation centers for the trauma care victims
e. Standardize minimum national specifications for various types of Emergency Response Vehicles viz. First Responders, Patient Transport Ambulances, BLS Ambulances & ALS Ambulances, Crash Rescue Vehicles, Dispatch Centers, Command & Control Centers, etc. so as to bring homogeneity in the system across the country.

5.9. The Motor Vehicles (Amendment) Act, 2019

The Motor Vehicles (Amendment) Act, 2019[37] (Bill No. 154 of 2019) was introduced in Lok Sabha on July 15, 2019 by the Minister for Road Transport and Highways, Mr. Nitin Gadkari. The Bill seeks to amend the Motor Vehicles Act, 1988 to provide for road safety. The Act provides for grant of licenses and permits related to motor vehicles, standards for motor vehicles, and penalties for violation of these provisions.

Extract of Statement of Objects and Reasons as presented in the Bill

The Motor Vehicles Act, 1988 (the Act), was enacted with a view to consolidate and amend the laws relating to motor vehicles. The Act was amended several times to adapt to the technological up gradation emerging in road transport, passenger and freight movement and in motor vehicle management. With rapidly increasing motorization, India is facing an increasing burden of road traffic injuries and fatalities. The emotional and social trauma caused to the family which loses its bread winner, cannot be quantified. India is signatory to the Brasilia Declaration and is committed to reduce the number of road accident fatality by fifty per cent. by the year 2020. The road transport sector also plays a major role in the economy of the country.

Numerous representations and recommendations in the form of grievances and suggestions from various stakeholders have been received in the Ministry, citing cases of increase in road accidents, delay in issue of driving licenses, the disregard of traffic rules and regulations, etc. Therefore, in order to improve road safety and transport system, certain amendments are required to be made in the Motor Vehicles Act, 1988 to address safety and efficiency issues in the transport sector.

In view of the above, it has become necessary to amend certain provisions of the said Act. The Motor Vehicles (Amendment) Act, 2019 seeks to address the issues relating to road safety, citizen facilitation, strengthening public transport, automation and computerization.

[37] The Motor vehicles (Amendment) Act 2019 is accessed from the public domain web ink: http://egazette.nic.in/WriteReadData/2019/210413.pdf

The Motor Vehicles (Amendment) Act, 2019, inter alia, provides for the following, namely:—

(a) to facilitate grant of online learning license;
(b) to replace the existing provisions of insurance with simplified provisions in order to provide expeditious help to accident victims and their families;
(c) to increase the time limit for renewal of driving license from one month to one year before and after the expiry date;
(d) to increase the period for renewal of transport license from three years to five years;
(e) to enable the licensing authority to grant license even to the differently abled persons;
(f) to enable the States to promote public transport, rural transport and last mile connectivity by relaxing any of the provisions of the Act pertaining to permits;
(g) to increase fines and penalties for violation of provisions of the Act; and
(h) to make a provision for protection of Good Samaritans.

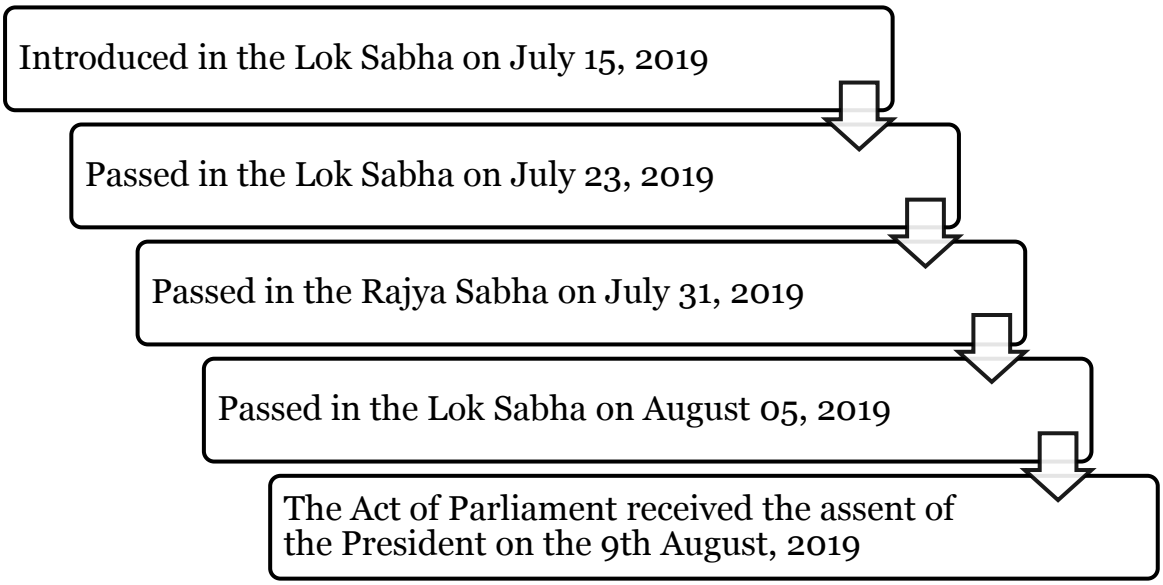


Figure 38. The MV (Amendment) Act's Chronology

5.9.1. The MV (Amendment) Act Summary[38]

Compensation for road accident victims: The central government will develop a scheme for cashless treatment of road accident victims during golden hour. The Bill defines golden hour as the time period of up to one hour following a traumatic injury, during which the likelihood of preventing death through prompt medical care is the highest. The central government may also make a scheme for providing interim relief to claimants seeking compensation under third party insurance. The Bill increases the minimum compensation for hit and run cases as follows: (i) in case of death, from Rs 25,000 to two lakh rupees, and (ii) in case of grievous injury, from Rs 12,500 to Rs 50,000.

[38] PRS Legislative Research, Bill Summary: The MV (Amendment) Bill, 2019. https://www.prsindia.org/sites/default/files/bill_files/Motor%20vehicles%202019%20bill%20summary.pdf

Compulsory insurance: The Bill requires the central government to constitute a Motor Vehicle Accident Fund, to provide compulsory insurance cover to all road users in India. It will be utilised for: (i) treatment of persons injured in road accidents as per the golden hour scheme, (ii) compensation to representatives of a person who died in a hit and run accident, (iii) compensation to a person grievously hurt in a hit and run accident, and (iv) compensation to any other persons as prescribed by the central government. This Fund will be credited through: (i) payment of a nature notified by the central government, (ii) a grant or loan made by the central government, (iii) balance of the Solatium Fund (existing fund under the Act to provide compensation for hit and run accidents), or (iv) any other source as prescribed the central government.

Good samaritans: The Bill defines a good samaritan as a person who renders emergency medical or non-medical assistance to a victim at the scene of an accident. The assistance must have been (i) in good faith, (ii) voluntary, and (iii) without the expectation of any reward. Such a person will not be liable for any civil or criminal action for any injury to or death of an accident victim, caused due to their negligence in providing assistance to the victim.

Recall of vehicles: The Bill allows the central government to order for recall of motor vehicles if a defect in the vehicle may cause damage to the environment, or the driver, or other road users. The manufacturer of the recalled vehicle will be required to: (i) reimburse the buyers for the full cost of the vehicle, or (ii) replace the defective vehicle with another vehicle with similar or better specifications.

National Transportation Policy: The central government may develop a National Transportation Policy, in consultation with state governments. The Policy will: (i) establish a planning framework for road transport, (ii) develop a framework for grant of permits, and (iii) specify priorities for the transport system, among other things.

Road Safety Board: The Bill provides for a National Road Safety Board, to be created by the central government through a notification. The Board will advise the central and state governments on all aspects of road safety and traffic management including: (i) standards of motor vehicles, (ii) registration and licensing of vehicles, (iii) standards for road safety, and (iv) promotion of new vehicle technology.

Offences and penalties: The Bill increases penalties for several offences under the Act. For example, the maximum penalty for driving under the influence of alcohol or drugs has been increased from Rs 2,000 to Rs 10,000. If a vehicle manufacturer fails to comply with motor vehicle standards, the penalty will be a fine of up to Rs 100 crore, or imprisonment of up to one year, or both. If a contractor fails to comply with road design standards, the penalty will be a fine of up to one lakh rupees. The central government may increase fines mentioned under the Act every year by up to 10%.

Taxi aggregators: The Bill defines aggregators as digital intermediaries or market places which can be used by passengers to connect with a driver for transportation purposes (taxi services). These aggregators will be issued licenses by state. Further, they must comply with the Information Technology Act, 2000.

5.10. Conclusions

Legal framework for combating rising road accidents and fatalities, should take a "zero tolerance" policy toward the most common transgressions – dangerous and reckless driving; disregard for traffic rules; jumping red lights; driving under the influence of liquor; failing to use seatbelts, and driving without a helmet – to bring about a visible change. However, the strict implementation of traffic rules and stringent punishments alone will not solve the persisting crisis. Change in the mindset of riders and drivers and road users realizing their responsibilities alone will bring about a change.

In this chapter, existing legal framework, policies etc., in the country have been studied, which deals with the road safety. Law and order is being the subject of the State, post

crash investigation will be with the respective state governments. However, round the clock enforcement of traffic rules, which is a preventive action, is lacking on Indian roads, particularly on the National highways. In present scenario, enforcement of traffic rules is done mostly by the States and there is no agency belonging to the Center, which can do enforcement work under the MV act.

The State enforcement agencies are doing traffic law enforcement predominantly in the urban areas. On the national highways which predominantly pass through rural areas, effective, evidence based and omnipresent enforcement is not taking place.

Absence of enforcement on the national highways means lack of deterrent penalties/ penal actions for the road users who break traffic laws and in turn, the violators are susceptible of the risk of an accident or endangering the their lives or of others.

Therefore, it is suggesting that, on the NHs across the length and breadth of the country, there should be multiple agencies with powers under the MV Act, to do the enforcement. So that there will be:

- General deterrence, it occurs when road users obey road rules because they perceive a substantial risk of being detected and punished if they don't
- Specific deterrence, it occurs when someone who has broken the rules is punished and stops the unlawful behavior as a result

The quintessential aspect of this proposal is to reduce the total number of accidents on the national highways, by setting up an agency that;

- ➡ has Zero Tolerance on an offence or violation under the motor vehicle act,
- ➡ ensures certainty of punishment

There should not be a situation where the errant vehicles are stopped on the high-speed highways for enforcement actions. To achieve effective enforcement operations on the national highways, the proposal suggests contact less and IT enabled/ Technology driven enforcement. Fundamentally, the legal framework is actually suggesting that, there should be multiple agencies both the federal government and also the state governments on the national highways to enforce the MV Act.

Chapter-6

Use of ITS and AI in Transportation

6. USE OF ITS AND AI IN TRANSPORTATION

6.1. History of ITS

The origin of the formal ITS program dates back to the nineteen sixties with the development of the Electronic Route Guidance System, or ERGS in the United States, to provide drivers with route guidance information based on real-time traffic analysis. The system used special hardware located at various intersections across the road network, on-board 2-way devices in vehicles that would form the hub of communication between the driver and the ERGS system, and a central computer system that processed the information received from the remote systems. During the early seventies, the ERGS program led to a more sophisticated, automated system comprising interactive visual digital maps called the Automatic Route Control System or ARCS. The Urban Traffic Control System was developed concomitantly, connecting various traffic signals and computer generated predetermined signal timings for better traffic organization. Numerous ITS applications have been developed by various organizations/institutions around the globe and tailored to offer transportation solution to meet their specific needs. The same era saw the development of the Japanese Comprehensive Automobile Traffic Control System (CACS) program, presumably one of the earliest public-private partnership efforts in the world to test an interactive route guidance system with an in-vehicle display unit. The Autofahrer Leit and Information System (ALI) in Germany was a dynamic route guidance system based on real traffic conditions, employed in the seventies. This was followed by AMTICS and RACS projects that heralded the era of high-tech traffic management in Japan.

Meanwhile, the United States strove to formulate the Federal Transportation Bill, the successor to the Post Interstate Bill of the fifties, to solve issues of growing traffic congestion, travel related accidents, fuel wastage and pollution. In 1986, the Intelligent Vehicle Highway System (IVHS) was formulated that led to a spate of developments in the area of ITS. The General Motors-funded Highway Users Federation for Safety and Mobility Annual Meeting (HUFSAM) was held in Washington DC in November 1986 to collaborate with the US DOT in sponsoring a National Leadership Conference on "Intelligent Vehicle Highway System (IVHS)". A Federal Advisory Committee for IVHS was incorporated to assist the US-Department of Transportation and was aimed to promote orderly and expeditious movement of people and goods, develop an efficient mass transit system that interacts smoothly with improved highway operations and an active IVHS industry catering to both domestic and international needs. This laid the foundation for the formal Intelligent Transportation Society of America (ITS America) in 1991 as a non-profit organization to foster the use of advanced technologies in surface transportation systems.

In Europe, the Program for a European Traffic System with Higher Efficiency and Unprecedented Safety (Prometheus) was designed by auto manufacturers and this was followed by Dedicated Road Infrastructure for Vehicle Safety in Europe (DRIVE) project, set up by the European Community.

6.1.1. ITS Around the World

In developed countries, road operators have become dependent on ITS for not only congestion and demand management, but also for road safety and improved infrastructure. A detailed account of ITS deployments around the world is discussed below[39]

6.1.1.1. United States of America

The U.S. Department of Transportation coordinates the ITS research activities in the country through its Research and Innovative Technology Administration (RITA) wing. The RITA combines cutting edge research with technology transfer and aims to improve the country's transportation system. The main aims of RITA include:

- Coordinating, facilitating and reviewing research and development programs and activities of the in-house team as well as academic and industrial partnerships
- Developing innovative concepts for traffic management through academic and small business innovative research (SBIR) programs
- RITA's Contributors
- Performing comprehensive transportation statistics research, analysis and reporting; and
- Educating special groups and general public in transportation and transportation-related fields.

RITA also coordinates the activities of many Federal and Private Agencies [List 1] and collates knowledge gained into developing ITS. Some US-ITS initiatives of special focus are Telephonic Data Dissemination, Intel i-Drive, Next Generation 9-1-1, Cooperative Intersection Collision Avoidance Systems, Congestion Initiative, Integrated Corridor Management Systems, Carus Initiative, Emergency Transportation operations, Mobility Services for All Americans and Electronic Freight Management

6.1.1.2. Japan

ITS in Japan was formalized around the middle of the last decade. This period, called the initial stage of ITS, started the use of in-vehicle navigation systems and electronic toll collection. The second phase (2005) built on the discoveries and developments of Phase I efforts, provided more extensive and accurate public transport information for optimization of travel time and convenience. Core areas of development included rapid emergency and rescue activities, establishment of public transport organizations as part of the ITS and improvement of information services to improve the convenience of transportation. The future Fourth Phase (after 2010) is to integrate all technology and concepts developed in the previous phases and apply them in synergy for a fully functional ITS. This would involve, among other activities, setting up a full-scale advanced information and telecommunications society with extensive optic fiber network

[39] Intelligent Transportation Systems, Synthesis Report on ITS, Transportation Engineering Division, Dept. of Civil Eng., IIT Madras

and innovative social systems. Additionally, a reduction in business traffic will permit to relieve the roadside environment and the global environment.

The first ITS implementation was a computer-controlled area traffic control system in Japan and was installed in Tokyo in 1970. It is reported that the implementation has reduced travel time and saved man-hours and gas consumption in the order of 5.7 times the installation cost. After the success of the Tokyo Area Traffic Control System, nationwide installation of traffic control centers started in a series of Five-year Projects for Traffic Safety Systems. The Comprehensive Automobile Control System (CACS), sponsored by the Ministry of International Trade and Industries was developed during 1973 — 1978. This involved the interaction between each vehicle and the management system such that roadside management equipment communicated directions to each vehicle depending on its declared destination and ID. The directions or 'guide table' for every destination in the neighborhood was stored in the roadside equipment and updated periodically according to traffic conditions so that the vehicle was guided to the best route. The vehicle ID was used to measure travel time between roadside equipment. The implemented CAS comprised the following five subsystems:

- Route guidance subsystem (RGS)
- Driving information subsystem (DIS)
- Traffic incident information subsystem (TIS)
- Route display board subsystem (RDB)
- Public service vehicle priority subsystem (PVP).

In 1987, Toyota Electro Multi-vision was installed in its Crown model, which was the first car using a Cathode Ray Tube to display the map. Today, Japan uses the largest number of navigation systems in its vehicles. According to a survey in 2006 by Cross Marketing Inc., more than 50% of Japanese cars use advanced navigation systems. The Road Automobile Communication System (RACS) was organized by Highway Industry Development Organization. Under the supervision of the Ministry of Construction, a series of field experiments with 91 road-side equipment were conducted in a 350 km2 study area between Tokyo and Yokohama

6.1.1.3. Europe

Mainland Europe's Intelligent Transport Systems falls under the umbrella of Road Transport Informatics (RTI). RTI focuses on two interacting programs - Road Infrastructures for Vehicle safety in Europe (DRIVE) and Program for European Traffic with Highest Efficiency and Unprecedented Safety (PROMETHEUS). DRIVE falls under the control of the Commission of European Communities (CEC), and PROMETHEUS is part of the European Research Coordination Agency (EUREKA) platform, an industrial research initiative involving 19 countries and European vehicle manufacturers. System development is the primary goal of the PROMETHEUS project, while DRIVE focuses on human behavior issues and implementation of systems in the European community. Other

European Union (EU) public-private partnership focusing on specific safety applications of ITS technologies initiatives are safety, INVENT, and PREVENT.

The INVENT program works towards improving traffic flow and traffic safety by development of novel driver assistance systems, knowledge and information technologies, and solutions for more efficient traffic management, to prevent or minimize the severity of accidents. INVENT focuses on eight specific projects:

- Detection and Interpretation of the Driving Environment through the use of laser, radar, sensors and video image processing, and communicating the information to road users.
- Anticipatory Active Safety through automatic detection of crossing cyclists and pedestrians and warning drivers, and support the driver in lane changing and turning maneuvers.
- Congestion Assistance through automatic cruise and headway control for regulation of speed to, maintenance of safe distance and detection of potential obstacles.
- Driver Behavior and Human Machine Interaction measure the driver's reactions and response to new systems, to improve the human—machine interface.
- Traffic Performance Assistance through vehicle-based data collection and analysis of traffic state, and communication to upstream vehicles.
- Network Traffic Equalizers use dynamic route guidance and navigation systems to track traffic data and choose optimal route to destination.
- Traffic Management in Transport and Logistics enabled by intelligent route planning systems for deliveries, and optimized courier services taking into account mobility of customers and duration of trip, guaranteeing precise delivery times.
- Traffic Impact, Legal issues and Acceptance evaluate the economic and business implications of the new technologies, as well as potential legal conflicts.

6.1.1.4. United Kingdom

Some successful implementations of ITS-UK include:

- Internet based maps aimed at freight transport. In London, "Transport for London" (TfL) have produced a digital map of all London's speed limits which is available free of charge to anyone who wishes to use the map for personal use, or to create commercial applications.
- Managed motorways: benefits of reduced emissions due to smoother traffic flow, of the removal of the need for additional road building (a carbon intensive activity), and of better design of roadside equipment reducing energy consumption.
- Cameras: As part of the "Ring of Steel" program of Coucestershire Constabulary, cameras have been installed on major routes across the country to monitor journey times and traffic flow

- Television: Several tools have been developed to facilitate the "Strategic Road Network" Programme, including motorway traffic viewer (MTV) and the web-based online MTV.
- Information services to support travel planning - for towns, workplaces, other activity centers, and individual
- Toll collection and management. Electronic toll collection has been implemented in the following regions of the country:
    - Ireland - Easy Pass on national toll roads in Ireland
    - United Kingdom - DART-tag for the Dart ford Crossing
    - United Kingdom - London congestion charge in London
    - United Kingdom - Fast tag Mersey tunnels: Queensway Tunnel and Kingsway Tunnel
    - United Kingdom - M6 Toll tag in the Midlands
    - United Kingdom - Severn TAG for the Severn Bridge crossing and Second Severn Crossing
    - United Kingdom - Tamar Bridge
- Point to point speed enforcement has been ensured by use of multilane cameras and automated information display for smoother and safer traffic flows
- Two kinds of Intelligent Speed Adaptation (ISA) applications are being implemented in London. Advisory ISA system takes the speed limit and displays the information to the driver via a dashboard unit. Voluntary helps the driver by making it difficult to accidently
- Accelerate beyond the speed limit the key to both systems is that the vehicle is aware of its location on the road and the speed limit at that location. It does this using a Global Positioning System (GPS) signal and a digital speed limit map, which is held within the ISA unit. A beta Advisory ISA system is now available for public download, including source code released under the GNU license.
- The London Road Safety Unit (LRSU) manages the London Safety Camera Partnership (LSCP), which uses cameras to enforce speeds and reduce the number of people running red lights.
- London's TfL is also working on designing a futuristic bus shelter that uses solar power to operate CCTV and a real time passenger information display.
- Step-free access tube stations in London are equipped with ramps and escalators
- The public transportation buses in London are being slowly converted to hybrid vehicles. It is being planned that all new buses entering service after 2012 will be hybrid powered

6.1.1.5. Middle East

Inspired by the traffic efficiency and safety in European roads due to the introduction of ITS, the Middle East, whose transportation sector is expanding faster than anywhere else in the world, has begun introducing and implementing ITS systems since last decade. The flagship conference of the ITS-Arab Organization, focusing on ITS issues and required developments in the Middle East was held during December 2006 in Dubai. This

conference with the theme `Shaping the Future with ITS' established the foundation of a formal ITS program in the Middle East. The ITS system is supported by Gulf Traffic Intelligent Systems, Canada; Intelligent Transport Systems India; South African Society for Intelligent Transport Systems and ITS America.

Dubai Municipality started the implementation phase I for project ITS Dubai, which is considered to be the first comprehensive ITS project in the Middle East, and one of the most sophisticated ITS projects currently being implemented in the world. This ITS is expected to serve a rapidly growing population and the potential for phenomenal economical growth has attracted investors and businesses from all over the world.

Several integrated approaches are being implemented to achieve ITS in Dubai, such as constructing new roads and interchanges, promoting public transportation and enhancing road network. The ITS project by the Dubai Municipality has been working on this project since Mid 2002, and the project has currently reached the tendering stage, having successfully completed planning, study, preliminary design, and final design phases.

The ITS is designed such that the municipality is automatically alerted of incidents on its roadways by a combination of real-time traffic flow information via 63 freeway monitoring stations. Point detection using radar sensors and wide area detection using video image processing are expected to be installed, particularly along bridges, within tunnels, and at key interchanges. Stations are designed to be non-pavement intrusive, for easy maintenance and relocation if necessary.

The ITS is designed such that once an incident is detected and verified, a software will search through the response planning bank and will recommend to the operator the best way to deal with the incident. The municipality is also slated to rebuild the existing Traffic Control Centre to a State of Art Comprehensive Traffic Management Centre.

- Advising motorists ahead of a traffic jam to alter routes
- Diverting traffic safely and with least inconvenience, away from accident induced blocked lanes
- Automatic moderation of speed limits during incidents or congestions.
- Implementation of pre approved and tested plans jointly with Police Department and
- Establishing easy and rapid approach to accident locations and hospitals during incidents.
- Prioritizing signals to support traffic incidents and civil defense vehicles
- Handling equipment to guarantee reaching injured drivers and passengers as soon as possible.
- Automating traffic management plans to reduce congestion during special events

Relevant traffic related information is provided to the drivers through LED-based Dynamic Message Signs "DMS" that are located upstream of decision points. State-of-the-art graphical information with concise English and Arabic text are designed. Nearly 300 real time lane use control signals and speed control signals are being installed along

critical segments and bridges and tunnel approaches. Real-time wireless messaging including SMS and WAP services are being provided to compatible mobile phones in partnership with Etisalat. Map-based information on the internet, showing travel times, congestion information, and video images from DM cameras are being designed for efficient communication of travel-related data to the public. The Municipality of Dubai has also developed a dynamic navigation system for vehicles. The testing phase has been completed and the CD is set to be released in the market soon. Traveler information kiosks with touch-screen navigation are also located in shopping malls and other public areas to provide important travel related information to the public.

6.1.1.6. Canada

Canada has been in the forefront of intelligent transport for more than half a century. The world's first computer-controlled traffic signal system operated in Toronto in 1959. The world's first all-electronic, open-access toll highway, the 407 ETR (electronic toll route) opened in Greater Toronto in 1999. Other ITS innovations in Canada have included ramp metering on the Queen Elizabeth Way (QEW) and the COMPASS freeway traffic management system on the QEW and Highway 401, the main route through Toronto and one of North America's busiest highways. The very successful Combo smartcard has been used on the Burlington, Ontario transit system since 1995.

Transport Canada is part of the Transportation, Infrastructure and Communities (TIC) portfolio of the Government of Canada to develop regulations, policies and services in the transportation sector in Canada. Transport Canada has been responsible for the development of a "Border Information Flow Architecture (BIFA)" in partnership with the U.S. Federal Highway Administration, to ensure that technologies deployed at border crossings interact efficiently with each other. The development of the BIFA followed the regional ITS architecture practices widely used throughout Canada and the U.S. The BIFA was developed in conjunction with federal, state and provincial agencies from both sides of the border. Transport Canada is a leader in developing technologies, and promoting strategies and policies that help persons with disabilities, seniors and other citizens with unique needs use the national transportation network without undue obstacles.

6.2. Range of ITS Applications

Intelligent Transportation Systems can play significant role on the road network. ITS based applications are critical for the success of multi-sectoral road safety interventions, as the technology brings down the gaps between the stakeholders. Some of the ITS Applications are listed below:

- **Traffic Information**
  - Advanced Traveler Information System (ATIS)
  - Traffic – transport information system
  - Mobile Applications
  - Real Time tracking systems
  - CCTV
- **Traffic Control**
  - Intelligent Signaling system
  - Automatic vehicle location system

- Police patrol monitoring system
- e- Challan (ticketing)
- Pedestrian/biker detection system
- Smart card-based DL system
- Traffic control maintenance services system
- Traffic flow monitoring system
- Ramp metering system
- Automatic speed detection system
- Automatic number plate recognition system
- Automatic vehicle detection system
- Area traffic control system
- Red light violation detection
- Automatic traffic counter and classifier
- Wrong way vehicle detection

❑ **Incident Management**

- Emergency and accident response
- Automatic incident detection
- Distress call response management system
- Smart tracking and distress alert system for automobiles

❑ **Demand Management**

- Automatic fare collection system
- Electronic toll collection system
- Parking management and information system
- Parking guidance system
- Intelligent parking lot management system

❑ **Driver Support and Monitoring**

- Journey time monitoring system
- Vehicle information and communication system (VICS
- Route guidance system – dynamic route guidance

❑ **Fleet and Transport Management**

- Multimodal transportation logistics support system
- Transportation monitoring system (fleet monitoring system)
- Goods vehicle weight monitoring system
- Vehicle tracking system

➡ **ITS for Enhanced Enforcement**

❑ **Speeding**

- Intelligent Speed Adaptation
- In-vehicle Information Displays

❑ **Driving Under the Influence of Alcohol and Other Drugs**

- Alcohol Sniffer Systems
- Performance Tests
- Electronic Licenses
- CCTV to Better Target Alcohol and Drug Testing

❑ **Vehicle Immobilization Technology**

❑ **Seatbelt Wearing**

❑ **Giving Way (emergency vehicles)**

❑ **Railway Level Crossing Warnings and Camera**

❑ **Keeping a Safe Following Distance**

❑ **Prevention of Use of mobile phones in vehicles**

❑ **Licensing and Registration**

- Automatic License Plate Recognition Systems
- Electronic Licenses
- Overloading

❑ **Detection of violations**

- Closed Circuit Television
- In-vehicle Event Data Recorders
- ALPR Systems and Electronic Vehicle Identification
- Remote engine immobilization
- Remote speed governing device
- Vehicle Tagging and Tracking Device
- Electronic Toll Collection
- Freight Mobility
- Detection for Red Light & Speed Violation

6.3. ITS Options

Despite legislation designed to prevent traffic rule violations, many drivers involved in fatal traffic collisions clearly failed to comply with one or more road traffic laws at the time of their collision. Road rules will only be obeyed if people believe that not obeying them will result in outcomes like fines or license cancellation. The perceived likelihood of being caught and penalized for disobeying road rules should be high. In addition, the penalties should be large enough to discourage people from disobeying the rules. In other words, improvements in traffic law enforcement should be part of an integrated road safety policy and have been shown to lead to rapid reductions in deaths and injuries when applying best practice.

6.3.1. Process of Proposal Selection

After careful evaluation of crash data, it is imperative to enforce of traffic laws especially speeds, which has larger positive impact with fatalities and serious injuries, pointing to the importance of speed control and possibly also of improved emergency response with improved or increased police deployment. Hence, based on accident analysis and field surveys, the following enforcement activities are recommended be taken up to minimize traffic violations and reduce fatalities:

6.3.1.1. ITS Enabled Enforcement

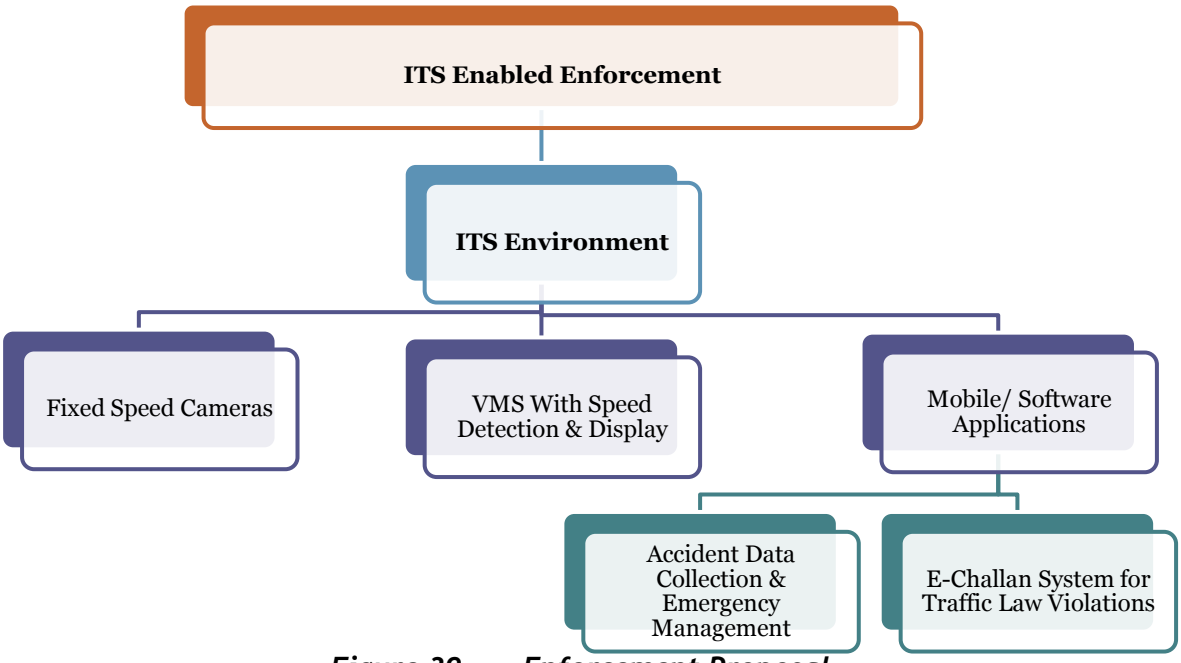


Figure 39. Enforcement Proposal

Over speeding Speed Camera based ITS Solution

- Automatic -Speed Camera based ITS solution
- Warning against over speeding- Electronic Variable message Signs displaying vehicle speeds

Aggressive Driving

- Surveillance- Gantry mounted Camera

In addition, it should be noted that ITS supported Enforcement of Traffic Rules is the way to go and should be of highest priority to instill discipline to motorists and discourage them to follow unsafe and aggressive driving on Highways. Considering that, Highway

Patrol/ Police have limited presence on Rural Highways to enforce traffic rule violations in consistent manner, which is resulting in reckless driving by motorists.

6.3.1.2. Objective

The Objectives of an ITS based Advanced Traffic Management System:

- To provide Automatic Speed Enforcement System (ASES) at suitable/ requisite number of locations for capturing vehicles on both directions at each location along project corridor with Automatic Number Plate recognition (ANPR) Camera linked to Speed Measuring Radar for capturing image / Video of every vehicle traveling above threshold speed. Data shall be transferred to Central ITS Server via High Speed Fiber Optic Backbone.
- To provide Automatic Video Incident Detection Systems (AVIDS) at suitable/ requisite number of locations for capturing vehicles on both directions at each location along project corridor that automatically detect incidents such as wrong way driving, speeding, accidents and more, to ensure appropriate response. Data shall be transferred to Central ITS Server via High Speed Fiber Optic Backbone.
- To provide CCTV System at suitable/ requisite number of locations for capturing vehicles on both directions at each location along project corridor to monitor traffic flow conditions. Data shall be transferred to Central ITS Server via High Speed Fiber Optic Backbone.
- To Communicate with Road Users thru Variable Messaging Display (VMD/VMS) System installed at suitable/ requisite number of locations along corridor covering both directions of traffic at each location:
    - VMD shall display the messages received on-site or from back-office via High Speed Fiber Optic Backbone
- To provide suitable/ requisite number of Mobile/Portable VMS Sign Board with trailer and hitch for displaying Traffic Information
- Field equipment associated with ASES, AVIDS, VMDS and CCTV shall be energized by conventional electrical power.
- To integrate e-challan system at Central Server and to furnish e-challan machines to police for issuing challans on site. E-challan software could be procured from National Informatics Center, NIC-India or develop the same meeting specified requirements.
- To survey, design, procurement, supply, installation, construction, configuration, testing, commissioning and maintenance of a Corridor wide Optical Fiber Cable Network, for building a backbone for a corridor, along with the associated active, passive, civil, mechanical and power components.
- To establish Control Room with central ATMS/ITS central server system at a location specified by Purchaser. ASES/ITS Central Server:
    - To Procure, Install, Commission and Maintain Pre-Fabricated Container style Control Room/Command Center along with required furniture at location specified by Purchaser.
    - To Procure, Install, Commission and Maintain Central Severs at Control Room with required network hardware to connect& communicate with various equipment installed such as Cameras, Speed Measuring Radars,

Video Incident Detection Cameras, CCTV Cameras, VMD/VMSs, e-Challan Machines via high speed fiber cable network.

- To Procure/Develop, Install, Commission and Maintain server software/applications associated with ASES, VIDS, CCTV, VMD/VMS & e-Challan systems (to be procured from NIC-India thru Police Dept.).
- To Receive, Analyze and Manage data received from various systems/equipment such as ASES, AVIDS, CCTV, VMD/VMS& e-Challan Systems
- To Establish and Maintain e-challan processes by validating camera captured violation data on specified workstations and access vehicle data from "VAHAN" related to identified number plates of violating vehicles

➢ To establish Sub-Control Room and provide workstations at district Police headquarter control rooms to communicate with central ITS server to receive violation data and for generating challan on over speed vehicles as per speed violation rules.

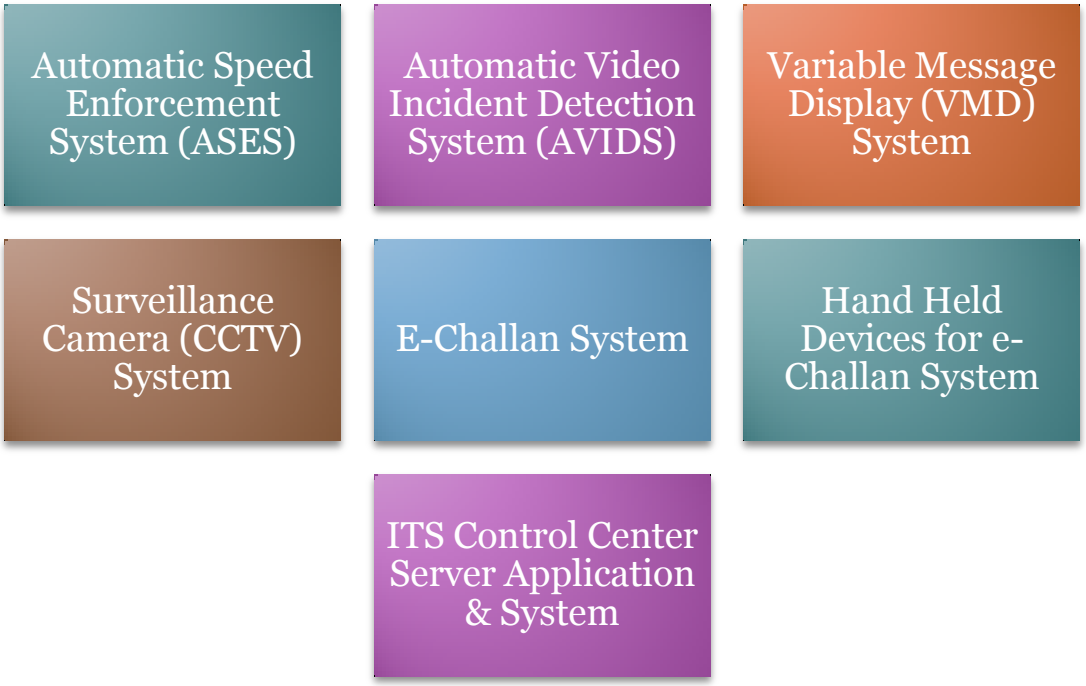


Figure 40. Summary of ITS Components

6.3.2. Automatic Speed Enforcement System (ASES)

6.3.2.1. Requirement of Equipment:

The most important enforcement issue in India is speed control. Without this, it will be difficult to lower crash rates. Lack of human resources to effectively manage Highway Patrol has been the major constraint / hindrance for effective enforcement by Police.

6.3.2.2. Functionality:

ASES consist of Speed Detection Radar Gun to capture speeds of vehicles passing on either direction at a location covering all traffic lanes and shall trigger ANPR Camera to capture image/recording of vehicle number plates, which are plying above threshold speed. The image will be processed at location and image of License Plate along with required information will be stored locally and also transmitted over GSM/GPRS to ITS center server located at control room further processing.

Using graphical user interface (GUI) it highlights the vehicles which over speeds than the assigned speed limit. It does not require lane disciplined traffic for violation detection. The speed limit is configurable and can be assigned to the system according to the user. The speed detection does not require any manual intervention.

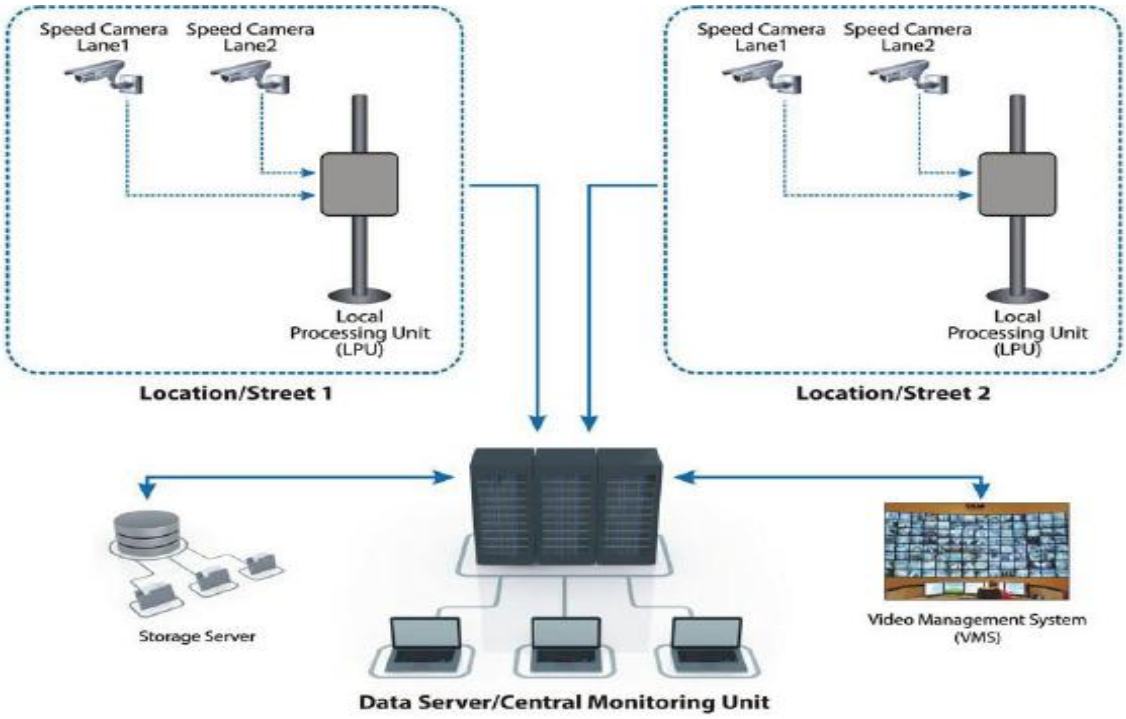


Figure 41. System Architecture

Graphical User interface (GUI) provides following information:

- Image of the vehicle
- Image of the number plate
- Text conversion of number plate after using OCR (Optical Character Recognition) technology
- Date, Time and location of offending vehicle

- Instantaneous Speed of the Vehicle

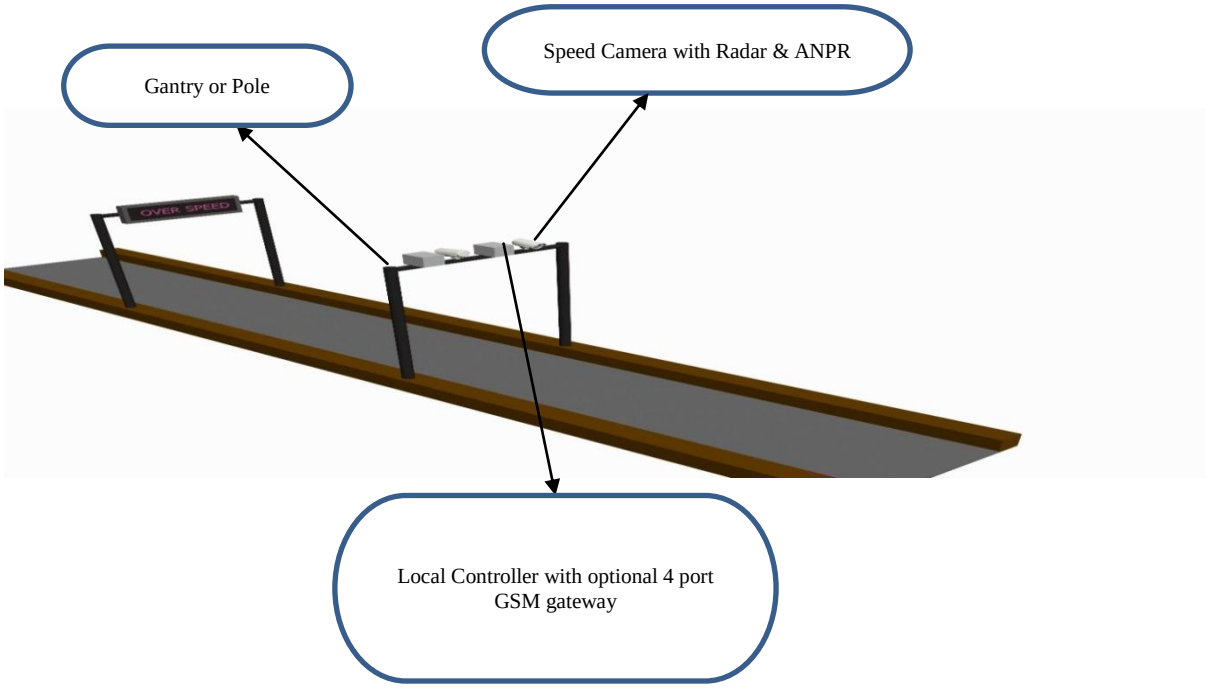


Figure 42. Equipment for ASES

The ANPR function can be integrated with the RTA database of vehicles. It will fetch the details of the violating vehicles using their license plate number and will help to generate effective e-challans. Speed Violation Detection System uses Video based system technology in speed violation detection system, which is far better than radar or loop based systems.

