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Status Paper on Road Safety in Nepal



Arjun Jung Thapa

DDG, Department of Roads

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ACRONYMS

ADB	Asian Development Bank
AH	Asian Highway
DDC	District Development Committee
DFID/UK	Department for International Development of the United Kingdom
DoR	Department of Roads
DoTM	Department of Transport Management
DoLIDAR	Department of Local Infrastructure and Agricultural Roads
EWB	Highway East- West Highway
GDP	Gross Domestic Product
GoN	Government of Nepal
HMIS	Highway Management Information System
HMIU	Highway Management Information Unit
HVMP	Heavy Vehicle Management Policy
LRN	Local Road Network
LSGA	Local Self-Governance Act
MoLD	Ministry of Federal Affairs and Local Development
MoLT	Ministry of Labor and Transport
MoPIT	Ministry of Physical Infrastructure and Transport
MRM	Mahendra Rajmarga
NGO	Non –Governmental Organization
NRB	Nepal Road Board
NRSP	National Road Safety Plan
NTSC	National Transportation Safety Committee
PIP	Priority Investment Plan
PRA	Public Road Act
PRM	Prithvi Rajmarga
RBA	Road Board Act
TA	Technical Assistance
TESU	Traffic Engineering and Safety Unit
TPO	Traffic Police Office
TRP	Tribhuvan Rajpath
SBST	Single Bituminous Surface Treatment
SRN	Strategic Road Network
SSRN	Statistics of Strategic Road Network
UK	The United Kingdom
USA	The United States of America
VTMA	Vehicle and Transportation Management Act
VTMR	Vehicle and Transportation Management Regulation
WB	World Bank
ZTMO	Zonal Transport Management Office

1. Country Background

Nepal is situated in the Himalayas bordering the Peoples Republic of China on the north and India on the remaining three sides. Nepal is elongated in east west direction with an average length of 885 km and the width varying from 133 km to 255 km in North South direction having an area of 147,181 sq. km. The Population of the country is 26.494 million with growth rate 1.35% per annum¹.

Interim Constitution, 2006 has declared the country as a Federal Republic but the structure of federation is yet to be finalized. The first Constitutional Assembly (CA) elected on 2008 could not draft the constitution and new election 2013 has just accomplished to form a second Constituent Assembly to draft the Constitution.

Nepal has mainly three regions: southern lowland plains or Terai bordering India with tropical climate, Hill Region (Pahad) abuts the mountains and varies from 800 to 4,000 metres in altitude with progression from subtropical climates below 1,200 metres to alpine climates above 3,600 metres and the Mountain Region (Parbat), situated in the Great Himalayan Range, makes up the northern part of Nepal. It contains the highest elevations in the world including 8,848 metres height Mount Everest (Sagarmatha in Nepali) on the border with China. Seven of the world's eight thousand metre peaks are in Nepal or on its border with China: Lhotse, Makalu, Choyu, Kanchenjunga, Dhaulagiri, Annapurna and Manaslu. Nepal has five climatic zones, broadly corresponding to the altitudes. The tropical and subtropical zones lie below 1,200 metres, the temperate zone 1,200 to 2,400 metres, the cold zone 2,400 to 3,600 metres, the subarctic zone 3,600 to 4,400 metres, and the Arctic zone above 4,400 metres.

2. Modes of Transportation

Nepal's transport sector accounts for a large part of domestic passenger and freight movements. Being a landlocked country and due to high current and inadequate water depth in Nepalese river the water transport has very limited potential². Air services were the main mode of transportation in remote hills of Nepal till few years back and still contribute to passenger movements to key commercial and tourist destinations, and to the transport of both passengers and goods into remote hill areas. The single operating railway system covers only 52 km within the country which is in pathetic condition. The road construction in Nepal is very difficult and costly due to the rugged topography and poor geology. There are 2 districts among 75 districts still not connected by road³. International trade movements are conducted through various land routes across Nepal India border among which 7 routes are significant and there is only one land route across China Nepal border. Limited high-value goods are carried by air. Therefore, Roads are the principal transport mode in Nepal.

