

## ROAD SAFETY

### FINAL REPORT OF THE WORKING GROUP ON ENGINEERING (ROADS)

#### 1. Background

Pursuant to the decision taken in the meeting of the 12<sup>th</sup> National Road Safety Council (NRSC) held on 25.3.2011, separate Working Groups were constituted by the Ministry of Road Transport & Highways on each of the four E's of Road Safety, viz. Education, Enforcement, Engineering and Emergency care. These Working Groups were tasked to deliberate in detail and submit their recommendations on short term, long term measures for immediate implementation so as to curb road accident in the country.

A copy of the ref. No. RT-25014/3/2011-RS, dated 11.4.2011, regarding the composition of these Working Groups and their Terms of References (TORs) are at **Annexure-I**.

The Working Group on Engineering (Roads), constituted pursuant to the above, held two nos. of meetings and finalized its recommendations. Accordingly, the report is submitted.

#### 2. Introduction

##### 2.1. Road Accidents and Fatalities

Accidents and the fatalities on road are the result of inter-play of a number of factors. Road users in India are heterogeneous in nature, ranging from pedestrians, animal-driven carts, bi-cycles, rickshaws, handcarts and tractor trolleys, to various categories of two/three wheelers, motor cars, buses, trucks, and multi-axle commercial vehicles etc.

The vehicles population has been steadily increasing with the pace picking up significantly since the Eighties. Increase in vehicle population in the face of the limited road space used by a large variety of motorized and non-motorized traffic has heightened the need and urgency for a well-thought-out policy on the issue of road safety. Government of India is alive to the issue and has accorded a high priority to the same.

More than one lakh and twenty-five thousand people were killed and more than five lakh were injured in about five lakh reported road accidents in the country during the year 2009. These numbers translate into one road accident every minute, and one road accident death every four minutes. In terms of road fatalities, India has the dubious distinction of being at the top of amongst all nations.

The summary of the accident data for the last ten years is as under:-

Year	All roads			National Highways		
	Accidents	No. of persons	Persons injured	Accidents	No. of persons	Persons injured

		killed			killed	
2000	391449	78911	399265	110508	30216	124600
2001	405637	80888	405216	115824	32108	119592 (P)
2002	407497	84674	408711	131738	33621	132307
2003	406726	85998	435122	127834	33153	131102
2004	429910	92618	464521	130265	34723	143140
2005	439255	94968	465282	129994	35439	145582
2006	460920	105749	496481	140158	39820	152807
2007	479216	114444	513340	138922	40612	154880
2008	484704	119860	523193	137995	42670	149693
2009 (P)	486384	125660	515458	142511	45222	152816

The trend of rising accidents and fatalities has to be reversed sooner than later.

## **2.2. Procedure for road accident data collection**

The data in respect of accidents, persons killed and injured in these accidents is initially reported to the Police. The concerned Police Stations compile the data and transit to District Headquarters who in turn provide the same to State Headquarters. The Nodal Officer of the Police Departments of the respective States compile the data for the entire States and then forward the same on annual basis (for the calendar year January to December) to the Transport Research Cell of Department of Road Transport and Highways.

At present there is no system of scientific investigation, recording, analysis and maintaining of database in the country.

## **2.3 Causes of Accidents**

An analysis carried out on the accident data for the year 2009 showed that the main causes of road accident in our country are: drivers' fault (78.5%), pedestrian fault / fault of passengers (2.2%), mechanical defect in vehicles (1.8%), bad roads (1.3%) and other factors like bad weather, cattle coming in the way, fallen trees, road blockage, absence of rear reflectors, road signages, non-functioning of road signals etc. (16.2%).

#### **2.4. Cost of Accidents**

A Working Group set up by the Planning Commission in the year 2000 to look into road accidents, injury prevention and control had gone into the issue of social cost of accidents in India and had estimated the cost at Rs. 55,000 crore in the year 1999-2000, which constituted 3% of the GDP for the year. At present the estimated loss to the Nation on account of road accidents may be of the order of about Rs. 100,000 crore.