- **Control, Operations & Maintenance of ASES**
  - ✓ Speed Cameras shall be procured with 5-Year Warranty with AMC from vendor. Annual Operation/Maintenance cost beyond AMC period will be borne by Concerned Stakeholder Department.
  - ✓ Speed Cameras will be installed on Gantry Poles at height of about 6m.
  - ✓ Cameras have built in software to process the Vehicle Number Plate and will send required data to server over WiFi or via SMS to ITS Control Room Server.
  - ✓ The Cameras installed with Vandal proof housing.
  - ✓ Cameras are battery powered. The battery pack will be rechargeable with solar panels.
  - ✓ This violation data (speed, location, time & date, Lic. Plate no. and image of violation) will be used to generate Challan Notice to violators. This process is already established at Traffic Control Room ITMS Center. Same process and protocols will be followed to generate the challans.
  - ✓ ITS Control Room Technician will submit daily, weekly and monthly reports on Violations, Enforcement Activities, Challans, Accidents and Emergency Management to Corridor Safety Monitoring Team.

6.3.3. Automatic Video Incident Detection System (AVIDS):

6.3.3.1. Functionality

Main purpose of Video Automatic Incident Detection System is to increase safety on the road. Reliable Video Automatic Incident Detection system significantly improves the efficiency of traffic management systems. Automatic Incident Detection System (AVIDS) is installed at locations or sections of highway, which is vulnerable to traffic congestion, traffic rule violations to detect them to analyze the incident to provide support to minimize them.

The VIDS, essentially consisting of a fixed CCTV camera and an attached (& co-located) Video Image processing unit, shall perform remote incident detection at designated spots on the highway section and immediately provide local warning to nearby travelers / road-users on detection of relevant incidents. It shall also communicate such detected incidents to the ATMS Control Centre for storage, analysis & reporting.

- AVIDS consist of Intelligent Camera to capture change traffic conditions including violations at a location covering all traffic lanes and shall trigger alarm at Central ITS Server and capture image/recording of the violation. The image/recording will be transmitted over High Speed Fiber Network to ITS center server located at control room further processing.

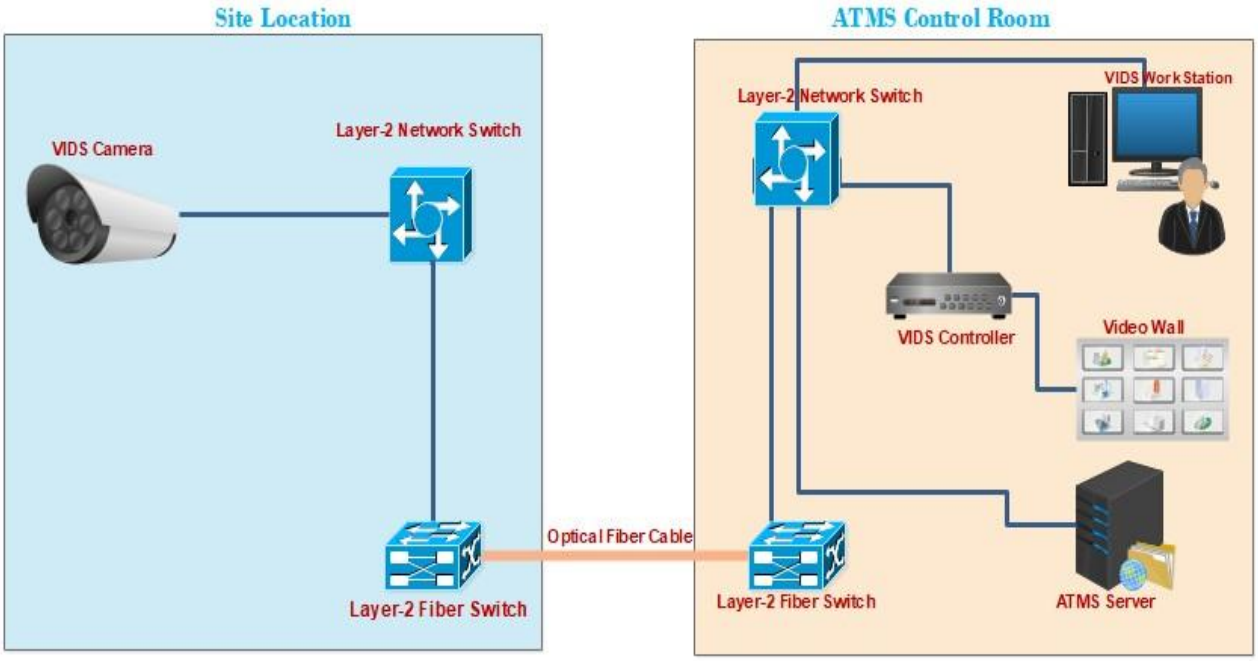


Figure 43. AVIDS General Layout

- The Supplier shall review specifications and requirements listed in this section to propose the necessary configuration to support the complete system requirements as well as performance requirements. The Supplier proposal shall specify clearly, the purpose of each of the system components proposed, as well as its available features and associated benefits.

- The development/customization of the System shall be carried out at the Supplier site but from Acceptance Testing onwards, it shall be carried out at client's site.
- The Supplier shall propose the Operating System (OS) and the appropriate platform that meets all the requirements stated in this section.
- The System shall be operational 24 hours per day and it shall be based on electrical powered. Down time for system shall not be more than 24 hours.
- The status of the individual components of the system shall be monitored by a Heartbeat message monitoring
- The optimum height for the system is based on the conditions and camera, hence, supplier shall suggest the same. In general situations, they shall be mounted at heights of about 6m above roadway level on a gantry.

6.3.4. Variable Message Display (VMD) System:

The VMD/ VMS shall provide road users advance information of road conditions ahead and shall be controlled from the local Central Control Centre. VMD system is one of the important and effective tools to manage traffic in response to road incidents, special events and construction or maintenance activities on the road. When drivers are to be warned of an incident, advised to opt for an alternate route, guided to reach a specific location or clear a lane as a response to an incident, the message posted should be appropriate and precise. The messages and the procedure for displaying them should be such that the information is grasped by a driver whose primary focus is driving his vehicle while ensuring his and his co-passenger's safety.

Under no circumstances shall VMS be used for advertising of any kind. It would be in a blank mode when traffic, roadway, environment or pavement conditions or public service announcements do not warrant the display of message or messages.

6.3.4.1. Requirement of Equipment:

The Gantry mounted variable message sign including speed gun is the safest means for alerting the drivers about the dynamic changes in the traffic arrangements and road situations. These devices can easily communicate with the motorists about the traffic congestion, accidents, incidents, roadwork zones, or speed limits on a specific highway segment. It uses latest technology to provide accurate and instant information to the people driving on roads. Speed limit warning display with speed detecting radar technology to improve safety for motorists and pedestrians. The sign displays the speed numbers in different colors as the approaching vehicle is going over the pre-set limit or not. Salient features are:

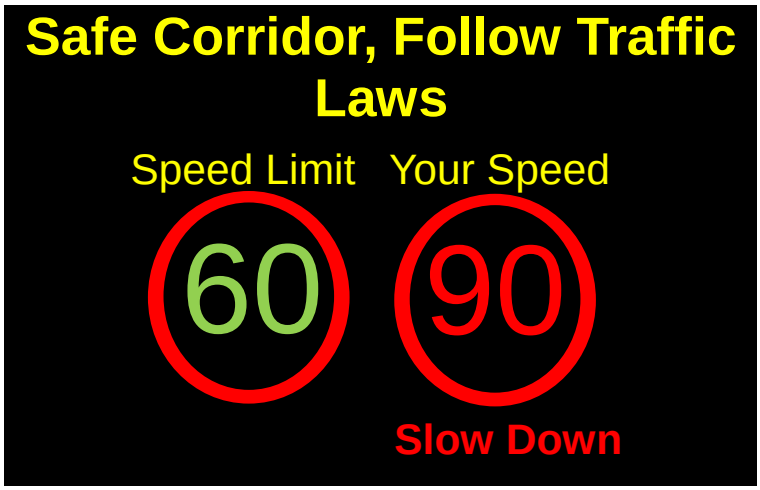


Figure 44. Representative Image VMS with speed detection

- AC Power /DC Power Optional /Solar Panel Optional.
- Lightweight and compact aluminum casing.
- Secure access panel.
- Rader system fully enclosed display.
- Wireless remote control for programming.
- Auto brightness adjustments.
- Selectable speed-limit setting.
- Alternating between driving speed and limit sign

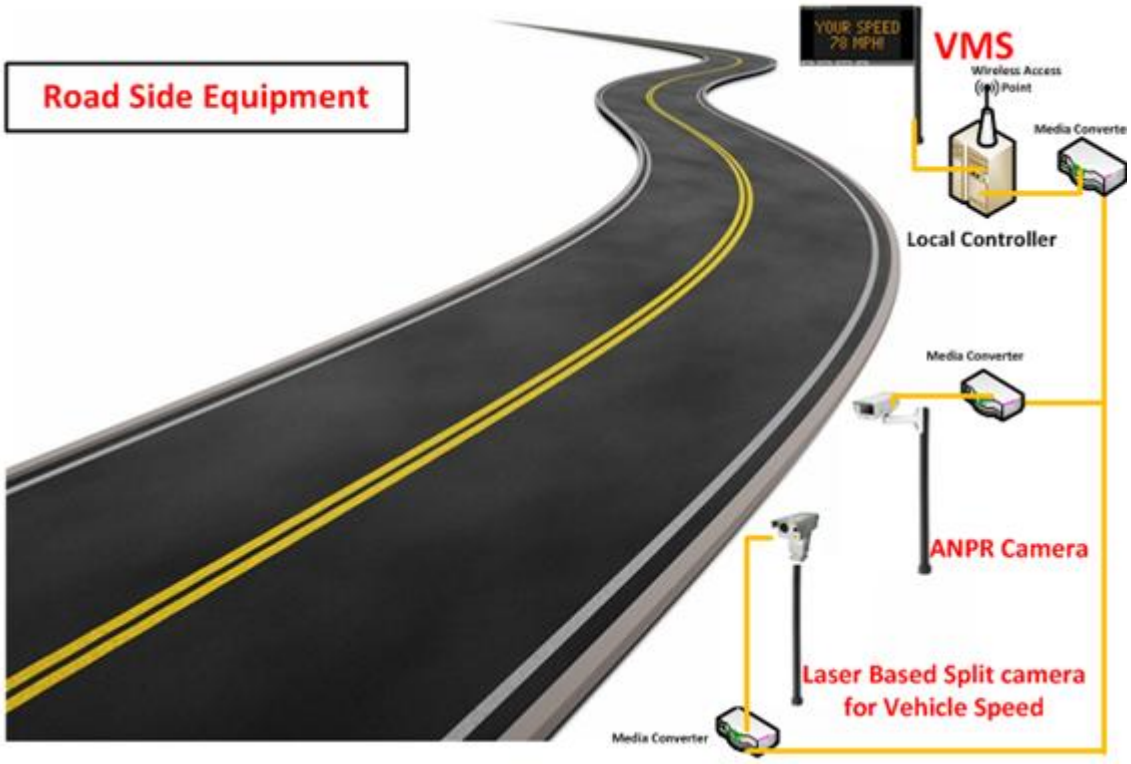


Figure 45. Road Side ITS Equipment, Speed Display thru VMS

6.3.5. Surveillance Camera (CCTV) System

Surveillance camera are installed at different position of the highway where the potential for crashes are high such as like Sharp change in alignment/curves, at grade junctions / intersections etc. This surveillance system is monitored 24x7 manually from control room. The system monitors vehicular and other road related activity along the highway stretch. CCTV system is required to ensure effective surveillance of the target road section and related surrounding areas and generate a tamperproof record for post event analysis.

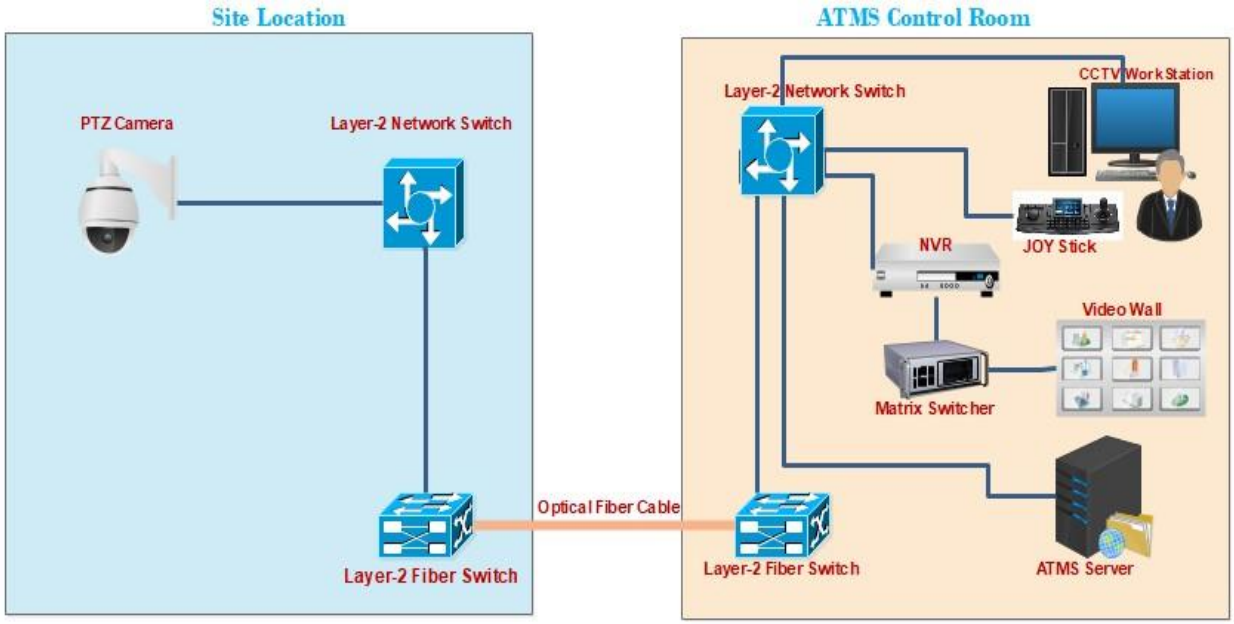


Figure 46. CCTV General Layout

6.3.6. E-Challan System

6.3.6.1. E-Challan Application for Traffic Violations

E Challan Application shall be procured from National Informatics Center (NIC-India and shall be integrated with Central Server will control the process of generating Challan cum receipt for the violation against MV Act and printing the same using mini electronic printer. The application will be loaded on Tablets or used with E-Challan Machines which works on both Active and Passive mode.

- In Active (online) mode device sync with server for checking theft vehicle list, also checks with insurance renewal, pollution renewal etc. Challan data will be stored in the remote sever.
- Passive (offline) mode in case of non-availability of GPRS all Challan information will be stored in the local database and later on availability of GPRS data will be uploaded to server or by connecting to computer data can pushed to server

One of the main features in central server is to track the vehicle registration number from vehicle image/ video. Control center application can also be integrated with VAHAN app, which stores all India vehicle registration number list. As per the tracked vehicle number, control center application will get the related information using VAHAN service.

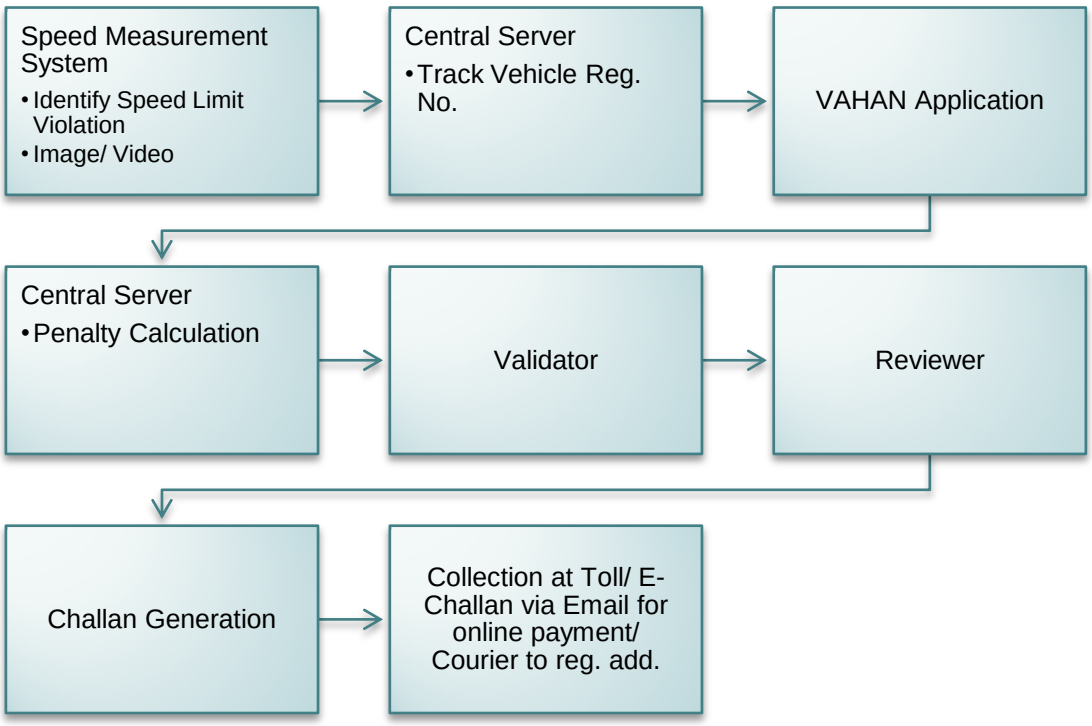


Figure 47. E-challan process

The facility to configure the penalty charges based on vehicle over speeding can be arrived at using a center server application. Central server application can automatically calculate the penalty on each over speed vehicle & later send it to validator with all information (Registration detail/ image/video). All the above information related to particular vehicle will get display on the validator screen with Paid/ Unpaid status with paid plaza details.

(PAID >received payment at plaza level,
UNPAID > challan will get generated).

After validation process, all validated data will also be reviewed by Reviewer & he will be responsible for performing below mentioned task: -

- Reviewer will check all the updated information & will verify.
- If speed of vehicle was found more than normal then automatic challan will get generated as per rules & configuration.
- Challan will be send to vehicle user via email address.
- Copy of CHALLAN will get maintain at control server application.
- If email ID is not available then one print of challan will be sent to vehicle user on its registered address-using courier.

This courier facility system is also linked with control server application, which will track each record & will maintain the status of every transit. Storage all information that transit is in built at central server.

- Challan records will get maintained

- Reports will get generated as per filter selected.
- Proper auditing will be done.
- On basis of Docket number courier will get traced on central server.
- Courier records will get maintained.

6.3.7. Optical Fiber Cable (OFC) Network for Corridor

The objective of this system is to provide uninterrupted network for 24x7 with fiber optic connectivity at all locations along the corridor like ITS sub-systems, ITS central server, other points of interest such as bus stands, traffic junctions, zone offices, hospitals and other critical locations. The objective is also to establish a medium for quick data gathering from multiple sources and make faster decisions. The fiber optic network will then be lit up using active devices to provide connectivity across selected offices around the corridor and ensure scalability, redundancy and committed uptimes. Proposed OFC shall be in conformance with TEC (Government of India) approved design.

OFC network to connect all relevant equipment associated with the project corridor with the Central ITS/ATMS Control Room to receive and transmit relevant information for each. Different network protocols are to be followed to have a smoother network. Ring Topology is to be followed for un-interrupted network connectivity in case of network device failure.

6.3.8. ITS Control Center Server Application & System

ITS Server system along with all associated software shall be installed in Control Room in consultation with client. Central Server application will integrate, control and communicate with all ITS related sub-systems, equipment and software as listed in sections above and ITS server:

- Shall be connected & communicate with various equipment installed such as Cameras, Speed Measuring Radars, VIDS, CCTV, VMD, e-Challan Machines via dedicated OFC network.
- Shall have software/applications associated with ASES, AVIDS, CCTV, SAVMD, VMD, e-Challan systems (to be procured from NIC-India thru Police Dept.).
- Shall receive, analyze and manage data received from various systems/equipment such as ASES, AVIDS, CCTV, SAVMD, VMD, e-Challan Systems
- Shall establish and maintain e-challan processes by validating camera captured violation data on specified workstations and access vehicle data from "VAHAN" related to identified number plates of violating vehicles
- Shall review and publish reports of health of sub-components daily, weekly & monthly and as required.
- Shall be located at Control Room located on along the corridor shall include workstations to monitor health of systems, field equipment, validating violation of data, miscellaneous data processing and data backup.
- Shall allow Police District Control Rooms to access server to receive applicable data such as violation records.

- Shall allow / share / receive data based on access level assigned to stakeholder departments.

6.3.8.1. Command Control Center

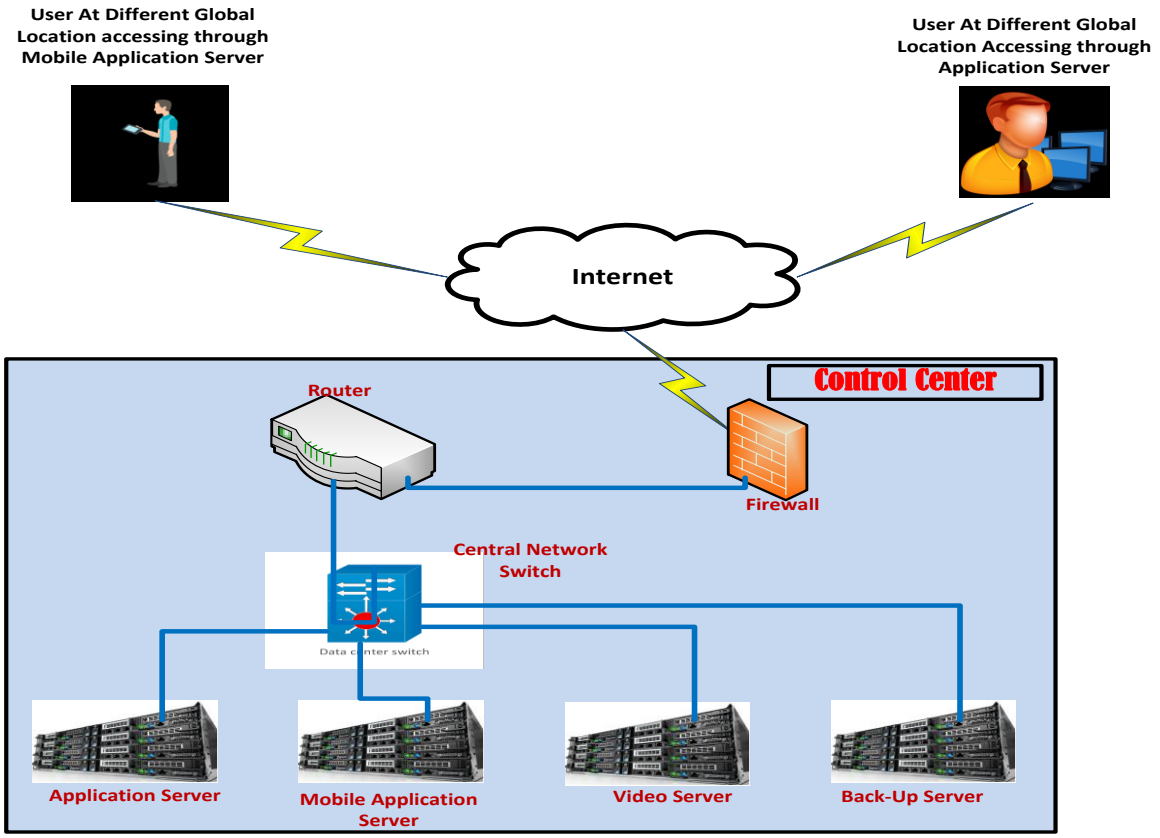


Figure 48. Server Hosting Architecture

ITS Server system along with all associated software shall be installed in SP-Control Room in consultation with Police. Central Server application will integrate, control and communicate with all ITS related sub-systems, equipment and software. Control room shall have setup which includes workstations to monitor health of systems, field equipment, validating violation of data, miscellaneous data processing and data backup. Police District Control Room shall access server to receive applicable data such as violation records, crash data and vehicle location data. Further, server shall give permission to receive data based access level assigned to stakeholder departments, Transport Department & PWD Department. The ITS Server System will be supported by modern architecture with latest technology in any circumstances to ensure that:

- The system should be support effective incident management.
- All the data like video and audio stream should not be lost in any circumstances and available on workstation as per requirement.
- Effective equipment like CCTV, VMS, is carried out with seamless manner with no disturbance.
- All the information collected from the various sources shall be saved at the ITS- over speed solution server for quick retrieval by authorize person.

6.3.8.2. Application Server:

- Software associated with all activities will be installed on this server and will be doing required analysis of events.
- The video analytics software will be installed on this server, which will be doing all the analytical part with the video footage and create event.
- All the other servers will be connected to this server through central switch and will be fetching the data from Application server.

Mobile Application Server:

- Mobile application server will have the mobile application software's such as CDCM installed in it, which will allow the global permitted users to access the analytical data and images, as applicable.
- Mobile application server will be fetching the data from Application server and which are already processed by video analytics.
- Through mobile application the permitted users will be able to access the video data and analytical data through Internet.

Video Server:

- Video Server will be storing the video footage of the entire recording in it.
- In case of any specific incident it will store the video clips of incidents on separate file.

Back-Up Server:

- Back-up Server will be keeping the data back-up from the entire server separately.
- These data can be used in case of any unwanted situation with the Servers.
- Daily backup will be stored to the backup server automatically.

6.3.8.3. Open Source Software

As much as practical, all software shall be transparent "open" source software available in source code form: the source code normally reserved for copyright holders provided under a software license that permits the Government to operate, maintain, add to and extend the ITS including integration with adjacent systems.

The distribution terms of open-source software shall comply with the following criteria

Free Redistribution

The license shall not restrict any party from giving away the software as a component of an aggregate software distribution containing programs from several different sources. The license shall not require a royalty or other fee for such sale

Source Code

The program must include source code, and must allow distribution in source code as well as compiled form. Where some form of a product is not distributed with source code, there must be a well-publicized means of obtaining the source code for no more than a reasonable reproduction cost preferably, downloading via the Internet without charge.

The source code must be the preferred form in which a programmer would modify the program. Deliberately obfuscated source code is not allowed. Intermediate forms such as the output of a preprocessor or translator are not allowed.

Derived Works

The license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software.

License Must Not Be Specific to a Product

The rights attached to the program must not depend on the program's being part of a particular software distribution. If the program is extracted from that distribution and used or distributed within the terms of the program's license, all parties to whom the program is redistributed should have the same rights as those that are granted in conjunction with the original software distribution.

License Must Not Restrict Other Software

The license must not place restrictions on other software that is distributed along with the licensed software. For example, the license must not insist that all other programs distributed on the same medium must be open-source software.

License Must Be Technology-Neutral

No provision of the license may be predicated on any individual technology or style of interface.

BOX-13: ITS Interventions on Hyderabad ORR – A Case Study

Case Study of "ADOR HARMONY, India Specific, resilient, idiot proof, reliable speed enforcement system" using technology

Ador Powertron Ltd. is an Indian Company based in Pune, MH State, India. Ador is a major investor (51%) in Acusensus Pty Ltd, an Australian company that specialises in driver behaviour change using radar- based camera technology. Ador Harmony, an India specific speed enforcement solution designed to require minimal power, no fibre optic data cables to the speed trap location in order to transmit infringement data and is capable of enforcement rates in excess of 97%. Harmony does this through optimised number plate reading using a specially designed, high- resolution 9 mega-pixel camera.

Recently Ador Harmony has conducted a demo by installing reliable speed enforcement system on Outer Ring Road, Hyderabad for Deployment from August 2019. The speed enforcement system has simple processes of installation, and capturing of the infringement vehicles. The following sections describe the highlights of the system and data capturing procedures of the system.

Highlights of the System

The following are some of the highlight of the system;

- Can be installed in less than one day
- Needs no optical fiber, data cables to function
- No Gantry required as one camera covers 3 to 4 lanes on a pole
- Works on 3G/4G SIM
- Limited server space required as video content is redundant
- Inbuilt Power back up
- Ultra high-resolution camera for maximum scene context and number plate resolution
- Designed in Australia, made in India & made for India

Data capturing procedures of the system

The system works in three Simple steps;

Step-1: A 9MP camera, triggered by sensitive radar located on a pole or a mobile system, captures Vehicles travelling over the speed limit.

Step-2: Two high definition pictures of the same speed infringement are sent through small packet format using a 3G/4G SIM & network either to a control room or to a squad car on a hand held device.

Step-3: A challan/ e-challan can be manually prepared from the evidence provided allowing for 99% of enforcement.

The system is capable of capturing certain vehicle Infringements/ violations both during daytime as well as during night, which are as follows;

- Over speed vehicles than the specified limits
- Distracted Driving
- Seat Belt
- Dangerous Behaviour of drivers or passengers
- Wrong Side

Typical Infringement Evidence captured by the system has the following information

- Two ultra high definition pictures per infringement, which can be simultaneous for both directions
- Date and time stamp information
- Location stamp
- Speed zone and actual speed for multiple vehicles in same frame
- Vehicle direction classification
- Picture can be blown up to very large size to read number plates due to high definition format.

This kind of systems are very much useful especially in India to control the driver behavior change and control the traffic violations using technology and evidence based enforcement and technology solution.

Notes & Pictures Courtesy: Ador Powertron Ltd., Pune, Maharashtra

BOX-13: ITS Interventions on Hyderabad ORR – A Case Study

Pictorial illustration of the system;

Speed Enforcement System demo location on Outer Ring Road, Hyderabad

capturing vehicle Infringements during day

capturing vehicle Infringements during Night

Dangerous Driving

Distracted driving

Use of mobile phone and no seatbelt while driving

Wrong side driving

6.4. Artificial Intelligence

In its discussion paper titled "National Strategy for Artificial Intelligence" (June 2018), the NITI Aayog states that Artificial Intelligence (AI) is poised to disrupt our world. With intelligent machines enabling high-level cognitive processes like thinking, perceiving, learning, problem solving and decision making, coupled with advances in data collection and aggregation, analytics and computer processing power, AI presents opportunities to complement and supplement human intelligence and enrich the way people live and work[40].

6.4.1. Artificial Intelligence in Transportation

NITI Aayog has evaluated various sectors that will be impacted by AI. The AI focus sectors include:

- Healthcare
- Agriculture
- Education (preparing tomorrow's generation to leverage the global AI revolution to India's advantage)
- **Smart Cities and Infrastructure (solving for India's rapidly urbanising population)**
- **Smart Mobility and Transportation (solving for challenges congestion, pollution, high rates of road accidents leading to economic inefficiency and enormous human cost).**

6.4.2. Artificial Intelligence Application Areas[41]

AI application areas are quite diverse. This section lists some of those application areas to which AI methods has been applied over the years, and explains how these may be relevant to transportation applications. Among the most important of AI application areas are the following:

- **System identification and function approximation**, which is concerned with building empirical dynamic models of systems from measured data, or mapping system inputs to outputs.
- Nonlinear prediction focuses on the prediction of the behavior of systems where the relationship between input and output is not linear. This is often the case with transportation problems including **predicting traffic demand, or predicting the deterioration of transportation infrastructure** as a function of traffic, construction, and environmental factors.
- Control focuses on controlling a system so as to achieve a desired output. Control applications abound in transportation. Examples include **signal control of traffic at road intersections, ramp metering on freeways, dynamic route guidance**, positive train control on railroads, and air traffic control.

[40] Discussion Paper on "National Strategy for Artificial Intelligence" (June 2018), NITI Aayog
[41] Transportation Research Circular E-C113: Artificial Intelligence in Transportation, Transport Research Board, www.TRB.org

- **Pattern recognition or classification**. Examples of pattern recognition or classification problems in transportation include **automatic incident detection** (i.e., classifying the traffic state as incident or incident free), **image processing** for traffic data collection and for identifying cracks in pavements or bridge structures. Another example of a transportation pattern recognition problem involves the very important area of **transportation equipment diagnosis**.
- Clustering refers to the problem of grouping cases with similar characteristics together, and identifying the number of groups or classes. For transportation, clustering could be used to **identify specific classes of drivers based on driver behavior**.
- AI-based decision support systems for transportation planning.
- Optimization refers to the study of problems in which one seeks to minimize or maximize a function by choosing values for a set of decision variables while satisfying a set of constraints. Optimization problems abound in transportation. Examples include **designing an optimal transit network, developing an optimal work plan for maintaining and rehabilitating a pavement network, and developing an optimal timing plan for a group of traffic signals.**

6.4.3. Automatic Traffic Counter Cum Classifier

The main purpose of installing ATCC is to monitor the traffic flow of the highway with the vehicle classification. The ATCC has its own classification module for classifying, detecting and counting of vehicle. It includes high definition cameras which need to be installed on the road and the live data can be analyzed at processing unit to get the output as vehicle counting as well as classification.

All these field cameras can be connected to central control room through fiber optic backbone network where these data will be stored for any future reference.

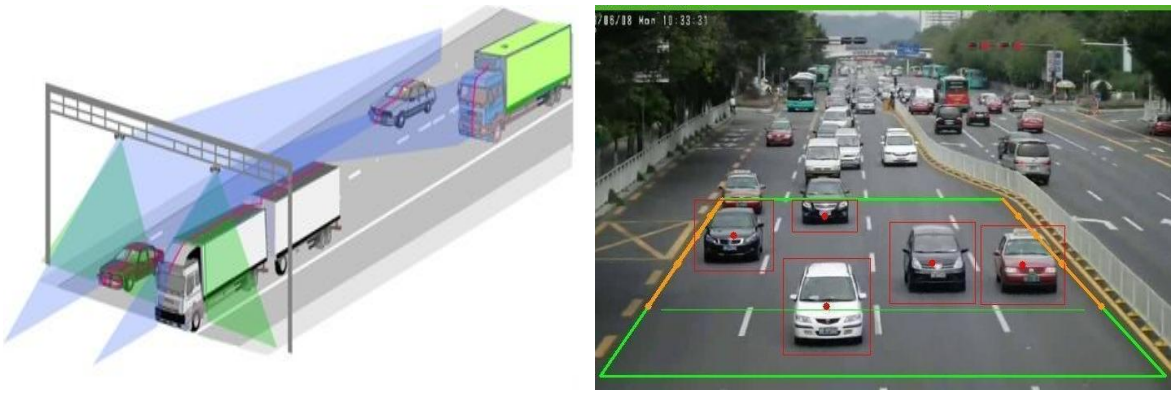


Figure 49. Automatic Traffic Counter Cum Classifier

6.4.4. Meteorological Data Station

MDS comes into picture when it is essential that a weather report is to be provided to the road user through VMD/ VMS (Mostly) and other process. Weather is also a factor which can affect the traffic flow and also can cause accidents on the road. By this weather report

the highway authority can plan accordingly and can take some pre-cautionary steps to minimize the possible accidents.

Type of Measurement with MDS

- Ambient temperature
- Road Temperature
- Humidity Sensors
- Visibility Sensors
- Wind Speed
- Wind Directions

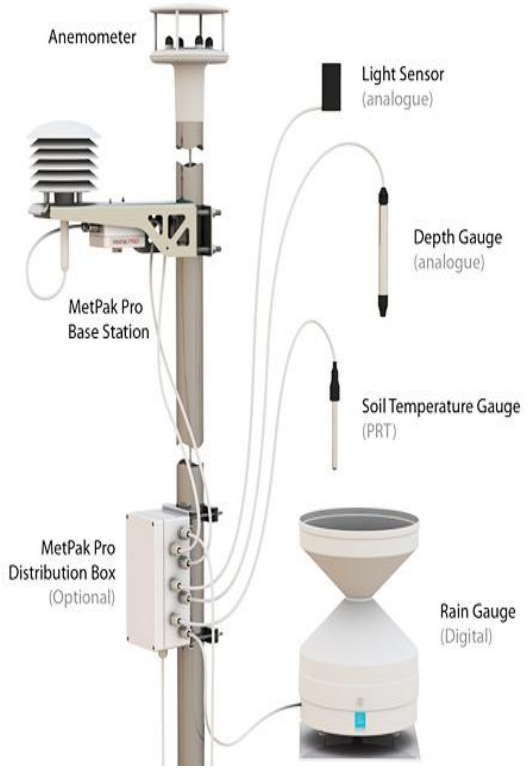


Figure 50. Meteorological Data Station

6.4.5. Facial Recognition and Analytics System (FRAS)

Facial Recognition and Analytics System is introduced to track peoples who are suspected to be a threat. It will locate, identify and apprehend known terrorist, watch list suspects and other wanted persons who are traversing the Highway.

✓ It can identify Suspects Automatically in seconds

✓ It can substantially reduce the time of Police officers need to identify suspect travelling on Highway

✓ It can be installed at each toll plaza and the processing unit will present at central control room.

6.5. Summing Up

Enforcement of Traffic Rules should be of highest priority to instill discipline to motorists and discourage them to follow unsafe and aggressive driving on Indian Highways. However, Police has limited presence on Rural Highways and lacks resources, equipment & training to enforce traffic rule violations which is resulting in reckless driving by motorists.

As part of multi-sectoral efforts, considering leading causes of accidents on Indian roads and relevant ITS recommendations are presented in this report. Hence, it is recommended to use Intelligent Transportation System (ITS) techniques to communicate, monitor, operate and manage the highways. It is envisioned that proposed ITS will set a bench mark for State for future enforcement and road operation activities on the State roads.

Chapter-7

Institutional Framework Requirement and its M&E

7. INSTITUTIONAL FRAMEWORK REQUIREMENT AND IT'S M&E

India has acknowledged the burden and impact of road crashes, but efforts to address the problem remain far from satisfactory. Our growing graph indicates that – our ongoing efforts in reducing the road accident fatalities are insufficient or our efforts are mis-prioritised and misdirected due to the following reasons but not limited to these reasons;

- In adequate/ Lack of central and state lead agencies for enforcement on highways,
- In adequate/ Lack of dedicated road safety funding,
- poor coordination mechanisms between different stakeholder departments,
- limited impact of laws, and certainty of punishments
- laxity in enforcement,
- limited safety features on roads and in vehicles,
- near absence of dedicated and committed emergency safety system
- deficient trauma care coupled with the absence of public engagement are few problems plaguing our systems.

Recent amendments, engagement and directives in Motor Vehicle Act 2019 are a welcome sign; however, implementation of the same to save more lives and zero tolerance for violation remains to be perceived. Adopting public health approaches to control road safety is the need for the hour.

In order to reduce the number of road accidents and fatalities, the need for bringing together all available evidence – information – data – studies, evidence based enforcement systems on a common platform would lay open the current scenario and provide directions for future activities. As mentioned in the earlier chapters, based on the comprehensive information regarding the road safety situation in India from a public health perspective, using information from official reports and research studies. The purpose is to examine changes over the last decade in India, identify reasons for the same and provide a framework for subsequent action. Further, an attempt is made to address the road safety issue by enchasing the enforcement mechanism and emergency care on highways.

The present chapter mainly focuses on the need for effective enforcement and emergency services on highways in controlling the number of road accidents and fatalities. The subsequent sections explain the following approaches in detail;

7.1. Enforcement Management and Emergency Care

Enforcement and Emergency Care are the two predominant approaches capable of reducing road accidents and fatalities significantly. This chapter deals with the significance of enforcement, and role of policing in controlling the traffic violations, on highways and the need for the establishment of dedicated emergency response system on highways to take the accident victims to hospitals within the golden hour. Implementation of these factors may lead to a considerable reduction in road accidents and fatalities.

7.1.1. Enforcement Management

Road safety in India is the responsibility of nearly 15 ministries and departments at central and state levels, with transport, police, health, welfare, law, industry, and road development authorities being principal partners; all these are on the concurrent list of the Indian constitution. The primary responsibility of enforcement of traffic laws rests with individual states amidst severe constraints of financial and trained human resources. All these agencies work independently without the convergence of actions amidst uncoordinated mechanisms within their available resources. There is no well-defined road safety policy and action plans at national and state levels, and targeted programs that are driven by good quality data and evidence are lacking. Some Indian states have drafted their individual policies, but these are not strong enough to guide road safety activities. Hence, the need for a strong enforcement management system has to be established for stringent enforcing on Indian roads especially national highways.

7.1.2. Objective of Enforcement Management

- Formulation of good practice under the enforcement management program addressing safe speed limits and enforcement
- Prepare a regular monthly reporting system from the Superintendent of Police of each district to the Director-General of Police.