¹ [National Population and Housing Census 2011 \(National Report\)](#)". Central Bureau of Statistics (Nepal). Retrieved 26 November 2012

² Preliminary Study Report on Water ways in Nepal, 2004

³ Yearly Plan 2013 14. National Planning commission 2013

3. Road Network Planning and Design

The National Road Network of the country is classified mainly two broad categories- Strategic Road Network (SRN) and Local Road Network (LRN). Depending upon importance, the roads are further classified as National Highway, Feeder Roads, District Roads, and Urban Roads. Nepal Roads Standard (NRS), 1971 has been recently revised incorporating new Classification system, Climbing Lanes, Emergency Escape Ramps, Bicycle Tracks, Acceleration and Deceleration in Intersection and Tunnels. According to NRS, second revision 2013, Functional Classification has been added as Class I, II, III and IV⁴. The first category is the highest standard road with divided carriageway and access control and the last category is the road with design speed up to 60 km/hr. Thus, the National highways belong to class I, II and III whereas Feeder Road belong to class II, III and IV.

The Department of Road (DoR), functioning under the Ministry of Physical Infrastructure and Transport (MoPIT), is responsible for the construction and maintenance of the Strategic Road Network (SRN). The Strategic Road Network (SRN), backbone of the National Road Network, are the main national arteries providing inter-regional connections and links to regional and district headquarters, international borders, key economic centers, touristic centers and the major urban roads.

Among the South Asian Countries, Nepal has a very low road density, not only in terms of serving the population but also in providing accessibility to various parts of the country. Although the strategic roads constitute about 20 percent of the National Road Network, it plays a very important role in terms of the movement of people and freight. The strategic roads have high traffic volume in comparison to district roads. At present, the Strategic Road Network consists of 21 National Highways and 208 Feeder roads totaling 11636 km as of year 2011/12⁵. The current lengths of SRN each pavement category of roads are summarized in Table 1 and Existing and proposed SRN are shown in figure 1.

The Local Road Network (LRN), comprising of district roads, village or agricultural roads and nonstrategic urban roads, are being constructed and maintained by the local governments and users with the support from Department of Local Infrastructure Development and Agriculture Roads (DoLIDAR), functioning under the Ministry of Federal Affairs and Local Development. Local Governments consists of District Development Committees (DDCs), village Development Committees (VDCs) and Municipalities. Actually, there was no inventory of these roads. DOLIDAR has recently conducted an inventory survey and found that there is some 51000 km of Local Road Network in the country as of 2013⁶. These roads were constructed to open up access to remote/rural areas as quickly as possible but without giving due consideration to the operability and sustainability of roads thus constructed. The geometry of these roads is poor and some serious environmental problems are created by these roads. About only 40 percent of the