#### **2.5. Engineering Measures to control accidents**

Road Safety is an integral part of engineering design at the Project Planning stage. An independent professional body named Indian Roads Congress (IRC) formulates, updates and disseminates various codes on road construction and maintenance including those pertaining to road safety. While the Central Government is responsible for National Highways (70,934 km out of the total road length of about 4.1 million km in the country), the other roads are under the domain of the States and the local authorities. The National Highways used to be built and maintained through the agency of State Public Works Departments (PWDs) till recently when the Central Government set up an autonomous body, namely, National Highway Authority of India to take over and widen/strengthen the high-density National Highway corridors linking the farthest North-South, East-West points of the country, major metropolitan cities, capitals of States and major economic, commercial and tourist centers. So far around 28,740 km of National Highways have been entrusted to NHAI under various phases of National Highway Development Project (NHDP). The balance length of National Highways is managed by the Ministry of Road Transport and Highways, Govt. of India through PWDs of States or other road agencies.

Road safety specifications / designs are incorporated in the planning and execution of NHAI. Design of highways is done by the consultants meeting all relevant geometric and safety standards which include provisions for flyovers, grade separators, by passes, Railway Over/Under Bridges, bus/truck lay-byes, service roads, junction improvements, overhead signs, cautionary / regulatory / regulatory / inforamatory retro-reflective sign boards, crash barriers, medians, thermoplastic road markings, traffic lights and delineators, etc. The policy is to provide by-passes for roads passing through busy towns and cities and also service – lanes to facilitate movement of local traffic without any conflict with the through traffic. Whereas the maintenance of completed BOT stretches is the responsibility of the concessionaires, the stretches of NHs developed under NHDP on EPC basis are handed over on long term and short term O&M contracts making the contractors fully responsible for ensuring the implementation of the safety measures during maintenance of such roads.

Some limited road safety audits have been carried out on National highways primarily developed under NHDP through NHAI.

As far as the other roads are concerned, the Ministry reviews the specifications and disseminates the safety codes to the States and other road agencies.

It is important that the codes / standards / Guidelines of IRC be reviewed with Safety Focus.

## **2.6. Major Challenges pertaining to Engineering Measures**

India's somewhat indifferent record of road safety is due to many reasons. The road network in this country had been historically developed from the point of view of providing accessibility rather than mobility. With economic growth and development, the mobility, particularly on trunk routes, has assumed a very high priority. Given the historical road deficiencies, it is extremely difficult to provide all the desired safety features on the existing network.

This is applicable even for the National Highways Network, which is the primary arterial road network in the country at present and vested with the Union Government. The difficulties become compounded especially since there is deficient fund available for development of the non-NHDP National Highways network. Situation is even worse as far as annually available funding for Maintenance & Repair of National Highways network is concerned, which is only about 35 – 40 % of the estimated fund requirement as per the norms for Maintenance of National Highways.

The situation is perhaps worse for majority of the State Roads which are vested with the concerned State Governments.

Secondly, in the absence of system of scientific recording, analysis and documentation of crash investigations at present, the efficacy of various improvement measures taken up are at times difficult to inter-se prioritize and justify from the perspective of road safety. The problem becomes compounded and the issue assumes greater significance in the scenario of constrained budgetary resources.

## **3. Present Policy regarding Engineering Measures for Road Safety**

**3.1.** Specifications and designs are constantly under review by the Ministry of Road Transport & Highways. Detailed guidelines were issued vide letter no. RW/NH-35072/04/2004-S&R(R), dated 27.4.2010 for framing all central and centrally sponsored projects keeping in view the specified safety measures as applicable to specific site conditions based upon the suggestions made by a group of experts from various organizations after detailed deliberations. A copy of these guidelines is at **Annexure-II**. It may be seen from the same the suggestions primarily pertained to Geometry of the Road, Separation of Local Traffic, Pedestrian Facility, Bus Bays, Illuminations, Development of Junctions, Signages, Traffic Calming and Safety Management Measures, Bridges / CD Structures, conduction of Road Safety Audits at all stages of road development, operation and maintenance, etc.