7.1.3. Benefits of Enforcement Management

7.1.3.1. General

Theoretical estimates of the potential accident reduction impact of policing, based on enforcement inducing full compliance are fairly high. The Norwegian Traffic Safety Handbook estimates that full compliance with speed regulations, avoiding drink driving and always using protective devices could save up to 38% of fatalities and up to 17% of other traffic injuries. Manual speed enforcement reduced the number of accidents by 2%. The reduction in fatal and injury accidents is higher, -14% and -6%. Automated speed enforcement shows a reduction of 19% to 35% of accidents. Speed cameras have a larger effect in urban areas.[42]

Drink-driving, more than any other non-compliance issue was always considered as a social behavior issue. The overall effect of controlling drink-driving by direct policing and all other accompanying measures is a reduction of 3.7%, 9%, and 7%, of all, fatal, and injury accidents, respectively. Some specific measures have a larger impact; for example, revocation of driving license has reduced the number of drink-driving accidents by 18%. Safety belts enforcement has had a 5% to 14% impact. In assessing the separate effects of various sanctions-, warning letters and license revocation stand out as having had 15% impact on accident reduction compared to 5% influence by demerit-points systems.

Several careful evaluation studies of community-wide and statewide long terms speed and drink-driving enforcement program in Canada, USA, Australia, and New Zealand

[42]David M. Zaidel, 'The impact of enforcement on accidents', Project "ESCAPE" (Enhanced Safety Coming from Appropriate Police Enforcement) 2002

reported 10%, 25% and even 33% reductions in relevant accident categories. Studies in Israel suggested much smaller reductions. The positive impact is larger with fatalities and serious injuries, pointing to the importance of speed control and possibly also of improved emergency response with improved or increased police deployment. The Norwegian Traffic Safety Handbook gives the estimates (based on a meta-analysis of studies in many countries) of the potential safety impact of full compliance with traffic regulations.

The following table explains the Potential of reduction in personal injuries and fatalities assuming full compliance Traffic Law Enforcement[43]

Table 29. Reduction in Accidents attributed to Traffic Law Enforcement

Main groups of traffic laws	% change in the number of injuries and fatalities (95% confidence interval)	
	Injured Persons	Fatalities
Speed Limits	-9 (±5)	-15 (±8)
Use of Protective equipment's	-5 (±3)	-14 (±8)
Alcohol Laws	-3 (±2)	-10 (±7)
Other Behavior rules in Traffic	-8 (±6)	-7 (±5)
Vehicle Technical requirements	-1 (±1)	-1 (±1)
Requirements of Drivers	-1 (±1)	-1 (±1)

7.1.3.2. Key Elements of Enforcement

Road crashes represent a major social cost to most societies, and their management has thus been a high priority. Efforts in management have been at the levels of both prevention (via education, enforcement, and engineering) and cure (via the hospital and insurance systems). This section focuses on road crash prevention by means of police enforcement.

Despite the involvement of police in their management, the causes of most crashes cannot truly be considered crimes except in the sense that negligent driving "without due care and attention" or breaking road rules is a crime. Nonetheless, the methods and opportunities for road crash prevention and crime prevention in particular, and situational crime prevention are at heart closely similar. Both involve the notion that coordinated action to make (breaking the law) more difficult or risky can achieve general reductions in the volume of law-breaking[44].

Road rules will only be obeyed if people believe that not obeying them will result in unwanted outcomes like fines or license cancellation. The perceived likelihood of being caught and penalized for disobeying road rules should be high. Also, the penalties should be large enough to discourage people from disobeying the rules.

[43]Elvik, R., Mysen, A.B and Vaa, T. (1997) Traffic Safety Handbook, Institute of Transport Economics, Oslo, Norway

[44]Using Police Enforcement to Prevent Road Crashes: The Randomised Scheduled Management System by L. M. W. Leggett Land Transport & Safety Division, Queensland Transport

7.1.3.3. The Theory Behind Enforcement and Key Elements for Success[45]

It is generally accepted that enforcement influences driving behavior through two processes

- General Deterrence: General deterrence occurs when road users obey road rules because they perceive a substantial risk of being detected and punished if they don't.
- Specific Deterrence: Specific deterrence occurs when someone who has broken the rules is punished and stops the unlawful behavior as a result.

Enforcement of road rules should be aimed primarily at causing general deterrence because then it is not necessary for police to catch and punish road users for them to be encouraged to obey the rules. To result in general deterrence, enforcement should be

- Accompanied by publicity
- Unpredictable and difficult to avoid
- A mix of highly visible and less visible activities
- Continued over a long period of time.

7.1.3.4. Intelligence-led policing

To maximize the road safety benefit, enforcement should be aimed at road rule violations that have been proven to increase the likelihood or severity of crashes. Safety benefits can be further increased through intelligence-led policing. In road rule enforcement, intelligence-led policing involves the use of data (for example, data on when and where crashes are occurring, data on severity factors such as not using seatbelts or helmets, or data on causal factors such as speeding or drink driving) to focus enforcement on the times and places that present the greatest risk.

7.2. Trauma Care Services/ Emergency Care

Though preventing the occurrence of RTIs is the primary goal of road safety and injury prevention programs, providing timely and quality care at various levels for the substantial number of injured persons is equally important. Well-established trauma care systems greatly help to reduce deaths by nearly 20–25% and serious disabilities by more than half.

7.2.1. The Goals of the Trauma Care System

- To decrease the incidence and severity of trauma
- To ensure optimal, equitable, and accessible care for all persons sustaining trauma.
- To prevent unnecessary deaths and disabilities from trauma.
- To contain costs while enhancing efficiency.
- To implement quality and performance improvement of trauma care throughout the system.

[45]Road Safety Toolkit, Treatments-Enforcement; iRAP.org

- To ensure certain designated facilities have appropriate resources to meet the needs of the injured.

7.2.2. Trauma Care Management

7.2.2.1. Introduction

The concept of a trauma centre was first developed at the University of Maryland, Baltimore in the 1960s and 1970s by heart surgeon and shock researcher Adams Cowley. Cook County Hospital in Chicago, Illinois claims to be the first Trauma centre in the United States. Dr. Boyd became the first shock – trauma fellow at the Shock Trauma centre from 1967 – 1968.

A trauma center is a hospital equipped and staffed to provide care for patients suffering from major traumatic injuries such as falls, motor vehicle collisions, or gunshot wounds. A trauma center may also refer to an emergency department (also known as a "casualty department" or "accident & emergency") with the presence of specialized services to care for victims of major. A perfect trauma center is staffed 24 hours a day, 7 days a week with a trauma surgery team that is specially qualified to attend to traumatic injury. After the patient is stabilized, his/her continuum of care is the responsibility of the trauma center staff until the patient is discharged from the trauma center.

Why are trauma centers needed? Can't accident victims be treated in our local emergency rooms?

Emergency rooms are not established in such a way as to provide the same services within the same time frame as a licensed trauma center. They function under lesser requirements than trauma centers. Trauma centers are required to have a staff of certified trauma surgeons on staff and present at all times. In addition to these surgeons, it is also required that a group of specialists and sub-specialists are available on an "on-call" basis, responding within a specifically defined number of minutes. All of these requirements are in place in order to provide highly specialized care within one hour of injury (the "golden hour").

Accelerated urbanization and industrialization have led to an alarming increase in the rate of accidental injuries, crime, and violence in India. An unprecedented increase in the number of vehicles has outpaced the development of adequate roads and highways. India has 1% of the motor vehicles in the world but bears the burden of 6% of the global vehicular accidents. It is well recognized that our health care system is not fully equipped to meet the challenge.

Over 400 people were killed in road accidents on an average every day in 2017[46], government data reveals. Ministry of Road Transport and Highways data indicates just how alarming the situation is. Over 1,47,913 people were killed in road accidents in India in 2017.

[46] Road Accidents in India – 2017, MoRTH, Government of India

7.2.3. Role of the Health Sector in Road Safety and Injury Prevention

The objectives of health systems are to promote health, prevent illness, impart care, and improve quality of life. In road safety and injury prevention, the objectives will be to promote safety, prevent injuries, provide timely care, and improve the quality of life of those afflicted. To deliver these, the health sector spends an enormous amount of resources for investigation, hospitalization, management, rehabilitation, judicial processes, documentation, and several other components. Due to difficulties in assessment and lack of monitoring costs, the burden on the health sector is not clearly known.

With the understanding that RTIs are predictable and preventable, the role of the health sector has undergone changes. From being a recipient of the burden, the health sector and professionals have taken active roles of catalysts, facilitators, and advocates in prevention through a number of strategies. In road safety, the impact of many policies, programs, and developments in related sectors of transport, development, police, judiciary, economic growth, and others are felt and absorbed by the health sector. WHO (2007) in a review of the health sector's contribution to road safety and injury prevention has outlined six major activities that need to be undertaken by the health sector; these include advocacy, data management, policies and programs, capacity strengthening, monitoring, and evaluation along with provision of curative and rehabilitative services. As per WHO, "the ministry of health is uniquely positioned to collect data, analyze risk factors, provide emergency and long-term care, coordinate multisectoral prevention efforts across a range of sectors, and campaign for political and legislative change. In many countries, if the ministry of health does not conduct these activities in the field of violence and injury prevention, no other body will."

The health sector needs to reorient its role and extend beyond the provision of acute and rehabilitative care into the areas of prevention and promotion through policies and programs. In many developed countries, injury prevention has been the primary focus of health agencies providing requisite inputs toward planning, programming, implementing, and evaluating road safety and injury prevention programs.

Specific activities which health sector can undertake include[47]

I. Improving data collection systems and building capacity for data management along with making data available for everyone to act.
II. Building organized systems of emergency and prehospital care.
III. Developing integrated trauma care systems by addressing equity in health care.
IV. Organizing delivery of rehabilitation services for critically injured.
V. Facilitating a national plan within the Ministry and within the national governments.
VI. Strengthening existing or new legislation for road safety and injury prevention
VII. Identifying key interventions that work based on the understanding of injuries

[47] Gururaj G, Gautham M S. Advancing Road Safety in India-Implementation is the Key, Bengaluru, 2017. National Institute of Mental Health & Neuro Sciences; 2017. Publication Number :136

VIII. Strengthening the capacity of policymakers in health and related sectors to scientifically address the injury burden through policies and programs.
IX. Building human resources for road safety and injury prevention through a variety of training programs.
X. Supporting a public health approach for prevention of RTIs and other injuries
XI. Conducting advocacy and awareness activities
XII. Monitoring and evaluation through data on the effectiveness of interventions and keeping track of changing trends
XIII. Facilitating greater participation of society in road safety by addressing RTIs as a public health problem.

7.2.4. Supreme Court on Emergency Care[48]

The reports of four Working Groups set up by the first respondent (Union of India & Ors) to submit recommendations and suggestions on short term and long-term measures to curb road accidents in the country. The said four Working Groups were required to go into four 'Es' of road safety, namely, Engineering, Enforcement, Education and Emergency Care.

The Working Group on Emergency Care took note of the fact that a large number of potentially salvageable patients die needlessly due to delay in retrieval and inadequate or ineffective treatment. In its report, the Working Group had enumerated the following problems in accident and emergency care delivery in India:

(a) The general public does not possess basic first aid skills.
(b) There is no standardized toll-free access number to call emergency medical help.
(c) There is Non-availability of appropriate and safe transport for the injured patient in the form of road ambulances, air ambulances, etc.
(d) The ambulances are inappropriately/ inadequately equipped.
(e) There is lack of awareness regarding Hon'ble Supreme Court of India's directives regarding the right to emergency care for RTA victims and the legal protection available to good Samaritans who offer help to a victim of a road accident.
(f) There is no provision to ensure adequate compensation to an RTA victim in case the accident-causing vehicle does not have a third party insurance.
(g) Majority of the drivers do not have a personal medi-claim policy to cater to their emergency medical needs in case of an accident.

7.2.5. Policies on Trauma Care

7.2.5.1. National Health Policy 2017 (Emergency Care & Disaster preparedness)[49]

Better response to disasters, both natural and manmade, requires a dispersed and effective capacity for emergency management. It requires an army of community members trained as the first responder for accidents and disasters. It also requires regular strengthening of their capacities in close collaboration with the local self-government and community-based organizations. The policy supports the development of earthquake and cyclone-

[48]Writ Petition (Civil) No. 295 of 2012, Supreme Court of India
[49] National Health Policy 2017, Ministry of Health & Family Welfare, Government of India

resistant health infrastructure in vulnerable geographies. It also supports the development of mass casualty management protocols for CHC and higher facilities and emergency response protocols at all levels. To respond to disasters and emergencies, the public healthcare system needs to be adequately skilled and equipped at defined levels, so as to respond effectively during emergencies. The policy envisages the creation of a unified emergency response system, linked to a dedicated universal access number, with a network of emergency care that has an assured provision of life support ambulances, trauma management centers:

- one per 30 lakh population in urban areas and
- one for every 10 lakh population in rural areas

7.2.5.2. National Road Safety Policy[50]

Policy Statement "(ix) Emergency Medical Services for Road Accidents": The Government will strive to ensure that all persons involved in road accidents benefit from speedy and effective trauma care and management. The essential functions of such a service would include the provision of the rescue operation and administration of first aid at the site of an accident and the transport of the victim from the accident site to a nearby hospital. Hospitals alongside the National Highways and State Highways would be adequately equipped to provide for trauma care and rehabilitation.

7.3. Components of Trauma Care Management

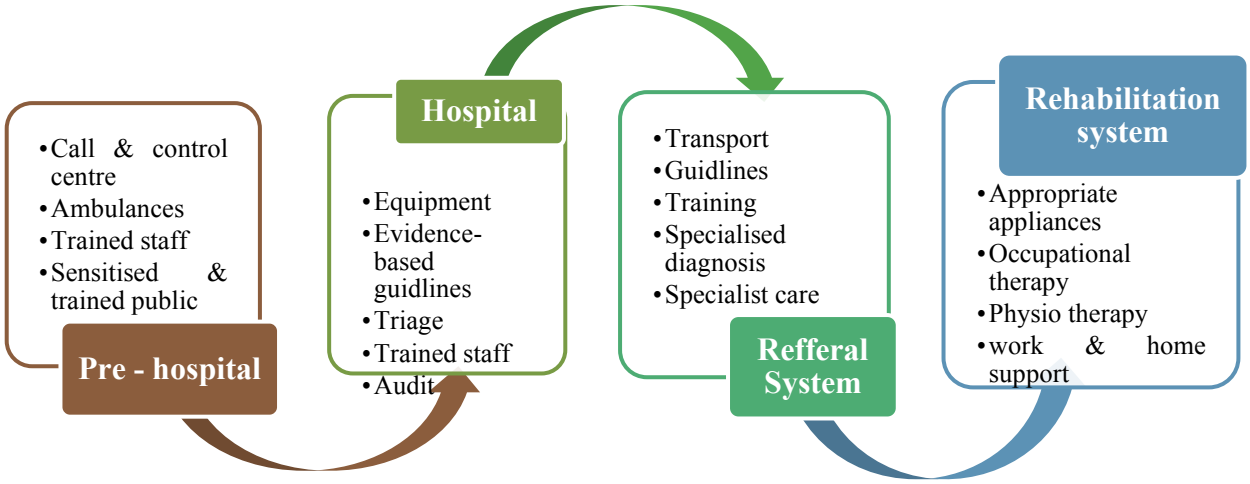


Figure 51. Elements of Effective Trauma Care system

Source: Gururaj G, NIMHANS Public Health Alerts, Trauma Care, NIMHANS

Trauma care systems are now evolving in India but are still, more of an urban phenomenon in cities and recently in district headquarters. The organization of trauma systems has four major domains, viz., pre-hospital care, in-hospital trauma care, referral services, and rehabilitation components. An integrated and coordinated approach encompassing human resources (staffing and training), physical resources (infrastructure, equipment, and supplies) and the process (organization, administration, and delivery) is required at all levels to deliver ideal trauma care. Beginning with identifying the trauma victim at the site of the accident till the rehabilitation of the individual, trauma care

[50] National Road Safety Policy, Government of India

services should be available, accessible, affordable, timely and efficient to the best possible extent and should consider the local topography, technology, and resources.

There are several components of a successful trauma management system (as shown below) including the crucial first hour after a serious injury, first responders who attend to a victim, trauma management, rehabilitation and, awareness among the general public[51].

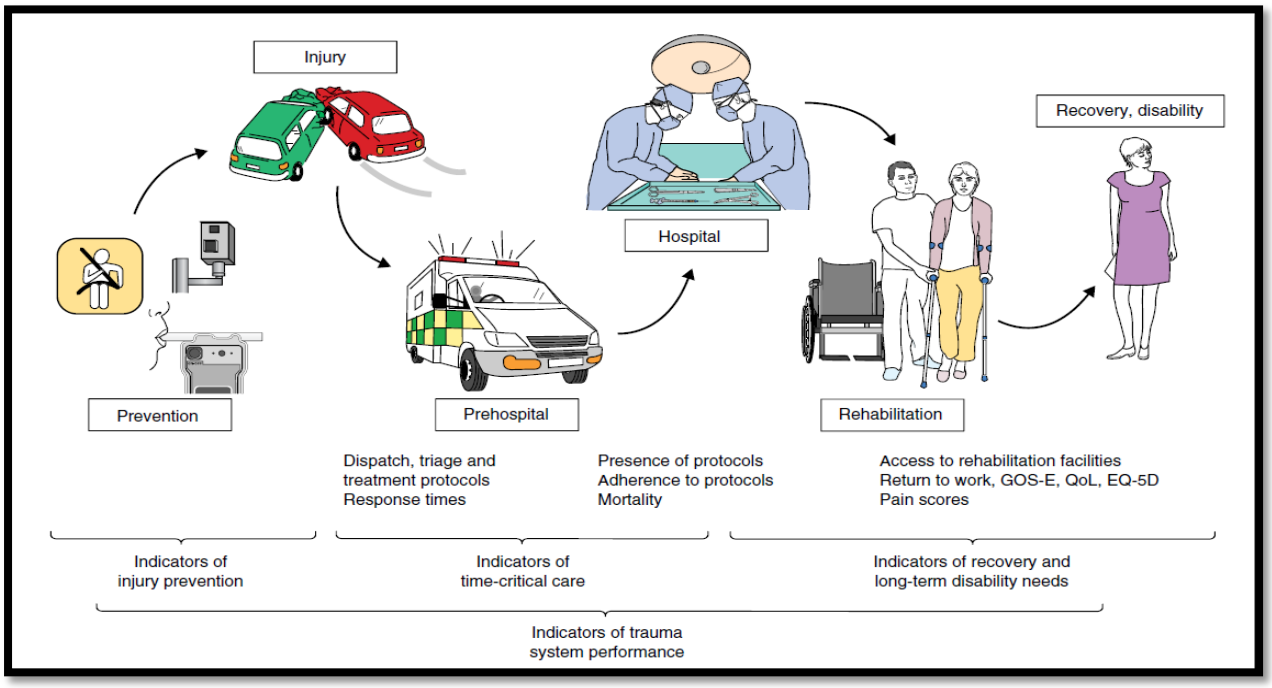


Figure 52. Components of Trauma Care Management

The above is a pictorial representation of the injured patients' journey from injury to death, recovery or long-term disability. The top row depicts examples of structure, process & outcome indicators. The middle row depicts composite indicators that encompass several components of the journey, such as time-critical care and recovery long term disability needs. The bottom row emphasizes the need to evaluate trauma system performance using a range of indicators such as GOS-E, extended version of the Glasgow Outcome Scale; QoL, quality of life

7.4. Classification of Trauma Centers[52]

The operational definition of Level I, II, III and IV hospitals as specified under 'Capacity for developing Trauma Care Facilities in Govt. Hospitals on National Highways'.

(I) Level IV Trauma Care:

This would be provided by appropriately equipped and manned mobile hospitals/ ambulances. These shall be provided by MoRTH/ NHAI/ NHRM/ State Governments., etc as the case may be.

[51]R. L. Gruen, B. J. Gabbe, H. T. Stelfox and P. A. Cameron, Indicators of the quality of trauma care and the performance of trauma systems, British Journal of Surgery 2012; 99 (Supply 1)

[52] Capacity Building for Developing Trauma Care Facility on National Highways, Ministry of Health & Family Welfare – December 2014, Government of India

(II) Level III Trauma Care

This Facility provides initial evaluation and stabilization (surgically inappropriate) to the trauma patient. Comprehensive medical and surgical inpatient services would be made available to that patient who can be maintained in a stable or improving condition without specialized care. Emergency doctors and nurses are available round the clock. Physicians, surgeons, Orthopaedic surgeon, and Anesthetist would be available round the clock to assess, resuscitate, stabilize and initiate transfer as necessary to a higher-level Trauma Care Services. Such hospitals will have limited intensive care facility, diagnostic capability, blood bank and other supportive services. The district/ tensile hospitals with a bed capacity of 100 to 200 beds would be selected for level III care.

(III) Level II Trauma Care

This facility provides definitive care for severe trauma patients. Emergency physicians, surgeons, Orthopaedicians and Anesthetist are in-house and available to the trauma patients immediately on arrival. It would also have on-call facility for neurosurgeons, pediatricians. If neurosurgeons are not available, general surgeons trained in neuro surgery for a period of 6 months in eminent institutions would be made available 24*7. The centre should be equipped with emergency departments, intensive care unit, blood bank, rehabilitation services, broad range of comprehensive diagnostic capabilities, and supportive services. The existing medical college hospitals or hospitals with bed strength of 300 to 500 should be identified as Level II Trauma Centre.

(IV) Level I Trauma Care

This facility will provide the highest level of definitive and comprehensive care for patient with complex injuries. Emergency physicians, nurses and surgeons would be in-house and available to the trauma patients immediately on their arrival. The services of all major super specialties associated with trauma care would be available 24*7. It should be situated at essentially at a distance of less than750 to 800 kms apart; these level I trauma care centres need not necessarily be along with the Highways corridor. These should be tertiary care centres to which patients requiring highly specialized medical care are referred. Due to high level of skill, specialists and infrastructure required, Level I Trauma Centres should be only in medical college hospital

7.5. Good Samaritan Law

“Good Samaritan” means a person, who in good faith, voluntarily and without expectation of any reward or compensation renders emergency medical or non-medical care or assistance at the scene of an accident to the victim or transports such victim to the hospital.

A Good Samaritan shall not be liable for any civil or criminal action for any injury to or death of the victim of an accident involving a motor vehicle, where such injury or death resulted from the Good Samaritan’s negligence in acting or failing to act while rendering emergency medical or non-medical care or assistance.

Protection of Good Samaritans mentioned under Motor vehicle Amendment Bill 2019, states that the Central Government may by rules provide for the procedure for questioning or examination of the Good Samaritan, disclosure of personal information of the Good Samaritan and such other related matters

In the public interest case filed in the Supreme Court on the need for emergency care of victims of accident, the Supreme Court of India stated in Parmand Katra v. Union of India as follows:

- "Every injured citizen brought for medical treatment should instantaneously be given medical aid to preserve life and thereafter the procedural criminal law should be allowed to operate in order to avoid negligent death.
- There is no legal impediment for a medical professional when he is called upon or requested to attend to an injured person needing his medical assistance immediately.
- The effort to save the person should be the top priority not only of the medical professional but also even of the police or any other citizen who happens to be connected with the matter or who happens to notice such an incident or a situation.
- Preservation of human life is of paramount importance. That is so on account of the fact that once life is lost, the status quo ante cannot be restored as resurrection is beyond the capacity of man.
- The patient whether he be an innocent person or be a criminal liable to punishment under the laws of the society, it is the obligation of those who are in-charge of the health of the community to preserve life so that the innocent may be protected and the guilty may be punished.
- Social laws do not contemplate death by negligence to tantamount to legal punishment.
- A doctor at the Government hospital positioned to meet the State obligation is, therefore, duty bound to extend medical assistance for preserving life.
- Every doctor whether at a Government hospital or otherwise has the professional obligation to extend his services with due expertise for protecting life.
- No law or State action can intervene to avoid/delay the discharge of the paramount obligation cast upon members of the medical profession. The obligation being total, absolute and paramount, laws of procedure whether in statutes or otherwise which would interfere with the discharge of this obligation cannot be sustained and must, therefore, give way.
- Every doctor should be reminded of his total obligation and be assured of the position that he does not contravene the law of the land by proceeding to treat the injured victim on his appearance before him either by himself or being carried by others.
- Zonal regulations and classifications cannot also operate as fetters in the process of discharge of the obligation and irrespective of the fact whether under instructions or rules. The victim has to be sent elsewhere or how the police shall be contacted; the guideline indicated in the 1985 decision of the Committee on

Forensic Medicine (set up by the Ministry of Home Affairs of the Government of India) is to become operative.

7.6. Golden Hour Principle

The law Commission in its 201st report had clearly stated that the medical literature on the subject states that the **'GOLDEN HOUR'** is the first hour immediately after the accident in which 'emergency medical care' is necessary and most victims die if no such care is available or is not given soon after the accident. The purpose of emergency medical care is to 'stabilize' the patient and this, unfortunately, is not done.

BOX-14: The Golden Hour

- With regard to emergency trauma care, a few minutes can mean the difference between life and death. This first hour of definitive medical care is called the "golden hour."
- In emergency medicine, the golden hour refers to a period following traumatic injury being sustained by a casualty during which there prompt medical treatment will prevent death.
- The first 60 minutes following an injury within which the trauma patient should reach the right hospital is referred to as the golden hour;

In emergency medicine, the golden hour refers to a time period lasting from a few minutes to several hours following traumatic injury being sustained by a casualty, during which there is the highest likelihood that prompt medical treatment will prevent death.

It is well established that the victim's chances of survival are greatest if they receive care within a short period of time after a severe injury. Some have come to use the term to refer to the core principle of rapid intervention in trauma cases, rather than the narrow meaning of a critical one-hour time period.

Cases of severe trauma, especially internal bleeding, surgical intervention is required. Complications such as shock may occur if the patient is not managed appropriately and expeditiously. It therefore becomes a priority to transport patients suffering from severe trauma as fast as possible to specialists, most often found at a hospital trauma centre, for definitive treatment. The lag time between injury and treatment should ideally be kept to a bare minimum; over time, this lag time has come to be specified as a now-standard time frame of no more than 60 minutes, after which time the survival rate for traumatic patients is alleged to fall off dramatically. The time element is critical not only to save lives but also for developing and managing the emergency medical response fleet.

BOX-15: Recommendations – Golden Hour Principle

In compliance with the golden hour principle, it is recommended to

- Provide operable life saving ambulance system, advanced life saving ambulance for every 100 kms of road length.
- These ambulances should be equipped with sophisticated and advanced medical equipment to provide initial treatment to the accident victim in ambulance itself.
- Further, establishment of adequate trauma centers along the highway will strengthen the facilities saving more lives of accident victims.
- With these interventions, there will be a considerable reduction in response time of carrying the accident victim to the nearest hospital/ trauma centre. Hence the golden hour principle is taken care

7.7. Need for a Framework In India For Road Safety

Even the above-contemplated proposals in the proposed MV amendment Bill, or the existing provisions of the Act 1988, there is no proper mechanism addressing the aspects of strengthening the pre-hospital care, in-hospital care and rehabilitation and dedicated enforcement on highways. Given the knowledge that Road Traffic Injuries are non-predictable and preventable, recent developments in India, commitment of political leaders, policy makers, professionals and the public on variety of platforms, the time is appropriate to move towards a system building endeavor for road safety in India. Efforts till date have focused on individual, short term and limited impact approaches rather than sustainable strategies and efforts. It is amply clear and evident that "no single solution is enough" and requires" multi-sectoral actions that are data driven and implemented in true spirit". Undoubtedly, this requires Consensus building, Greater Coordination, Convergence in actions, and Critical inputs by all stakeholders to implement policies and programmes.

In such a scenario, a framework for road safety that broadly delineates various activities and components is required for consideration of parliamentarians and policy makers. Development of such framework is the beginning of activities and not an end by itself as it lays down "what needs to be done in India in the coming days to save lives". India being a federal state, the roles and responsibilities is the shared responsibility between centre government and the state government. Hence, there needs to have a framework for performing certain activities at the central level with corresponding activities followed at the state level. Furthermore, at the state level, implementation of many activities is also subject to coordination between state and districts, as the last point of implementation of all activities on the ground are the Cities and districts of India.

It is essential to highlight that the activities and components provided in the framework are neither hierarchical nor exhaustive and is not all inclusive. In overall terms, they indicate the wide range of activities required to promote, strengthen and implement road

safety activities at national and state levels. Prioritization of activities shall be considered at the highest level by concerned ministries/ departments based on global understanding, evidence basis, technological availability, existing expertise and capacity, required finances and current administrative and legislative frameworks keeping the principles of sustainability and cost effectiveness.

In view of reducing the road accidents and fatalities in India, it is suggested to have a dedicated and separate enforcing agency for strict enforcement of the traffic violations across India, especially on National Highways. For this, a detailed National Road Safety Plan has been proposed with suggested institutional setup for a dedicated National Highways Road Safety Police (NHRSP) has been explained in the subsequent sections.

Further, the new motor vehicle amendment bill 2019 also proposes the need for electronic monitoring and enforcement of road safety and need for the National Road Safety Board under the following clauses, which are highlighted in the subsequent sections.

- Clause 47 seeks to insert a new section 136A in the Act in order to allow "electronic monitoring and enforcement of road safety".
- Insertion of new sections 215A, 215B, 215C and 215D
    - 215-A, Power of Central Government and State Government to delegate.
    - 215-B, National Road Safety Board
    - 215-C, Power of Central Government to make rules
    - 215-D, Power of State Government to make rules

7.8. Amended Provisions in Motor Vehicles (Amendment) Bill 2019

The Motor Vehicles (Amendment) Bill 2019, as per the proposed amendments, related to road safety, road accidents and trauma care, golden hour;

7.8.1. Electronic Monitoring and Enforcement of Road Safety

- ❖ The State Government shall ensure electronic monitoring and enforcement of road safety in the manner provided under sub-section (2) on national highways, state highways, roads or in any urban city within a State, which has a population up to such limits as may be prescribed by the Central Government.
- ❖ The Central Government shall make rules for the electronic monitoring and enforcement of road safety including speed cameras, closed-circuit television cameras, speed guns, body wearable cameras and such other technology.

7.8.2. Power of Central Government and State Government to delegate

- ❖ Notwithstanding anything contained in this Act,—
    a) the Central Government shall have the power to delegate any power or functions that have been conferred upon it by the Act to any public servant or public authority and authorize such public servant or public authority to discharge any of its powers, functions and duties under this Act;
    b) the State Government shall have the power to delegate any power or functions that have been conferred upon it by the Act to any public servant

or public authority and authorize such public servant or public authority to discharge any of its powers, functions and duties under this Act.

7.8.3. National Road Safety Board

- The Central Government shall, by notification in the Official Gazette, constitute a National Road Safety Board consisting of a Chairman, the Central Government may prescribe such number of representatives from the State Governments, and such other members, as it may consider necessary and on such terms and conditions as.
- The National Board shall render advice to the Central Government or State Government, as the case may be, on all aspects pertaining to road safety and traffic management including, but not limited to,—
    - the standards of design, weight, construction, manufacturing process, operation and maintenance of motor vehicles and of safety equipment;
    - the registration and licensing of motor vehicles;
    - the formulation of standards for road safety, road infrastructure and control of traffic;
    - the facilitation of safe and sustainable utilization of road transport ecosystem;
    - the promotion of new vehicle technology;
    - the safety of vulnerable road users;
    - programmes for educating and sensitizing drivers and other road users; and
    - such other functions as may be prescribed by the Central Government from time to time.

7.8.4. With respect to Golden Hour

1. It has been proposed that the Central Government would develop a scheme for cashless treatment of road accident victims during golden hour.
    a. The Bill proposed to define golden hour under clause **'(*12A*) "golden hour" means the time period lasting one hour following a traumatic injury during which there is highest likelihood of preventing death by providing prompt medical care'.**
2. Scheme for interim relief for claimants - The Central Government is also likely to introduce a scheme for providing an interim relief to claimants seeking compensation under third party insurance.

7.9. Standardization of Core Processes and Procedures

7.9.1. What is process standardization?

Fundamentally, process standardization describes the establishment of a set of rules governing how people in an organization are supposed to complete a given task or sequence of tasks. Standardization can be applied to any process, any task or procedure that is relevant to the organization. A well-defined standardization process can decrease ambiguity and guesswork, guaranteed quality, boost productivity, and increase morale. This is where Effective standardization of procedures in creating one correct way in to complete a particular task, which is defined in terms of a clear, measurable end result.

As the National Road Safety Plan represents entire nation, Standardization aims to unify the procedures adopted and reporting mechanism followed in various states that use different practices to do the same process. The following chapter deals with the standardization of accident data collection & recording system and standardization of trauma care services

7.9.2. Accident Data Collection

7.9.2.1. Development of Accident Recording System

For developing, a comprehensive and reliable accident recording system with main objective is to provide necessary data required for formulation of safety improvement program. Hence, the data collected should be of more scientific in nature. It has been observed that the present system of recording and analysis of accident data is technically inadequate to carry out comprehensive and complete analysis to recommend preventive safety measures.

Thus, there is an urgent need to develop a simple methodology to make it easier to collect, manage, and use accident record for formulation of road safety improvement programs. Some of the basic concepts and research needed for development of such an accident recording system in India as follows:

- The primary input of the accident data is the First Information Record (FIR) of the accident information collected by the police during their course of investigation at the place of incidence with the available information and witnesses. Thus, accident recording form obviously need to strike the right balance between the amount of detail the police record about each accident and their ability to do so in their available time and in certain aspect their expertise.
- There is a need to develop a simpler and easy way to fill the form for recording accident data to developed annual accident statics in a comprehensive way. The new accident form need to be designed to record various facts related to accident covering the general identification details related to vehicle, victim and property damage involved in a particular accident and at the same time keeping the data entry/ recording process simple and less time consuming.
- The accident recording system should be user friendly by possible reduction of quantum size of information asked for in these forms and at the same time recording all the information that will required for mass reporting which can help in developing indicators for carrying out detailed accident analysis at a subsequent stage.
- The accident record system needs to have several quality measures such as timeliness, accuracy, completeness, uniformity, integration, and accessibility. Improving these quality measures need to be provided for institutional support.
    - **Timeliness** is a measure of how quickly an accident data is available within an accident record system. The use of traditional data collection and entry methods can result in significant time lags. By the time data are entered in the data system, they may be unrepresentative of current conditions. Hence, it is required that the accident recording system should meet the criteria of timeliness to have data available when they are most

effective by using available technologies like automated accident data collection and processing of data with the help of tablets and a suitable software. Develop computerized accident recording and analysis system so that the data can be transfer online and there is no time leg in publishing national accident record. Data collection technologies offer improvements in the collection process and range from electronic accident report systems to barcode or magnetic strip technologies used to collect vehicle and license data.

- **Accuracy** is a measure of how reliable the data are, and if the data correctly represent an occurrence. Aside from inconsistencies due to multiple data collectors, some error in judgment is likely to occur. Use of advanced technologies (e.g., global positioning systems (GPS), may be used to determines the location of the accident. Hence, it is required that the accident recording system should meet the criteria of accuracy to achieve necessary precision on problem identification. For this purpose, a scientific investigation needs to be carried out.
- **Completeness** is a measure of missing information, including missing variables on the individual accident forms, as well as underreporting of accidents. Hence, it is required that the accident recording system should meet the criteria of completeness to show magnitude and provide all required details. It is also required that information on minor accident that does not involve police investigation may also be recorded.
- **Uniformity** is a measure of how consistent information is coded in the data system, and/or how well it meets accepted data standards. Lack of consistency includes both the number and types of variables collected and coded by each police station as well as the definitions used to define accident types and severity. Uniform coding and definition of data elements allows comparing accident problems of different regions, information exchange, and multiyear data analysis to detect trends, and identify emerging problems and effective road safety improvement program. Uniformity is necessary so that all highway data will be collected on a common basis that will permit future correlation.
- The accident record system should link accident data with other highway data including traffic volume, design element, and control devices inventories. Currently, each state maintains its own accident database to which the local agencies submit their accident reports. However, accident data alone do not typically provide sufficient information on the characteristics of the roadway, vehicle, driver experience, or medical consequences. If accident data are linked to other information databases such as roadway inventory, driver licensing, vehicle registration, citation/ conviction, EMS, emergency department, death certificate, census, and other state data, it becomes possible to evaluate the relationship among the roadway, vehicle, and human factors at the time of the accident. The information provided by this databank may be easily retrieved for research purpose.

- An accident recording system should also facilitate flexibility in the choice of methods used for data analysis and permits the study of a large number of accidents in a short time
- There is a need to develop a road location reference system, which permits the aggregation of accident data for locations.
- There is a need to develop an electronic data collection system, using new technologies and techniques to improve the safety data collection and analysis processes.
- It may be necessary to change policies and procedures to make it easier to collect, manage, and use of accident data.
- A data standards manual needs to be developed to identify data streams, data definitions, and the agencies responsible for data collection and analysis.
- There is a need to develop expertise in the country for accident recording and analysis work.

7.9.2.2. Review of accident data collection in other countries

For this purpose, accident data collection processes and procedures of different countries like France, Colorado, German, Drexel University, Washington, City of London etc., have been studied and are presented in this section. Based on these methods as a reference, comprehensive accident data collection and analysis software has to be developed for collecting the scientific data and rigorous analysis so that the accident data can be used for road safety improvement programs. The following are the some of the accident data collection formats and analysis formats reviewed which are followed in different countries and the formats for the same are provided in **Annexure-B**

- Analysis report of road traffic accidents unit code report no. Involving physical injury, France
- Traffic Accident Report, State of Colorado
- Accident Report, German
- Auto Accident Report Form, Drexel University
- Vehicle Accident Report, State of Washington
- Self-Reporting Scheme of Road Traffic Collision/ Accident, City of London Police
- Motor Vehicle Accident Report, New York State
- First Information report, India

Based on theses references a comprehensive data collecting system and analysis software has to be developed and the software has to be capable of integrating with the existing IT systems, the data should be stored on the central server and can be easily recalled from the server at any point of the time during the course of investigation.

7.9.3. Trauma Care Services

7.9.3.1. Strengthening Trauma Care Services

Efficient trauma care soon after the occurrence of injury can result in significant decline in mortality and reduce disabilities[53]. Preventing secondary injuries after occurrence of injury requires development of good-quality emergency and pre-hospital care. Some strategic approaches[54] include development of

- Basic first-aid courses for health and first-aid responders in the community like police, teachers, commercial vehicle drivers, students, and others in a prioritized manner
- Strict implementation of Good Samaritans Act at peripheral levels
- Safe transportation services that can deliver basic care and early transfer of injured persons to definitive hospitals
- Minimum guidelines and standard operating procedures for management of persons that are followed in different in all health care institutions
- Efficient trauma care systems through trauma care guidelines
- Training of emergency care physicians and nurses in a uniform manner along with provision of required facilities with a combination of Advanced Trauma Life Support (ATLS) and Basic Trauma Life Support (BTLS) programs
- Introduction of trauma audits in all major academic institutions
- Costs of trauma care to be addressed through the involvement of health, judiciary, and insurance sectors along with evaluation of ongoing pilot projects
- Developing trauma registry in select institutions

7.9.3.2. Improvement Suggestions

a) **Setting up a "universal" telephone number**

Many countries have established nationwide emergency telephone numbers to facilitate access to emergency services. If a country establishes a nationwide number, it should be well publicized and easy to remember. The use of a universal telephone number is desirable, but coverage is often less than universal, particularly in rural areas. In addition, the specific telephone number that is reserved for emergency use varies from country to country, so no telephone number is truly universal.

Ideally, a universal emergency telephone number should:

- ✓ be valid throughout the catchment area
- ✓ be available from every telephone device (landline or mobile)
- ✓ be readily accessible (e.g., available through emergency call boxes)
- ✓ be easy to remember and dial (i.e., limited to 3 or 4 digits)
- ✓ be free of charge

b) **Pre-Hospital -Emergency Medical Services (EMS) Network**

[53] Uthkarsh PS, Gururaj G, Girish NR. Practice and Perception of First Aid Among Lay First Responders in a Southern District of India. Arch Trauma Res. 2013;1(4):155–60."