⁴ Nepal Roads Standard 1971 Second Revision, 2013, Department of Roads 2013

⁵ Road Statistics 2011/12, Department of Road, 2012

⁶ Summary of Rural Roads, DOLIDAR, 2013

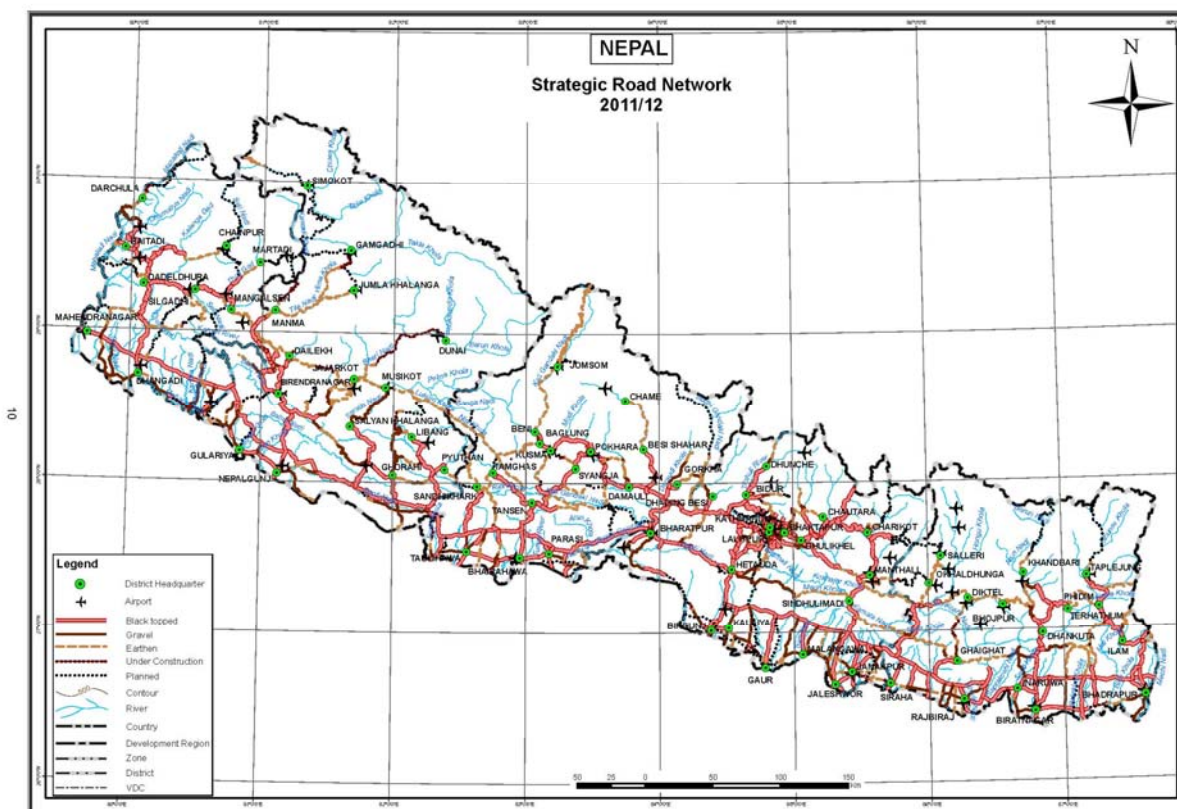
network is serviceable. However, the Department of Roads (DoR) also looks after approximately 10000 km of main roads of this local network⁷ which are mostly serviceable.

With the combined lengths of SRN and local road networks of 62579 km, the road density km per 100 sq. km is 42.51 and influenced population number per km is 425. If the serviceability is considered, the road density drops down drastically.

Table1: Total Road Network of Nepal, 2013

Type of Road	Bituminous	Graveled	Earthen	Total	Population/ km (26,620,809)	km per 100 sq km (147181)
SRN ⁷	5574	1888	4173	11636	2288	7.90
Local ⁶	1575	14601	34766	50943	522	34.61
Total	7149 (11.4%)	16489 (26.3%)	38939 (62.3%)	62579 (100%)	425	42.51

Figure 1: The present Strategic Road Network in Nepal, 2013



⁷ Road Statistics, Department of Roads, 2010

The National road network in Nepal has developed enormously since 1951, when the length of the network was only 376 km⁸. But the rapid expansion of the network took place in the last 25 years from around 5925 km in 1985 to 62579 km in 2013 an annual increase of around 9.9 percent. Now, the country is emphasizing gradually on upgrading of fair weather SRN roads to all weather conditions⁹.

4. Vehicle Population

First motorized vehicle entered Kathmandu Valley in year 1901¹⁰ on shoulders of men for the service of ruling Elites of that time. The time of entering first vehicle in Kathmandu differs with the previous Status papers, but this is the correct one. Latest photographic evidences of vehicle carrying by men are the vehicle gifted by Adolf Hitler to king Tribhuvan of Nepal in 1942. But the vehicles were running on Kathmandu roads well before. Number and types of vehicles increased in Nepal after the opening of Tribhuvan Rajpath (TRP), constructed by Indian Assistance in 1956, linking Terai and Indian border with Kathmandu valley.