### **3.2. Conducting Road Safety Audits – Present Scenario**

The **India Roads Congress (IRC)** has published comprehensive Road Safety Manual. Efforts are being made to follow the same in totality in majority of the projects being undertaken under the mega flagship scheme NHDP. However, due to limited availability of resources and the consequential compulsion to spread the resources thinly on majority of the balance National Highways Network to keep them in traffic worthy conditions poses major difficulties in adhering to these guidelines for non-NHDP NH network.

It needs to be ascertained that the Road Safety Manual evolves continuously based on the experiences gained, lessons learnt, State-of-Art practices and keeping in view the changing environment.

#### **3.3.1. The details of the Road Safety Audits undertaken by NHAI are as follows: -**

- (a) Safety Audit Completed by NHAI
  - 12 World Bank Projects of Lucknow Muzafarpur National Highway Project (LMNHP) (483 km) completed in April 2010. Reports sent to projects sites for implementation.
  - Western and Southern corridors (2825 km) completed in 2005.
  - Safety Audit conducted through CRR I on Various NHAI Projects (1569 km).
- (b) Safety audit in progress / recently awarded.
  - Safety Consultants Appointed for PPP Projects (DBFO) & Audit commenced (544 km):
    - ❖ Gurgaon-Jaipur, (226km):
    - ❖ Surat-Dihsar,(239km):
    - ❖ Chikaluripet –Vijaywada (79km)
  - Safety consultancy recently awarded for 53 DBFO projects (4820 km) all over the country.
  - Bids for appointment of Safety consultant for 26 packages of PPP Projects on DBFO basis (2222 km) invited for Safety Audit during design, and construction stage.
- (c) Recommendation by the consultants
  - Short term solutions – inadequate provision of stopping site distance, signage, shoulder width, delineators, pedestrian railing, crash barrier, cats eye, edge marking, chevron marking, lane marking, etc.
  - Medium term solutions – Improvement of junctions, inadequate bus/truck lay by, culvert parapet, lack of visibility at night, safety measures for pedestrians, rest areas, culvert protection in median, shoulder consolidation, etc.
  - Long term solutions – Construction of service road, grade separator intersection, pedestrian and two/three wheelers underpasses, flyovers, climbing lane for heavy vehicles at steep gradient.

The implementation of the suggested measures needs to be taken up in a time bound manner.

**3.3.2.** Further, Road Safety Cell, NHAI has initiated following Road Safety activities through World Bank Loan (LMNHP Ln No: 4764-IN) (under procurement).

- Appointment of Road Safety Advisor under World Bank Scheme for Road Safety Cell, is under procurement, (US\$ 750000) to assist to NHAI to build capacity of RSC on all safety-related aspects at all stages of highway development. The broad scope of work of the Road Safety Advisor shall include but not be limited to – review the current system, procedures and delegation to RSC; make recommendations to strengthen RSC functioning within NHAI including drafting of detailed procedures, delegations and resources required and; train and support RSC to implement the same. His tenure will be for two year initially and extendable with mutual agreement.
- Monitoring of Project Outcome Indicator and User Satisfaction Survey:
  - Consulting Services for Monitoring of Project Outcome Indicators (Primary accident data on LMNHP corridor) and Road User Satisfaction Survey on Delhi-Panipat of NH-1.
  - Under Technical Assistance (TA) loan of World Bank (under procurement).
- Appointment of Consultant for Network Safety Management
- Action for appointment of Consultant for Network Safety Management and Road Information Management under TA loan of World Bank has been taken up as a Pilot project of about a length of 2000 km. The Network Safety Management (NSM) comprises a comprehensive network analysis that enables Road Administrations to detect sections, where an improvement of the infrastructure is expected to be cost effective. The NSM is now being considered a better approach for safety management over traditional ‘accident black spot’ improvement approach. The NSM requires reliable GIS based crash, flow and other asset management data. The overall objective of this assignment is to build capacity of NHAI in Network Safety Management and develop an improved “Accident Information and Management System.”