[54] Gururaj G, Gautham M S. Advancing Road Safety in India-Implementation is the Key, Bengaluru, 2017. National Institute of Mental Health & Neuro Sciences; 2017. Publication Number :136

- The EMS Network should ensure an average primary crash response time of 8 – 10 minutes by deploying adequate number of First Responders and Ambulances.
- As far as possible, existing ambulances of both Govt. & Private Hospitals supported by a reimbursement model should be brought into this network to reduce the load on exchequer for immediate capital investment.
- This network should be adequately complemented by seamless communication, centralized dispatch & medical direction.
- Pre-hospital Care Triage protocols should be standardized and synchronized across the state.
- There should be a unified toll free access number for EMS across the country, which should be accessible from all landlines and mobiles.
- This number should be widely publicized through print & electronic media, textbooks, IEC material, Pamphlets, etc and by displaying prominent signage at every 5 kms along the national & state highways.
- Vandal Proof Emergency Call Boxes/ Posts through which the users in need of help can communicate with the control room and the latter can rush the help, rescue and relief should be mandatorily put at every 5 kms along the national & state highways
- Ambulances should be adequately supported by Crash Rescue Vehicles (CRV's), Police & Fire Services.
- Wherever required, the ground EMS Services should be supported by Heli-Ambulance Service for transfer to referral centers.

c) **Hospital based Emergency Care**

- As recommended by the National Human Rights Commission (NHRC Annual Report - 2004-2005), Emergency Healthcare facilities should be present at every 50kms along/near the national & state highways to ensure definite care to a RTA victim in the Golden Hour.
- To ensure the same, firstly the existing healthcare facilities both public and private along/near the Highways should be audited, verified & designated with respect to the provision of Trauma Care Facilities in accordance with the WHO "Guidelines for Essential Trauma Care"
- Those found deficient, should be upgraded in terms of manpower, equipment, skills, etc. in line with the WHO "Guidelines for Essential Trauma Care"
- The Govt. through its appropriate agencies should reimburse the private facilities empanelled in the EMS Network for providing Emergency Care to RTA victims. The funds for the same can be mobilized by imposing an EMS Cess on the Road Tax.
- New facilities should be planned only where there is no existing Govt. or Private facilities available.
- Regional Referral Trauma Centres should be established across the country supported by a Heli-Ambulance network to ensure speedy care to the severely injured

d) **Health Facility Networking**

- There should be dynamic linkages between various health care facilities in terms of manpower, resources, skills & information.
- SOP's for initiation of network response must be put in place and there should be role clarity amongst the various participants

e) **Capacity Building and Training**

- There is a dire shortage of trained Emergency Medical Technicians (EMT's) in the country. Immediate steps improve this situation need to be taken.
- Training in First Aid & Rescue must be mandatory for all Drivers, Police Personnel, Conductors, Teachers, Students, etc. Social organizations like Red Cross, Lions Club, Rotary Club & others offering such trainings may be roped in for the same.
- Six months – one year Heavy Motor Vehicle (HMV) driving training course should be started as a new trade in the existing ITI's. This course apart from imparting driving skills should also impart adequate training in First Aid, basic vehicle maintenance, etc. and after completing this course, the person should be able to directly get a HMV Driving License instead of going through the current system of having an initial experience of three years on LMV and then becoming eligible for a HMV Driving License.
- National Trauma Management Course (NTMC™) is an authentic course on acute trauma management, being organized in India. In the first critical hour after polytrauma, it is vital that doctors, nurses and paramedics act with speed, knowledge and skill to provide appropriate life support to the patient.

f) **Research and Development into post crash response**

- Post-Crash Response is a specialized field, which involves the active participation of multiple agencies like Fire, EMS, Police and Crash Rescue units.
- Currently there is no institute/university, which does a multidisciplinary research on this topic. To develop quality, effective and economical indigenous post-crash response techniques, protocols, specifications, etc. it is necessary that research in this field should be encouraged and liberal funding for the same should be ensured
- There is an urgent need to standardize minimum national specifications for various types of ambulances, rescue vehicles, Dispatch/ Command & Control Centres, etc. so as to bring homogeneity in the system across the country.

g) **Resource**

- Human resources: staffing and training
- Mostly little consideration has been given to optimizing the training of medical and nursing staff for the care of injured patients. As per present scenario, most of the Trauma centers are running with inadequate manpower. Pilot programmes need to be urgently taken to fill up all the post with suitable trained resources.
- Physical resources: infrastructure, equipment and supplies

7.9.4. Establishment of Review Committee

The purpose of the setting up of a Trauma Management review committee is as follows

- ✓ Commitment to the trauma program by the facility including the board, medical staff, etc,.
- ✓ Readiness to care for the trauma patient
- ✓ Availability Resources
- ✓ Framing and ensuring compliance with Policies, protocols and practices
- ✓ Improving Quality of care
- ✓ Initiating Performance improvement activities

7.9.4.1. Levels of Review

a) Primary Review Process-

- ✓ Finding the events
- ✓ Confirmation of the event
- ✓ Immediate resolution and feedback
- ✓ Events may be closed at this level and trended
- ✓ Use of tracking system to prove event reviewed, action taken and loop closure

b) Secondary Review Process-

- ✓ Investigate the issue in more detail
- ✓ Issue may be closed at this level
- ✓ Use tracking system & tools to prove issue has been reviewed, action taken and loop closure
- ✓ Push to the next level of Review

c) Tertiary Review Process-

- ✓ Presented at a formal committee
- ✓ Determined if system vs. provider related
- ✓ Requires corrective recommendations/actions
- ✓ Requires closed loop and documentation of actions and re-evaluation

7.10. Monitoring and Evaluation

Monitoring: Monitoring means tracking the key elements of programme performance on a regular basis (inputs, activities, and results)

Evaluation: In contrast, evaluation is the episodic assessment of the change in targeted results that can be attributed to the programme/ project intervention, or the analysis of inputs and activities to determine their contribution to results.

Monitoring and evaluation helps quantify the attainment of program goals and sub-goals:

- ➢ whether the actions were implemented as planned – as conducted in;
- ➢ whether assumptions made during identification of the problem and its context were correct;
- ➢ whether the actions have resulted in risk reductions; and
- ➢ whether new information has emerged that requires a strengthening and/or modification to the risk management plan.

Monitoring and Evaluation also prompts fresh thinking within organizations and their contacts with external stakeholders. As the emphasis on managing for results increases, the demand for rigorous and evidence-based evaluations is rising. To make out whether the cost incurred on the project has spent its money appropriately and to keep track on the achievements as per the desired outcomes. To address accountability, a monitoring and an evaluation helps to address questions such as:

- has the project worked?
- how have resources been used and spent?
- should the project continue?

In order to achieve these objectives, a standard procedures and guidelines (M&E Framework) have to be framed, in which the roles and responsibilities of each stakeholder department are clearly mentioned for better output and results.

7.10.1. Benefits of Monitoring and Evaluation

1. Monitoring and evaluation (M&E) helps programme implementers to:
   - determine the extent to which the programme/project is on track and to make any needed corrections accordingly;
   - make informed decisions regarding operations management and service delivery;
   - ensure the most effective and efficient use of resources;
   - evaluate the extent to which the programme/project is having or has had the desired impact.
2. Monitoring & Evaluation of interventions and provided improvements will guide the decision makers in adopting quick solutions in eliminating new bottlenecks arrived during implementation.
3. The need for collaboration arises from the diverse nature of the problem of road traffic fatalities and injuries. The problem has multiple determinants, affects many people and sectors, and requires action by different sectors. Many sectors are involved in road safety and it is important for them to collaborate and try to influence the likely success of road safety initiatives that are undertaken at national, regional and international levels.
4. Over and above, this approach brings all road safety violators the fear of enforcing, thus controlling the road accidents and fatalities. Congruence of decisions towards enhancing road safety will be realistic.
5. If successfully implemented, the plan as a Demonstration/ Model Project, the concept can be beacon of light for the decision makers (who are working towards safer roads) in the state, they will be equipped with ground results. Further, the project may be extended to state highways and other category of roads as well. This project aims in reducing the road accidents, fatalities & serious injuries by 50% over the period of 5 years with dedication and commitment.

7.10.2. M&E Framework

Measuring the progress of implementation systematically ('monitoring'), showing the plan effects, and judging if, and to what extent, the plan followed has resulted in achieving the stated goals ('evaluating') are core matters in every policy, thus also in national road

safety plan. The main objective of developing Monitoring and Evaluation (M&E) framework with clear and measurable indicators is to keep track on the achievements as per the desired outcomes. For which, a base line survey has to be conducted to collect the existing data which reflects the existing scenario and this data relates to the base line values and information, data/ information source and responsible agencies for data source.

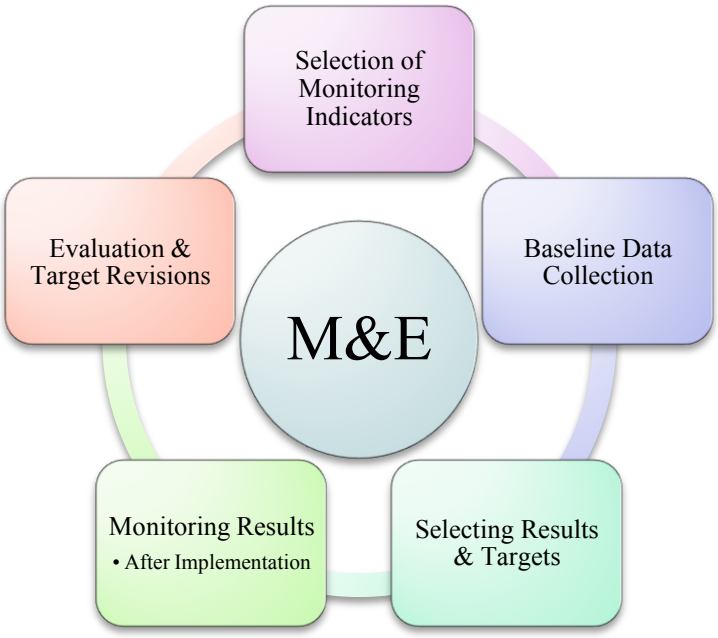
Four key-components for effective implementation of the national road safety plan can be indicated:

- organization,
- coordination,
- financing and
- knowledge/ information.

Monitoring and evaluation and its implementation are core matters in every policy, thus also in the national road safety plan. While many of the recommended actions in the national road safety plan are well-tried remedies that have been used for many years all around the world. However, in India, these recommendations are not fully implemented dedicatedly, no prescribed monitoring and evaluation procedures has followed to measure their impact hence, implementation of monitoring and evaluation with clear measurable indicators along with the national road safety plan to monitor and evaluate actual impact on accident reduction and then overall safety enhancement.

A simple but effective monitoring and evaluation system is required to track progress of road safety activities and to estimate the impact on overall safety. For action plans in developing countries, initial focus is often on institutional strengthening and capacity building rather than just on reducing of casualties in numeric terms. Monitoring and evaluation systems established, as a part of implementing action plans and safety initiatives must therefore, where appropriate, be able to indicate progress towards achievement of institutional impact and developmental objectives. The following are some of the interventions on each pillars of the road safety;

7.10.3. Process of M&E Framework



The plan will deliver a package of improvements aimed at directly addressing the identified problems to bring benefits in reducing the accidents and fatalities and to the local population, users and the wider economy. In order to monitor and evaluate the effectiveness of the proposed improvements/ interventions for the national road safety plan,

following M&E Framework is envisaged:

Implementation is often the great unknown. Without monitoring, it is difficult to understand the effective implementation of the proposal and if the implementation really does result in the expected effects. Further it is essential to know if, in the meantime, there have been developments that make it easier or more difficult to achieve the goals aimed at.

- Road Safety Interventions:
  - Enforcement with help of dedicated police and advanced enforcing equipment
  - Emergency Care with help of effective Emergency Response System
  - Education & Awareness
- Monitoring and Evaluation of effectiveness of proposed interventions

7.10.4. List of Road Safety Pillars, Interventions and Outcomes

The following are the list of the road safety pillars and the proposed intervention under the national road safety plan, and the expected safety outcomes are presented in the following table.

Table 30. Road Safety Pillars, Interventions and Outcomes

Road Safety Pillars	Intervention under National Road Safety Plan	Safety Outcomes
Road Safety Management Capacity	Establishment/ improvement of monitoring and evaluation systems such as crash data to measure fatalities and injuries	Systematic way of road safety management
Safer Vehicles/ Enforcement	Effective Implementation of regulations for managing commercial vehicle loading and the carriage of oversized goods by installing weigh bridges	Increase in rate of compliance for Safer Vehicles
Safer Road Users & Vehicles/ Enforcement	▪ Number of police enforcement incidents (citations, tickets, penalties, arrests, etc.) per year ▪ Hours of Police enforcement targeting high-risk behaviors/ increased Patrolling leading to high visible enforcement by establishment of highway patrolling outposts and by provision of requisite equipment for effective enforcement	Increase in rate of road user compliance with key road safety risk factors: Seat belt usage, helmet wearing rate, drink driving rate (decrease), speed limit compliance, etc.
Safer Road Users/ Education	By conducting counseling sessions to the traffic violators, road safety education and awareness campaigns	Increase in positive community attitudes toward road safety and increase in number of road users who think that safe road user behavior is improving in project area
Post-Crash Response	Recommend to provide operable life saving ambulance system, advanced life saving ambulance for every 100 kms of road length with sophisticated and fully equipped ambulances and establishment of adequate trauma center to reduce the response time in compliance with the golden hour principle	Accident victim will receive initial treatment in the ambulance to support the victim up to the hospital/ trauma centre. reduction in response time by crash victim recovery/ emergency medical services to road crashes

7.10.5. Performance Indicators

Proposed monitoring framework with measurable performance indicators related to crash data, enforcement, Reduction in Traffic Violations/ traffic safety, emergency/ post crash care, education & awareness are presented in the following table. In order to measure the performance of various activities as mentioned in the plan, a detailed baseline survey has to be conducted covering all the parameters as mentioned in the following table. The baseline values will act as reference values to compare the results/ outcomes of the activities performed as per the national road safety plan.

The monitoring and evaluation is the continuous process, the more monitoring and evaluation of the system the better the results are. The suggested timeline for conducting monitoring and evaluation is monthly up to the level of group road safety officer and the evaluation results has to be verified/ conducted at deputy road safety officer level and take further necessary action to improve the results. The yearly monitoring and evaluation and further necessary actions are to be conducted at the level of chief road safety officer.

Table 31. List of measurable performance indicators

S. No.	Performance Indicator	Baseline	Yearly Target	Monitoring	Evaluation	Current/ Revisions
Crash Data						
1.	Number of Crashes per year	To be Conducted	-	-	-	-
2.	Number of Fatal Crashes per year	To be Conducted	-	-	-	-
3.	Accident Severity (Fatalities per 100 crashes)	To be Conducted	-	-	-	-
4.	Crash Density (crashes per km/yr)	To be Conducted	-	-	-	-
5.	Fatality Density (fatalities per km/yr)	To be Conducted				
6.	No of Motorcycle (VRU) Fatal Crashes per Year	To be Conducted	-	-	-	-
7.	No of Pedestrian (VRU) Fatal Crashes per Year	To be Conducted	-	-	-	-
8.	Fatal Crashes near School/Educational Institutions	To be Conducted	-	-	-	-
Emergency/ Post Crash Care						
9.	Avg. Post Crash Emergency Response Time, minutes (Remote Point on corridor)	To be Conducted	-	-	-	-
10.	Avg. Time to reach TCC from Crash Loc, minutes (Remote Point on corridor)	To be Conducted	-	-	-	-
Enforcement						
11.	No. of Challans Issued per month to drivers w/o license	To be Conducted	-	-	-	-
12.	No. of Challans Issued per month to two wheeler/motorcycles riders Not wearing helmet	To be Conducted	-	-	-	-
13.	No. of Challans Issued per month to vehicle drivers NOT wearing seat belt	To be Conducted	-	-	-	-
14.	No. Challans issued per month to Motorists traveling above speed limits	To be Conducted	-	-	-	-

S. No.	Performance Indicator	Baseline	Yearly Target	Monitoring	Evaluation	Current/ Revisions
15.	No. of Challans Issued per month to drivers driving while Intoxicated	To be Conducted	-	-	-	-
16.	No. of Challans Issued per month to Overload/oversized Vehicles	To be Conducted	-	-	-	-
17.	No. of Challans Issued per month to triple or more riding motorcyclists	To be Conducted	-	-	-	-
18.	No. of Challans Issued per month to Vehicles without nighttime visible reflectors/tail lights, headlights etc.	To be Conducted	-	-	-	-
19.	No. of Challans issued per month for illegal parking on corridor	To be Conducted	-	-	-	-
Reduction in Traffic Violations						
20.	Traffic Safety - % Motorcycle Riders Not Wearing Helmet	To be Conducted	-	-	-	-
21.	Traffic Safety - % Drivers Not wearing Seat Belt	To be Conducted	-	-	-	-
22.	Traffic Safety - 85th Percentile Speed of vehicles	To be Conducted	-	-	-	-
23.	Traffic Safety - % of Drivers Driving Intoxicated	To be Conducted	-	-	-	-
24.	Traffic Safety - % of Vehicles w/o Reflectors/Tail Lights	To be Conducted	-	-	-	-
25.	Traffic Safety - % of Overloading/Oversized Vehicles	To be Conducted	-	-	-	-
26.	Scientific Crash Data Collection	To be Conducted	-	-	-	-
27.	Unsafe Parking (?) impacting Traffic Safety in KM	To be Conducted	-	-	-	-
28.	Highway ROW Encroachments affecting Traffic Safety in KM	To be Conducted	-	-	-	-
Education and Awareness						
29.	% of Citizens Utilizing Corridor are Awareness of Samaritan Law	To be Conducted	-	-	-	-
30.	% of Schools along corridor participating in Road Safety in School Zones Awareness Campaigns	To be Conducted	-	-	-	-
31.	% of Citizens Utilizing Corridor are Awareness of Free Medical Treatment for Crash Victims	To be Conducted	-	-	-	-
32.	Counseling & Training sessions to traffic violators	To be Conducted	-	-	-	-

7.10.6. Key Performance Indicators

In order to assess regional level performance of the interventions, following Key Performance (KPI) Indicates are recommended:

Table 32. List of measurable KPIs

S. No.	Key Performance Indicator (KPI)	Baseline	Yearly Target	Monitoring	Evaluation	Current/ Revisions
1.	Accident Severity (Fatalities per 100 crashes)	To be Conducted	-	-	-	-
2.	Crash Density	To be	-	-	-	-

	(crashes per km/yr)	Conducted				
3.	Fatality Density (fatalities per km/yr)	To be Conducted	-	-	-	-
4.	Cases of Speed Violations booked conducted per Km per Year	To be Conducted	-	-	-	-
5.	Avg. Total Response Time (Remote Point to Accident Location to Trauma Care Center)	To be Conducted	-	-	-	-
6.	Number of Road Safety Awareness Campaigns & Counseling Secessions conducted per Km per Year	To be Conducted	-	-	-	-

Chapter-8

National Road Safety Plan

8. NATIONAL ROAD SAFETY PLAN

In view of reducing the accidents and fatalities in India, it is suggested to have a dedicated and separate agency for strict enforcement of the traffic violations across India, especially on National Highways. To achieve this, it is proposed that a National Highways Road Safety Police (NHRSP) be established for strict enforcement on national highways. Similarly it is proposed that the state highway road safety police be established by every state for strict enforcement on the state highways.

The highway development in India has seen much awaited push since last two decades. The road length has increased considerably by construction of several multi Lane highways. However, over the same time, the safety performance of the roads has deteriorated in terms of increase in the number of road fatalities.

A committee on road safety and traffic management consisting of the stakeholders and experts was constituted in November 2005. After extensive consultations with the stakeholders and experts, the committee submitted its report in February 2007. Dedicated Highway Police is one of the major aspects discussed in the report; following is an extract of the same:

> *"18.* ***Dedicated Highway Police[55]:*** *The Committee also discussed the need for constituting a dedicated highway police force to enforce road safety on the National Highways (NH). The Committee noted that since law and order was a state subject, an NH police force would not be in a position to register crimes on the National Highways. The Committee also recognized that any move to create a dedicated highway police force could be resisted by the State governments. Nevertheless the Committee felt that it was necessary to have a dedicated force capable of policing the National Highways using modern technology and equipment. Borrowing personnel from the State governments was not a satisfactory arrangement as there was no guarantee of continuity, capacity or uniformity in dealing with traffic management and road safety issues on the National Highways. The Committee noted that Government was examining the possibility of employing the Central Industrial Security Force (CISF) for this purpose. The Committee was of the view that the Government should examine this further with a view to constituting a dedicated force for patrolling and managing traffic on the National Highways."*

The opportunity cost of a trained policeman to attend to only the issues related to traffic and Highway safety is very high. Therefore, a force/ service is required which will take on these duties and responsibilities. The members of this service will be provided the necessary wherewithal, administrative structure, recruitment rules, legal empowerment, area of responsibility, equipment, training etc. to carry out the task.

This force or service would be able to attend to the traffic safety on the national highways and deal with those issues uniformly across the whole country.

[55] Report of the Committee on Road Safety and Traffic Management, February, 2007

8.1. Justification for the formation of NHRSP

- The Law Commission, in its report (No. 234), as an important part of the enforcement measures recommended that there should be a vigorous campaign to highlight the impact and consequences of rash and negligent driving, installation of CCTV Cameras at all vulnerable points to curb traffic violations and to set up weighbridges to keep in check overloaded vehicles.
- Report of the committee on Road Safety and Traffic Management, 2007 emphases on the need for constituting a "Dedicated Highway Police" force to enforce road safety on the National Highways (NH). Since law and order was a state subject, an NH police force would not be in a position to register crimes on the National Highways. The Committee also recognized that any move to create a dedicated highway police force could be resisted by the State governments. Nevertheless, the Committee felt that it was necessary to have a dedicated force capable of policing the National Highways using modern technology and equipment.
- The National Road Safety Policy of 2010 expresses the will to take cognizance and reduce the number of accidents on national highways. Clause 8 of the policy states that the government will actively encourage the establishment and strengthening of Highway patrolling on national and state highways in cooperation, which state governments and union territories as appropriate.
- Road Safety Action Plan of 2016 – Clause XII of the short-term Action Plan reads "formulation of a policy for a private participation in the road safety activities like FOB, patrolling etc. The long term Action Plan speaks of "establishment of traffic control and command centers with traffic and accident management on the Delhi Mumbai and Mumbai Chennai corridor.
- Motor vehicle amendment bill 2019 has;
    - addressed the need for a National Road Safety Board, to be created by the central government through a notification. The Board will advise the central and state governments on all aspects of road safety and traffic management including standards of motor vehicles, registration and licensing of vehicles, standards for road safety, and promotion of new vehicle technology.
    - proposed to increase penalties to act as deterrent against traffic violations. Stricter provisions are being proposed in respect of offences like juvenile driving, drunken driving, driving without license, dangerous driving, over-speeding, overloading etc.
    - proposed that the State Government shall ensure electronic monitoring and enforcement of road safety on national highways, state highways, roads or in any urban city within a State which has a population up to such limits as may be prescribed by the Central Government. Further that the Central Government shall make rules for the electronic monitoring and enforcement of road safety including speed cameras, closed-circuit television cameras, speed guns, body wearable cameras and such other technology.
- In this background the proposed NHRSP model is developed.

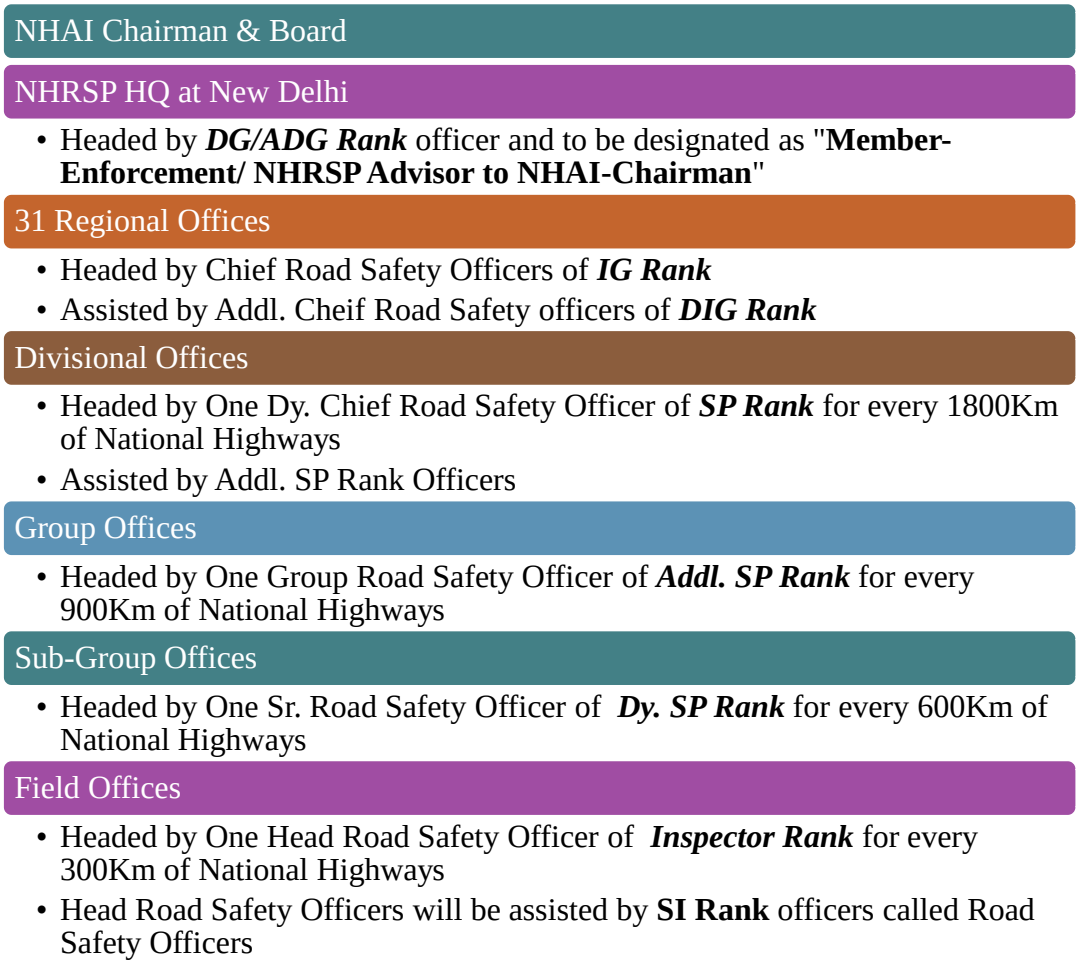
8.2. Structure of the NHRSP

The NHRSP would be administered through a registered society managed and funded by the NHAI. With the above background, a structure of the NHRSP especially pertaining to its area of operation is proposed.

8.2.1. Organogram

At the national level, there shall be DG/ ADG level officer who will be member of the NHAI Board. He will be designated, as the Member-Enforcement/ NHRSP Advisor to Chairman and will be assisted by such number of DIG rank officers posted in the Regional Offices of NHAI in each state. The Chief Road Safety Officer will head the effective unit of the NHRSP. The area of operation and the work force of each of these operational units will depend on the length of the highways and their sensitivity analysis on various parameters. The organizational set-up shall be as follows:

Figure 53. NHRSP Organogram



8.2.2. Regional Offices

Establishment of NHRSP Regional Offices, headed by the Chief Road Safety Officers, at each of the NHAI's Regional Offices across the country. As on 01.03.2019, the total length of NHs in India is **1,32,500 Kms**. However, it is to be noted that the NHAI manages about 40%, NHIDCL manages about 10% and MoRTH thru the State Agencies manages the rest of National Highways across the country. As the NHAI encompasses the

nation and has its regional offices covering all the States/ UTs, the proposed NHRSP is ideally suited to be located in the NHAI's structure.

8.2.3. Manpower

The following manpower is proposed within the area of responsibility of one Chief Road Safety Officer. This is proposed based on their duties and responsibilities and the area of responsibilities:

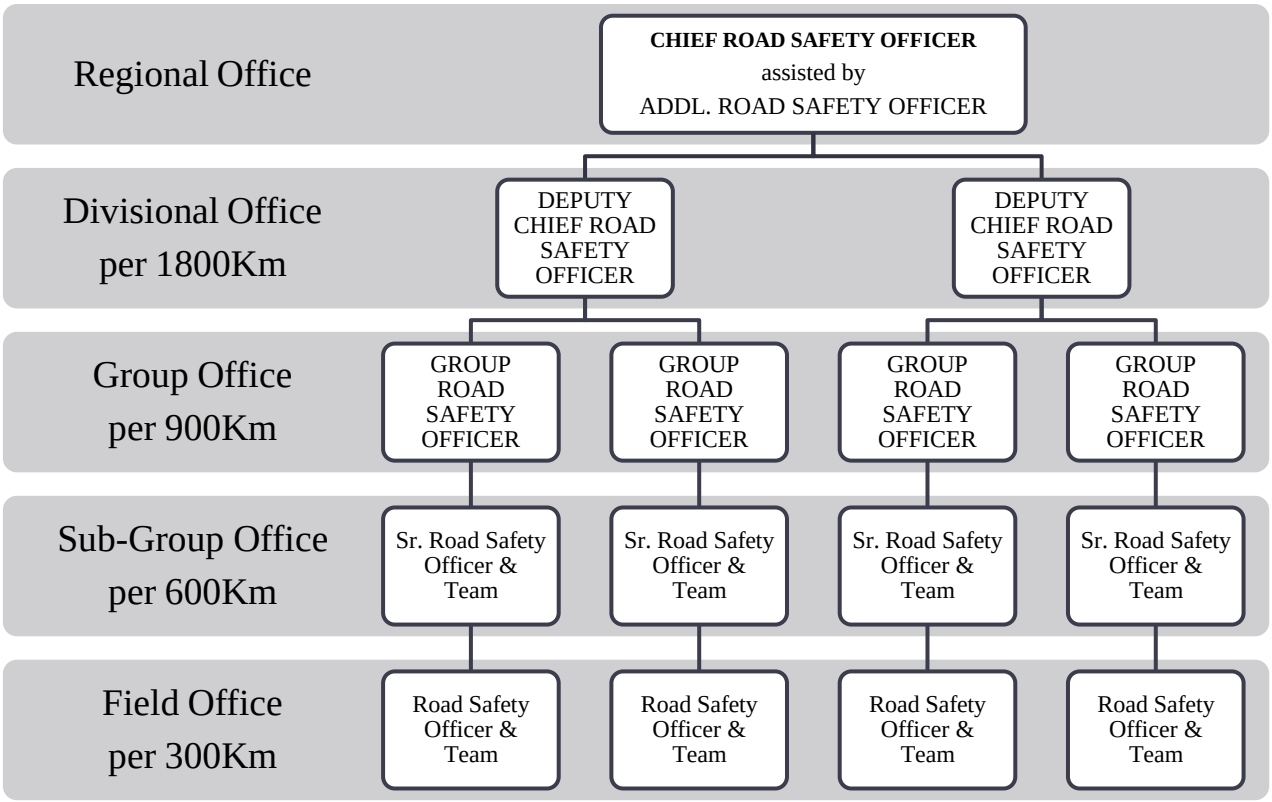
Table 33. NHRSP Manpower Rationale (Typical Unit)

S. No.	Position	Area of responsibility	Team Composition with Support Staff
1.	Chief Road Safety Officer	1 Per RO	• **Regional Office** o Chief Road Safety Officer – Assisted by Addl. Chief Road Safety Officer o 2-Sr. Road Safety Officers, 6-Road Safety Officers, 8-Constables, 5-DEOs and 6-Drivers
2.	Dy. Chief Road Safety Officer	1 Per Every 1800Km	• **Divisional Office** o Dy. Chief Road Safety Officer – Assisted by One Group Road Safety Officer o 3-Road Safety Officers, 3-Constables, 3-DEOs and 3-Drivers
3.	Group Road Safety Officer	1 Per Every 900Km	• **Group Office** o Group Road Safety Officer o 2-Road Safety Officers, 2-Constables, 2-DEOs and 2-Drivers
4.	Sr. Road Safety Officer & Team	1 Per Every 600Km	• **Sub-Group Office** o Sr. Road Safety Officer o 2-Road Safety Officers, 1-Constable, 1-Paramedic, 1-DEO and 2-Drivers
5.	Road Safety Officer Team	2 Per Every 300Km	• **Field Office** o 2-Head Road Safety Officer (Office Supervisor) o 14-Road Safety Officers, 6-Constables, 3-Paramedics, 1-DEO and 6-Drivers o 1-Patrolling Team o 1-Interceptor Team (without paramedic)

The area of responsibility and the availability of manpower and equipment in each "operational unit" shall be decided by also keeping in view the Population density, Traffic density, Accident analysis, Geographical conditions, Road Safety Issues, Traffic Lanes, Availability of other safety infrastructure, State and District boundaries etc.

The present categorization is based on the total length of national highways under respective NHAI Regional Offices. Based on the above data and the area of responsibility of each unit in respective regional offices are worked out. The other parameters of criticality analysis can be dovetailed into the system later and suitable re-categorization/ re-organization can be undertaken. A typical set-up of NHRSP Regional Office is presented below:

Figure 54. NHRSP RO Structure – Typical



Further the States and UTs are categorized as under:

A. Field Offices are proposed for every 150Km, if **Accident Density ≥ 1.90 and Severity > 60**, States/ UTs in this Category are:

State/ UT	NHRSP Regional Offices	NH Length	Accident Density	Severity
Bihar	Patna	5,358	0.65	**61**
Jharkhand	Ranchi	3,367	0.53	**62**
Karnataka	Bengaluru	7,335	**1.90**	28
Kerala	Thiruvanthapuram	1,782	**5.14**	14
Uttarakhand	Dehradun	2,949	0.27	**65**
Tamil Nadu & Puducherry	Chennai	6,769	**3.27**	27
Haryana, Punjab & Chandigarh	Chandigarh	6,455	0.89	**60**

B. Field Offices are proposed for every 200Km, if **Severity ≥ 40**, States/ UTs in this Category are:

State/ UT	NHRSP Regional Offices	NH Length	Severity
Gujarat	Gandhinagar	6,635	46
Odisha	Bhubaneswar	5,762	43
Rajasthan	Jaipur	10,342	56
Uttar Pradesh	Lucknow	11,737	55
West Bengal	Kolkata	3,664	50
Arunachal Pradesh, Assam & Meghalaya	Guwahati	7,602	40

C. For the rest of the States/ UTs, the NHRSP Field Offices are proposed for every 300Km

Table 34. Proposed NHRSP Set-up

S. No.	State/ UT	NHRSP ROs	NH Length[(1)] (Km)	No. of Accidents[(2)]	Accident Density[(3)]	No of Deaths[(4)]	Severity[(5)]	RO	DO	GO	SGO	FO[(6)]
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*K*	*L*	*M*
1	Andhra Pradesh	Vijayawada	6,913	8,498	1.23	3,027	36	1	4	8	12	24
2	Bihar	Patna	5,358	3,489	0.65	2,142	61	1	3	6	9	36
3	Chhattisgarh	Raipur	3,606	3,783	1.05	1,163	31	1	3	5	7	13
4	Delhi	Ro Delhi	157	838	5.34	255	31	-	-	1	1	1
5	Gujarat	Gandhinagar	6,635	4,721	0.71	2,143	46	1	4	8	12	34
6	Himachal Pradesh	Shimla	2,607	1,347	0.52	441	33	1	2	3	5	9
7	Jammu & Kashmir	Jammu	2,423	2,064	0.85	405	20	1	2	3	5	9
8	Jharkhand	Ranchi	3,367	1,785	0.53	1,117	62	1	2	4	6	23
9	Karnataka	Bengaluru	7,335	13,921	1.90	3,955	28	1	5	9	13	49
10	Kerala	Thiruvanthapuram	1,782	9,163	5.14	1,300	14	1	1	2	3	12
11	Madhya Pradesh	Bhopal	8,772	11,643	1.33	2,442	21	1	5	10	15	30
12	Odisha	Bhubaneswar	5,762	4,265	0.74	1,843	43	1	4	7	10	29
13	Rajasthan	Jaipur	10,342	6,808	0.66	3,778	56	1	6	12	18	52
14	Telangana	Hyderabad	3,795	5,743	1.51	2,031	36	1	3	5	7	13
15	Uttar Pradesh	Lucknow	11,737	13,093	1.12	7,254	55	1	7	14	20	59
16	Uttarakhand	Dehradun	2,949	787	0.27	508	65	1	2	4	5	20
17	West Bengal	Kolkata	3,664	4,452	1.22	2,209	50	1	3	5	7	19
18	Goa & Maharashtra	Mumbai	18,050	11,902	0.66	3,841	32	1	11	21	31	61
19	Tamil Nadu & Puducherry	Chennai	6,769	22,102	3.27	5,932	27	1	4	8	12	46
20	Haryana, Punjab & Chandigarh	Chandigarh	6,455	5,774	0.89	3,447	60	1	4	8	11	44
21	Arunachal Pradesh, Assam & Meghalaya	Guwahati	7,602	3,849	0.51	1,545	40	1	5	9	13	39
22	Manipur, Mizoram & Nagaland	Imphal	4,721	574	0.12	145	25	1	3	6	8	16
23	Sikkim	-	463	99	0.21	35	36	-	-	1	2	4
24	Tripura	Agartala	854	221	0.26	66	30	1	1	1	2	4
25	A & N Islands	-	331	79	0.24	6	8	-	-	-	1	2
26	Dadra & Nagar Haveli	-	31	-	-	-	-	-	-	-	1	1
27	Daman & Diu	-	22	4	0.18	3	35	-	-	-	1	1
28	Lakshadweep	-	-	-	-	-	-	-	-	-	-	1
			1,32,502 Total Length of NHs	**1,40,999** Avg. no. of Accidents	**1.06** Avg. Accident Density	**51,027** Avg. no. of Deaths	**36.5** Severity National on NHs	**22**	**84**	**160**	**237**	**651**
								No. of NHRSP Office Units				

Notes:

(1) State/ UT wise National Highway Lengths as on 01.03.2019, are considered. Based on lengths smaller states are grouped under one regional office, for

example the States of Arunachal Pradesh, Assam & Meghalaya are grouped and a RO is proposed at Guwahati.

(2) Average of Number of Accidents on NHs during the years 2014, 2015, 2016 & 2017 are presented in this table.

(3) Accident Density = Number of Accidents/ Length of NHs under respective RO

(4) Average of Number of Fatalities on NHs during the years 2014, 2015, 2016 & 2017 are presented in this table.

(5) Severity = Number of Fatalities/ 100 Accidents on NHs during the years 2014, 2015, 2016 & 2017 are presented in this table.

(6) ROs-Regional Office, DO-Divisional Office, GO-Group Office, SGO-Sub Group Office and FO-Field Office

8.2.4. Duties and Responsibilities

8.2.4.1. Field Office Team

Each Field Office Team, headed by Head RSP (Inspector Rank Officer), has an area of operation of 300km or 200km or 150km. Each field teams will be headed by RSOs (SI Rank Officers) provided with one patrolling team and one team for interceptors. One paramedic staff will assist the RSO team in the patrol vehicles.

Teams & Shifts:

- Patrolling Team:
  - Field Day Shift 1: RSO-1, Constable-1, Paramedic-1 and Driver-1
  - Field Day Shift 2: RSO-1, Constable-1, Paramedic-1 and Driver-1
  - Field Night Shift 1: RSO-2, Constable-1, Paramedic-1 and Driver-1
- Interceptor Team:
  - Field Day Shift 1: RSO-1, Constable-1 and Driver-1
  - Field Day Shift 2: RSO-1, Constable-1 and Driver-1
  - Field Night Shift 1: RSO-2, Constable-1 and Driver-1
- Office: Head RSO-2, RSO-3, and DEO-1

Some of the duties of the Team are:

- Liaison with State Police – Local SHO
- Reporting and providing first aid to road crash victims
- Enforcement against over speeding, overloading, drunken driving, contra-flow movement, helmet and seat belts etc.
- Enforcement against unauthorized access to highways and all types of encroachments.
- Assistance to the concessionaire/ toll tax operator in case of emergency response.
- Ensuring the availability of local police constable as liaison officer with each Road Safety Officer Team.
- Accident site management (traffic diversion and control etc.) and clearance of accident debris.
- Accident data collection
- Education and awareness drive for road users.

8.2.4.2. Sub-Group Office Team

- Headed by Sr. RSO (Dy. SP Rank Officer) with area of operation of 600km of National Highways.
- Liaison with State Police – Local SDOP/SHO
- Reporting and providing first aid to road crash victims
- Supervise three Road Safety Officer Teams
- Provide backup and assistance in case of accidents and maintain liaison with the local police and other authorities for attending to accidents immediately.
- Maintain database of workshops, mechanics, doctors, clinics, revenue authorities, Police for immediate response.
- Ensuring the availability of local police constable as liaison officer with each Road Safety Officer Team.
- Sub-Group Office Team Consists of: **Sr. RSO-1, RSO-2, Constable-1, Paramedic-1, DEO-1 and Driver-2**

8.2.4.3. Group Office

- Each Group Office will be headed by Group RSO (Addl. SP Rank Officer) with area of operation of 900km of National Highways.
- Liaison with State Police – Local SP/ SDOP
- Review and follow – up of road crash cases to the emergency response system, and reporting of the response to the senior management in the reporting channel.
- Ensuring adequate manpower, infrastructure of the Senior Road Safety Officer and Road Safety Officer Teams
- Capture all accident related data (especially fatalities and injuries), ensure first – level analysis and forward the data to Dy. Chief Road Safety Officer Office.
- Maintain regular liaison with local police
- Maintain database
- Provide leave replacement, equipment, tow trucks recovery vans/mobiles etc. to the SMCs and HMTs
- Ensuring public interface and citizen feedback on the performance and service standards of the NHRSP
- Ensuring the availability of local police constable as liaison officer with each Road Safety Officer Team.
- Collect road crash data and other related data from other organisations such as Police, Municipal Corporations and Hospitals and their areas of jurisdiction for comprehensive analysis of road accidents.
- Group Office Team Consists of: **Group RSO-1, RSO-2, Constable-2, DEO-2 and Driver-2**

8.2.4.4. Divisional Office

- Each Divisional Office will be headed by Dy. Chief RSO (SP Rank Officer) with area of operation of 1800km of National Highways.
- Liaison with State Police – Local DIG/SP.