Table:4- Statistics of different types of vehicle registered

Year	Bus/Mini bus/Micro bus	Car /jeep/Van /Pickup	Crane/D ozer/Truck	Tractor	Tempo	Motorbike	others	Total
up to 2000	14,507	54,963	21,309	21,072	6,702	150,185	3,715	272,453
2000/01	1,453	5,152	1,271	3,519	232	29,291	77	313,448
2001/02	1,163	4,374	1,798	3,189	248	38,522	86	362,828
2002/03	962	3,487	1,212	2,485	17	29,404	43	400,438
2003/04	1,853	7,557	1,477	2,191	16	26,547	58	440,137
2004/05	1,622	4,781	1,592	1,374	48	31,093	21	480,668
2005/06	2,257	5,150	2,263	635	60	45,410	0	536,443
2006/07	2,508	5,892	3,278	2,942	12	72,568	1,536	625,179
2007/08	2,629	6,329	3,594	3,297	18	69,666	205	710,917
2008/09	2,564	8,144	3,643	4,663	20	83,334	202	813,487
2009/10	2,810	14,243	4,524	11,460	9	168,707	31	1,015,271
2010/11	3,095	8,510	1,969	7,937	2	138,907	133	1,175,824
2011/12	3,410	8,711	1,333	8,413	10	145,135	91	1,342,927
2012/13	4,749	9,595	3,332	9,795	57	175,381	152	1,545,988
Total	45,582	146,888	52,595	82,972	7,451	1,204,150	6,350	1,545,988

Source: Department of Transport Management¹², Traffic Directorate, Nepal Police, 2013

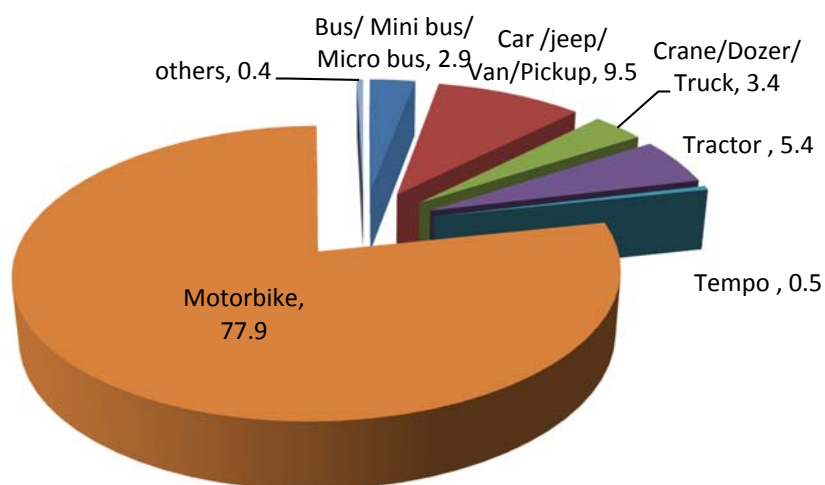
⁸ 20 Year Road Plan 2002-2020, NEPECON, 2002

⁹ DoR 3 Year Business plan 2011

¹⁰ History of Shree Tin Ranas, Purushwottam Shamshere Rana, 1992

At present more than 1545998¹¹ motorized vehicles are registered in the country with highest share of motorized two wheelers is 77.9%. Light vehicles, car, Jeep and pickup share the second highest as 9.5% and the public utility vehicle mainly Bus, Mini Bus and microbus share 2.9%. And Crane, Dozer and Truck share (3.4%) and Tractors, three wheelers and other share 5.4%, 0.5% and 0.4% respectively.