### **3.4. Requirement vis-a-vis available resources for the National Highways Network**

#### **3.4.1. Resources for Development of National Highways**

The resources available annually for development of Non-NHDP National Highways from GBS (i.e. under NH(O)) is generally not adequate; e.g. the projected B.E. allocation for NH(O) under Annual Plan 2011-12 was Rs. 6,173 crore. However, the outlay provided under A.P. 2011-12 is Rs. 4,971.34 crore; this also includes Rs. 1,161.87 crore out of total earmarked cess of Rs. 9,411.87 crore dedicated for NHs during 2011-12 as per the CRF Act, 2000 amended by the Finance Act, 2005 (which is generally fully earmarked under NHAI (Investment) for NHDP).

The estimated deficit in allocation under NH(O) at this stage for the FY 2011-12 is about Rs. 1,600 crore also considering that the Ministry is contemplating taking up of few works on Non-NHDP NH stretches on BOT(Toll) mode following Empowered Institution (EI) route under Annual Plan 2011-12 onwards with funding of pre-construction activities, VGF, etc., from GBS allocation under NH(O).

#### **3.4.2. Resources for Maintenance & Repair of National Highways**

The allocations that are available annually for M&R of NHs are of the order of about 35 ~ 40% of the actual requirements as per the Ministry's stipulated norms based on the Report of the Committee (2001).

The gap in M&R allocations provided annually over the years as compared to the estimated fund requirement has resulted into thin spreading of resources on large stretches of NHs and consequent difficulty in maintaining the entire NH network in traffic worthy condition. Further, the absence of adequate funds for the timely maintenance of NHs result into the need for premature rehabilitation at a much higher level of investment.

**Trend of allocation of funds under M&R of NHs over the year:-**

(Amount in Rs. Crore)

Year	Requirement of funds as per norms	Amount provided (Ministry + BRO)	Shortfall	% Shortfall
(1)	(2)	(3)	(4)	(5)
2004-05	2,480.00	745.56	1,734.44	69.94
2005-06	2,480.00	868.10	1,611.90	65.00
2006-07	2,480.00	814.38	1,665.62	67.16
2007-08	2,280.00	1,001.68	1,278.32	56.07
2008-09	2,500.00	973.97	1,306.03	57.28
2009-10	2,500.00	1,059.10	1,440.90	57.64
2010-11	2,800.00	2,056.96*	743.04	26.53
2011-12	2,800.00	1,027.25	1,772.75	63.31

\*- Additional outlay of Rs. 1,000.10 crore received in December 2010 under R.E.

**4. Recommendations / Suggested Policies**

**4.1. Standards and Guidelines for Highways and Urban Roads**

- Highway and urban road design standards and guidelines will be made consistent with the safety requirements and in tune with the international best practice.
- All existing standards/guidelines/ manuals/codes, etc., of IRC/MoRT&H will be reviewed for their specific Focus to Road Safety, and deficiencies/shortfalls identified in relation to safety.
- New standards and manuals will be prepared for filling the gaps in the current standards.
- There should be adequate engineering measures supported by strict enforcements to ensure segregation of fast and slow moving traffic, especially on the multi-lane (i.e. having 4- or more lanes) highways. To that extent the Project Scopes defined in the Concession Agreements of projects being undertaken under various phases of NHDP need to be adequately reviewed. This should also apply to the O&M contracts / OMT concessions.
- All road projects being delivered at present (either at planning stage, design stage, construction stage, or even at implementation stage and operation stage ), whether on BOT or as Item Rate / EPC Contracts, will be reviewed at each stage to identify any issue related to road safety.

- All State Highways and National Highways are to be provided with both pavement markings and road signs as per the requirements specified by the standards of IRC/MoRT&H. These shall be mandatory requirement for road safety.
- Initiatives are required to be taken for taking up adequate State-of-Art Traffic Calming Measures in the relevant areas / places, especially in urban areas, near habitations, etc. for enhanced safety to vulnerable road users.
- For ensuring the construction zone safety for traffic operation, there should be proper estimate prepared at the stage of Detailed Design, and it should be part of the total project cost like any other item in the form of BOQ items.