- Review and follow – up of road crash cases to the emergency response system, and reporting of the response to the senior management in the reporting channel.
- Visit all large-scale accident sites and provide emergency support.
- Analyze all accident related data (especially fatalities and injuries) and forward the data to Chief Road Safety Officer Office.
- Ensure collection of all enforcement related data for performance and policy analysis.
- Assisting the Chief Road Safety Officer in overall administrative function of the NHRSP within his Area of responsibility
- Ensuring public interface and citizen feedback on the performance and service standards of the NHRSP.
- Ensuring the availability of local police constable as liaison officer with each Road Safety Officer Team.
- Collect road crash data and other related data from other organisations such as Police, Municipal Corporations and Hospitals and their areas of jurisdiction for comprehensive analysis of road accidents.
- Divisional Office Team Consists of: **Dy. Chief RSO-1, Group RSO-1, RSO-3, Constable-3, DEO-3 and Driver-3**

8.2.4.5. Regional Office

- Each RO will be headed by the Chief Road Safety Officer (IG Rank Officer).
- Overall superintendence, command and control of all policy, administrative, emergency, training, recruitment and other needs of the NHRSP in a jurisdiction of the Regional Office.
- Liaison with State Police – Local IG/DIG
- Review and follow – up of road crash cases to the emergency response system, and reporting of the response to the senior management in the reporting channel.
- Chief RSO will be assisted by Addl. Chief Road Safety Officer.
- The Addl. Chief Road Safety Officer will analyze all accident related data (especially fatalities and injuries) with the help of a technical team and through analysis software prepared by NHAI at national level.
- Ensure collection of all enforcement related data for performance and policy analysis
- All the units from Road Safety Officer Teams and up to Chief Road Safety Officer Office shall be provided adequate manpower, equipment, vehicles etc., as per their needs, duties and responsibilities.
- Ensure that police officers are deputed with Senior Road Safety Officer, Group Road Safety Officer and Deputy Chief Road Safety Officer for continuous liaison, especially in the matters related to enforcement, law & order management and immediate response to accidents.
- Ensuring public interface and citizen feedback on the performance and service standards of the NHRSP
- Regional Office Team Consists of: **Chief RSO-1, Addl. Chief RSO-1, Sr. RSO-2, RSO-6, Constable-8, DEO-5 and Driver-6**

8.2.4.6. NHRSP Headquarter

- Headed by DG/ADG Rank officer and to be designated as "Member-Enforcement/ NHRSP Advisor to NHAI-Chairman"
- Liaison with State Police – State DGP, ADG (L & O), ADG (Traffic)
- Coordination with the Regional Officer of the NHAI/ MoRTH within the State.
- Overall superintendence, command and control of all policy, administrative, emergency response, training, recruitment and other functions of the NHRSP in a jurisdiction of entire State irrespective of the road length.
- Supervision of all Chief Road Safety Officers within that specific State.
- Provide regular status reports to NHAI Chairman
- Visit the accident spot and ensure submission of reports of any serious road accident or such accidents or incidents assigned to it by the Government, within a period of 15 days.
- Ensuring public interface and citizen feedback on the performance and service standards of the NHRSP
- NHRSP Advisor to NHAI Chairman
- Liaison with Ministry of Home Affairs and DGPs of all States
- Assisting the NHAI Chairman with all policy issues of NHRSP
- Liaison with all concerned Ministries of Government of India
- Overall administration, supervision and monitoring of NHRSP.
- Provide regular status reports to NHAI Chairman
- Member Secretary of the NHRSP Advisory Committee; convene at least two meetings in a year; regular re-constitution of the Committee
- Conducting annual audit related to NHRSP performance, road safety, incident response
- HQ Team consists of: **Chief RSO-1, Addl. Chief RSO-1, Sr. RSO-2, RSO-6, Constable-8, DEO-5 and Driver-6**

8.2.5. Project Management and Implementation Unit (PMIU)

Project Management and Implementation Unit is a technical project management unit that serves as the technical secretariat for the team for coordination, facilitation, monitoring and to provide guidance to all regional offices, divisional offices, group & sub-group offices, and field offices in all aspects of the project implementation. PMIU should be part of the NHRSP Headquarters headed by DG/ADG rank officer. PMIU should comprise qualified professionals experienced in various spheres, coordinates with relevant procurement officials and cooperates with the Transaction Advisor, as well as with the other advisors and consists of the domain experts, project management practitioners, and subject experts. PMIU reports directly to Member Enforcement/ NHRSP advisor to NHAI chairman and is tasked to implement daily tasks and manage and oversee the project development through regional offices.

8.2.6. NHRSP Advisory Committee

There shall be an Advisory Council of the NHRSP for overall review of the policy and administrative framework of NHRSP.

- The NHRSP Advisory Committee will meet at least once in six months.
- Overall review of the policy and administrative framework of NHRSP and suggest modifications.
- Review of the annual audits related to NHRSP performance, road safety, incident response.
- Form subject expert groups to evolve new parameters and indicators for improved performance of NHRSP – Technology & Equipment, Data Management Systems, Blackspot Analysis Engineering, Road Safety, Education, Emergency Response, Disaster Management, Manpower Issues.

The NHRSP Advisory Committee's composition will be as follows –

1. NHAI Chairman - Chairperson
2. Advisor to NHAI Chairman – Member Secretary
3. ADG, BPR&D
4. Jt. Secretary, MHA
5. Jt. Secretary, MoRTH
6. Jt. Secretary, Ministry of Health
7. DGPs of 04 States (on rotation basis; to be changed every year)
8. Director, CRRI
9. DG, NDRF
10. Experts on subjects such as Road Engineering, Security, Incident Management, Traffic Education etc.
    (Subject to revision as and when necessary)
11. Three Non – Government Organizations
    (Subject to revision as and when necessary)
12. Any other Member(s) as deemed necessary

BOX 16: Road Safety Scenario in Tamil Nadu – A Case Study

A midterm project review meeting on National Road Safety Plan has been held at BPR&D Hqrs on July 12, 2019 to review the project progress. During the meeting, the participants of the meeting felt that it is necessary to gain experiences from the Tamil Nadu Model of Road Safety in reducing considerable number of road accident fatalities. In this connection, project research team along with the project nodal officer has visited Tamil Nadu on August 2, 2019 at the office of IG(P), Traffic and Road Safety, Chennai to study the Tamil Nadu Model of Road Safety. The following are some of the major observation made.

- It has observed that in Tamil Nadu state, a State Traffic & Planning Cell has created on 17.03.2005 through G.O.Ms.No.2016; basic aim of forming this cell is to focus on reducing the road accidents and resultant deaths and disabilities as top priority. For this, the State Traffic & Planning Cell started functioning with an officer in the rank of Additional Director General of Police as the head. The following are some of the functions of the cell;
    - Collect, compile, collate and analyse details of road accidents on National highways, State highways and District major roads.
    - Plan road safety measures
    - Coordinate with other government agencies and NGOs.
    - Purchase the road safety materials and distributed to the district.
    - To evolve plans and send proposals to the governments on

BOX 16: Road Safety Scenario in Tamil Nadu – A Case Study

        - Traffic Enforcement, Traffic Engineering, Traffic Education and Traffic Environment
    - Monitoring the functioning of Highway Patrol Teams and its role in prevention of accidents and post accidents scenario
    - Liaison with revenue, highways, institute of road transport and transport research cell in IIT etc and with other stakeholders.
- the Government's key interventions/ actions with respect to the evolution of TRSC in its present composition are as follow:
    - the State's daily monitoring and evaluation framework (Dashboard) for fatal accidents and enforcement actions
    - the functions of the State's Road Accident Data Management System (RADMS), which was launched with the assistance from the World Bank, which helped the State's data driven and scientific endeavour in reduction of road accident fatalities
    - the launch of Highway Patrol program on the State's Road Network and the steps taken by the Government in enhancing the effectiveness of Highway Patrol System
    - the coordinated efforts of stake holder departments, viz, Police, Transport, Highways, Medical and Education departments
    - the Standard Operating Procedures followed at the district level in the event of fatal road accidents and role of the Interdepartmental teams in case of fatal accidents causing multiple fatalities.
- The following table explains the accident and fatality figures for the past three years, From the table it is observed that the percentage reduction in total no. of accidents in 2018 over 2017 is about **2.5%** and percentage reduction in total no. of persons killed in road accidents in 2018 over 2017 is about **24.4%**

Comparison of number of accidents and Fatalities over past three years

Sl. No.	Particulars	2016	2017	2018	2019 up to June
1.	Total No. of accidents	71431	65562	63920	29991
2.	Total No. of fatal deaths	17218	16157	12216	5633
3.	Total No. of Grievous injuries	8421	6588	5999	2573
4.	Total No. of Minor injuries	73742	67984	68538	32677
5.	No. of Accidents per day	196	180	175	166
6.	No. of Accidental deaths per day	47	44	33	31

- The Tamil Nadu state has introduced 272 numbers of highway patrol vehicles, fitted with GPS and equipped with enforcement equipment like Speed Radar Guns, Breath Analysers, Reflector Jackets and batons utilised in preventing traffic accidents. The following are the some of the duties/ tasks of the highway patrol teams;

    - Removing parked vehicles on roadsides;
    - Imposition of traffic calming measures beside regulating traffic on highways
    - In case of accidents and during emergency, the injured accident victims are carried to the nearest hospital/ medical centres in compliance with the golden hour principle. The following are some of the results pertaining to this;

BOX 16: Road Safety Scenario in Tamil Nadu – A Case Study

Year	No. of accident victims carried to Hospitals	No. of accident victims survived during Golden Hour	% of accident victims survived
2015	20535	13325	35.1%
2016	25307	18522	26.8%
2017	26781	15757	41.2%
2018	21507	15327	28.7%
2019 up to May	7116	4398	38.2%

- For collecting the reliable accident data and for utilizing the data in research and analysis, RADMS (Road Accident Database Management System) software has been developed with World Bank fund in 2009. Police, Transport and Highways being the key stakeholder departments, have to record the road accident data comprehensively in Tamil Nadu.
- Reliable and scientific data collected using RADMS is used to
  - Study of accident-prone road stretches on National highways authorities/ state highways to correct the engineering defects rose during construction.
  - Use of RADMS data by the health department in locating the ambulance service to reduce the response time and alerting the hospitals regarding the arrival of accident victims
  - Transport department used this data for cross checking the defaulters while registering and renewing the licences of the vehicles and the drivers.
- In addition to the above, under National Health Mission, Tamil Nadu Accident and Emergency care Initiative (TAEI) has been evolved to establish process to streamline emergency and trauma care delivery
- Road Safety Awareness Initiatives;
  - in the year 2018 about 5.45 lakh awareness campaigns were held across the State in schools, colleges, villages etc.,
  - establishment of Road Safety Corners at Police Stations and Two Wheeler Showrooms
  - establishment of Road Safety Parks at Schools
  - production of short films and spreading awareness via FM Radio
- Improvements and Future Goals;
  - Use of application TARA (Transportation Accident Reporting Application) for real time accident data collection
  - Use of advances technologies such as ITS, e-Challan through Smart-PoS integrated with VAAHAN database for enforcement, ANPR Cameras, Vehicle Tracking Devices etc
  - iRAD (Integrated Road Accident Database)
- Traffic and road safety cell Chennai, monitoring the road accidents, fatalities and performance of the system on daily basis with the help of daily monitoring systems, status reports and dashboard and further enhance the system.

BOX 16: Road Safety Scenario in Tamil Nadu – A Case Study

Summary

After the review of the Tamil Nadu model for road safety, the overall efforts of all concerned stakeholder departments in the state of Tamil Nadu in reducing number of road accidents and fatalities are immense. The success story of Tamil Nadu is a combination of multi stakeholder interventions and multi disciplinary factors. However, the following observed has made to enhance the system further the following suggestions may be considered to complete the system.

- After perusing daily accident data and enforcement dashboard, it is suggested that, data related to tracking of medical treatment of the victims will further improve the system. In addition, mapping of hospitals, trauma care facilities, blood banks (along with supply status) and ambulances are also essential.
- It is suggested to enhance the daily accident reporting system along with the information related to insurance, compensation and other related aspects may be included. Use of Artificial Intelligence algorithms, to track the cases, compensations and action taken reports can further improve the system.

8.3. Recruitment Training & Branding

8.3.1. Recruitment

1. The NHRSP Staff are expected to take on the Highway Traffic Safety related duties on the National Highways.
2. NHRSP is a separate organization and a cadre by itself.
3. During the initial establishment of the NHRSP;
   (i) A Senior IPS Officer of DG/ADG Rank on deputation be designated as "Member-Enforcement/ NHRSP Advisor to NHAI-Chairman"
   (ii) For the posts of IG/ DIG ranked NHRSP officers, the staffing ratio can be as follows;
      - 25% on deputation from IPS
      - 25% on deputation from CPF
      - rest 50% directly under the NHRSP Cadre

   (iii) For the posts of SP/ Addl. SP/ Dy. SP ranked NHRSP officers, the staffing ratio can be as follows;
      - $1/3^{rd}$ on deputation from CISF
      - rest directly under the NHRSP Cadre

   (iv) For the posts of Inspector/ Sub-Inspector ranked NHRSP officers, the staffing can be directly under the NHRSP Cadre
4. There will be three levels of induction into the cadre by direct recruitment;
   (i) for post of Sr. Road Safety Officer of Dy. SP Rank
   (ii) for post of Head Road Safety Officer of Inspector Rank
   (iii) for post of Data Entry Officer/ Operator of appropriate Rank
5. During the initial establishment of the NHRSP, until all the officers are recruited, trained and deployed, Police Officers from respective States can be taken on deputation for a suitable period.
6. Salary Structure can be similar to that of the officers of CRPF/ CISF

8.3.2. Training

For establishing NHRSP with well trained officers:

1. Training Centers:
   (i) Separate and dedicated training academies are to be established; initially one at the National Level and subsequently region wise centers may be established. NHRSP to train its personnel in these academies.
   (ii) National Police Academy to provide learning and development center dedicated to Road Safety and effective enforcement on the roads.
   (iii) State Police Academies to fund and provide learning and development centers dedicated to Road Safety and effective enforcement on the roads.
2. The Road Safety Officers and Senior Road Safety Officers who are on deputation from other agencies will undergo a basic course at the designated police training institutions to prepare them for duties and responsibilities of Road Safety Officers.
3. Every Officer of the NHRSP shall be required to undergo at least one in-service/ refresher/ specialized course on ever changing enforcement techniques, Highway Safety Issues and best practices every year.
4. Imparting Training to all RSOs covering on following:
   (i) Inculcating the importance of road safety considering Indian traffic scenario
   (ii) Implement good road safety practices
   (iii) Conduct periodical road safety awareness programs
   (iv) Collection and analysis of road crash data
5. The training modules for NHRSP staff for enforcement issues will be designed with appropriate SOPs.
6. To facilitate public acceptance and success of NHRSP appropriate media publicity will be made.

8.3.3. Uniform & Logo

Uniform accoutrements & logo suitable to climate may be designed by hiring the services of professional experts in the field like NIFT or other private agencies by appropriate established measures. The uniform would include:

(a) Trousers
(b) Shirts
(c) Winter clothing (as per requirement)
(d) Headgear
(e) Shoe
(f) Belt with provisions for equipment such as wireless sets
(g) Reflective jacket

The following are some of the pictures, illustrating the uniform used by the patrolling police in other countries;


Source: bordermail.com.au


Source: abc.net.au

Source: fullboost.com.au

While designing the dress code for National Highway Road Safety Police, It is recommended to consider the climatic conditions of India and the clothing material should be suitable to suit various climatic conditions for the country for the comfort of the staff. Further, different uniform should be there for to accommodate winter, summer and rainy seasons. In addition, standard reflective jackets written as "National Highway Road Safety Police" on it for easy identification and for better reflectivity during night. Logo, dress code and other peripherals should be same and uniform throughout the country.

8.4. Technology & Equipment

8.4.1. Enforcement Equipment

Road Safety Officer Team shall be required to be provided with the following facilities to perform their functions flawlessly on round-the-clock basis.

(a) Handheld Device for E-challan, Accident Data Capture
(b) Wheel Locks
(c) Breathe Analyzers
(d) Dragon Lights
(e) Interlocking Plastic Barricades
(f) Rechargeable Batons
(g) Traffic Cones
(h) Body Worn Cameras
(i) Hydraulic Combi Tool Cutter
(j) Interceptors

Pictorial Illustration of Enforcement Equipment

Handheld Device for E-challan

Wheel Lock


Breath Analyzers

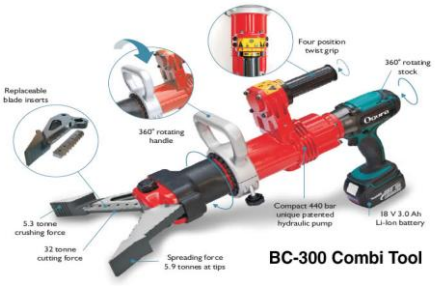
Dragon Lights

Interlocking Plastic Barricades

Rechargeable Batons

Traffic Cones

Body Worn Cameras



Hydraulic Combi Tool Cutter

Speed Guns

Reflective Jackets

Interceptor

Highway Patrol Vehicle

Air Ambulances

Source: https://dharmakshethra.com

Source: Representative image of an air ambulance (@FlyingDoctorsNG/Twitter)

8.4.2. Technology

The NHRSP manpower, coupled with advanced Intelligent Transportation Systems (ITS) will enhance enforcement of traffic laws on the National Highways. The proposed integrated ITS technologies are designed such that, a typical 100km section of a National Highway will have:

- ✓ Two – Variable Message Display (VMD) Systems with Speed Detection & Display
- ✓ Four – Surveillance Camera (CCTV) Systems
- ✓ Two – Automatic Video Incident Detection Systems (AVIDS)
- ✓ Two – Automatic Speed Enforcement Systems (ASES)

8.4.3. Integration with Existing Infra

As per the Standard Contract Agreements (PPP/EPC/BOT/HAM) the NHAI mandates the Contractors/ Concessionaires or the O&M Contractors to establish Incident Management Teams which will have the following facilities already in their system, which will be suitably integrated to the NHRSP system.

(a) Smart Surveillance Vehicle (SUV)
(b) CCTV Camera Network
(c) Central Control Room (Corridor)
(d) Communication Network
(e) Communication through VMS
(f) Ambulance equipped with paramedics and medical facilities
(g) Recovery Van (Crane)

8.4.4. Command Centre

The existing command and control system of NHAI, proposed command and control system of NHRSP and existing medical response systems in States need to be in line with each other with lateral levels of exchange and authentication. NHAI regional control centre being developed as part of a modern Incident Management System should be available for NHRSP in the longer run as unified command and control centre.

8.4.5. Control Room and Highway Posts

Operational control rooms will be set up at the level of Group Road Safety Officer and Dy. Chief Road Safety Officer for collection of data on road related data from NHAI as well as other organizations such as Police, Civic Bodies and Hospitals.

Control rooms will also function to give directions to the field formations in day to day operations and immediate response to emergencies.

Operational control would be ensured by connecting all levels of hierarchy. Operational control is understood by process of detection, reporting, sharing and coordination. The communication would be two way over radio in the first phase. In the second phase option of video feed can be implemented. For monitoring purposes GPS enabled system for tracking of vehicles in the field

NHAI is developing regional control center at the state level which will be on both video and radio feed based. NHRSP can take advantage of this system as and when implemented. Therefore to start with VHF/UHF Radio communication system can be established in the NHRSP network. The radio system requires

(a) Static and hand held radio sets (All ranks)
(b) Antennae and other ancillary equipment for support staff
(c) Hand held VHF/UHF radio sets for Road Safety Officer on duty

To supervise the control rooms for collection of all accident and enforcement related data from NHAI as well as other organizations such as Police, Civic Bodies and Hospitals.

8.5. Tentative Budget for NHRSP

8.5.1. Units

Table 35. Office Set-up

S. No.	Office Set-up	No. of Units	Remarks
1.	Headquarters	1	New Delhi
2.	Regional Office	22	State level offices
3.	Divisional Office	84	1 per every 1800 Km^{T}
4.	Group Office	160	1 per every 900 Km
5.	Sub-Group Office	234	1 per every 600 Km
6.	Field Office	651	1 per every 300 Km

T - Typically

8.5.2. Fixed Costs – Office Establishment, Vehicles & Equipment

Table 36. Details of Equipment per Patrol Vehicle

S. No.	Infrastructure	No. of Equipment per Unit	Rate per Unit	Cost
1.	Handheld Device for E-challan, Accident Data Capture etc	3	30,000	90,000
2.	Wheel Locks	10	2,500	25,000
3.	Breath Analyzers	3	40,000	1,20,000
4.	Dragon Lights	4	5,000	20,000
5.	Interlocking Plastic Barricades	15	10,000	1,50,000
6.	Rechargeable Batons	40	1,000	40,000
7.	Traffic Cones	50	1,000	50,000
8.	Body Worn Cameras	3	35,000	1,05,000
9.	Hydraulic Combi Tool Cutter	1	6,50,000	6,50,000
	Total			**12,50,000**

Table 37. Details of Equipment per Interceptor Vehicle

S. No.	Infrastructure	No. of Equipment per Unit	Rate per Unit	Cost
1.	Handheld Device for E-challan, Accident Data Capture etc	3	30,000	90,000
2.	Breath Analyzers	4	40,000	1,60,000
3.	Dragon Lights	4	5,000	20,000
4.	Interlocking Plastic Barricades	15	10,000	1,50,000
5.	Rechargeable Batons	40	1,000	40,000
6.	Traffic Cones	35	1,000	35,000
7.	Body Worn Cameras	3	35,000	1,05,000
8.	Laser Gun	1	9,00,000	9,00,000
	Total			**15,00,000**

Table 38. Fixed Costs - Office Establishment, Vehicles & Equipment

Office Set-up	No. of Units	Office Establishment
Headquarters	1	25,00,000
Regional Office	22	20,00,000
Divisional Office	84	15,00,000
Group Office	160	10,00,000
Sub-Group Office	237	7,00,000
Field Office	651	5,00,000
	Subtotal (A)	**82,00,000**

Office Set-up	Cost of Patrol Vehicles				Cost of Interceptor Vehicles		
	No. of Vehicles	Cost of Vehicles[(1)]	Enforcement Equipment[(2)]	Essential Medical Equipment and consumables[(3)]	No. of Vehicles	Cost of Vehicles[(4)]	Enforcement Equipment[(5)]
Headquarters	12	2,40,00,000	1,50,00,000	12,00,000	-	-	-
Regional Office	44	8,80,00,000	5,50,00,000	44,00,000	-	-	-
Divisional Office	126	25,20,00,000	15,75,00,000	1,26,00,000	-	-	-
Group Office	240	48,00,00,000	30,00,00,000	2,40,00,000	-	-	-
Sub-Group Office	261	52,20,00,000	32,62,50,000	2,61,00,000	237	47,40,00,000	35,55,00,000
Field Office	782	1,56,40,00,000	97,75,00,000	7,82,00,000	651	1,30,20,00,000	97,65,00,000
	1465	**2,93,00,00,000**	**1,83,12,50,000**	**14,65,00,000**	**888**	**1,77,60,00,000**	**1,33,20,00,000**
		Subtotal (B)	**Subtotal (C)**	**Subtotal (D)**		**Subtotal (E)**	**Subtotal (F)**

Office Set-up	Total Capital Cost
Headquarters	4,27,00,000
Regional Office	14,94,00,000
Divisional Office	42,36,00,000
Group Office	80,50,00,000
Sub-Group Office	1,70,45,50,000
Field Office	4,89,87,00,000
Total (A+B+C+D+E+F)	**8,02,39,50,000**
Total in Crores	**802.39**

NOTES

(1) Cost of Patrol Vehicles including Internal Fittings & Branding @ 20 Lakh per unit
(2) Enforcement Equipment @ 12.5 Lakh per Patrol Vehicles
(3) Cost of Essential Medical Equipment and consumables @ 1 Lakh Per Patrol Vehicle
(4) Cost of Interceptor Vehicles including Internal Fittings & Branding @ 20 Lakh per unit
(5) Enforcement Equipment @ 15 Lakh per Interceptor Vehicles

Table 39. Fixed Costs - ITS Component

S. No.	ITS Component	No. of Units	Unit Rate	Cost (in Cr.)	Remarks
1.	VMD Systems-OFC Based (Fixed)	2,652	14,00,000	371.28	Two Systems per 100km covering both traffic directions
2.	VMD Systems-Mobile/Portable	531	9,10,000	48.32	One Portable systems per 250km
3.	CCTV Systems-OFC Based	5,304	5,00,000	265.20	Four Systems per 100km at Major Junctions/ Sensitive Locations etc

S. No.	ITS Component	No. of Units	Unit Rate	Cost (in Cr.)	Remarks
4.	Automatic Video Incident Detection System (AVIDS)	2,652	6,25,000	165.75	Two Systems per 100km covering both traffic directions
5.	Automatic Speed Enforcement System	2,652	25,00,000	663.00	Two Systems per 100km covering both traffic directions
6.	CENTRAL CONTROL ROOM EQUIPMENT	1	1,00,00,000	1.00	Central Control Room at Head Quarters
7.	REGIONAL CONTROL ROOM EQUIPMENT	22	50,00,000	11.00	Control Room at each Regional Office
8.	GROUP CONTROL ROOM EQUIPMENT	160	25,00,000	40.00	Control Room at each Group Offices (i.e. one for 900km)
9.	OFC Cost	LS	40% of the Cap Ex towards ITS Components	626.22	Laying of OFC on about 2% of the NHs
10.	Central Data Center + Equipment + Software etc.	LS	20% of the Cap Ex towards ITS Components	313.11	-
			Total in Cr.	**2504.88**	

Notes:

- Unit rates of various ITS (S. No. 1 to 5) components are arrived based on past experience and cursory market / web based research.
- Unit rates considered for control rooms include:
    - At Central Control: Hardware with supporting infra, Software, Monitoring screens and other requisite equipment
    - At Regional & Group level Controls: Hardware with supporting infra, Software, Monitoring screens and other requisite equipment
- Central Data Center/ Server/ Equipment/ Software costs depend upon type of actual data storage, sharing, streaming, duration, back-up, crash protection and many other requirements. At this conceptual stage such detailed design/ estimation is not taken-up.

8.5.3. Recurring Expenditure

Table 40. NHRSP Manpower

S. No.	Designation	Rank	**Headquarters** (Nationwide Operations)	**Regional Offices** (Statewide Operations)	**Divisional Offices** (1 per 1800Km)	**Group Office** (1 per 900Km)	**Sub-Group Office** (1 per 600Km)	**Field Office** (1 Per 300Km)	**Total No. of Staff**
1.	Member - Enforcement	DG/ ADG	1						1
2.	Chief Road Safety Officer	IG	5	22					27
3.	Addl. Chief Road Safety Officer	DIG	5	22					27
4.	Dy. Chief Road Safety Officer	SP			84				84
5.	Group Road Safety Officer	ADDL. SP			84	160			244
6.	Sr. Road Safety Officer	DY. SP	5	44			237		286
7.	Head Road Safety Officer	INSPECTOR	5					1,302	1,307
8.	Road Safety Officer	SUB-INSPECTOR	10	132	252	320	474	9,114	10,302
9.	Constable	Constable	15	176	252	320	237	3,906	4,906
10.	Paramedic	-					237	1,953	2,190
11.	Data Entry Operators	-	22	110	252	320	237	651	1,592
12.	Driver	-	12	132	252	320	474	3,906	5,096
		Total	**80**	**638**	**1,176**	**1,440**	**1,896**	**20,832**	**26,062**

Table 41. Annual Costs – NHRSP Manpower

S. No.	Designation	Rank	No. of Staff	Salary	Monthly Salary	Annual Salary	Uniform Cost	Uniform Cost per Annum	Annual Cost (Salary + Uniform)
1.	Member - Enforcement	DG/ ADG	1	1,15,000	1,15,000	13,80,000	15,000	15,000	13,95,000
2.	Chief Road Safety Officer	IG	27	95,940	25,90,380	3,10,84,560	15,000	4,05,000	3,14,89,560
3.	Addl. Chief Road Safety Officer	DIG	27	85,410	23,06,070	2,76,72,840	15,000	4,05,000	2,80,77,840
4.	Dy. Chief Road Safety Officer	SP	84	76,050	63,88,200	7,66,58,400	15,000	12,60,000	7,79,18,400
5.	Group Road Safety Officer	ADDL. SP	244	60,840	1,48,44,960	17,81,39,520	15,000	36,60,000	18,17,99,520
6.	Sr. Road Safety Officer	DY. SP	286	30,975	88,58,850	10,63,06,200	12,000	34,32,000	10,97,38,200
7.	Head Road Safety Officer	INSPECTOR	1,307	26,550	3,47,00,850	41,64,10,200	12,000	1,56,84,000	43,20,94,200
8.	Road Safety Officer	SUB-INSPECTOR	10,302	22,125	22,79,31,750	2,73,51,81,000	12,000	12,36,24,000	2,85,88,05,000
9.	Constable	Constable	4,906	20,000	9,81,20,000	1,17,74,40,000	12,000	5,88,72,000	1,23,63,12,000
10.	Paramedic	-	2,190	20,000	4,38,00,000	52,56,00,000	12,000	2,62,80,000	55,18,80,000
11.	Data Entry Operators	-	1,592	18,000	2,86,56,000	34,38,72,000	12,000	1,91,04,000	36,29,76,000
12.	Driver	-	5,096	18,000	9,17,28,000	1,10,07,36,000	12,000	6,11,52,000	1,16,18,88,000
					43,96,56,060	5,27,58,72,720		23,36,37,000	5,50,95,09,720
									550.96 Cr.

Table 42. Recurring Costs - NHRSP Office Admn. + Vehicle + Misc

Office Set-up	No. of Units	Running Unit Rate (Monthly) including contingency	Total Running Cost (Monthly)	No. of Vehicles	Cost of Essential Medical Equipment and consumables @ 1 Lakh Per Patrol Vehicle	Fuel + Maintenance Unit Rate (Monthly)	Fuel + Maintenance Cost (Monthly)	Annual Cost
Headquarters	1	5,00,000	5,00,000	12	12,00,000	1,13,000	13,56,000	3,66,72,000
Regional Office	22	4,25,000	93,50,000	44	44,00,000	1,13,000	49,72,000	22,46,64,000
Divisional Office	84	3,75,000	3,15,00,000	126	1,26,00,000	1,40,000	1,76,40,000	74,08,80,000
Group Office	160	3,00,000	4,80,00,000	240	2,40,00,000	1,67,000	4,00,80,000	1,34,49,60,000
Sub-Group Office	237	2,50,000	5,92,50,000	498	2,61,00,000	1,94,000	9,66,12,000	2,18,35,44,000
Field Office	651	1,75,000	11,39,25,000	1,433	7,82,00,000	1,94,000	27,80,02,000	5,64,15,24,000
			26,25,25,000	**2,353**	14,65,00,000		43,86,62,000	10,17,22,44,000
								1,017.23 Cr.

Table 43. Recurring Costs – Control Room Manpower

S. No.	Office Set-up	Central Control Room	Regional Control Room	Group Control Room	No. of Staff	Salary	Monthly Salary	Annual Salary
1.	Head of IT Operations	1	22	160	183	85,410	1,56,30,030	18,75,60,360
2.	Sr. IT Manager	5	66	320	391	76,050	2,97,35,550	35,68,26,600
3.	IT Manager (Mid Level)	10	132	640	782	60,840	4,75,76,880	57,09,22,560
4.	Computer Operator	20	264	1,280	1,564	22,125	3,46,03,500	41,52,42,000
5.	Operators for Collecting and Collating the ITS Data	40	528	2,560	3,128	20,000	6,25,60,000	75,07,20,000
					6,048		19,01,05,960	2,28,12,71,520
								228.13Cr.

8.5.4. Summary of Costs

Table 44. Summary of Expenditure

S. No.		Description	Amount in Crores
1.	**Cap-Ex.**	Office Establishment, Vehicles & Equipment	802.40
2.		ITS Component	2,504.88
3.	**Op-Ex.**	NHRSP Manpower	550.95
4.		NHRSP Office Admn. + Vehicle + Misc	1,017.22
5.		Control Room Manpower – ITS	228.13
6.		AMC – ITS Component*	150.00
7.		Radio Communication System with AMC	30.00
8.		Public Outreach, Awareness Programs	30.00

i.e.

Capital Cost 3308 Cr.

Recurring Cost Annually 2007 Cr.

* AMC for ITS Components is 5% for 1st year, 10% for 2nd year and later increased at 2% per year compared to previous year. Average of first 4 years is considered for this estimation.

For the Ministry of Road Transport and Highways, GoI the Budgeted Expenditure is Rs. 83,016 Crores (financial year 2019-20). The estimated Cap-Ex for NHRSP is about 4% and annual Op-Ex is about 2.4% of the budgeted expenditure under the Ministry.

8.6. Benefit Analysis

Any cost intensive project, which is in terms of improving the existing facility, is subjected to economic and financial analysis to establish its viability and ensure that the investment proposed would yield appropriate return to the national economy.

8.6.1. Economic Cost of Accidents

Injuries in total and Road Traffic Injuries in particular cost approximately 5% and 3% of GDP respectively. Economic cost of road traffic injuries and deaths (year 2000) is approximated at $550,000 million. Between years 2011 to 2015, an estimated 844297 lives were lost on Indian roads 703581as per official reports). Predictions using ARIMA method indicate that an additional 976,474 lives would be lost by 2030, if solutions are not implemented on an urgent basis[56].

[56] Gururaj G, Gautham M S. Advancing Road Safety in India-Implementation is the Key, Bengaluru, 2017. National Institute of Mental Health & Neuro Sciences; 2017. Publication Number :136.

(A) IRC Recommendation

As it is possible to predict the reduction in accidents on account of road improvements, the accident cost values evolved from the earlier studies can be used after updating using the ratio of WPI for the economic cost of different types of accidents and economic cost of vehicle damage. IRC:SP:30-2009[57], presented the updated values of the study titled, "Evaluation of Road Accident Costs" conducted by TCS in 1999[58] considering the WPI price levels as of 21 March 2009. Similarly the Road Accident Costs are estimated for 2017, considering the WPI price levels as of 01 November 2017 and they are tabulated herein:

Table 45. Economic Cost for different type of Accidents

S. No.	Type of Accident	Economic Cost of Accidents (in Rs.) 2009 prices	Economic Cost of Accidents (*in Rs.*) 2017
1	Fatal	8,64,350	12,87,352
2	Serious/ Major	2,82,225	4,20,343
3	Minor	30,450	45,352

Table 46. Vehicle damage cost due to Accidents

S. No.	Type of Accident	Economic Cost of Accidents (in Rs.) 2009 prices	Economic Cost of Accidents (in Rs.) 2017
1	Cars	26,150	38,948
2	Two Wheelers	6,650	9,905
3	Three Wheelers	7,600	11,320
4	Buses	76,050	1,13,268
5	HCV	8,600	12,809
6	MAV	13,40,400	19,96,374

(B) IIT-Delhi Research

In the research paper by Shri Dinesh Mohan, titled "The Road Ahead: Traffic Injuries and Fatalities in India" (April 2004), as part of Transportation Research and Injury Prevention Programme, WHO Collaborating Centre, IIT-Delhi, based on the costs of Road Traffic Injuries (RTIs) given in above mentioned TCS Report, estimated that "***the road accident costs to 3.2 per cent of the GDP of India in 1995***".

Table 47. Accident Costs in % of GDP

Injury Severity	Dinesh Mohan (April 2004)	
	Estimated Number	Estimated Cost 1995 Rs.
Fatalities	71,948	38,52,73,62,572
Serious/ major	10,79,220	1,88,69,83,79,340
Minor	50,36,360	94,96,05,67,800
Total		**3,22,18,63,09,712**
Per cent of GDP		**3.2 per cent**

[57] IRC:SP:30-2009, Manual on Economic Evaluation of Highway Projects in India, 2009 (Second Revision)
[58] TCS (1999) "Evaluation of Road Accident Costs", Research Scheme R-79, Report Submitted to MOST, Government of India, New Delhi.

Further stated that, the above calculations do not include the effects of pain and suffering experienced by victims of RTI and their families in particular and society in general. These can be substantial. A catastrophic injury can destroy a poor or lower middle class family forever. It has been documented that the process of expensive treatment and patient care puts enormous emotional, time and financial burden on families: loss of jobs, children dropping out of school, reduction in nutritional quality and perpetual indebtedness. These effects on an individual family can have ripple effects and affect societies at large[59].

(C) International Studies

Economic Analysis of RTIs: There has long been assumed among policy analysts that road traffic injuries cause damage across the economy, well beyond the cumulative impact on households. There is little agreement, however, on how to demonstrate this phenomenon empirically[60]. A recent WHO analysis of eight countries in the East Asia and Pacific Region (Australia, Cambodia, Japan, the Lao People's Democratic Republic, Malaysia, New Zealand, the Philippines, the Republic of Korea, and Viet Nam) suggested that road trauma has a substantial negative macroeconomic impact in low-and middle-income countries, with losses to GDP ranging from 1.03 percent in the Republic of Korea to 2.9 percent in Vietnam[61].

(D) iRAP – International Road Assessment Program Recommendation

The values of prevention for fatalities and serious injuries as percentages of GDP per capita that are recommended for use as default values as well as for sensitivity analysis for the Economic Appraisal of the countermeasures that will be generated from the iRAP inspections. It also shows the value of serious injury and the ratio of number of serious injuries to number of fatalities to be used.

Table 48. iRAP Economic appraisal model values[62]

Description	Lower	Central	Upper
Value of Fatality	60 × GDP per capita	70 × GDP per capita	80 × GDP per capita
Value of Serious Injury	12 × GDP per capita (20% VSL)	17 × GDP per capita (25% VSL)	24 × GDP per capita (30% VSL)
Number of Serious Injuries to Number of Fatalities	8	10	12

8.6.2. Estimation of Benefits

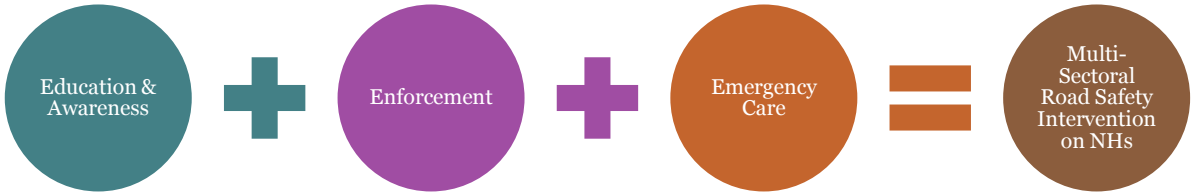
India suffers an estimated GDP loss of 3% due to road accidents and related fatalities/ injuries. The proposed NHRSP is dedicated for enforcement on National Highways.

[59] Dinesh Mohan, The Road Ahead: Traffic Injuries and Fatalities in India" (April 2004), Transportation Research and Injury Prevention Programme, WHO Collaborating Centre, IIT-Delhi
[60] World Bank. 2017. The High Toll of Traffic Injuries: Unacceptable and Preventable. © World Bank.
[61] WHO (World Health Organization). (2016). Road Safety in the Western Pacific Region 2015. WPR/2016/DNH/022. WHO Western Pacific Region.
[62] International Road Assessment Program (iRAP): The True Cost of Road Crashes, Valuing Life and the Cost of a Serious Injury

Effective enforcement by the field officers and IT based applications of NHRSP can significantly reduce the number of accidents on the NHs. Trained NHRSP officers render multi-sectoral services on the National Highways with the help of requisite equipment.

In addition to its enforcement role, the proposal recommends inclusion of a skilled paramedic in the field team's manpower to enhance the NHRSP's capacity as an effective first responder team in the event of an accident.

Assiduous NHRSP personnel will also impart road safety education and awareness to the road users



With this envisaged plan the NHRSP will strive:

- ✓ to reduce traffic law violations
- ✓ to uphold the Golden Hour principle in the event of a road accident
- ✓ to educate and make aware of the hazards of traffic law violations

thereby, effecting significant change in road user behavior and reduce road accidents, fatalities and injuries. NHs cause about 51,000 fatalities per year (Average of years 2014, 2015, 2016 & 2017), which is about 35% of the total fatalities on Indian roads.

To estimate the benefits of this proposal:

- ❑ Proposed Amendments in various penalties under the Motor Vehicles (Amendment) Act, 2019 are considered. Following are some of the MV Act violations considered:

MV Act Section	Violation	Revised penalty
181	Driving without license	5,000
183	Over speeding (LMV)	1,000
	Over speeding (Medium passenger vehicle)	2,000
185	Drunken driving	10,000
194 B	Seat Belt	1,000
194 D	Helmets	1,000

- Assumption of number of violations per day.

Violation	Violations detected by Patrol Veh. per day per Team	Violations detected by Interceptor Veh. per day per Team	Total Violations Detected per day (by 700 Field RSOs)	Violations detected by Speed Cameras per day per Cam.	Total Violations Detected per day (by 2000 Speed Cameras)
Driving without license	6	6	8,400	-	-
Over speeding (LMV)	-	10	7,000	15	30,000
Over speeding (Medium passenger vehicle)	-	3	2,100	5	10,000
Drunken driving	3	3	4,200	-	-
Seat Belt	3	3	4,200	-	-
Helmets	3	3	4,200	-	-

- Estimation of revenue collection in the form of penalties, assuming complete implementation of NHRSP proposal.

MV Act Section	Violation	Revised penalty	Total Violations per day	Total Penalties collected per day
181	Driving without license	5,000	8,400	4,20,00,000
183	Over speeding (LMV)	1,000	37,015	3,70,15,000
	Over speeding (Medium passenger vehicle)	2,000	12,105	2,42,10,000
185	Drunken driving	10,000	4,200	4,20,00,000
194 B	Seat Belt	1,000	4,200	42,00,000
194 D	Helmets	1,000	4,200	42,00,000
			Total penalties collected per day	15,36,25,000
				15.36 Cr./ day
			Total penalties collected per year	**5,607 Cr./ year**

- Estimation of reduction in accidents, fatalities and injuries on the NHs.

Adherence to traffic laws by the road users and deterrent enforcement as described in section ***7.1.3 Benefits of Enforcement Management*** of this report, can reap overwhelming results on Indian Roads, in this case, the National Highways. It is estimated that, potential of reduction in personal injuries and fatalities, assuming full compliance Traffic Law Enforcement, is about 20% and 40% respectively.

Because of NHRSP on the National Highways there will be:

- General deterrence, it occurs when road users obey road rules because they perceive a substantial risk of being detected and punished if they don't
- Specific deterrence, it occurs when someone who has broken the rules is punished and stops the unlawful behavior as a result
- Effective first responder team with trained paramedic and requisite medical supply for initial stabilization at the site
- Persistent Road Safety Education and Awareness

In this perceived context, reduction in road accidents, fatalities and injuries are conservatively estimated, cumulatively over 5 years after implementation of NHRSP as envisaged.

Year	As is Scenario on NHs		Scenario After NHRSP Implementation on NHs	
	Accidents	Fatalities	Accidents	Fatalities
2014	1,39,920	49,666		
2015	1,44,287	53,223		
2016	1,44,380	54,096		
2017	1,43,489	55,204		
2018*	1,44,718	57,201		
2019	1,44,865	58,595		
2020	1,45,030	60,178		
2021	1,45,549	61,935	1,23,276	51,151
2022#	1,45,828	63,599	1,07,250	44,502
2023	1,46,151	65,361	95,452	39,161
2024	1,46,527	67,187	86,862	34,854
2025	1,46,855	69,035	81,650	31,368

* Road accident data is available upto 2017, the number of accidents and fatalities on NHs, 2018 onwards, are projected based on average year-on-year growth of previous 4 years.