Figure 2: Composition of Vehicles in Nepal, 2013

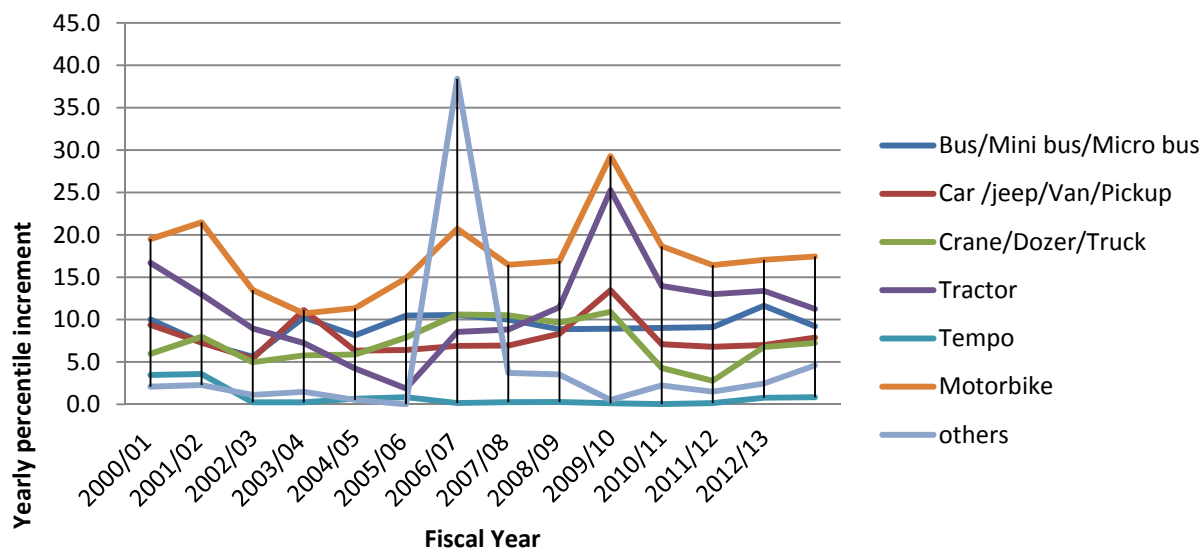


Besides the motorized vehicles there are also considerable numbers of non-motorized vehicles plying in the roads such as Cycle, Tricycle (Rikshaw), Oxen carts etc. Oxen carts and Rikshaw are used mainly in the Southern plains, the Terai. There is no specific record for numbers of non-motorized vehicles but are highly susceptible for cause of the road accidents due to no proper safety features.

The growth rate for Bus/Mini bus/Micro bus is ranging from 5.6 to 11.6 % with an average of about 9.2%. Average growth rate of motorized two-wheeler is highest with about 17.5%. The average growth rates for light vehicles, trucks, tractors, tempo and others are 7.9%, 7.2%, 11.3%, 0.8% and 4.6% respectively.

Such high growth rate in two wheelers and light vehicles is mainly due to increasing economy and lack of efficient mass public transportation system in urban areas.

¹¹ Progress Report of Department of Transport Management, 2013

Figure 3: Annual Growth rate of motorized Vehicle

5. Road Safety Law and Requirement

After opening up of new roads in the country, the number of vehicles increased. The first Vehicle Act was enacted in 1964 to manage the vehicles plying in roads and public transportation and was followed by Transportation Management Act in 1970. Later, a combined Vehicle and Transportation Management Act, 1993 (VTMA) and VTM Regulations, 1998 replaced them. Besides VTMA, the Public Road Act, 1975; Local Self-Governance Act, 1999; and Road Board Act, 2002, also considers some part of road safety consideration such as implementation and management of traffic flow, vehicle axle load, and right of way.

Technical and safety requirements for all types of vehicles have been provisioned in Vehicle and Transportation Management Act, 1993 (VTMA)¹² and Vehicle and Transportation Management Regulations, 1999 (VTMR)¹³. Some provisions regarding vehicle standard and safety in VTMR 1998 are:

- Standard dimension of the public vehicles
- Number of seats, height, width and folding provisions
- Fire extinguisher and emergency doors in public vehicles
- Insurance provision and First aid kits
- Lock in good condition on doors and windows
- Shock observer in good condition
- Speed limit
- Axle load limit
- Driver change and refreshment provision in long route driving