#### **4.2. Monitoring and evaluation of road designs and traffic management strategies**

- Road Safety Audit should be made an integral part of the project planning, report preparation, appraisal, designing, implementation, operation and maintenance, etc. The project should be duly reviewed and necessary corrective actions should be taken pursuant to the report of the Road Safety Audit at every stage.
- The entire network of NH and SH are to be subjected to Road Safety Audit (RSA) in a planned manner over next three years. The RSA shall identify all the potential hazards in terms of deficiencies observed in the network, which are required to be corrected on continuous basis for making the road network safe.
- The States and MoRTH will prioritize the network to be audited, and will implement the improvements recommended by Road Safety Audit. The priority roads with high accident records are to be taken up first within the first six months.
- To carry out Road Safety Audit (RSA) for the entire primary network, required capacity is to be developed through proper training of qualified engineers, who are eligible for training. For this purpose, a special committee will be set up to draw up guidelines for a RSA procedure suitable for Indian traffic and safety issues with special reference to vulnerable road users by December 2011. Teaching and research institutions including IITs, NITs, CSIR, etc. will be identified for establishing training programmes for RSA professionals.
- Road Safety Audit is to be carried out for the roads using the trained auditors available in the country and in accordance with the manual of Road Safety Audit adopted by IRC. All steps of audit delivery including the initial meeting and audit completion meeting with the Client must be completed with submission of audit report and exception report etc for every road assigned for audit. This will bring out what all is required to be done for the road ensuring highest level of safety.
- No compromise, whatsoever, should be made in essential road safety features and all safety concerns must be addressed as per the recommendations of the Road Safety Audit Report. This aspect needs to be critically considered especially while analyzing project viability.



- No projects should be sanctioned / approved unless the report entirely complies with the Safety Audit Report. This should be applicable for the major projects such as NHDP, SARDP-NE, etc., to start with. The approach should then replicated for the projects on entire NH network in a time bound manner subject to availability of funds and inter-se priority.
- Encourage Institutionalization of conducting Road Safety Audits by certified Road Safety Auditors.
- An accreditation body is required to be created for Road Safety Auditors, which will control the utilization of these trained auditors and will maintain the register of certified auditors. Such auditors will have to undergo training and retraining as per a set of guidelines to maintain a high standard of auditing.
- Capacity for Road Safety Audit works in the country is to be enhanced by training and conducting certifications courses for Road Safety Auditors.

#### **4.3. Accident Investigation**

- Accident data recording system is to be adopted uniformly across all States for roads in urban and non-urban areas in a standard format. This standard format is to be evolved with national consensus and should include all rational data that are required for accident investigation, accident reconstruction, and also adjudication of the accident cases.
- The data collection should be tech-savvy with hand-held GPS and computer interface so as to collect all data with highest precision.
- There will be standard accident analysis module for accident investigation and adjudication uniformly to be used across the country without any exception.
- Only a few specialized centres shall study selected accidents, using the accident reconstruction technique, etc. and the same data system.
- Institutionalized System of Database storage shall be developed.

#### **4.4. Training**

- The engineers involved in planning, design, construction and operation of roads and highways in the country are to be trained on road safety aspects covering engineering measures, safety at construction sites and hands on experience in road safety audit.

#### **4.5. Research & Development**

- To establish about five to seven Centres of Excellence for Road Safety Research and Accident Analysis in Academic Institutions across the country in addition to the existing research institutions.
- The capacity in road safety research and accident analysis is also to be developed, for which bright young professionals are to be identified for specialized training.

#### **4.6. National Road Safety & Traffic Management Board**

Government is already initiated the process of approving the Bill for creation of a Road Safety & Traffic Management Board. This Central Body is an urgent requirement along with the counterparts in the States.

#### **4.7. Institutional Arrangements for planning, delivery, evaluation, monitoring and improvement**

The concerned Road Agency should be made responsible for the planning, delivery, evaluation, monitoring and improvement with specific focus to road safety. For this purpose, it is of utmost importance that necessary institutional arrangements be developed within a fixed time frame.

#### **4.8. Inter-Disciplinary Coordination**

It is very important to establish synergy between various stakeholders at various levels (i.e Central, State, District, etc.), which is presently missing, e.g. between the engineering authorities (viz. Road Agency, R&D / Academic organizations,) enforcement authorities (viz. Police, State Transport Authorities), organizations responsible for emergency care (viz. M/o Health & Family Welfares, Hospitals, Trauma Care Centres, etc.). The focus should be to establish a robust mechanism to address road safety issues in a comprehensive manner.