\# With the assumption of complete implementation NHRSP across the nation by the end of year 2020 and considering conservative average yearly reduction of approximately 10-12%, it is estimated that by the end of 2025 there will be cumulative reduction of about 44% in accidents and 48% in fatalities on the National Highways, compared to year 2020, graphical representation of the same is given below:

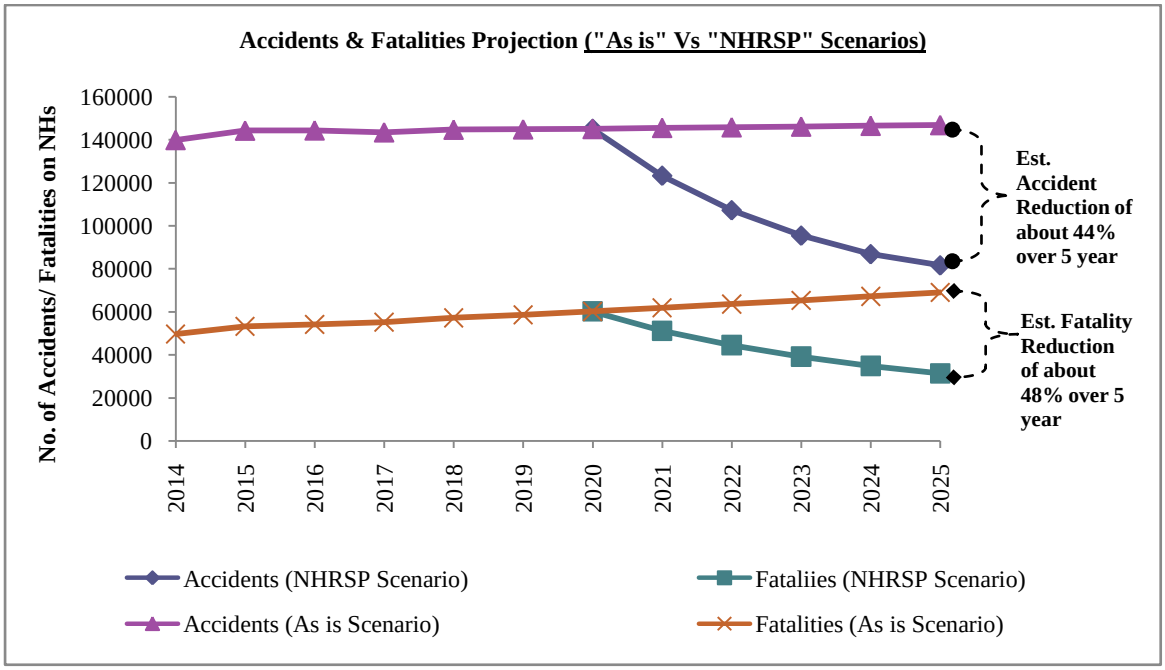


Figure 55. Accidents & Fatalities Projection ("As is" Vs "NHRSP" Scenarios)

BOX 17: The High Toll of Traffic Injuries: Unacceptable & Preventable*

The cost of inaction in RTI reduction – accrues to about 2-3 percent points in unrealized per capita GDP growth for low- and middle- income countries. The report's findings are briefly presented herein:

- Reducing road traffic injuries has a positive effect on national income growth
- Significant long-term income growth – 7 to 22 percent increase in GDP per capita over 24 years - can be achieved through substantial reduction in road traffic injuries in line with the current UN targets. The study shows that by reducing road traffic mortality and morbidity by 50 percent and sustaining it over a period of 24 years could generate an additional flow of income equivalent to 7.1 percent of 2014 GDP in Tanzania, 7.2 percent in the Philippines, **14 percent in India**, 15 percent in China and 22.2 percent in Thailand.
- Welfare benefits equivalent to 6 percent to 32 percent of the national GDP can be realized from reducing 50 percent of road deaths and injuries over a period of 24 years.
- Assuming that the monetary value of one Disability Adjusted Life Year (DALY) averted is equivalent to one GDP per capita, the range of welfare benefits of reducing RTI mortality and morbidity by 50 percent over 24 years expressed as percentage of GDP are: 6.3 percent for China, **16.3 percent for India**, 32 percent for Tanzania, 8.25 percent for Thailand, and 5.91 percent for Philippines.
- Reducing RTI should be at the core of any strategy aimed at developing health capital, and hence to contribute to human capital accumulation and enhancing overall social welfare.

* World Bank. 2017. The High Toll of Traffic Injuries: Unacceptable and Preventable. © World Bank.

8.6.3. Economic Benefit Comprehension

Road accidents cause about 3% loss to the nation's GDP. About 1/3rd of accidents and fatalities happen on the national highways. Therefore, it can be stated that accidents and fatalities on NHs alone cause about 1% loss to the nation's GDP[63], which is about Rs. 1,901 billion (Rs. 1,90,102 Crores).

NHRSP Implementation costs about Rs. 3,308 Crores towards Capital Expenditure and has annual recurring expenditure of about Rs. 2,007 Crores. However, it is also estimated that there will be revenue generation by collection of penalties of about Rs. 5,000 crores per year. The estimated costs and benefits (revenue collection from penalties) are tabulated below:

(Rs. Crores)

Sl. No.	Year	Expected Capital Cost	Expected Operational Cost	Total Cumulative Estimated Cost	Expected Revenue from Penalties	Total Cumulative Estimated Benefits	Cost vs Benefits
1	2020	3,308	2,007	5,315	-	-	**-5,315**
2	2021	-	2,107	7,422	5,000	5,000	**-2,422**
3	2022	-	2,212	9,634	4,750	9,750	**116**
4	2023	-	2,323	11,957	4,513	14,263	**2,306**
5	2024	-	2,439	14,396	4,287	18,549	**4,153**
6	2025	-	2,561	16,957	4,073	22,622	**5,665**

Notes:

- Expected Operational Costs are increased 5% annually.
- Revenue from Penalties are reduced 5% annually, assuming decrease in violations

[63] GDP, Rs. 1,90,102 billion (at current market prices) 2018-19 (provisional est.) as in Table 0.1: Key Indicators, Pg 2, Economic Survey 2018-19 Volume 2, Ministry of Finance, Government of India

As presented in previous section, it is conservatively projected that after complete implementation of NHRSP, by the end of 2025 there will be cumulative reduction of about 44% in accidents and 48% in fatalities on the National Highways, compared to year 2020. In other words, there will be significant gain to the nation's GDP, i.e. about Rs. 874 billion (Rs. 87,400 Crores). Following table tabulates projected GDP Losses in "AS IS" vs "NHRSP" scenarios:

(Rs. Billion)

Sl. No.	Year	GDP Loss "AS IS" Scenario	GDP Loss NHRSP Scenario	Cumulative GDP Lost "AS IS" Scenario	Cumulative GDP Lost in NHRSP Scenario	Cumulative Saving in GDP Loss in NHRSP Scenario
1	2020	1,901	1,901	1,901	1,901	-
2	2021	1,996	1,616	3,897	3,517	**380**
3	2022	2,096	1,373	5,993	4,890	**1,103**
4	2023	2,201	1,167	8,194	6,058	**2,136**
5	2024	2,311	992	10,504	7,050	**3,454**
6	2025	2,426	843	12,930	7,894	**5,037**

Notes:

- GDP Losses in "AS IS" Scenario are increased 5% annually.
- GDP Losses in NHRSP Scenario are decreased 15% annually, considering similar reduction in accidents and fatalities on NHs.
- Revenue from Penalties are reduced 5% annually, assuming decrease in violations

An illustration of

- Cumulative savings in GDP Loss in NHRSP Scenario
- Cumulative Cost (Capex+Opex) vs Benefit (Revenue from Penalties) in NHRSP Scenario

are presented below:

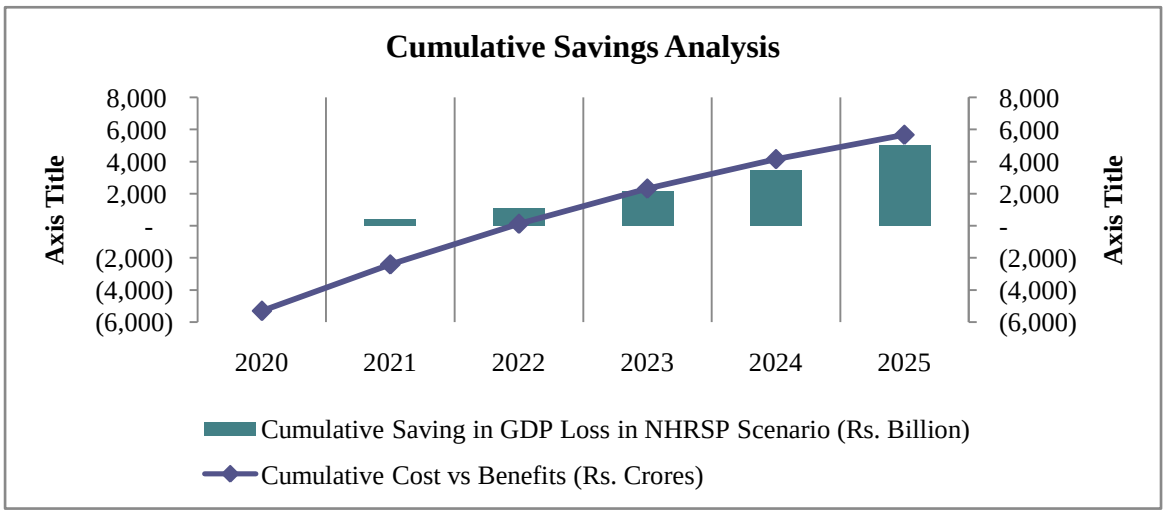


Figure 56. Cumulative Savings Analysis

8.7. State Highways Road Safety Police.

In India, enforcement is majorly restricted to city limits only. There exists no dedicated enforcing mechanism on national and state highways. Hence it is anticipated that the road crashes and deaths are happening more on highways. In fact, 55% of road crashes and 62% of road fatalities happen on National and State highways, which amount to just 5% of total road length in India. Therefore, it is strongly recommended initiating the effective enforcement activities on national highways, state highways and other roads as well. Similar to the National Highways Road Safety Police, it is proposed that each state should also have a dedicated State Highway Road Safety Police established for strict enforcement on the State Highways.

- State Highways Road Safety Police (SHRSP)
- Station House Officer (SHO)

They will be empowered and equipped to perform **"EEE" duties** – Enforcement, Emergency Response and Education. The following structure of statutory bodies has proposed to do effective enforcement on various roads;

Type of Road	National Highway Road Safety Police	State Highways Road Safety Police	Station House Officer
National Highway	☑	☑	☑
State Highway	☒	☑	☑
Major District Roads/ Other Roads	☒	☒	☑

8.8. State Highway Road Safety Police (Example: Telangana State)

On similar lines to NHRSP, State Highways Road Safety Police – SHRSP, has been envisioned.

- State's HQ will be headed by Addl. Chief Road Safety Officer – DIG Rank
- Each district HQ will be headed by Group/ District Road Safety Officer – Addl. SP rank officer
- Sr. Road Safety Officer – Dy. SP rank officer & Team for every 100Km
- Road Safety Officer – SI rank officer & Team for every 50Km

on State Highways.

A tentative budget for SHRSP set-up for the State of Telangana which has about 2,600Kms of State Highways, is estimated

Capital Cost 168 Cr.

Recurring Cost Annually 160 Cr.

Chapter-9

Conclusions and Recommendations

9. CONCLUSIONS AND RECOMMENDATIONS

9.1. Conclusions

9.1.1. Data Analysis

Brasilia Declaration on Road Safety: The High-Level Road Safety Conference in Brasilia in November 2015, India, a signatory to Brasilia Declaration, is committed to reduce the number of road accidents and fatalities by 50% by 2020 as part of UN Sustainable Development Goals adopted in September 2015. In 2015, about 1,46,133 people killed on Indian roads, more than half killed on the roads are Vulnerable Road Users (motorcyclists, pedestrian, bicyclists) and 54% of fatalities are young people in the age group of 15-34 years.

The road traffic accident deaths have increased from 1,14,444 in 2007 to 1,47,913 in 2017 i.e, over 30% increase in the road accident fatalities in 10 years. We could not achieve the targeted reduction despite various efforts, by both Centre and the State governments. "Road safety concerns every person across the country. Road accidents cannot be considered an unavoidable byproduct of economic growth. The lack of road safety has overwhelming statistics and tragic implications.

9.1.2. Global Best Practices

the global best practices including Institutions and Processes followed in USA, UK, Republic of Korea, Australia, Germany related to road safety, accident prevention and compared the Institutional Set-Up with India. Study of Global Practices with respect to 4 pillars of Road Safety, best practices adopted in reducing the number of road accidents and fatalities and lessons learned on global practices reveals that, in most of the developed countries, focused and scientific research is carried out on road safety and road crash injury prevention. These countries have specialized and dedicated bodies to plan adequate resources and administer the activities required to improve road safety. However, there is no such full-time dedicated agency in India to deal with road safety issues.

Global best practices with respect to four pillars of the road safety raveled that the European Union has come a long way in road safety and achieved incredible results, over the last 15 years, they have cut down the fatality rates by more than 50 %. Safer roads for all the EU Good Practice Guide, European Union, 2017, discuss a mix of measures adopted in reducing the fatalities like **Education and Enforcement**; as well as new and innovative solutions, especially when it comes to vehicles and infrastructure. The following are some of the highlights and lessons learned from the international best practices adopted in reducing the number of road accidents and fatalities;

- An **integrated and dedicated statutory body** is necessary to provide for continuity, expertise, and credibility to combat the rising menace of road accidents and fatalities in the country
- Need for a statutory body to perform the following functions, namely:—
    - *need for the application of traffic management techniques using advanced ITS/ AI technologies;*

- *recommend minimum design, construction, operation and maintenance standards for the national highways or issue guidelines for the same;*
- *recommend minimum standards for establishing and operating trauma facilities and para-medical facilities for dealing with traffic-related injuries on the national highways;*
- *conduct or cause to be conducted safety audits to monitor compliance with the standards notified by the authority;*
- *recommend minimum safety requirements and standards for the design and manufacture of vehicles;*
- *recommend minimum conditions for safe usage of vehicles including specifying the maximum load-bearing and capacity limits;*
- *conduct or cause to be conducted safety audits to monitor compliance with the standards notified by the authority;*
- *recommend standards for vehicular traffic on the national highways including the schemes for segregation of various classes of vehicles in separate speed lanes and their right of way;*

- ❑ establishment procedures and centers for multidisciplinary crash investigation;
- ❑ promote relevant practices in road safety and traffic management, undertake road safety and traffic education programs, and conduct campaigns to create awareness amongst all sections of road users, children and students on matters relating to road safety;
- ❑ involve non-government organizations working in the area of road safety and traffic management, and assist them in the promotion of efficient traffic management and road safety;
- ❑ special requirements for women, children, senior citizens, disabled persons and pedestrians relating to road safety and traffic management;
- ❑ data collection and analysis, accident investigation, research, finance or administration;
- ❑ traffic management, road user behavior strategies or road safety education, trauma care, and rehabilitation.
- ❑ Study of the procedures followed by the National Highway Authority of India and compared with FHWA procedures of US.

9.1.3. MV Act 2019

The New Motor Vehicle Amendment Act 2019 strengthens and enhances special provisions related to Road Safety. The Act provides grant of licenses and permits related to motor vehicles, standards for motor vehicles, and penalties for violation of these provisions. The amendment Act also facilitates Compensation for road accident victims, Compulsory insurance cover to all road users, Good Samaritans, recall of vehicles, and increases penalties for several offences etc.

Key Features of the Act

- **Compensation for road accident victims:** The central government will develop a scheme for cashless treatment of road accident victims during golden hour. The Act defines golden hour as the time period of up to one hour following a traumatic injury, during which the likelihood of preventing death through prompt medical care is the highest. The central government may also make a scheme for providing

interim relief to claimants seeking compensation under third party insurance. The Act increases the minimum compensation for hit and run cases as follows: (i) in case of death, from Rs 25,000 to two lakh rupees, and (ii) in case of grievous injury, from Rs 12,500 to Rs 50,000.

- **Compulsory insurance:** The Act requires the central government to constitute a Motor Vehicle Accident Fund, to provide compulsory insurance cover to all road users in India. It will be utilised for: (i) treatment of persons injured in road accidents as per the golden hour scheme, (ii) compensation to representatives of a person who died in a hit and run accident, (iii) compensation to a person grievously hurt in a hit and run accident, and (iv) compensation to any other persons as prescribed by the central government. This Fund will be credited through: (i) payment of a nature notified by the central government, (ii) a grant or loan made by the central government, (iii) balance of the Solatium Fund (existing fund under the Act to provide compensation for hit and run accidents), or (iv) any other source as prescribed the central government.
- **Good Samaritans:** The Act defines a Good Samaritan as a person who renders emergency medical or nonmedical assistance to a victim at the scene of an accident. The assistance must have been (i) in good faith, (ii) voluntary, and (iii) without the expectation of any reward. Such a person will not be liable for any civil or criminal action for any injury to or death of an accident victim, caused due to their negligence in providing assistance to the victim.
- **Recall of vehicles:** The Act allows the central government to order for recall of motor vehicles if a defect in the vehicle may cause damage to the environment, or the driver, or other road users. The manufacturer of the recalled vehicle will be required to: (i) reimburse the buyers for the full cost of the vehicle, or (ii) replace the defective vehicle with another vehicle with similar or better specifications.
- **National Transportation Policy:** The central government may develop a National Transportation Policy, in consultation with state governments. The Policy will: (i) establish a planning framework for road transport, (ii) develop a framework for grant of permits, and (iii) specify priorities for the transport system, among other things.
- **Road Safety Board:** The Act provides for a National Road Safety Board, to be created by the central government through a notification. The Board will advise the central and state governments on all aspects of road safety and traffic management including: (i) standards of motor vehicles, (ii) registration and licensing of vehicles, (iii) standards for road safety, and (iv) promotion of new vehicle technology.
- **Offences and penalties:** The Act increases penalties for several offences under the Act. The central government may increase fines mentioned under the Act every year by up to 10%. For example,
    - The maximum penalty for driving under the influence of alcohol or drugs has been increased from Rs 2,000 to Rs 10,000.
    - If a vehicle manufacturer fails to comply with motor vehicle standards, the penalty will be a fine of up to Rs 100 crore, or imprisonment of up to one year, or both.

    - If a contractor fails to comply with road design standards, the penalty will be a fine of up to one lakh rupees.
- **Taxi aggregators:** The Act defines aggregators as digital intermediaries or market places which can be used by passengers to connect with a driver for transportation purposes (taxi services). These aggregators will be issued licenses by state governments. Further, they must comply with the Information Technology Act, 2000.
- **Electronic Monitoring of Road Safety:** The Act mandates state governments to ensure electronic monitoring and enforcement of road safety on National Highways, State Highways, and urban roads as per guidelines framed by the central government. It is unclear who will bear the cost of implementing such safety measures.
- **Agency responsible for road safety:** The Act provides for a National Road Safety Board, to be created by the central government through a notification. The Board will comprise of a Chairman, representatives of the state governments, and other members as specified by the central government. The Board will provide advice to the central and state governments on all aspects of road safety and traffic management including: (i) standards of design, weight, manufacturing process, operation and maintenance of motor vehicles, (ii) registration and licensing of vehicles, (iii) formulating standards for road safety, road infrastructure and control of traffic, (iv) promotion of new vehicle technology, and (v) safety of vulnerable road users. The central government may make rules regarding the terms and conditions of appointment if the Board, and other functions of the Board.
- **Road design and engineering:** The Act provides that any contractor or consultant responsible for the design, construction, or maintenance of the safety standards of roads must follow design, construction and maintenance standards specified by the central government. Failure to comply with such standards will be punishable with a fine of up to one lakh rupees, and such amount will be credited to the Motor Vehicle Accident Fund. The Act also specifies certain road design characteristics that the Courts should consider when looking at such cases. These include: (i) characteristics of the road and the type of traffic which was expected on it, (ii) standard maintenance norms for roads, and (iii) the state of repair in which road users would have expected to find the road.

9.1.4. Use of IT and AI

The need and use of Intelligent Transportation System (ITS) and Artificial Intelligence techniques to communicate, monitor, operate and manage the highways in a sensible and organized way. It is envisioned that ITS will set a benchmark for future enforcement and road operation activities on the highways.

To make the road users follow the Traffic Rules as the highest priority, based on the effective enforcement technique using the advanced technology, to instil discipline among the road users and discourage them to follow unsafe and aggressive driving behaviour on Indian Highways. The experience and current procedures reveal that the police have a limited presence on Nation Highways especially in rural areas and lacks resources, equipment & training to enforce traffic rule violations. Various ITS and AI

technologies used across the globe (United States of America, Japan, Europe, United Kingdom, Middle East, and Canada) in the field of transportation have been reviewed and proposed Some of the technology-related enforcement techniques, their functionalities, benefits, working procedures, and server requirement have been presented in this report which is suitable for Indian conditions;

- Automatic Speed Enforcement System (ASES)
- Automatic Video Incident Detection System (AVIDS):
- Variable Message Display (VMD) System:
- Surveillance Camera (CCTV) System
- E-Challan System
- Hand-Held Devices for e-Challan System
- Optical Fiber Cable (OFC) Network for Corridor
- ITS Control Center Server Application & System

The research reveals that the Education, Enforcement and Emergency response are three predominant approaches capable of reducing the road accident fatalities. Implementation of these road safety interventions has a very high probability to reduce road accidents and fatalities considerably. This brings out that there is an imminent and immediate need for a dedicated agency to carry out the three road safety interventions (viz, Education, Enforcement, and Emergency Response) on the highways in various and unequal degrees in reducing the traffic violations, road accidents and fatalities.

This report proposes the formation of a dedicated agency (National Highway Road Safety Police) for effective enforcement on highways with sufficient manpower, enforcement equipment, and vehicles with sharply defined Standard Operating Procedures (SOPs). Further, this report highlights suitable Monitoring Evaluation Framework with clear measurable key performance indicators (KPI's), which will help in quantifying the effect of road safety activities implemented in the country in reducing road accidents and fatalities by implementing the road safety initiatives as mentioned above and by comparing the results with the baseline which was conducted before project implementation.

9.1.5. Requirement of Institutional Framework

Under institutional framework, it is essential to have statutory bodies in the form of Road Safety Authorities/ Board's both at National level and State level, with quasi judicial powers and sizable Road Safety Funds.

9.2. Recommendations

In India, enforcement is majorly restricted to city limits only. There exists no enforcing mechanism on national and state highways. Hence it is anticipated that the road crashes and deaths are happening more on highways. In fact, 55% of road crashes and 62% of road fatalities happen on just 5% of road length of National and State highways. Therefore, it is strongly recommend initiating the effective enforcement activities on national highways, state highways and other roads as well. For this purpose, the following structure of statutory bodies has proposed to do effective enforcement;

- National Highways Road Safety Police (NHRSP)
- State Highways Road Safety Police (SHRSP)

- Station House Officer (SHO)

They will be empowered and equipped to perform **"EEE" duties** – Enforcement, Emergency Response and Education.

Type of Road	National Highway Road Safety Police	State Highways Road Safety Police	Station House Officer
National Highway	☑	☑	☑
State Highway	☒	☑	☑
Major District Roads/ Other Roads	☒	☒	☑

All the three agencies will perform 3 E duties on National Highways. SRDP and SHO will perform the same duties on State Highways. Thus on National Highways, and State Highways where large number of crashes and fatalities takes place, all the three agencies will perform Road Safety duties.

NRSP, SRSP and SHOs not only restricted to enforcing of traffic violations but also perform emergency and medical related duties (both enforcement and saving of life) during accidents to facilitate the accident victims reach hospital during the golden hour.

9.2.1. National Highway Road Safety Police

In order to reduce the accidents and fatalities in India, it is suggested to have a dedicated and separate agency for strict enforcement of the traffic violations across India, especially on National Highways. To achieve this, it is proposed that a National Highways Road Safety Police (NHRSP) be established for strict enforcement on national highways.

The highway development in India has seen much awaited push since last two decades. The road length has increased considerably by construction of several multi Lane highways. However, over the same time, the safety performance of the roads has deteriorated in terms of increase in the number of road fatalities.

A budgetary support arrangement coupled with a pan India Road Safety Police, i.e. National Highways Road Safety Police – NHRSP, will effectively complement India's endeavor in reducing the road accident deaths and also resulting in saving of the cumulative loss to the GDP to the extent of about 5 lakh crore rupees by the end of the fifth year.

9.2.2. State Highway Road Safety Police

Similar to the National Highways Road Safety Police, it is proposed that each state should also have a dedicated State Highway Road Safety Police established for strict enforcement on the State Highways.

9.2.3. Centre, State Collaboration for Road Safety

There is an eminent need for all the states to increase their efforts to reduce road crashes and deaths. However, some states do not have adequate resources and infrastructure. Hence, there is a need for proactive and intense collaboration between the central government and state government.

Central government may accept funds from the multi lateral agencies such as United Nations, World Bank, ADB etc., for National Road Safety Plan (NRSP). It is strongly recommended that the national road safety plan should have;

- Institutional framework
- Robust funding mechanism
- All pervasive Enforcement, Emergency Response, and Education apparatus and mechanisms.

9.2.3.1. Institutional Framework

Under institutional framework, it is essential to have statutory bodies in the form of Road Safety Authorities/ Board's both at National level and State level, with quasi judicial powers and sizable Road Safety Funds.

9.2.3.2. Robust Funding Mechanism

With respect to the robust and sustainable funding mechanism, it is strongly recommended that the central government should raise central road safety fund (CRSF) to the tune of rupees 15,000 crores (i.e. 2 billion dollars) involving contribution from centre, state and multi lateral agencies. This fund will be utilised to provide grants to different states to take up activities in road safety.

For the first two years, the grants are decided on the basis of the base line data, from the third year onwards the grants are commensurate to the performance and outcomes (impact) as well by each state in the first two years. Sharply defined key performance indicators (KPI's) as mentioned in section 7.10.6 of the report should be used. The evaluation system should be Dynamic Performance Evaluation System (DPES) in which the evaluation parameters can be modified as per future needs.

9.2.3.3. All pervasive Enforcement, Emergency Response, and Education apparatus and mechanisms.

The National Highways Road Safety Police and the State Highways Road Safety Police on similar lines should fan out in the length and breadth of the country for;

- Effective Enforcement
- Medical Emergencies
- Following Golden Hour Principle and
- Massive Education Programs

9.2.4. Emergency Medical Response System (EMRS)

EMRS is an integral part of the Incident Management System of the NHAI, which covers break down, accidents, medical situations on the highways. This system is already in place. This system will be dovetailed into the NHRSP. Further, it is proposed to establish Emergency Medical Response System (EMRS) through

- Mapping of Public, Private and Not–for–Profit healthcare center services existing on National Highways

- Support of MoHFW will also be taken for the above. There is a need to promote SC guidelines on Good Samaritan for helping the crash victims.
- This will facilitate prioritization of medical care even before taking care of legal/police aspects.

In compliance with the golden hour principle, it is recommended to

- Provide operable life saving ambulance system, advanced life saving ambulance for every 100 kms of road length.
- These ambulances should be equipped with sophisticated and advanced medical equipment to provide initial treatment to the accident victim in ambulance itself.
- Further, establishment of adequate trauma centers along the highway will strengthen the facilities saving more lives of accident victims.
- Further, suggested to introduce concepts like Air Ambulance and Air Surveillance using advanced technologies and equipment.
- With these interventions, there will be a considerable reduction in response time of carrying the accident victim to the nearest hospital/ trauma centre. Hence the golden hour principle is taken care

It is also proposed that State level trauma system should be coordinated with the Incident Management System of NHAI to ensure trauma care within "Golden Hour" to every victim of road traffic injury. There is need to prioritize and strengthen coordination for high quality online, on - site and in - transport level of pre – hospital care.

9.3. Impact of National Road Safety Plan

Even though, formation of a dedicated agency, incurs a fixed cost in the form of the purchase of enforcement equipment, vehicles, installation of ITS equipment & data/ command control centers, office setup, etc, and recurring cost in terms of office maintenance, vehicle maintenance, and fuel, and salaries to the personal, etc, appears to be very high. The impact of the enforcement activities conducted by the dedicated agency and the expected outcomes from the dedicated policing in the form of revenue generation collected through fines and penalties, reduction in road accidents and fatalities, reduction in the cost to GDP, etc., will compensate the cost incurred in just less than two years.

It is anticipated that the implementation of the Nation Road Safety Plan will result in about ~12 to 15% of annual reduction in road accidents and fatalities. It will increase traffic law compliance among road users, and encourage good driving practices among road users. It is also to be noted that the operating expenditure of the proposed NHRSP constitutes about 4% of the annual budget provided for MoRTH and the recurring annual expenditure is about 2.4% of the budget. In addition, the proposed NHRSP is providing employment to around 32,000 aspirants across India.

Final Impact: Expected Final Impact of National Road Safety Plan after a period of 5 years is as follows;

- Total cumulative capital and operation expenditure incurred up to 5 years is expected about Rs. 17,000 crores, where as the cumulative estimated benefits (revenue from

penalties) at the end of 5th year is estimated as Rs. 22,622 crores, which is about Rs. 5,000 crores more than the actual expenditure.

- Total cumulative GDP loss in "AS IS" scenario is Rs. 5,037 billion (Rs. 5,03,700 crores) more than that of in "NHRSP" scenario, ie., Rs. 5,037 billion GDP loss is saved.
- About 37,667 human lives notionally will be saved in NHRSP Scenario when compared to "AS IS".

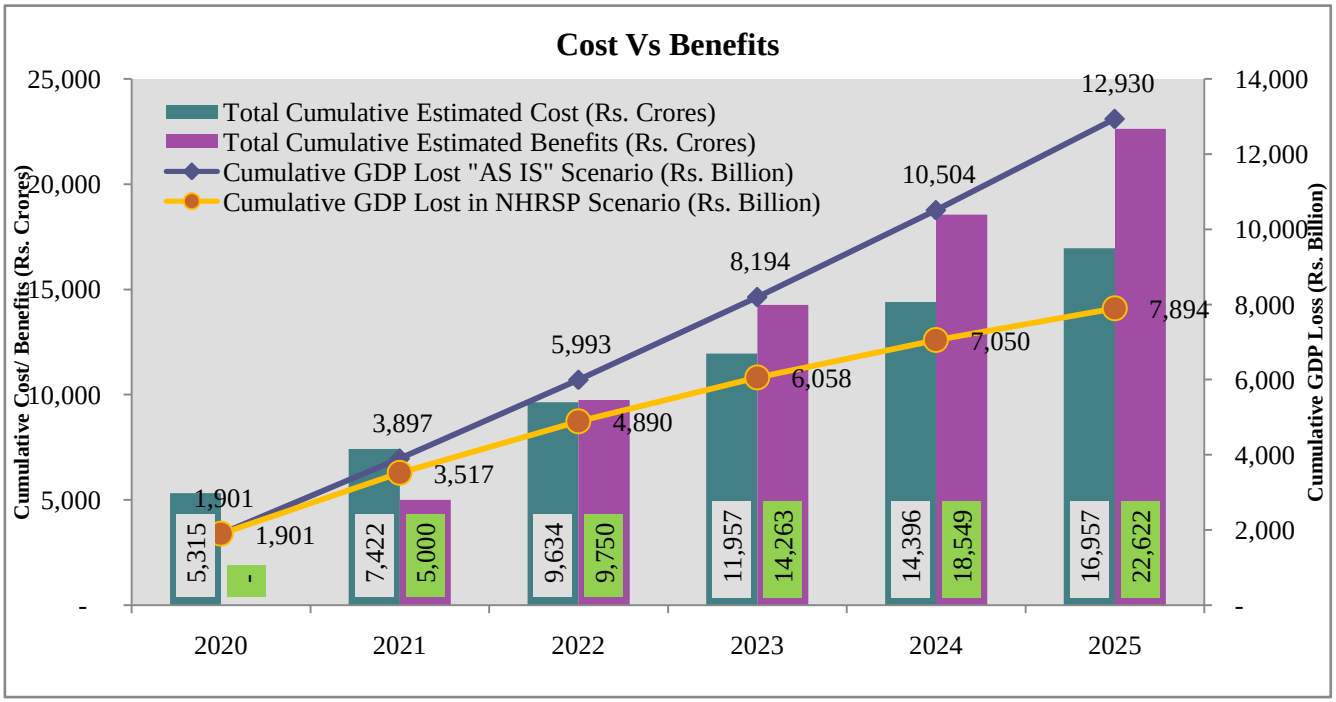


Figure 57. Costs Vs Benefits – NHRSP

9.3.1. ENFORCEMENT – Laws, Rules & Regulations and Procedures

- So far as the enforcement provisions of Motor Vehicle Act concerned, the agreed upon provisions of the law will be delegated to the authorized ranks of NHRSP viz. officers of the rank of Road Safety Officer and above.
- The enabling provisions of MV Act and other related laws can be delegated to NHRSP system by appropriate authorization or amendments to the existing acts.
- The medico-legal, crime and law and order cases on national highways shall remain the responsibility of the state agencies. Whereas, safety management, enforcement activities and security of road infrastructure on the national highways shall be the responsibility of NHAI through NHRSP.
- The regulation of traffic and enforcement responsibilities on national highways has to be delegate to NHRSP as per the charter of duties and responsibilities at various levels as mentioned in section 8.2.5 of this chapter.
- The coordinating instructions and the communications protocols need to be framed in form of the SOP in consultation with all the stakeholder departments. Further, the SOPs have to be updated regularly as a dynamic process by resolving the implementation gaps and bottlenecks.

9.3.2. Implementation Strategy

❑ Constitution of the Advisory Council

- Filling up of the posts of IG/Advisor to NHAI Chairman and the DIGs in the States
- Notification of the initial number of "operational units" based on the criticality analysis on the parameters explained above
- Assessment of the manpower requirement based on the number of "operational units"
- Formation of subject expert groups to evolve parameters and standard operating procedures for NHRSP – Technology & Equipment, Data Management Systems, Blackspot Analysis, Engineering, Road Safety, Education, Emergency Response, Disaster Management, Manpower Issues
- Recruitment plan – Administrative and supervisory officers of NHRSP (Chief Road Safety Officer, Addl. Chief Road Safety Officer, Dy. Chief Road Safety Officer and Group Road Safety Officer) who are likely to be inducted on deputation basis
- Recruitment Plan – Operational and field level staff of NHRSP (Sr. Road Safety Officer, Head Road Safety Officer and Road Safety Officer) from private security agencies through open advertisement
- Procurement Plan-Infrastructure, vehicles, resources and logistics
- Training Plan –Liaison with the designated state police training institutions for training the NHRSP manpower of various ranks in a time-bound manner
- Suggested to use drone technology for the following purposes;
    - Rescue operations;
    - For supply of food, essential medical equipment for the accident victims fell in valley where persons are not able to reach easily
    - Over-speeding enforcement
- Suggested the use of Air Ambulances
- Policy
    - As per The Control of National Highways (Land & Traffic) Act, 2002 and The Highway Administration Rules, 2004 certain powers of enforcement vis-a-vis encroachment, regulation of traffic etc., may also be delegated to the Road Safety Officer and above.

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ANNEXURES

Annexure-A
Details of Penalties applicable to the Federal-Aid Highway program in USA

Penalties Applicable to the Federal-aid Highway Program in USA

TYPE/STATUTE	REQUIREMENT (as of the effective date of the FAST Act)	PENALTY FOR NONCOMPLIANCE (as of the effective date of the FAST Act)
	STATE TRAFFIC SAFETY LAWS	
National Minimum Drinking Age 23 U.S.C. 158	Each State must have laws that prohibit the purchase or public possession of any alcoholic beverage by a person who is less than 21 years of age.	Withholding of 8 percent of the State's apportionments for the National Highway Performance Program (NHPP) and Surface Transportation Block Grant Program (STBG). Funds withheld lapse immediately.
Drug Offenders 23 U.S.C. 159	Each State must certify that it either: 1) has a law that requires the revocation or suspension of drivers' licenses for at least 6 months (or delay in the issuance or reissuance of a license) for those convicted of any violation of the Controlled Substances Act or any drug offense or 2) has a statement by the Governor opposing enactment or enforcement of such a law and a resolution by the State legislature expressing opposition to such law.	Withholding of 8 percent of the State's apportionments for the NHPP and STBG. Funds withheld lapse immediately.
Zero Tolerance Blood Alcohol Concentration for Minors 23 U.S.C. 161	Each State must enact and enforce a law that considers any individual under 21 years who operates a motor vehicle while having a blood alcohol concentration (BAC) of 0.02 grams of alcohol per 100 milliliters of blood or above to be driving while intoxicated or driving under the influence of alcohol.	Withholding of 8 percent of the State's apportionments for the NHPP and STBG. Funds withheld lapse immediately.
Open Container Requirements 23 U.S.C. 154	Each State must enact or have and enforce a law prohibiting the possession of open alcoholic beverage containers or the consumption of any alcoholic beverage in the passenger area of a motor vehicle. For motor vehicles designed to transport many passengers, this requirement is considered satisfied if a State has a law prohibiting the possession of any open alcoholic beverage container by the driver (but not by a passenger): (1) in the passenger area of a motor vehicle designed, maintained, or used primarily for the transportation of persons for compensation; or (2) in the living quarters of a house coach or house trailer.	Reservation of an amount equivalent to 2.5 percent of the State's NHPP and STBG apportionments and associated obligation authority. Reserved amounts will be transferred to the State's Section 402 apportionment for use for alcohol-impaired driving countermeasures, for enforcement of impaired or intoxicated driving laws, or reserved for activities eligible under the Highway Safety Improvement Program (HSIP), with the amount for each purpose to be determined by the State. The amounts transferred to the State's Section 402 program or reserved for HSIP-eligible uses may be derived from any combination of the NHPP and STBG apportionments at the State's option.
Use of Safety Belts 23 U.S.C. 153(h)	Each State must have a law that makes it unlawful to operate a passenger vehicle if any front seat occupant (other than a child secured in a child restraint system) is not properly wearing a seat belt. An alternate compliance criterion is provided for New Hampshire (§354, P.L. 107-87, Dec. 18, 2001).	Transfer of 2 percent of the State's apportionments for the NHPP, STBG, and HSIP to the section 402 safety program.
Repeat Offenders 23 U.S.C. 164	Each State must enact and enforce a law that provides that any individual convicted of a second or subsequent offense for driving under the influence or while intoxicated shall: (a) receive a suspension of all driving privileges for at least 1 year or a restriction on driving privileges that limits the individual to operating only motor vehicles with an ignition interlock device installed for at least 1 year, unless a special exception applies, or a restriction on driving privileges that	Reservation of an amount equivalent to 2.5 percent of the State's NHPP and STBG apportionments and associated obligation authority. Reserved amounts will be transferred to the State's Section 402 apportionment for use for alcohol-impaired driving countermeasures, for enforcement of impaired or intoxicated driving laws, or reserved for activities eligible under the HSIP, with the

TYPE/STATUTE	REQUIREMENT (as of the effective date of the FAST Act)	PENALTY FOR NONCOMPLIANCE (as of the effective date of the FAST Act)
	limits the individual to operating motor vehicles only if participating in, and complying with, a 24-7 sobriety program for at least 1 year or any combination thereof; (b) receive an assessment of the individual's degree of alcohol abuse and treatment as appropriate; and (c) receive at least an assignment of 30 days of community service or 5 days imprisonment (unless the State certifies that the general practice is that such an individual will be incarcerated) for a second offense and at least an assignment of 60 days of community service or 10 days imprisonment for a third or subsequent offense (unless the State certifies that the general practice is that such an individual will receive 10 days of incarceration). (Note: The FAST Act's changes to this requirement are effective as of October 1, 2016. The requirement remains as in effect under MAP-21 for FY 2016.)	amount for each purpose to be determined by the State. The amounts transferred to the State's section 402 program or reserved for HSIP-eligible uses may be derived from any combination of the NHPP and STBG apportionments at the State's option.
Operation of Motor Vehicle by Intoxicated Persons 23 U.S.C. 163	Each State must enact and enforce a law that provides that any person with a BAC of 0.08 grams of alcohol per100 milliliters of blood or greater while operating a motor vehicle to be driving while intoxicated.	Withholding of an amount equivalent to 6 percent of the State's NHPP and STBG apportionments. If a State enacts and is enforcing the prescribed law within 4 years from the date that funds were withheld, the State's apportionments will be increased by an amount equal to the amount withheld. Otherwise, the withheld funds will lapse.
	TRUCKS	
Vehicle Weight Limitations—Interstate System 23 U.S.C. 127(a)	Each State must permit a minimum and maximum of 20,000 pound single axle, 34,000 pound tandem axle, and 80,000 pound gross weight of combination (5-axles or more) vehicles to operate on the Interstate System. Maximum weight cannot exceed that allowable under bridge formula. Grandfather rights create State- specific exceptions to all limits.	Withholding of 50 percent of State's NHPP apportionment. If withheld funds are not restored during their availability period, they will lapse.
Enforcement of Vehicle Size and Weight Laws 23 U.S.C. 141(a) and (b)	Each State must certify that it is enforcing all State laws respecting maximum vehicle size and weights permitted on the Federal-aid primary system, the Federal-aid urban system, and the Federal-aid secondary system, including the Interstate System in accordance with 23 U.S.C. 127.	Withholding of 7 percent of the State's apportionments for NHPP, STBG, HSIP, Congestion Mitigation and Air Quality Improvement Program (CMAQ), National Highway Freight Program (NHFP), and Metropolitan Planning. Withheld apportionments are restored if enforcement is shown to be acceptable within 1 year; otherwise, the withheld funds are apportioned to all other eligible States.
Registration—Proof of Heavy Vehicle Use Tax Payment 23 U.S.C. 141(c)	Each State must require proof of payment of the Federal heavy vehicle use tax prior to registering a heavy vehicle subject to the use tax.	Withholding of up to 8 percent of the State's apportionments for the NHPP. The withheld funds are apportioned to other eligible States.
Commercial Driver's License 49 U.S.C. 31314	Each State must be in compliance with minimum Federal standards for licensing, reporting, and penalties related to the licensing of drivers of commercial vehicles.	Withholding of up to 4 percent of the State's apportionments for the NHPP and STBG for the first noncompliance and up to 8 percent thereafter. Funds withheld lapse immediately.