¹² Vehicle and Transportation Management Act, 1993

¹³ Vehicle and Transportation Management Regulations, 1999 (VTMR)

6. Road Safety problems

More focus was in developing road length by constructing new roads and very low consideration was given for maintenance and road safety till 80s. Most of the roads were under traffic to their design capacity. Road construction followed standard geometrics with least concern for road safety. As the traffic increased in these roads, accidents are also increasing in alarming rate. The problems related to road safety can be summarized¹⁴ as:

- Roads and bridges without walkways and other required road safety features.
- Narrow bridge approaches
- Poor visibility at blind corners
- Poor shoulders
- Unforgiving side-drains
- Inadequate safety barriers at steep vertical drops
- Unscientific location of passing bays in single lane roads
- Lack of climbing lanes
- Very steep gradients at numerous sections
- Narrow sections at built-up
- Driver negligence
- Drunk driving
- Random roadside parking
- Reckless pedestrian crossing
- Poor road conditions
- Lack of awareness of traffic rules to all stakeholders

The road accident cost for year 1994/95 alone was estimated to be more than £ 9 million¹⁵ (0.4%) of GDP).

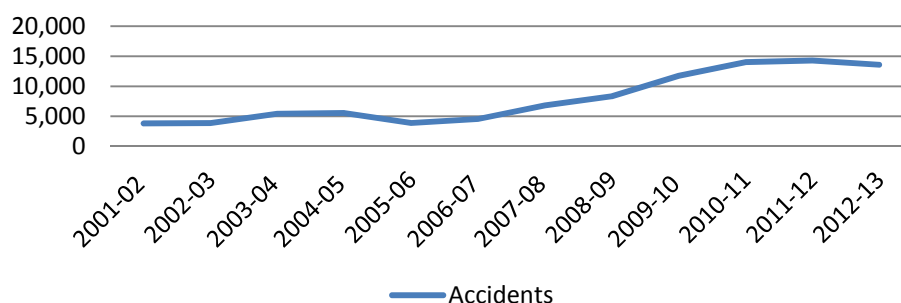
7. National Statistical Trends in Road Accident

Road accidents are increasing in Nepal due to increased vehicle fleet and speed. Most of the accidents having any human injury are reported to the police. Accidents with minor injury and small damages to the vehicles may be settled at the accident site with mutual understanding and may not be reported to the police. A fairly large number of accidents are never reported to the police, mainly because the involved parties want to settle the matter between them. Generally, only those accidents with high injury or property damage or with disputes are reported and recorded in the police office. This under-representation is assumed to be less pronounced for severe accidents. The figures do not give the full accident picture.

¹⁴ Nepal Road Safety Action Plan 2013-2020, Ministry of Physical Infrastructure and Transport, 2013

¹⁵ Road Accident Costs, Department of Roads, June 1997

Figure 4: Road Accidents in Nepal



Considering the heavy loss of lives and wealth in road accidents the concerned road and traffic management agencies have started to incorporate road safety issues in their program but it seems inadequate as the losses of life and property from road accidents is increasing. Trend of road accidents and losses of life and property is increasing in recent year.

Table 2: National statistical trends in road accident (2001-2010)

Year	Accidents	Fatalities	Serious Injuries	Slight Injuries	Injury/fatal ratio	Total vehicles	Fatality per 10000 vehicles
2001-02	3,823	879	458	4,138	5.23	362,828	24.23
2002-03	3,864	682	785	4,442	7.66	400,438	17.03
2003-04	5,430	802	1,659	3,925	6.96	440,137	18.22
2004-05	5,532	808	1,795	4,039	7.22	480,668	16.81
2005-06	3,894	825	1,866	3,655	6.69	536,443	15.38
2006-07	4,546	953	2,583	5,331	8.30	625,179	15.24
2007-08	6,821	1,131	2,663	5,245	6.99	710,917	15.91
2008-09	8353	1356	3609	6457	7.42	813,487	16.67
2009-10	11747	1734	4130	7383	6.64	1,015,271	17.08
2010-11	14013	1689	4,018	8,503	7.41	1,175,824	14.36
2011-12	14,297	1837	4,018	7,811	6.44	1,342,927	13.68
2012-13	13,582	1816	3,986	8,000	6.60	1,545,988	11.75
Sum	54,010	9,170	19,548	44,615	7.00	1,545,988	