#### **4.9. Availability of Resources**

Adequate funds should be made available commensurate to the requirements, especially for development and maintenance of non-NHDP National Highways Network. It needs to be appreciated that in the absence of required allocations, there is inevitable compulsion of compromising with many of the essential features and requirements which have significantly adverse road safety implications. Similarly resources provided for State roads shall have to be commensurate to the estimated requirements.

#### **4.10. Capacity Building in Safety Administrations**

Due emphasis is required to be given to fast track capacity building of all stakeholders and organizations associated with Road Safety aspects. Further, these aspects shall also have to essentially reviewed on a continuous basis for needful adaptation with changing environment and evolving State-of-Art practices.

#### **4.11 Indicative Action Plan**

An Action Plan (Engineering Measures) showing the time frame for implementation of the various activities along with estimated cost and the agencies responsible for implementing and monitoring, is given at **Annexure-III**.

Concrete steps required to be taken within the suggested timeframe and required budget are also indicated in the said annexure. The organizations responsible for action have also been indicated. In general, the action plan suggests that within the time frame of five years all the engineering deficiencies in roads, etc. would be accomplished.

#### **4.12. Funding**

The estimate-wise requirements as indicated in the Action Plan at **Annexure-III** suggests that most of the expenditure will be in the initial three years. It is estimated that approximately Rs. 800 crore to Rs. 900 crore will be required for the suggested Engineering Measures requiring an annual average of Rs. 300 crore specific from the road safety perspective alone. Funding for this has to be arranged from different sources, viz. the following potential sources: -

(i) 1% cess earmarked from cess for road safety ( $\approx$  Rs. 90 crore annually);

(ii) Rs. 50 crore annual contribution from NHAI as a part of their corporate responsibility;

(iii) Specific earmarking of at least about 10 % of annual available allocation under National Highways (Original) [NH(O)] for road safety related measures (annual level of available NH(O) allocation is about Rs. 400 crore at present, which need to be augmented to at least about Rs. 5,500 crore; further enhancement may be required in case there is addition to existing NH network of 70,934 km);

(iv) Private sector contribution in the form of fully funded driver training institutes, centres of excellence, sponsored training workshops, etc.,

The resources likely to be generated from the above potential sources are to be utilized for all road safety related activities encompassing the Four E's, viz. Education, Enforcement, Engineering and Emergency care.

#### **5. Conclusions**

The Working Group on Engineering (Roads) recommends that the Action as proposed above should be approved and initiated as early as possible.

## Action Plan (Engineering Measures) for Road Safety

Broad Cost Estimate (Rs. Lakh)

Sl. No.	A. Improving Safety on NH and SH Network	Time Frame	Budget (in Lacs)			Responsibility for Monitoring	Remarks
			2012-13	2013-14	2014-15		
(i)	<b>Road Markings and Signages</b> All National and State Highways should have signs and road markings as per IRC Standard. National Highways State Highways	2 years	200	800	1000	MoRTH / NHAI	IRC Standards on signs, markings and safety measures to be hosted on the web site
		4 years	400	1000	1000	State PWD	
(ii)	<b>Road Safety Audit (RSA)</b> (a) RSA for entire NH network to be completed (b) RSA for entire SH network to be completed Note : Priority roads to be started for: National Highways State Highways	3 years	1000	1500	1500	MoRTH / NHAI	This will depend on number of packages
		4 years	500	1500	1500	State PWD	
		3 months					
		6 months					
(iii)	<b>Implementation of RSA Recommendations</b> This has to start immediately after completion of RSA National Highways State Highways	1 year					Safety measures to be put in Plan
		4 years	3000	7500	7500	MoRTH / NHAI	
		5 years	3000	5000	5000	State PWD	
(iv)	<b>Review of Standards / Guidelines &amp; Evolving New Guidelines</b> (a) To be reviewed with safety focus for NHs and SHs (b) Developing Manuals on Traffic Control Devices	2 years	100	100	-	MoRTH	
		1 year	50				
(v)	<b>Modification in Bid Documentation</b> Policy guidelines be issued that all safety related items including those during construction should be a paid item and not incidental. NHs and SHs	3 months	20	-	-	MoRTH	