TYPE/STATUTE	REQUIREMENT (as of the effective date of the FAST Act)	PENALTY FOR NONCOMPLIANCE (as of the effective date of the FAST Act)
	MAINTENANCE	
Maintenance 23 U.S.C. 116	Each State must properly maintain or cause to be maintained any project constructed under the provisions of the Federal-aid Highway Program.	After notifying the State of lack of proper maintenance, and a period of 90 days in which to remedy the issue, the Secretary shall withhold project approvals for all types of projects in the State highway district, municipality, county, and other subdivisions of the State in which the project is located, or the entire State, as the Secretary deems appropriate.
	PLANNING, ENVIRONMENT, AND RIGHT-OF-WAY	
Control of Outdoor Advertising 23 U.S.C. 131	Each State must provide for effective control of outdoor advertising signs along the Interstate System, on the Primary System as it existed on June 1, 1991, and on any highway not on such system but on the National Highway System (NHS). Effective control means that a State must not allow outdoor advertising signs along certain routes unless the signs are from a permissible category.	Withholding of 10 percent of the State's apportionments for NHPP, STBG, HSIP, CMAQ, NHFP, and Metropolitan Planning. The funds withheld are apportioned to the other eligible States. The Secretary may suspend application of this penalty if deemed to be in the public interest.
Control of Junkyards 23 U.S.C. 136	Each State must provide for effective control of the establishment, use, and maintenance of junkyards adjacent to the NHS.	Withholding of 7 percent of the State's apportionments for NHPP, STBG, HSIP, CMAQ, NHFP, and Metropolitan Planning. The withheld funds are apportioned to other eligible States. The Secretary may suspend application of this penalty if deemed to be in the public interest.
Clean Air Act Compliance 42 U.S.C. 7509	Each State is subject to State Implementation Plan (SIP) related sanctions. Each State must submit and implement all provisions of a complete, adequate SIP that provides for attainment of air quality standards in accordance with intermediate and final deadlines specified in the Clean Air Act. Penalty applies for failure to submit a SIP, or other related provisions, Environmental Protection Agency (EPA) disapproval of a SIP, and for failure to implement the SIP.	Cessation of certain highway project approvals within the non-attainment area 2 years after the SIP deficiencies are not corrected. Some projects are exempt from highway sanctions (i.e., seven congressionally authorized activities that discourage single occupancy vehicles (SOV); safety projects whose principal purpose is to improve safety by significantly reducing or avoiding accidents; and projects which EPA finds will improve air quality and not encourage SOV).
Transportation Conformity 42 U.S.C. 7506(c)	No transportation plan, program, or project may be approved, accepted, or funded unless it has been found to conform to an applicable SIP by the metropolitan planning organization and the DOT. The Clean Air Act requires USDOT to make a conformity finding on the metropolitan transportation plan and TIP and a project level conformity finding on FHWA/FTA projects within a nonattainment or maintenance area, based on technical analysis using transportation, emissions, and air quality models.	Lack of a conformity determination (a conformity lapse) on an area's transportation plan or transportation improvement program (TIP) will prevent the expenditure of FHWA and FTA funds on many activities, with the exception of certain exempt categories. The consequences of a conformity lapse would apply to the entire nonattainment or maintenance area.
Metropolitan Planning 23 U.S.C. 134(k)(5)	Each metropolitan planning organization (MPO) in a transportation management area must be certified at least every 4 years by the Secretary of Transportation to be carrying out the required planning process in accordance with applicable provisions of Federal law.	The Secretary may withhold up to 20 percent of the State's apportionments attributable to the metropolitan planning area of the MPO for projects funded under Title 23 and Chapter 53 of Title 49, U.S.C. Funds are restored when the Secretary certifies the MPO.

TYPE/STATUTE	REQUIREMENT (as of the effective date of the FAST Act)	PENALTY FOR NONCOMPLIANCE (as of the effective date of the FAST Act)
	PERFORMANCE AND ACCOUNTABILITY	
Interstate System Pavement Minimum Condition 23 U.S.C. 119(f)(1)	Interstate pavement condition, excluding bridges on the Interstate system, in each State must meet or exceed the minimum level of condition established by the Secretary by regulation.	If a State reports that Interstate pavement conditions (not including on Interstate bridges) falls below the minimum, the State must, at a minimum, devote the following resources to improve Interstate pavement conditions during the following fiscal year (and each year thereafter if the condition does not exceed the minimum): (1) NHPP funds in an amount not less than the State's FY 2009 Interstate Maintenance (IM) apportionment, to increase by 2% per year for each year after FY 2013; and (2) funds transferred from STBG (other than suballocated amounts) to NHPP in an amount equal to 10% of the State's FY 2009 IM apportionment.
NHS Bridge Minimum Condition 23 U.S.C. 119(f)(2)	Not more than 10 percent of the NHS bridge deck area in each State may be on structurally deficient bridges.	Set-aside from the State's NHPP funds of an amount equal to 50 percent of the State's Highway Bridge Program apportionment in FY 2009; set-aside amount to be used only for eligible projects on NHS bridges.
NHPP Target Achievement 23 U.S.C. 119(e)(7)	Each State must achieve or make significant progress toward achieving its performance targets for the performance measures established by DOT for the NHS.	If a State fails to achieve or make significant progress toward these targets, it must describe in its next performance report to DOT the actions it will undertake to achieve its targets.
Rural Road Safety 23 U.S.C. 148(g)(1)	Each State must maintain or improve the fatality rate on rural roads.	If the traffic fatality rate on rural roads in a State increases over the most recent two-year period for which data are available, in the next fiscal year the State must obligate for projects on high risk rural roads an amount equal to at least 200 percent of the amount of funds that the State received for high risk rural roads in FY 2009.
Older Driver Safety 23 U.S.C. 148(g)(2)	Each State must maintain or improve the number of fatalities and serious injuries per capita for drivers and pedestrians over the age of 65	If the number of traffic fatalities and serious injuries per capita for drivers and pedestrians over 65 in a State increases during the most recent two-year period for which data are available, the State must include, in the subsequent Strategic Highway Safety Plan of the State, strategies to address the increases in those rates, taking into account the recommendations in the FHWA's Highway Design Handbook for Older Drivers and Pedestrians.
HSIP Target Achievement 23 U.S.C. 148(i)	Each State must achieve or make significant progress toward achieving its performance targets for the performance measures established by DOT for the HSIP.	If a State fails to achieve or make significant progress toward these targets it must: 1) annually submit an implementation plan as described under the HSIP; and 2) use a portion of its obligation authority only for HSIP projects. The dedicated amount must be equal to the State's apportionment for the HSIP program in the prior year. The requirements continue until the Secretary determines that the State is meeting its targets or making significant progress.

Annexure-B
Accident Data Collection Formats

ANALYSIS REPORT OF ROAD TRAFFIC ACCIDENTS INVOLVING PHYSICAL INJURY

IDENTIFIER

UNIT CODE	REPORT No.	PAGE No.	CREATED BY
3 – 9	10 – 14	15	17

1 - National Gendarmerie
2 - prefecture of Police, Paris
3 - C.R.B.
4 - P.A.F.
5 - Public security

1 – CHARACTERISTICS

LIGHT
Daylight -1
Twilight or dawn -2
Night without public lighting -3
Night with public lighting... turned off -4
turned on -5

LOCATION
Outside built-up area -1
In built-up area -2

INTERSECTION
1- Outside of intersection
In intersection or immediate vicinity
2- in X
3- in T
4- in Y
5- with more than four roads
6- Roundabout
7- Square
8- Level crossing
9- Other

WEATHER CONDITIONS
Normal -1
Light rain -2
Heavy rain -3
Snow-hail -4
Fog-smoke -5
Strong wind-storm -6
Blinding sun -7
Overcast -8
Other -9

TYPE OF COLLISION
Accident involving:
- two vehicles
1- Head on collisions
2- rear
3- side
- three vehicles and more
4- in series
5- multiple collisions
6- other collision
7- without collision

Evening before bank holiday
Bank holiday

GPS CODE
Indicator of origin
Latitude
Longitude
65 66 – 79 80

DATE			TIME		INSEE CODE PLACE OF ACCIDENT	
Day	Month	Year	Hour	Minute	Departement	Commune
18 – 20	20 – 22	22 – 25	25 – 27	29	30 – 33	33 – 36

37 – 38 | 39 | Postal address- state the road number, category and name | 40 – 63

2 – LOCATIONS

HIGHWAY CODE – CATEGORY
1- Motorway
2- Trunk road
3- County road
4- Communal road
5- Outside public network
6- Car park open to public traffic
9- Others

TRAFFIC SYSTEM ROAD:
One-way -1
Single carriageway -2
dual carriageway -3
With variable lane allocation -4

ROAD
Index letter A
Bis - 2 B
Ter - 3 C
etc ...
Number or finato

Total number of traffic lanes

SPECIAL PATHS
1- Cycling path
2- Cycling lane
3- Designated lane

LONGITUDINAL PROFILE
1- Flat
2- Slope
3- Summit of hill
4- Bottom of hill

HORIZONTAL ALIGNMENT
(direction of 1st vehicle described)
Rectilinear part - 1
In the curve to the left - 2
In the curve to the right - 3
In S- 4

KM OR REFERENCE POINT
(take one's bearings via the following point)
No. of point | Metres

WIDTH
(in metres)
Central reserve | Reservation outside centres

ROAD SURFACE
1- Normal
2- Wet
3- Puddles
4- Flooded
5- Snow
6- Mud
7- Icy
8- Greasy - oil
9- Other

INFRASTRUCTURE MANAGEMENT
1- Underground _tunnel
2- Bridge - flyover
3 - Interchange or link road
4 - Railway track
5 – Engineered intersection
6 - Pedestrian zone
7 - Toll zone

ACCIDENT LOCATION
1- On carriageway
2- On hard shoulder
3- On shoulder
4- On pavement
5- On cycle path

SCHOOLS
1- Near a school
2- Not near a school

HIGHWAY CODE	ROAD	Total number of traffic lanes	SPECIAL PATHS	LONGITUDINAL PROFILE	HORIZONTAL ALIGNMENT	KM OR REFERENCE POINT	WIDTH	ROAD SURFACE	INFRASTRUCTURE MANAGEMENT	ACCIDENT LOCATION	SCHOOLS
18 – 19	20 – 25	26 – 27	28 – 31	32	33	33 – 41	43 , – 46 ,	49	50	51	56 – 57

3 – VEHICLES

01- Bicycles
02- Mopeds + 30 - scooter <50 cm³
03- Vans, tricycle
31- Motorcycle >50 <125 cm³
32- Scooter >50 <125 cm³
33- Motorcycle >125 cm³
34- Scooter >125 cm³
07- Light vehicle alone
10- Vehicule alone (1.5t <tgw <3.5t)
13- HGV alone (3.5t <tgw <7.5t)

ADMINISTRATIVE CATEGORY
14- HGV alone (tgw >7.5t)
15- HGV + trailer
16- Tractor unit alone
17- Tractor unit + semitrailer
37- Bus 35-Quad <= 50cm³
38- Coach 36-Quad < 50cm³
39- Train
40- Tram
20- Special vehicle
21- Agricultural tractor
99- Other

INFRASTRUCTURE
1- Driver
2- Stolen vehicle
3- Consenting owner
4- Administration
5- Business

SPECIAL VEHICLES
1- Taxi
2- Ambulance
3- Fire engine
4- Police Forces
5- School bus
6- Hazardous goods
9- Other

FACTOR LINKED TO THE VEHICLE = FACV
1- Mechanical defect
2- Lighting - signing
3- Tyres worn
4- Tyre burst
5- Load
6- Movement of vehicle
7- Fire of vehicle
9- Other

INSURANCE
1- Yes
2- No
3- Not produced

FIXED OBJECT HIT
01- Stationary vehicle
02- Tree
03- Metal safety fence
04- Concrete safety fence
05- Other safety fence
06- Building, wall, bridge pile
07- Vertical signal support or emergency telephone
08- Post
09- Street furniture
10- Parapet
11- Traffic Island, refuge, bollard
12- Side of the pavement
13- Ditch, rubble, rock wall
14- Other fixed object on carridgeway
15- Other fixed object on the pavement or the shoulder
16- Exit from carridgeway with no obstacle

MOBILE OBJECT HIT
1- Pedestrian
2- Vehicle
4- Vehicle on rails
5- Domestic animal
6- Wild animal
9- Other

POINT OF INITIAL IMPACT
1- Front
2- Front right
3- Front left
4- Rear
5- Rear right
6- Rear left
7- Side right
8- Side left
9- Multiple impacts (overturning)

MAIN MOVEMENTS BEFORE THE ACCIDENT

DRIVING
01- Without changing direction
02- Same direction same queue
03- Between 2 lanes
04- In reverse
05- The wrong way
06- By encroaching on the central reserve
07- In the bus lane – in the same direction
08- In the bus lane – in the opposite direction
09- By joining traffic
10- By turning round on the carriageway

CHANGING LANE 11- to the left 12- to the right
MOVING 13- to the left 14- to the right
TURNING 15- to the left 16- to the right
PASSING 17- to the left 18- to the right

19-Crossing the carriageway
20-Parking manoeuvre
21-Avoiding manoeuvre
22-Opening door
23-Stopping (apart from parking)
24-Parking (with occupants)

NUMBER OF PAX IN PSV

CONVENTIONAL LETTER
HIGHWAY CODE
1- Runaway vehicle
2- Runaway driver
DIRECTION OF TRAFFIC
1- increasing marker posts
2- decreasing marker posts

REGISTRATION
Within dept. Or national

DATE of first registration
Month | Year

CNIT Code: copy the "type"entered in the vehicle's logbook.

CONVENTIONAL LETTER	HIGHWAY CODE	DIRECTION OF TRAFFIC	REGISTRATION	DATE of first registration	ADMINISTRATIVE CATEGORY	INFRASTRUCTURE	SPECIAL VEHICLES	FACTOR LINKED TO THE VEHICLE = FACV	INSURANCE	FIXED OBJECT HIT	MOBILE OBJECT HIT	POINT OF INITIAL IMPACT	MAIN MOVEMENTS BEFORE THE ACCIDENT	NUMBER OF PAX IN PSV
18	19 – 20	21	22 – 24	27 – 29	43 – 44	45 – 47		48		50 – 51		52 – 61 – 75		54 – 56

3 – USERS

CONVENTIONAL LETTER

PLACE IN THE VEHICLE
2- wheels: ② ① ③
4- wheels:

4	7	1
5	8	6
3	9	2

1- Presumed responsibility

CATEGORY
1- Driver
2- Passenger
3- Pedestrian
4- Pedestrian on roller skates or scooter

SERIOUSNESS
1- Unhurt
2- Killed (30 days)
3- Injured + hosp.
4- Slightly injured

SOCIO-PROFESSIONAL CATEGORY
1- Professional driver
2- Farmer
3- Artisan, trader, independent professional
4- Senior management, liberal
5- Middle management, employee A-Student
6- Worker
7- Retired professions, business owner
8- Unemployed
9- Other

1- Male
2- Female
GENDER

RESIDENCE (county or country)

BIRTH Month | Year

ALCOHOL TEST
Impossible -1
Refused -2
Blood sample -3
Ethylometer -4
Result unknown -5
Test negative -6

FACTOR LINKED TO THE USER
1- Discomfort-fatigue
2- Medicines-drugs
3- Disability
4- Attention distracted
5. Clear intoxication

DRIVING LICENCE
1- Valid
2- Expired
3- Banned
4- Driving in driving school
5- Category not valid
6- No licence
7- Accompanied driving

LEVEL OF ALCOHOL

DATE OF OBTAINING LICENCE
Month | Year

JOURNEY
1- commuting (to/from work)
2- commuting (to/from school)
3- Errands-purchases
4- Use- professional
5- Recreation-leisure
9- Other

NATINF OFFENCE
1st offence | 2nd offence

SAFETY EQUIPMENT

AVAILABILITY
Safety belt -1
Helmet -2
Child seat -3
Reflective equipment -4
Other -9

USE
1- Yes
2- No
3- Non de

POSITION OF PEDESTRIAN ON THE ROAD
1- At + 50 m from the pedestrian crossing
2- At- 50 m from the pedestrian crossing

ON THE PEDESTRIAN CROSSING
3- Without light signals
4- With light signals

VARIOUS
5- On the pavement
6- On shoulder or hard shoulder
7- On refuge
8- On side lane

ACTION
MOVING
1- Dir. of veh hit
2- Rev. dir. of veh
Various
3- Crossing
4- Masked
5- Playing, running
6- With animal
9- Others

1- Only
2- Accompanied
3- In a group

DRUG TEST
1- Not done
2- Impossible
3- Refused
4- Positive for at least 1 substance
5- Negative for all substances
6- Result not known (blood)

Testing | Blood

CONVENTIONAL LETTER	PLACE IN THE VEHICLE	CATEGORY	SERIOUSNESS	SOCIO-PROFESSIONAL CATEGORY	GENDER	RESIDENCE	BIRTH	FACTOR LINKED TO THE USER	ALCOHOL TEST	LEVEL OF ALCOHOL	DRIVING LICENCE	DATE OF OBTAINING LICENCE	JOURNEY	NATINF OFFENCE	SAFETY EQUIPMENT	POSITION OF PEDESTRIAN ON THE ROAD	ACTION	DRUG TEST
18 – 20		21 – 22	29	30 – 34	37	39		43	44 – 45	48 – 49	51	53 – 54		59 – 64 – 65		66	67 – 68	73 – 74

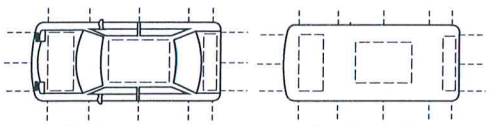
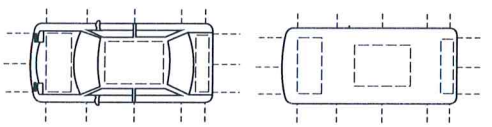
DR 2447A (11/17/05)
COLORADO DEPARTMENT OF REVENUE

MAIL TO: STATE OF COLORADO
MOTOR VEHICLE
TRAFFIC RECORDS
DENVER, CO 80261-0016

STATE OF COLORADO TRAFFIC ACCIDENT REPORT

1☐ AMENDED/SUPPL. 2☐ UNDER $1,000 3☐ COUNTER REPORT 4☐ PRIVATE PROPERTY

PAGE 5 OF _____ PAGES

CDOT Code 6	☐ INTERSTATE HWY ☐ STATE HWY ☐ CITY ST/CNTY RD 8	HWY NUMBER ☐☐☐ MILEPOINT ☐☐☐.☐☐	DOR Code 9										
Case # 7													
Date of Accident 10	City 11		Agency 12			County 13						County # 14	
Time (24 Hr.) 15	Officer Number 16	Officer Name 17			Signature 18							Detail 19	
Number Killed 20	Number Injured 21	Location Route, Street, Road _____ Miles _____ Feet N☐ S☐ E☐ W☐ OF:											
Date of Report 22	23	☐ At: _____ Latitude _____ Longitude _____											
Agency Code 24	Investigated @ Scene 25 ☐	Total Vehicles 26	District Number 27	Public Property/ Employee 28 ☐	Photos Taken ☐ 29	Railroad Crossing Related ☐ 30	Const. Zone Related ☐ 31	Highway Interchg. 32 ☐	Bridge Related 33 ☐				
Traffic Unit # 1 or 34 ☐ Veh. ☐ Parked ☐ Bicycle ☐ Pedestrian ☐ Non-Vehicle ☐ Non-Contact Veh.										**Traffic Unit # 2 or 34a** ☐ Veh. ☐ Parked ☐ Bicycle ☐ Pedestrian ☐ Non-Vehicle ☐ Non-Contact Veh.			
Last Name 35	First	MI								Last Name	First	MI	
Street Address 36			Personal Phone ( ) 38							Street Address			Personal Phone ( )
City 37	State	ZIP	Bus. Phone ( ) 39							City	State	ZIP	Bus. Phone ( )
Driver License Number 40	CDL 41	State 42	Sex 43	DOB 44						Driver License Number	CDL	State	Sex DOB
Primary Violation ☐ DUI 45										Primary Violation ☐ DUI			
Violation Code 46	Citation Number 47		Common Code 48							Violation Code	Citation Number		Common Code
Year 49	Make 50	Model 51	Body Type 52							Year Make	Model		Body Type
License Plate Number 53	State or Country 54		Color 55							License Plate Number	State or Country		Color
Vehicle Identification Number 56										Vehicle Identification Number			
Vehicle Owner Last Name ☐ Same 57	First	MI								Vehicle Owner Last Name ☐ Same	First	MI	
Address ☐ Same 58	City	State	ZIP							Address ☐ Same	City	State	ZIP
Towed Due to Damage ☐ By: To: 59										Towed Due to Damage ☐ By: To:			
Trailer VIN# _____ 60  _____ Undercarriage _____ Undercarriage 1- Slight 2- Moderate 3- Severe										Trailer VIN# _____  _____ Undercarriage _____ Undercarriage 1- Slight 2- Moderate 3- Severe			
Insurance Company ☐ None ☐ No Proof 61	Exp. Date 62									Insurance Company ☐ None ☐ No Proof	Exp. Date		
Policy Number 63										Policy Number			
Owner Damaged Prop. Last Name 64	First	MI								Address 65	City	State	ZIP
Owner Damaged Prop. Last Name	First	MI								Address	City	State	ZIP

T.U. #	POS.	REST.	ENDO	SAFETY EQUIP.	AIR BAG	EJECT	SUSPECTED ALCO	SUSPECTED DRUG	INJ. SEV.	AGE	SEX	NAME / ADDRESS
68	69	70	71	72 - 74	75	76	77	78	79	80	81	82	83

Approved By	I.D. #	Date

Case # 7a	DOR CODE 9a	Accident Date 10a	Agency 12a

Describe Accident

66

67

T.U. #	Carrier Name	US DOT ☐ ICC ☐ State DOT ☐
	Address 84	Carrier Identification # 85
T.U. #	Carrier Name	US DOT ☐ ICC ☐ State DOT ☐
	Address	Carrier Identification #

TRAFFIC ACCIDENT REPORT

OVERLAY A

A. LOCATION

01. On Roadway
02. Ran Off Left Side
03. Ran Off Right Side
04. Ran Off 'T' Intersection
05. Vehicle Crossed Center Median Into Opposing Lanes
06. On Private Property

B. HARMFUL EVENT SEQUENCE

NON-COLLISION ACCIDENT
01. Overturning
02. Other Non-Collision

COLLISION WITH PEDESTRIAN
03. School Age To / From School
04. Pedestrian on Toy Motorized Veh.
05. All Other Peds

COLLISION WITH MOTOR VEHICLE IN TRANSPORT
06. Front to Front
07. Front to Rear
08. Front to Side
09. Rear to Side
10. Rear to Rear
11. Side to Side-Same Direction
12. Side to Side-Opposite Direction

COLLISION WITH OTHER VEHICLE
13. Parked Motor Vehicle
14. Railway Vehicle/Light Rail
15. Bicycle
16. Road Maintenance Equipment

COLLISION WITH ANIMAL
17. Domestic Animal
18. Wild Animal

COLLISION WITH OBJECT
19. Light Pole / Utility Pole
20. Traffic Signal Pole
21. Sign
22. Guard Rail
23. Cable Rail
24. Concrete Highway Barrier
25. Bridge Structure
26. Vehicle Debris or Cargo
27. Culvert or Headwall
28. Embankment
29. Curb
30. Delineator Post
31. Fence
32. Tree
33. Large Rocks or Boulder
34. Railroad Crossing Equipment
35. Barricade
36. Wall or Building
37. Crash Cushion / Traffic Barrel
38. Mailbox
39. Other Fixed Object (Specify in Narrative)
40. Other Object (Specify in Narrative)

1st
2nd
MOST

C. APPROACH/OVERTAKING TURN

01. Approach Turn
02. Overtaking Turn
03. Not Applicable

D. ROAD DESCRIPTION

01. At Intersection
02. Driveway Access Related
03. Intersection Related
04. Non-Intersection
05. Alley Related
06. Roundabout
07. Highway Interchange
08. Parking Lot

E. ROAD CONTOUR

01. Straight On-Level
02. Straight On-Grade
03. Curve On-Level
04. Curve On-Grade
05. Hillcrest

F. ROAD SURFACE

01. Concrete
02. Blacktop
03. Brick or Block
04. Gravel, Slag or Stone
05. Dirt
06. Other (Describe in Narrative)
07. Unknown

G. ROAD CONDITION

01. Dry
02. Wet
03. Muddy
04. Snowy
05. Icy
06. Slushy
07. Foreign Material
08. Dry W/Visible Icy Road Treatment
09. Wet W/Visible Icy Road Treatment
10. Snowy W/Visible Icy Road Treatment
11. Icy W/Visible Icy Road Treatment
12. Slushy W/Visible Icy Road Treatment

H. LIGHTING CONDITION

01. Daylight
02. Dawn or Dusk
03. Dark - Lighted
04. Dark - Unlighted

J. ADVERSE WEATHER CONDITION

00. None
01. Rain
02. Snow / Sleet / Hail
03. Fog
04. Dust
05. Wind

K. VEHICLE / VEHICLE COMBINATION

FMC (Overlay C) Required
01. Vehicle / Vehicle Combination (10,001 lbs. and over)
02. School Bus (all school buses)
03. Non-school Bus (9 occupants or more including driver) in commerce
04. Transit Bus

GVWR 10,000 lbs. or Less
05. Passenger Car / Passenger Van
06. Passenger Car / Passenger Van W/ Trailer
07. Pickup Truck / Utility Van
08. Pickup Truck / Utility Van W/Trailer
09. SUV
10. SUV W/Trailer
11. Motor Home
12. Motorcycle
13. Bicycle
14. Motorized Bicycle
15. Farm Equipment
16. Hit & Run Unknown
17. Light Rail
18. Other (Describe in Narrative)

L. DIRECTION OF TRAVEL – PRIOR TO IMPACT

01. North
02. Northeast
03. East
04. Southeast
05. South
06. Southwest
07. West
08. Northwest

M. VEHICLE MOVEMENT – PRIOR TO IMPACT

01. Going Straight
02. Slowing
03. Stopped in Traffic
04. Making Right Turn
05. Making Left Turn
06. Making U-Turn
07. Passing
08. Backing
09. Entering / Leaving Parked Position
10. Parked
11. Changing Lanes
12. Avoiding Object in Roadway
13. Weaving
14. Spun Out of Control
15. Drove Wrong Way
16. Other (Describe in Narrative)

N. ROADWAY SPEED LIMIT - Vehicles Only

Traffic Unit #1 or _____

Traffic Unit #2 or _____

P. ESTIMATED VEHICLE SPEED - Vehicles Only

Traffic Unit #1 or _____

Traffic Unit #2 or _____

Q. DRIVER ACTIONS (Officer Opinion Only)

00. No Action
01. Exceeded Safe/ Posted Speed
02. Impeded Traffic
03. Failed to Yield ROW
04. Disregard Stop Sign
05. Failed to Stop at Signal
06. Disregarded Other Device
07. Improper Turn
08. Turned from Wrong Lane or Position
09. Other Improper Turns
10. Lane Violation
11. Improper Passing on Left
12. Improper Passing on Right
13. Followed Too Closely
14. Improper Backing
15. Signaling Violation
16. Reckless Driving
17. Careless Driving (if used, block R can not be coded "00")

R. DRIVER - MOST APPARENT HUMAN CONTRIBUTING FACTOR (Officer Opinion Only)

00. No Apparent Contributing Factor
01. Asleep at the Wheel
02. Driver Fatigue
03. Illness / Medical
04. Driver Inexperience
05. Aggressive Driving
06. Driver Unfamiliar With Area
07. Driver Emotionally Upset
08. Evading Law Enforcement Officer
09. Physical Disability
10. DUI, DWAI, DUID
11. Distracted / Passenger
12. Distracted / Cell Phone
13. Distracted / Radio
14. Distracted / Other i.e. Food, Objects, Pet, etc.
15. Other Factor (Describe in Narrative)

S. BY PEDESTRIAN ACTION (Officer Opinion Only)

01. Cross Against Signal
02. Cross / Enter at Intersection
03. Cross / Enter NOT at Intersection
04. Standing in Roadway
05. Playing in Roadway
06. Soliciting Rides
07. Walking in Roadway in Direction of Traffic
08. Walking in Roadway Against Direction of Traffic
09. Entering / Exiting Vehicle
10. Pushing / Working on Vehicle
11. Lying in Roadway
12. Other (Describe in Narrative)

T. VEHICLE DEFECT / CONDITION (Officer Opinion Only)

00. No Vehicle Defects
01. Defective Head Light(s)
02. Defective Brake/Tail Light(s)
03. Defective Signaling Device
04. Brakes Defective/Out of Adjustment
05. Defective Tires
06. Sudden Tire Failure
07. Improper Tires for Conditions
08. Mechanical Failure
09. Obstructed Window(s)
10. Improper Load
11. Spilled Load – Commercial Aggregate
12. Spilled Load – Commercial Non- Aggregate
13. Spilled Load – Other
14. Parking Violation
15. Other Defect(s) (Describe in Narrative)

COLORADO INVESTIGATOR'S FATAL TRAFFIC ACCIDENT SUPPLEMENTAL REPORT

Case # 2	DOR CODE 3	Accident Date 4	Agency 5

EMERGENCY MEDICAL SERVICES

(Record all time using 24 Hr. time)

Time Notified 6	Time Arrived @ Scene	Time Arrived @ Hospital

If times are unknown provide name of responding services

TRAFFICWAY FLOW — 7

01. Not Divided (Two Way)
02. Divided, Median W/O Barrier
03. Divided, Median W/Barrier
04. One Way

NUMBER OF TRAVEL LANES — 8

If the accident is totally contained on half of a divided highway (physical barrier not painted median), only count the number of travel lanes on that half.

ACCIDENT AVOIDANCE MANEUVER — 10

00. No Avoidance Maneuver
01. Braking (Skid marks evident)
02. Braking (Per driver, no skid marks evident)
03. Braking (Per witness, no skid marks evident)
04. Steering (Evidence or stated)
05. Steering & Braking (Evidence or stated)
06. Other Avoidance Maneuver

Traffic Unit #1 or ___ | Traffic Unit #2 or ___ | Traffic Unit #3 or ___ | Traffic Unit #4 or ___

FIRE/HAZARDOUS MATERIALS INVOLVEMENT — 11

00. No Fire/No Haz-Mat Cargo
01. No Fire/Haz-Mat Cargo Not Involved
02. No Fire/Haz-Mat Incident
03. Vehicle Fire/No Haz-Mat Cargo
04. Vehicle Fire/Haz-Mat Cargo Not Involved
05. Vehicle Fire/Haz-Mat Incident

Traffic Unit #1 or ___ | Traffic Unit #2 or ___ | Traffic Unit #3 or ___ | Traffic Unit #4 or ___

TRAFFIC CONTROL DEVICE FUNCTIONING — 9

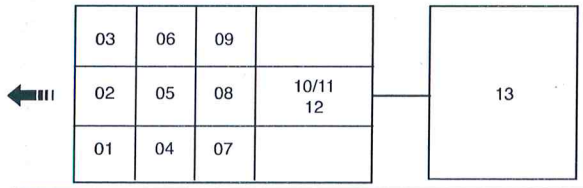
01. No Controls
02. Not Functioning
03. Functioning Improperly
04. Functioning Properly
05. Unknown

List the Most Significant Types of Traffic Control Devices

MUST BE COMPLETED FOR ALL PERSONS INVOLVED EXCEPT UNINJURED BUS/RAILWAY PASSENGERS.

(A) Traffic Unit Number (list Traffic Unit Number as on DR 2447)

(B) Position in Vehicle — 14



01. Driver
02-09. Passengers
10. Other **ENCLOSED** passenger/cargo area
11. Other **UN-ENCLOSED** passenger/cargo area
12. Sleeper Section of Truck
13. Trailer
14. Riding/Hanging on to Exterior of Vehicle or Trailer
15. Pedestrian

(C) Ejection Path 00. Not Ejected/ Not applicable; 01. Through Side Door Opening; 02. Through Side Window; 03. Through Windshield; 04. Through Back Window; 05. Through Back Door/Tailgate Opening; 06. Through Roof Opening (sun roof/convertible top down); 07. Through Roof (convertible top up); 08. Other Path (e.g. back of pickup truck); 09. Unknown

(D) Alcohol Suspected (Officer Opinion Only) — Yes > 01. Preliminary Breath Test; 02. SFST; 03. Observed; 04. Passive Alcohol Sensor; 05. Other method — No > 06. Preliminary Breath Test; 07. SFST; 08. Observed; 09. Passive Alcohol Sensor; 10. Other method

(E) Tested for Alcohol 00. Not Tested; 01. Blood; 02. Breath; 03. Urine; 04. Other; 05. Refusal; 06. By Coroner

(F) Other Drug/Impairment Suspected (Officer Opinion Only) — Yes > 01. Drug Recognition Expert; 02. SFST; 03. Observed; 04. Other — No > 05. Drug Recognition Expert; 06. SFST; 07. Observed; 08. Other Method

(G) Tested for Other Drugs 00. Not Tested; 01. Blood; 02. Breath; 03. Urine; 04. Other; 05. Refusal; 06. By Coroner

(H) Dead at Scene 00. No; 01. Yes

									Name	Taken to	Expired Date	Expired Time

Accident Report

Does **not** constitute an admission of liability, just a statement of identity and the circumstances.

Accidentsketch.com

1 Date of accident . _____ Time . _____

2 Locality · Country · Place . _____

3 Injuries even if slight — no ☐ yes ☐

4 Material damage — other than to vehicles A and B: no ☐ yes ☐ | objects other than vehicles: no ☐ yes ☐

5 Witnesses: names, addresses, tel. . _____

Vehicle A

6 Insured/policyholder* (* see insurance certificate)

Surname . _____
First name . _____
Address . _____
Postcode . _____ Country . _____
Tel. or e-mail . _____

7 Vehicle

Motor:	Trailer:
Make, type . _____	
Registration No. . _____	Registration No. . _____
Country of registration . _____	Country of registration . _____

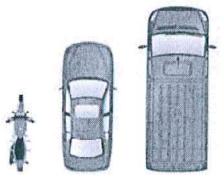
8 Insurance company (see insurance certificate)

Surname _____
Policy No. . _____
Green Card No. . _____
Insurance Certificate or Green Card valid from . _____ to . _____
Agency (or bureau, or broker) . _____
Address . _____
Country . _____
Tel. or e-mail . _____
Does the policy cover material damage to the vehicle? no ☐ yes ☐

9 Driver (see driving licence)

Surname . _____
First name . _____
Date of birth . _____
Address . _____
Country . _____
Tel. or email . _____
Driving licence No. . _____
Category (A, B, ...) . _____
Driving licence valid until: . _____

10 Indicate the point of initial impact **to vehicle A** by an arrow →



11 Visible damage to vehicle A: . _____

Circumstances

12 Put a cross in each of the relevant boxes to help explain the drawing -* delete where appropriate:

A	What happened?	B
1	* parked / stopped	1
2	* leaving a parking space / opening a vehicle door	2
3	entering a parking space	3
4	*emerging from a parking space, from private premises, from a track	4
5	*entering a parking space, private premises, a track	5
6	entering a roundabout	6
7	circulating a roundabout	7
8	striking the rear of the other vehicle in the same line of traffic and travelling in the same direction	8
9	going in the same direction but in a different line of traffic	9
10	changing lines of traffic	10
11	overtaking	11
12	turning to the right	12
13	turning to the left	13
14	reversing	14
15	changing to a lane reserved for traffic in the opposite direction	15
16	coming from the right (at a junction)	16
17	had not observed a priority sign or a red light	17

☐ ← State the number of boxes marked with a cross → ☐

13 Sketch of accident when impact occurred

Complete your sketch later: www.AccidentSketch.com

Indicate **1.** the layout of the road **2.** by arrows the direction of the vehicles A, B **3.** their position at the time of impact **4.** the road signs **5.** names of the streets or roads

Your Sketch of the accident:

Vehicle B

6 Insured/policyholder* (* see insurance certificate)

Surname . _____
First name . _____
Address . _____
Postcode . _____ Country . _____
Tel. or e-mail . _____

7 Vehicle

Motor:	Trailer:
Make, type . _____	
Registration No. . _____	Registration No. . _____
Country of registration . _____	Country of registration . _____

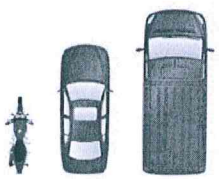
8 Insurance company (see insurance certificate)

Surname _____
Policy No. . _____
Green Card No. . _____
Insurance Certificate or Green Card valid from . _____ to . _____
Agency (or bureau, or broker) . _____
Address . _____
Country . _____
Tel. or e-mail . _____
Does the policy cover material damage to the vehicle? no ☐ yes ☐

9 Driver (see driving licence)

Surname . _____
First name . _____
Date of birth . _____
Address . _____
Country . _____
Tel. or email . _____
Driving licence No. . _____
Category (A, B, ...) . _____
Driving licence valid until: . _____

10 Indicate the point of initial impact **to vehicle B** by an arrow →



11 Visible damage to vehicle B: . _____

14 My remarks: . _____

15 Signatures of the drivers

A B

14 My remarks: . _____

Auto Accident Report Form

Keep In Your Glove Box

When an accident occurs:

First Steps	Do Not Say	While Still At the Scene
• Remain calm • Get to a safe place • Check for injuries • Administer First Aid • Call police/EMT	• It's all my fault, (even if it is). • My insurance will pay for everything. • It's OK, I have full coverage.	• Get as much information as possible on this report. • Take Pictures • When the police come, cooperate and tell them what you know.

Driver Information

Name		Phone	
Address			

Your Vehicle Information

Vehicle Make/Model		Vehicle Color	
License Plate Number		Vehicle Year	

Accident Details

Day/Date/Time AM/PM	
Weather/Road Conditions	
Location of Accident	
Accident Details	

Damage Descriptions

Your Vehicle	Other Vehicle
Towing Company Name & Phone	Towing Company Name & Phone

Other Driver/Vehicle Information

Owner's Name:	
Owner's Address:	
Owner's Phone:	
Vehicle Make:	
Vehicle Model & Year:	
Vehicle Color:	
License Plate Number	
Insurance Company:	
Agent Name & Phone:	
Other Drivers Name:	
Other Drivers Address:	
Other Drivers Phone:	

Passengers/Injuries:

Your Vehicle	Other Vehicle
# Passengers:	# Passengers:

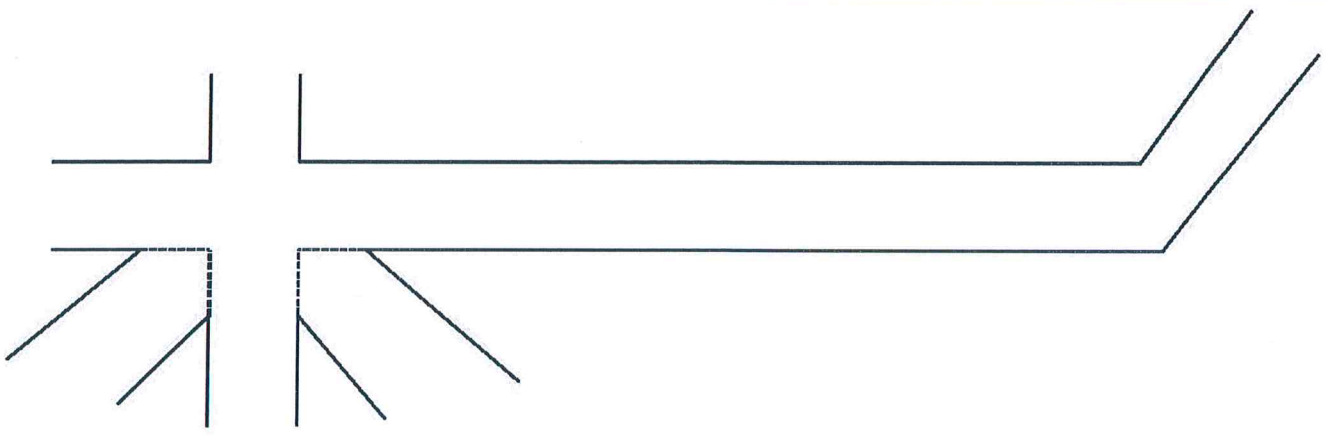
Police Information

Officer Name:	
Department:	
Phone:	
Badge Number:	
Other Info:	

Witness Information

Name:		Name:	
Address:		Address:	
Home Phone:		Home Phone:	
Work Phone:		Work Phone:	

Sketch The Accident Scene:



Report all accidents immediately to:

Office of Risk Management
Phone: 215-895-2149
Fax: 215-571-4518

FORM
S.F. 137
RMD EF 02/12

STATE OF WASHINGTON

VEHICLE ACCIDENT REPORT

Date of Accident (MM/DD/YYYY)	
Time	☐ AM ☐ PM

INSTRUCTIONS: This report must be mailed* within two working days to the following offices:

① Department of Enterprise Services
Office of Risk Management
1500 Jefferson Street SE /POB 41466
Olympia, Washington 98504-1466

② Safety/Risk Management
Office of Reporting Agency

*Scanned form can be e-mailed to desmiriskmanagement@des.wa.gov

STATE EMPLOYEE

DRIVER

Name	Age	Employing Agency	Position

Business Address	Zip	Business Phone	Email	Was vehicle being used on Official State Business ☐ Yes ☐ No

Operator's License No.	License Restrictions ☐ Yes ☐ No	If Yes, Indicate	Have you had a previous accident while driving on state business? ☐ Yes ☐ No

VEHICLE NO. 1

License No.	Year	Make	Body Type	Where Located	No. of Passengers	Est. Repair Cost

Owning Agency	Describe Damages Fully (Parts, type, and extent of damage)

If Privately Owned, Name and Address of Owner (If State Owned, Equipment No. Only)	Insurer

OTHER VEHICLES

Owner Car No. 2	Phone	Owner Car No. 3	Phone

Address	City	Zip	Address	City	Zip

Driver	Age	Phone	Driver	Age	Phone

Address	City	Zip	Address	City	Zip

Driver's License No.	Vehicle License No.	Driver's License No.	Vehicle License No.

Vehicle Make	Year	Body Type	Vehicle Make	Year	Body Type

Name of Passengers	Name of Passengers

Repair Cost	Describe Damage	Repair Cost	Describe Damage

Insurance Company	Policy No.	Insurance Company	Policy No.

OTHER PROPERTY

What was Damaged?	Repair Cost

Name and Address of Owner	City	Zip	Phone

INJURED PARTIES

Name and Address	Extent of Injury	Age	Veh. 1	Veh. 2	Veh. 3	Ped.

WITNESSES

Name	Address	City	Zip	Phone

OTHER

Police Investigate? ☐ Yes ☐ No	Which Division (Sheriff, WSP, City)	Citation Issued? ☐ Yes ☐ No Issue To ☐ You ☐ Veh. 2 ☐ Veh. 3	Have you filed a Collision Report Form WSP 161 As Required by Law? ☐ Yes ☐ No

Location	Or Near Intersection of
City/County	Type of Accident ☐ Front to Rear ☐ Head-On ☐ Parked Car ☐ Pedestrian ☐ Broadside ☐ Sideswipe ☐ Bike - Car ☐ Hit Object

Information Regarding Accident	No. 1, Your Vehicle	No. 2, Other Party (Name)	No. 3, Other Party (Name)
1. If pedestrian, where was he/she (crosswalk, etc.)?			
2. Road conditions (dry, glare, icy, rain, snow, etc.)? (Gravel, blacktop, etc.)			
3. At what distance danger was first noticed?			
4. Speeds at time danger was first noticed?			
5. Speeds at time of accident?			
6. What warning signals were given?			
7. Obstruction to vision (weather and other)?			
8. Lights On? Wipers On? Windows Fogged?			
9. Had any party been drinking? Who?			

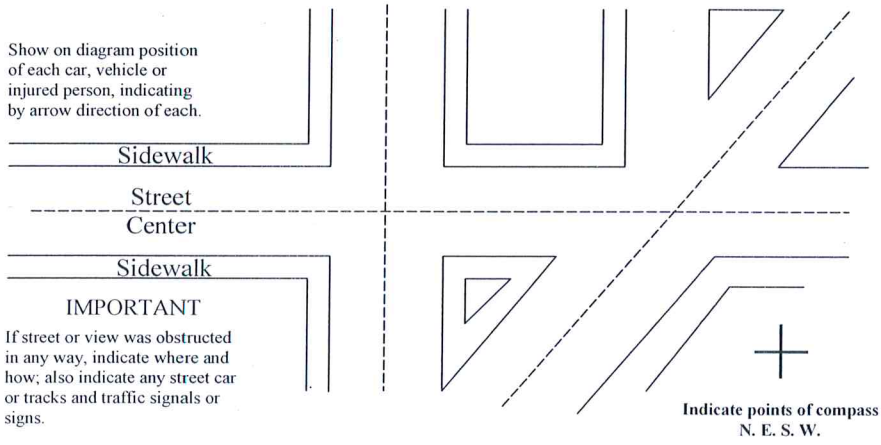
Describe in Detail What Happened (Use additional paper if necessary)

☐ Straight Road
☐ Curve – R or L
☐ Level

☐ Hillcrest
☐ Uphill
☐ Downhill

☐ One Lane
☐ One and One-Half Lane
☐ Two Lane or Four Lane

Show on diagram position of each car, vehicle or injured person, indicating by arrow direction of each.

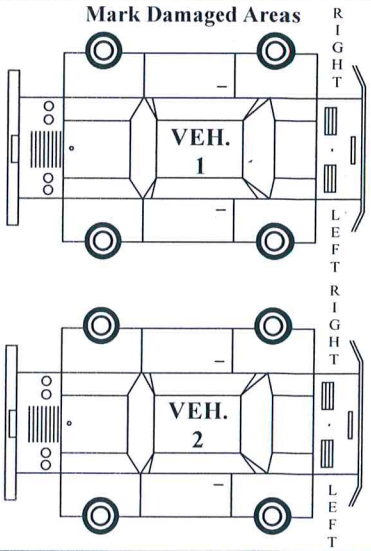


IMPORTANT

If street or view was obstructed in any way, indicate where and how; also indicate any street car or tracks and traffic signals or signs.

Indicate points of compass
N. E. S. W.

Mark Damaged Areas



Signature (Driver)	Date	Signature (Supervisor)	Date

Form SF 137 (RMD Rev 02/12)

FORM
S.F. 137
RMD EF 02/12

STATE OF WASHINGTON

VEHICLE ACCIDENT REPORT

Date of Accident (MM/DD/YYYY)	
Time	☐ AM ☐ PM

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*Scanned form can be e-mailed to desmiriskmanagement@des.wa.gov

STATE EMPLOYEE

DRIVER

Name	Age	Employing Agency	Position
Business Address / Zip	Business Phone	Email	Was vehicle being used on Official State Business ☐ Yes ☐ No
Operator's License No.	License Restrictions ☐ Yes ☐ No	If Yes, Indicate	Have you had a previous accident while driving on state business? ☐ Yes ☐ No

VEHICLE NO. 1

License No. / Year	Make	Body Type	Where Located	No. of Passengers	Est. Repair Cost
Owning Agency	Describe Damages Fully (Parts, type, and extent of damage)				
If Privately Owned, Name and Address of Owner (If State Owned, Equipment No. Only)				Insurer	

OTHER VEHICLES

Owner Car No. 2 / Phone	Owner Car No. 3 / Phone
Address / City / Zip	Address / City / Zip
Driver / Age / Phone	Driver / Age / Phone
Address / City / Zip	Address / City / Zip
Driver's License No. / Vehicle License No.	Driver's License No. / Vehicle License No.
Vehicle Make / Year / Body Type	Vehicle Make / Year / Body Type
Name of Passengers	Name of Passengers
Repair Cost / Describe Damage	Repair Cost / Describe Damage
Insurance Company / Policy No.	Insurance Company / Policy No.

OTHER PROPERTY

What was Damaged?	Repair Cost
Name and Address of Owner / City / Zip	Phone

INJURED PARTIES

Name and Address	Extent of Injury	Age	Veh. 1	Veh. 2	Veh. 3	Ped.

WITNESSES

Name / Address / City / Zip	Phone

OTHER

Police Investigate? ☐ Yes ☐ No	Which Division (Sheriff, WSP, City)	Citation Issued? ☐ Yes ☐ No Issue To ☐ You ☐ Veh. 2 ☐ Veh. 3	Have you filed a Collision Report Form WSP 161 As Required by Law? ☐ Yes ☐ No

Road Traffic Collision/Accident Report

Please complete in black ink	Tick boxes as applicable

Instructions for person reporting collision/accident:

- Please complete the form and ensure that it is handed directly to the Station Reception Officer.
- Please answer all questions or delete where appropriate.
- If you are unable to complete this form please ask for assistance.

Is the accident being reported for insurance purposes only?	Yes		No	
Are you willing to attend court if necessary?	Yes		No	
Has any person received any injuries as a result of this collision/accident?	Yes		No	

If 'Yes', please give details:

A. Details of the Collision/Accident

Date of collision/accident:	Time:
Location of collision/accident:	
Your name: (*Mr/Mrs/Miss/Ms)	Date of birth:
Private address: Post code:	Business address: Postcode:
Telephone No.:	Telephone No.:

B. Description of your vehicle

Make and Model:	Colour:			
Registration Mark:	Plate No. (if cab):			
Are you the owner of the vehicle?	Yes		No	
If 'NO', please state the name and address of the registered Keeper:				
Details of damage to your vehicle:				

C. Witnesses

Please give names, addresses and telephone numbers.

State whether witnesses are independent or passengers in a vehicle involved.

D. Please state briefly what happened

Weather conditions:	*Sunny	☐	Dry	☐	Overcast	☐	Raining	☐	Snowing	☐	Windy ☐
Road conditions:	*Dry	☐	Wet	☐	Icy	☐	Uneven road surface			☐	
Visibility conditions:	*Clear	☐	Foggy	☐	Daylight	☐			Dusk	☐	
	Street-lighting (please state whether)						ON	☐	OFF	☐	

E. Other vehicles Involved (if known)

1. Name: (*Mr/Mrs/Miss/Ms)	
Address:	
Telephone Number:	
Vehicle Registration Mark:	Make, Model and Colour:
Damage:	

2. Name: (*Mr/Mrs/Miss/Ms)	
Address:	
Telephone Number:	
Vehicle Registration Mark:	Make, Model and Colour:
Damage:	

F. This section needs to be completed if the other driver(s) involved in the collision/accident failed to stop and/or exchange particulars of Name, Address and Vehicle Registration Mark

How load was the sound of the collision/accident? *Inaudible ☐ Clear ☐ Loud ☐ Very loud ☐

Did the other driver stop at all? *YES ☐ NO ☐

If 'Yes', describe what he or she did, e.g. sat in car, got out of car, stopped for a moment and then drove off, etc.

If 'NO', give reason why believe the other driver knew a collision/accident had occurred, e.g. by turning his/her head and accelerated away quickly, other vehicle sustained damage at the front, etc.

Was there any conversation between you and the other drive? YES ☐ NO ☐

Did you ask the other driver for his/her name and address? YES ☐ NO ☐

If 'YES' was it? Supplied ☐ Refused ☐ Request ignored ☐

Did police attend the scene whilst you were still there? YES ☐ NO ☐

If 'Yes', had the vehicles been moved before the police arrived? YES ☐ NO ☐

Was the registration mark of the other vehicle recorded by you at the time of the collision? YES ☐ NO ☐

If 'NO', provide the name and address of the person who recorded the registration mark of the other vehicle at the time of the collision/accident.

NB: The original note of the registration mark of the other vehicle is an important exhibit and if it has not been handed in with the report, it must be retained in a safe place and kept for production in court if required.

Describe briefly the other driver involved in i.e. gender , age, height, build, eye colour, hair, complexion and any other distinguishing features. Say whether you would be able to identify the other driver.

Please complete section G

I understand that without the full registration number, Police may not be able to take further action.

When completed, please hand back personally to the Station Reception Officer.

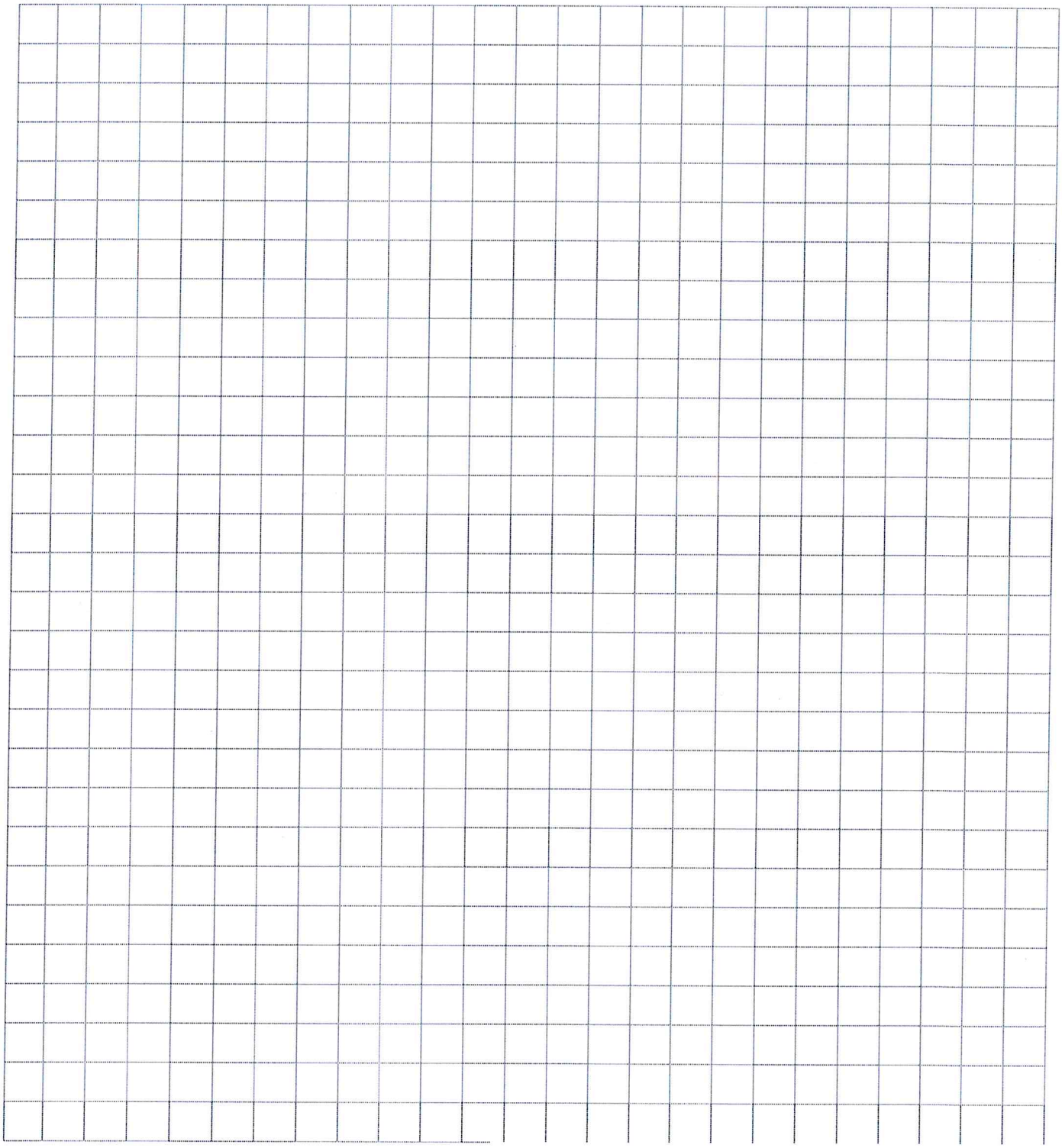
I hereby declare that the information given on this form is true to the best of my knowledge and belief, and I give it knowing that if it is tendered in evidence I shall be liable to prosecution if I have wilfully in it stated anything which I know to be false or I do not believe to be true.
(C.J. Act, 1967, S.9 Mag. Ct. Act 1980, SS.5A(3)(A) and 5B, M.C. Rules 1981 S.70)

Signature of person reporting:.....

Witnessed by:.....(SRO)

G. Plan of Collision/Accident

Please draw a sketch of the collision/accident showing positions of vehicles, direction of travel, road signs, crossings, bollards, etc. It would be helpful if you could indicate NORTH.



This section is to be completed by the Station Reception Officer or the Station Officer.

Name:..... Signature:.....

Rank/Title..... Date:..... Time:.....

Did you check the damage to the vehicle shown in Section B? YES ☐ NO ☐

If 'YES', give details of the damage seen

I.D. codes of: Person(s) injured:

1		2	
1		2	

Was an ambulance called? YES ☐ NO ☐ Time of arrival: ☐

Injured person conveyed to:.....

Person injured: *Pedestrian, Driver, Rider, Pillion passenger, Passenger in vehicle. No.....(front/rear seat)

Name: _____ Date of birth/Approx. age _____ Male ☐ Female ☐

Address: _____

Telephone No.: _____ Nature of injury: _____

If child casualty (aged 5-16) school attended _____

On journey to or from school? YES ☐ NO ☐

Produce your Driving Licence, and insurance on returning form to Police Station

Driving Licence	Insurance	MOT
Correct: Yes/No	**Correct: Yes/No**	**Correct: Yes/No**
Driver No: (Type of licence)	**Policy No.:**	**Serial No.:**
Issue No.:	**Issued by:**	**Date of issue:**
Expiry Date:	**Date of issue:**	**Expiry date:**
Full/Provisional	**Expiry date:**	**Name and address of testing station:**
Old/New	**Tel No.: (of available)**	
Categories/Group		**No. of testing station**

HO/RT1 to be produced at:

NB: HORT/1 to be issued by a Police officer

Criminal Justice Unit only: Action:.....

NFA (if documents correct):.....PA.....

Scene Details: All sections must be completed by the checking officer for ALL COLLISIONS/ACCIDENTS by entering the appropriate number in box

Vehicle Record Enter vehicle number: ☐☐

Type of vehicle ☐☐

01 Pedal cycle
02 Moped
03 Motorcycle 125 c.c. and under
04 Motorcycle over 125 c.c.
08 Taxi
09 Car
10 Minibus (8-16 passenger seats)
11 Bus or coach (17 more passenger seats)
14 Other motor vehicle
15 Other non-motor vehicle
16 Ridden horse
17 Agricultural vehicles
18 Tram/light rail
19 Goods vehicle 3.5 tonnes maximum gross weight (mgw) & under
20 Good vehicle over 3.5 & under 7.5 tonnes mgw
21 Goods vehicle 7.5 tonnes & over

Towing and articulation ☐☐

0 Not towing/articulated
1 Articulated vehicle
2 Double/multiple trailer
3 Trailer caravan
4 Single trailer
5 Other tow

Manoeuvres ☐☐

01 Reversing
02 Parked
03 Held up
04 Stopping
05 Starting
06 U-Turn
07 Turning left
08 Waiting to turn left
09 Turning right
10 Waiting to turn right
11 Changing lane to left
12 Changing lane to right
13 Overtaking on offside moving vehicle
14 Stationary vehicle
15 Overtaking on nearside
16 Going ahead – L hand bend
17 Going ahead – R hand bend
18 Going ahead – other

Vehicle location ☐☐

01 Leaving the main road
02 Entering the main road
03 On the main road
04 On the minor road
05 Tram/Light rail
06 On lay-by/hard shoulder
07 Entering lay-by/hard shoulder
08 Leaving lay-by/hard shoulder
09 On cycleway
10 Not on carriageway

Vehicle location at first impact ☐☐

0 Not at or within 20 metres of junction
1 Approaching junction / parked at junction
2 Vehicle in middle of junction
3 Cleared junction / parked at junction exit
4 Did not impact

Skidding ☐☐

1 Not applicable
2 Skidded and overturned
3 Jack-knifed
4 Jack-knifed and overturned
5 Overturned

First Point of Impact (Use one code only) ☐☐

0 Did not impact
1 Front
2 Back
3 Offside
4 Nearside

Vehicle leaving carriageway (i.e. one wheel at least leaving) ☐☐

0 Did not leave carriageway
1 Left carriageway – nearside
2 Left carriageway – nearside and rebounded
3 Left carriageway straight ahead at junction
4 Left carriageway on to central reservation
5 Left carriageway on to central reservation and rebounded
6 Left carriageway and crossed central reservation
7 Left carriageway offside
8 Left carriageway – offside and rebounded

Vehicle Record (continued)

Object in carriage way hit ☐☐

00 No object hit
01 Previous accident
02 Roadworks
03 Parked vehicle lit
04 Parked vehicle unit
05 Bridge (Roof)
06 Bridge (side)
07 Bollard/refuge
08 Open door of vehicle
09 Central island of roundabout
10 Kerb
11 Other object

Object in carriage way hit ☐☐

00 No object hit
01 Roadside/Traffic signals
02 Lamp post
03 Telegraph/Electricity post
04 Tree
05 Bus stop/Shelter
06 Central crash barrier
07 Nearside/offside barrier
08 Submerged
09 Entered ditch
10 Other permanent object

Enter appropriate code Nos. in boxes Casualty No. ☐1 ☐2

If pedestrian casualty ☐☐

1. LOCATION
01 In carriageway, crossing on pedestrian crossing
02 In carriageway, crossing on zig-zag lines approach
03 In carriageway, crossing on zig-zag lines exit
04 In carriageway, crossing elsewhere within 50 metres (55 yards) of pedestrian crossing
05 In carriageway, crossing elsewhere
06 On footpath or verge
07 On refuge or central island or reservation
08 In centre of road, not on refuge or central island
09 In carriageway, not crossing
10 Unknown

2. MOVEMEMENT ☐

1 Crossing from driver's nearside
2 Crossing from driver's nearside masked by parked or stationary vehicle
3 Crossing from driver's offside
4 Crossing from driver's offside masked by parked or stationery vehicle
5 In carriageway not crossing (standing or playing)
6 In carriageway not crossing (standing or playing) masked by parked or stationery vehicle
7 Walking along in carriageway facing traffic
8 Walking along carriageway back to traffic
9 Unknown

3. PEDESTRIAN DIRECTION ☐

Compass point bound:

1. N 2. NE 3. E 4. SE 5. S 6. SE 7. W 8. NW

IF DRIVER OR PASSENGER CASUALTY ☐

4. SEAT BELT USAGE
1. Safety belt in use
2. Safety belt not in use
3. Safety belt not fitted
4. Child safety belt/harness in use
5. Child safety belt/harness fitted – not in use
6. Child safety belt/harness not fitted
7. Unknown

IF P.S.V PASSENGER CASUALTY ☐

5. 1. Boarding 2. Alighting 3. Standing passenger 4. Seated passenger

CARRIAGE WAY TYPE OF MARKINGS

1. Roundabout (on circular highway)
2. One way street
3. Dual carriageway – 2 lanes in each direction
4. Dual carriageway – 3 or more lanes in each direction
5. Single carriageway – single track road
6. Single carriageway – 2 lanes (one each direction)
7. Single carriageway – 3 lanes (2 way capacity)
8. Single carriageway – 4 or more lanes (2 way)
9. Unknown

SPEED LIMIT (M.P.H)

JUNCTION DETAIL

0. Not at or within 20m (22yds) of junction
1. Roundabout
2. Mini roundabout
3. 'T' or staggered junction
4. 'Y' Junction
5. Slip road
6. Crossroads
7. Multiple junction
8. Using private drive or entrance
9. Other junction

JUNCTION CONTROL

0. No crossing facility within 50m (55 yds)
1. Zebra
2. Zebra crossing controlled by S.C.P
3. Zebra crossing controlled by other authorised person
4. Pelican
5 Other light controlled crossing
6. Other sights controlled by S.C.P
7. Other sights controlled by other authorised person
8. Central refuge – no other controls
9. Footbridge or subway

LIGHT CONDITIONS

DAYLIGHT
1. Street lights present
2. No street lights present
3. Presence of street lighting unknown

DARKNESS
4. Street lights present and lit
5. Street lights present nu unlit
6. No street lighting
7. Presence of street lighting unknown

WEATHER

1. Fine
2. Rain
3. Snow
4. Fine (High winds contributed)
5. Rain (High winds contributed)
6. Snow (High winds contributed)
7. Fog or mist (if hazard)
8. Other
9. Unknown

ROAD SURFACE

1. Dry
2. Wet / damp
3. Snow
4. Frost / Ice
5. Flood (surface water over 3cm [1"] deep)
6. Oil or diesel
7. Mud

SPECIAL CONDITIONS

0. None
1. A.T.S – out
2. A.T.S – defective
3. Permanent road signs or markings defective or obscured
4. Road works
5. Road surface defect (not including oil, water etc.)

CARRIAGEWAY HAZARDS

0. None
1. Dislodged load
2. Other object (not including pedestrians or other motor vehicles).
3. Involvement with previous accident
4. Dog in carriageway
5. Other animal in carriageway

Special projects | **M.P. Special projects**

DTp.: | | | | | | | |

CAUSATION FACTORS

This section must be filled in by the Officer reporting the collision/accident. This information is required for intelligence led enforcement activity.

Please show up to three main causes of the collision/accident in order of priority by writing numbers 1, 2, and 3 in the relevant boxes.

1. Drunk
2. Drugs
3. Driver aggression
4. Excessive speed for conditions
5. Following too close
6. Failure to comply with a) ATS* / b) Pedestrian crossing
7. Fail to give precedence at pedestrian crossing
8. Failure to comply with traffic sign*
9. Failure to signal
10. Failing to observe a hazard
11. a) Fatigue* / b) Distraction of driver* / c) Use of mobile phone*
12. Overtaking
13. Improper use of lanes
14. a) Turning right* / b) left* / c) U turn*
15. a) Defective* / b) Inattention / c) Lights*
16. Cyclist – a) Inattention* / b) Lights*
17. Pedestrian – a) Lack of familiarity* / b) Attention* / c) Confused*
18. Foreign – a) Pedestrian / b) Driver
19. Parked vehicle – a) Parking restrictions* / b) Obstruction*
20. Vehicle defects – a) Tyres* / b) Brakes* / c) Steering* / d) Lights* / e) obscured view* / f) Load – type, manner etc.*
21. Other, please specify as simply as possible

.....

MV-104 (5/11) **PAGE 1 of 2**

FOLD → ← HERE

Use only for accidents that happen in New York State

New York State Department of Motor Vehicles

REPORT OF MOTOR VEHICLE ACCIDENT

www.dmv.ny.gov

BEFORE COMPLETING THIS FORM, READ THE INSTRUCTIONS IN SECTION A ON PAGE 2

DO NOT FORGET ACCIDENT DATE ↓ Page _____ of _____ ☐ ***RUSH*** - DRIVER OF VEHICLE 1 - LICENSE SUSPENDED FOR FAILURE TO REPORT

Accident Date Month / Day / Year	Day of Week	Time ☐ AM ☐ PM	Number of Vehicles	Number Injured	Number Killed	Did police investigate accident at scene? ☐ Yes ☐ No	If "Yes", Name of Police Agency or Precinct & Accident Number

	DRIVER OF VEHICLE 1	☐ VEHICLE 2 ☐ PEDESTRIAN ☐ BICYCLIST ☐ OTHER PEDESTRIAN
1 DRIVER	Driver License ID Number / State of License	Driver License ID Number / State of License
	Driver Name–exactly as printed on license (Last, First, M.I.)	Name–exactly as printed on license (Last, First, M.I.)
	Address (*Include Number & Street*) / Apt. Number	Address (*Include Number & Street*) / Apt. Number
	City or Town / State / Zip Code	City or Town / State / Zip Code
	Date of Birth Month / Day / Year; Sex; Number of People in Vehicle; Public Property Damaged ☐	Date of Birth Month / Day / Year; Sex; Number of People in Vehicle; Public Property Damaged ☐
2 REGISTRANT	Name–exactly as printed on registration; Date of Birth Month / Day / Year; Sex	Name–exactly as printed on registration; Date of Birth Month / Day / Year; Sex
	Address (*Include Number & Street*) / Apt. Number	Address (*Include Number & Street*) / Apt. Number
	City or Town / State / Zip Code	City or Town / State / Zip Code
	Plate Number; State of Reg.; Vehicle Year & Make; Vehicle Type; Ins. Code	Plate Number; State of Reg.; Vehicle Year & Make; Vehicle Type; Ins. Code

3 VEHICLE DAMAGE

Estimated Cost of Property Damage - Vehicle 1: ☐ $1,001-$1,500 ☐ $1,501-$2,500 ☐ Over $2,500

Estimated Cost of Property Damage - Vehicle 2: ☐ $1,001-$1,500 ☐ $1,501-$2,500 ☐ Over $2,500

Describe damage to vehicle 1

ACCIDENT DIAGRAM: Circle one of the 9 diagrams (numbered 0-8) if it describes the accident, or draw your own diagram below in space #9. Number the vehicles. Your vehicle is # 1

0. Left Turn	1. Rear End	2. Sideswipe (same direction)
3. Left Turn	4. Right Angle	5. Right Turn
6. Right Turn	7. Head On	8. Sideswipe (opposite direction)

9.

Describe damage to vehicle 2

4 ACCIDENT LOCATION

Place Where Accident Occurred in New York State:

County _____ ☐ City ☐ Village ☐ Town of _____. Permanent Landmark _____

Road on which accident occurred _____ (Route Number or Street Name)

at ☐ 1) intersecting street _____ (Route Number or Street Name)

or 2) _____ Feet _____ Miles ☐N ☐S ☐E ☐W of _____ (Milepost, Nearest intersecting Route Number or Street Name)

How did the accident happen?

5 ALL INVOLVED

Names of All Persons Involved	8. Which Veh. Occupied	9. Position in/on Vehicle	10. Safety Equip.Used	12. Age	13. Sex	16. Injury A	B	C	Describe Injuries	If Deceased, Enter Date of Death

6 INSURANCE

Identify Damaged Property Other Than Vehicle(s)	VIN
Name of Insurance Company That Issued Policy For Vehicle 1	Policy Number
Name and Address of Policy Holder	Policy Period From To
If Vehicle was Operated Under Permit (ICC, USDOT or NYSDOT), give No.	Name and Address of Permit Holder
If Self-Insured, give Certificate No.	and State

Date	Print Name of Driver (*or Representative**) of Vehicle 1	Signature of Driver (*or Representative**) of Vehicle 1

* A representative may sign for the driver if the driver is unable to sign because of injury or death. If you are signing as the driver's representative, check the box that describes why the driver cannot sign. ☐ Injury ☐ Death

An accident report is not considered complete and filed unless it is signed, and if not signed may result in the suspension of your driver's license.

reset/clear

1 2 3 4 5 6 7 23 24 25 26 27 28 29 30

SECTION A

You must report within 10 days any accident ***occurring in New York State*** *causing a fatality, personal injury or damage over $1,000 to the property of any one person. Failure to do so within 10 days is a misdemeanor. Your license and/or registration may be suspended until a report is filed. Check the "RUSH" box at the top of page 1 if your license is suspended for failure to report this accident on time.* ***You must fill in all information requested on the report.***

Then fill in the boxes numbered 1-7 and 23-30 in the right margin on page 1 by entering the number of the item from Section B that best describes the circumstances of the accident. If a question does not apply, enter a dash ("-"). If you do not know an answer, enter an "X".

INSTRUCTIONS - *PLEASE PRINT OR TYPE ALL INFORMATION - USE BLACK INK*
*** First — fold along this shaded, dotted line.***

* ***Don't fold internet form. Instead, place page 2 over page 1, with the arrows on page 2 pointing to the boxes on the right edge of page 1.***

VEHICLE INVOLVEMENT - If you were in an accident involving:

- **two-cars,** enter your information in the VEHICLE 1 section and the other driver's information in the VEHICLE 2 section.
- **a pedestrian, bicyclist or other pedestrian** (a person using a non-motorized conveyance such as in-line skates, skateboard,sled, etc.), enter the information in the "Driver" spaces provided for Vehicle 2, and check the PEDESTRIAN, BICYCLIST or OTHER PEDESTRIAN box.
- **a vehicle other than a motor vehicle** (such as a snowmobile, mini-bike, aircycle, all-terrain vehicle, trail bike, or other non-motor vehicle), enter the driver, registrant and vehicle information in the space provided for VEHICLE 2.
- **an unoccupied vehicle**, enter all available information. Be sure to enter the correct vehicle Plate Number and Vehicle Type in the VEHICLE 2 block.
- **more than two vehicles**, fill out additional accident reports. On these reports, place the information for the third vehicle in the space marked VEHICLE 1 and mark it # 3. Use the space marked VEHICLE 2 for the fourth vehicle, and mark it # 4 and so on. Additional forms are available at any Motor Vehicles office or from the DMV website: www.dmv.ny.gov.

❶ **DRIVER** - Enter the information for each driver EXACTLY as it appears on his/her driver license.

❷ **REGISTRANT** - Enter registrant information EXACTLY as it appears on the registration of each vehicle involved in the accident.

❸ **VEHICLE DAMAGE** - Indicate if the accident exceeds the $1,000 threshold for property damage to any one vehicle or property caused by the accident, and describe the vehicle damage.

❹ **ACCIDENT LOCATION** - Enter the county, locality and street(s) where the accident occurred. Check the box if there is an intersecting street. If available, identify a **permanent landmark** nearby, such as a business, school, shopping mall, parking lot, water tower, railroad, mountain or cell tower.

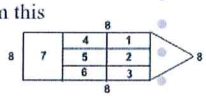
❺ **ALL INVOLVED** - List the names of all persons involved in the accident, and provide the date of death if anyone was killed in, or as a result of, the accident. If more than four people are involved, complete another report. In the ALL INVOLVED section of that report, provide the required information for everyone else involved in the accident. Enter the following codes in the appropriate columns:

WHICH VEHICLE OCCUPIED *(Column 8)* - Enter the appropriate number or letter.

1. Vehicle 1 2. Vehicle 2 B. Bicyclist P. Pedestrian O. Other Pedestrian

POSITION IN/ON VEHICLE *(Column 9)* - Enter the number from this diagram which corresponds to each person's position.

1. Driver 2-7. Passengers 8. Riding/Hanging on Outside



SAFETY EQUIPMENT USED *(Column 10)*

1. None
2. Lap Belt
3. Shoulder Restraint
4. Lap Belt Restraint
5. Child Restraint Only
6. Helmet (Motorcycle Only)
7. Air Bag Deployed
8. Air Bag Deployed/Lap Belt
9. Air Bag Deployed/Shoulder Restraint
A. Air Bag Deployed/ Lap Belt/Restraint
B. Air Bag Deployed/Child Restraint
O. Other

In-Line Skater/Bicyclist
C. Helmet Only
D. Helmet/Other
E. Pads Only
F. Stoppers Only

INJURY *(Columns 16A-C)* - Check all column(s) that apply and DESCRIBE INJURIES:

A - Severe lacerations, broken or distorted limbs, skull fracture, crushed chest, internal injuries, unconscious when taken from the accident scene, unable to leave accident scene without assistance.

B - Lump on head, abrasions, minor lacerations.

C - Momentary unconsciousness, limping, nausea, hysteria, complaint of pain (no visible injury), whiplash (complaint of neck and head pain).

❻ **INSURANCE** - Enter damage to private property, if any, insurance policy information and VIN.

Attach additional reports to page one. Each page of the report must be numbered in the upper left corner. Mark additional sheets #2, #3, etc. Date and **sign** on the bottom line of each attached report. **THE REPORT MUST BE SIGNED BY THE DRIVER OF VEHICLE 1, UNLESS HE OR SHE IS UNABLE TO SIGN BECAUSE HE/SHE IS INJURED OR DECEASED.**

Send **original** to: CRASH RECORDS CENTER
6 EMPIRE STATE PLAZA
PO BOX 2925
ALBANY NY 12220-0925

SECTION B

USE TO COMPLETE BOXES 1-7 and 23-30 ON PAGE 1

Be sure your answers are marked INSIDE THE BOXES ON PAGE 1

PEDESTRIAN/BICYCLIST/OTHER PEDESTRIAN LOCATION
1. Pedestrian/Bicyclist/Other Pedestrian at Intersection
2. Pedestrian/Bicyclist/Other Pedestrian Not at Intersection

PEDESTRIAN/BICYCLIST/OTHER PEDESTRIAN ACTION → 1
1. Crossing, With Signal
2. Crossing, Against Signal
3. Crossing, No Signal, Marked Crosswalk
4. Crossing, No Signal or Crosswalk
5. Riding/Walking/Skating Along Highway With Traffic
6. Riding/Walking /Skating Along Highway Against Traffic
7. Emerging from in Front of/Behind Parked Vehicle
8. Going to/From Stopped School Bus
9. Getting On/Off Vehicle Other Than School Bus
11. Working in Roadway
12. Playing in Roadway
13. Other Actions in Roadway
14. Not in Roadway

TRAFFIC CONTROL → 2
1. None
2. Traffic Signal
3. Stop Sign
4. Flashing Light
5. Yield Sign
6. Officer/Guard
7. No Passing Zone
8. RR Crossing Sign
9. RR Crossing Flashing Light
10. RR Crossing Gates
11. Stopped School Bus-Red Lights Flashing
12. Construction Work Area
13. Maintenance Work Area
14. Utility Work Area
15. Police/Fire Emergency
16. School Zone
20. Other

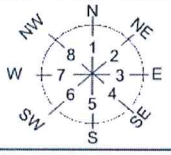
LIGHT CONDITIONS → 3
1. Daylight
2. Dawn
3. Dusk
4. Dark-Road Lighted
5. Dark-Road Unlighted

ROADWAY CHARACTER → 4
1. Straight and Level
2. Straight and Grade
3. Straight at Hillcrest
4. Curve and Level
5. Curve and Grade
6. Curve at Hillcrest

ROADWAY SURFACE CONDITION → 5
1. Dry
2. Wet
3. Muddy
4. Snow/Ice
5. Slush
6. Flooded
0. Other

WEATHER → 6
1. Clear
2. Cloudy
3. Rain
4. Snow
5. Sleet/Hail/Freezing Rain
6. Fog/Smog/Smoke
0. Other

DIRECTION OF TRAVEL → 7



1. North
2. Northeast
3. East
4. Southeast
5. South
6. Southwest
7. West
8. Northwest

Veh. 1 → 23
Veh. 2 → 24

PRE-ACCIDENT VEHICLE ACTION
1. Going Straight Ahead
2. Making Right Turn
3. Making Left Turn
4. Making U Turn
5. Starting from Parking
6. Starting in Traffic
7. Slowing or Stopping
8. Stopped in Traffic
9. Entering Parked Position
10. Parked
11. Avoiding Object in Roadway
12. Changing Lanes
13. Passing
14. Merging
15. Backing
16. Making Right Turn on Red
17. Making Left Turn on Red
18. Police Pursuit
20. Other

Veh. 1 → 25
Veh. 2 → 26

LOCATION OF FIRST EVENT → 27
1. On Roadway
2. Off Roadway

TYPE OF ACCIDENT → First Event 28

COLLISION WITH
1. Other Motor Vehicle
2. Pedestrian
3. Bicyclist
4. Animal
5. Railroad Train
6. In-Line Skater
7. Deer
8. Other Pedestrian
10. Other Object (Not Fixed)

COLLISION WITH FIXED OBJECT
11. Light Support/Utility Pole
12. Guide Rail - Not At End
13. Crash Cushion
14. Sign Post
15. Tree
16. Building/Wall
17. Curbing
18. Fence
19. Bridge Structure
20. Culvert/Head Wall
21. Median - Not At End
22. Snow Embankment
23. Earth Embankment/ Rock Cut/Ditch
24. Fire hydrant
25. Guide Rail - End
26. Median - End
27. Barrier
30. Other Fixed Object

Second Event
Veh. 1 → 29
Veh. 2 → 30

NO COLLISION
31. Overturned
32. Fire/Explosion
33. Submersion
34. Ran Off Roadway Only
40. Other

FIRST INFORMATION REPORT

(Under Section 154 and 157 Cr.P.C) A.P.P.M. Orders 470,500

1. **District :** Rangareddy **P.S :** Chevella **Year :** 2016 **FIR No.** 67/2016 **Date :** 18/04/2016
2. **Acts & Section(s) :** 304(A) IPC
3. a) **Occurrence of Offence : Day :** Monday **Date & Time From :** 18/04/2016 15:30
   Date & Time To : **Prior To :** **Time Period :**
   b) **Information Received at P.S. : Date & Time :** 18/04/2016 19:30
   c) **General Diary Reference: Entry No :** 20 **Date & Time :** 18/04/2016 19:30
4. **Type of Information :** Written
5. **Place of Occurrence:**
   a) **Distance and Direction From P.S. :** 8 Km,North-East **Beat No. :**
   b) **Address Place :** NEAR MIRJAGUDA GATE **Area/Mandal :** CHEVELLA **Street/Village :** NEAR MIRJAGUDA GATE
   City/District : Rangareddy **State :** Telangana **PIN :**
   c) **In case , outside the limit of this Police Station, then**
   Name of P.S. : **District :**
6. **Complainant / Informant :**
   a) **Name :** GOPAL JONNADA
   b) **Father's / Husband's Name :** ANTHAIAH Late
   c) **Date/Year of Birth :** **Age :** 42
   d) **Nationality :** e) **Caste :**
   f) **Passport No :** **Date of issue :** **Place of issue :**
   g) **Occupation :**
   h) **Address House No :** KADUMUR **Area/Mandal :** POODUR **Street/Village :** KADUMUR
   City/District : Rangareddy **State :** Telangana **PIN :**
7. **Details of known/suspected/unknown accused with full particulars :**

   Serial No : 1
   a) **Name :** DRIVER OF THE CAR AP-28-BR-7899
   b) **Father's /Husband's Name :** c) **Occupation :**
   d) **Caste :** e) **Gender :** f) **Age :** **Nationality :**
   g) **Address House No :** **Street/Village :** **Area/Mandal :**
   City/District : Rangareddy **State :** Telangana **PIN :**
   h) **Phone(Off) :** 0 **Phone(Resi) :** 0 **Cell No :** 0
   i) **Email :**

Physical features, deformities and other details of the Suspect :

S. No	Sex	Date/Year of Birth	Build	Height (cms)	Complexion	Identification Marks(s)
1	2	3	4	5	6	7
1		DOB/AGE:0		0cm		

Deformalities/ Peculiarities	Teeth	Hair	Eyes	Habbit(s)	Dress Habit(s)	Languages/ Dialect
8	9	10	11	12	13	14

Place Of				
Burn Mark	Leucoderma	Mole	Scar	Tattoo
15	16	17	18	19

8. **Reasons for delay in reporting by the complainant / informant :**

NO DELAY

9. **Particulars of properties stolen/involved (Attach separate sheet, if necessary) :**

10. **Total value of property stolen :**

11. **Inquest Report/ U.D. Case No. if any :**

12. **Contents of the complaint / statement of the complainant or informant :**

The Brief facts of the case are that occurred on: 18.04.2016 at 03:30 hours at Mirjaguda gate Chevella Mandal, and reported on: 18.04.2016 at 19:30 hours by complainant Sri. Jonnada Gopal s/O Anthaiah Late, age: 42 years, occ: Agriculture, caste: Kuruma, r/o Kadumur village, Poodur Mandal RR Dist. In which he stated that his son by name Jonnada Suresh age: 22years, occ Privet job, r/o Chevella Village and Smt: Jyothi @ Manasa W/o Jonnada Suresh was coming to Chevella village from Vikarabad Hospital on his new CBZ bike engine No: KC12EEEGEO3237 mean time, Driver of the car Br No: AP-28-BR-7899 drove a vehicle in rash and negligent manner and gave a dash to CBZ bike at Mirjaguda gate. As a result the both are received bleeding injuries. Immediately they were shifted to OGH Govt Hospital on 108 services Hyderabad undergoing middle way they were died. They Return To Chevella Hospital and Bodies preserved in Mortuary Further the complainant requested to take necessary action on the above matter. Hence FIR.

The original FIR along with petition of the complainant submitted to the Hon'ble Judicial First Class Magistrate, Chevella Court. The copies of FIR submitted to the all concerned Officers.

13. **Action taken:**

Since The above information reveals commission of offence(s) U/s as mentioned at item No : 1

1) **Registered the case and took up the investigation or : Name :** BEEMKUMAR B
2) **Directed to take up the Investigation or Rank :** Sub-Inspector
3) **Refused investigation due to :**
4) **Transferred to P.S : District : on point of jurisdiction.**

F.I.R. read over to the complainant / informant, admitted to be correctly recorded and a copy given to the complainant /informant, free of cost.

R.O.A.C

14. **Signature / Thumb impression of the complainant / informant.**

Signature of Officer in charge, Police Station

Name : BEEMKUMAR B

Rank : Sub-Inspector

15. **Date and time of dispatch to the court :**