# Action Plan (Engineering Measures) for Road Safety

Broad Cost Estimate ( Rs. Lakh)

Sl. No.	A. Improving Safety on NH and SH Network – contd..	Time Frame	Budget (in Lacs)			Responsibility for Monitoring	Remarks
			2012-13	2013-14	2014-15		
(vi)	<b>Implementation of other road safety engineering measures</b> <b>(a) Speed management measures (100 settlements/year) i.e. 100 locations</b> <b>(b) Provision of service roads (100 settlements/year)</b> <b>(c) Provision of pedestrians/cattle crossings (50 locations/year)</b> <b>(d) Improvements of inter-State border check posts on NHs (20 check posts in 1<sup>st</sup> year and 30 each in subsequent years)</b> <b>(e) Provision of truck lay bays along NHs (100 nos. in 1<sup>st</sup> year and 200 nos. each in subsequent years)</b> <b>(f) Provision of bus bays and bus shelter along NHs (100 nos. in 1<sup>st</sup> year and 200 nos. each in subsequent years)</b> <b>(g) Closure of unauthorized median openings</b>					MoRTH / NHAI	
	<b>B. Road Safety Audit</b>						
(i)	<b>Building Capabilities in RSA</b> 1000 number of Safety Auditors to be trained. (a)Training course content : To be decided (b) Training Providers : To be identified (c) Training Course : To be started	3 years 2 months 2 months 6 months	80	150	150	MoRTH	

# Action Plan (Engineering Measures) for Road Safety

Broad Cost Estimate ( Rs. Lakh)

Sl. No.	C. Institutional Arrangements for Road Safety	Time Frame	Budget (in Lacs)			Responsibility for Monitoring	Remarks
			2012-13	2013-14	2014-15		
(i)	<p><b>National Road Safety and Traffic Management Board</b></p> <p>Bill already introduced in Parliament and under consideration of Standing Committee.</p> <p>(a) Constitution of the Board after enactment of the Bill</p> <p>(b) Constitution of State Boards : States to be advised after enactment of the Bill</p>	<p>1 year</p> <p>1 year 1 months</p>	-	-	-	<p>MoRTH</p> <p>State Governments</p>	<p>Funds to be provided for the Centre and State Safety Board to be decided after enactment</p>
(ii)	<p><b>Accident Recording System</b></p> <p>System of accident recording to be introduced in a formal way to assist in devising proper safety measures.</p> <p>(a) Data Recording System</p> <p>(b) Training of police personnel</p>	<p>6 months</p> <p>3 years</p>	25	300	500	<p>MoRTH</p> <p>MoRTH / State Police</p>	

# Action Plan (Engineering Measures) for Road Safety

Broad Cost Estimate ( Rs. Lakh)

Sl. No.	D. Training for Road Safety	Time Frame	Budget (in Lacs)			Responsibility for Monitoring	Remarks
			2012-13	2013-14	2014-15		
(i)	<b>Training of Engineers</b> Engineers involved in planning, design, construction and operation of highways to be trained in road safety (a) Development of Training Modules (b) Identification of Training in Engg. Measures (c) Training	3 months  6 months  3 years	50 75 3000	3000	3000	Indian Academy of Highway Engineers (IAHE) [Formerly NITHE] & others	Training to be imparted to Civil Engineers of Clients / Consultants / contractors / concessionaires
(ii)	<b>Awareness Training Workshops</b>	3 years	1000	1000	1000	IRC	



# Action Plan (Engineering Measures) for Road Safety

Broad Cost Estimate ( Rs. Lakh)

Sl. No.	E. Research on Road Safety	Time Frame	Budget (in Lacs)			Responsibility for Monitoring	Remarks
			2012-13	2013-14	2014-15		
(i)	<b>Centre of Excellence (CoE)</b>					MoRTH	For CoEs PPP arrangements to be explored
	(a) Govt. To establish CoE	3 years	1000	2000	3000		
	(b) Advance training in safety research	3 years	200	300	500		
(ii)	<b>Accident analysis for corrective actions</b>	Continual	200	1000	1000	MoRTH	