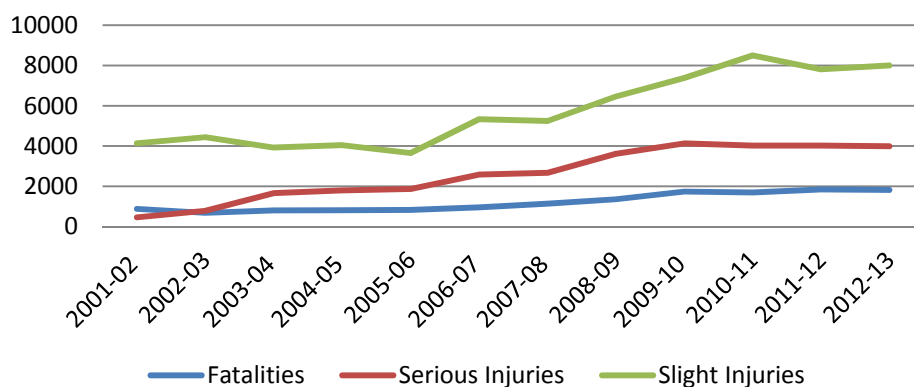
Source: Traffic Accidents Record¹⁶, Traffic Directorate, Nepal Police, 2013

Total number of road fatalities in past decade was going decreasing in 2002, 2003 2004 and 2005 in comparison with base year 2001 but it became increasing since 2006 and seems very much threatening in 2009. The trend can be seen well in the Figure 4.

¹⁶ Traffic Accident Records, Traffic Directorate, Nepal Police, 2013

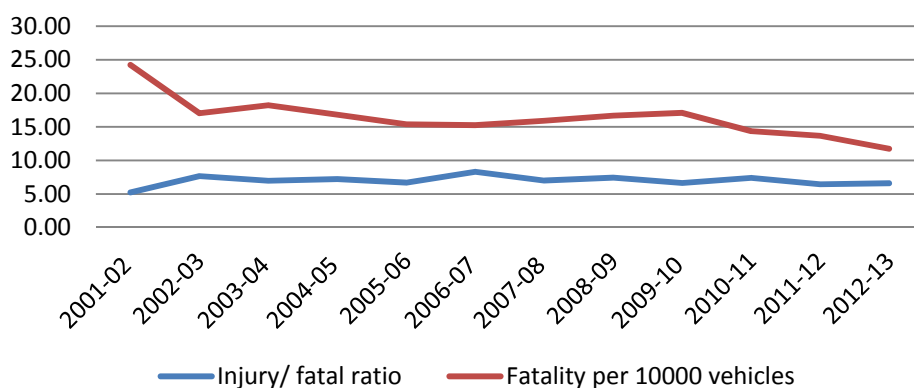
The number of death of passengers and pedestrians per 10000 vehicles is also increasing steeply since 2006. The trend of minor injury, serious injury and fatality are also in increasing trend and was steeply rising from 2006 to 2010.

Figure 5: Trend of Minor Injury, Serious Injury and Fatality



The disaggregated data for the death of motorcyclists could not be found however a study on various road users and number of casualties in road accidents showed highest number of road casualties is happening to pedestrians followed by motorcycle riders.

Figure 6: Trend of injury to fatal ratio and fatality per 10000 vehicles



Since there is no dedicated lead agency for road safety in Nepal national data of “Fleet safety” records of public/private sector organizations (death/100,000 km) is not achieved.

Table3: Causes of accidents

Year	Negligence by driver	Negligence of Pedestrian	Overtaking	High Speed	Drinking and driving	Technical fault of vehicle	Overload	Cattles on the road	Miscellaneous	Total
2007/08	1491	492	546	962	461	310	339	17	19	4637
2008/09	1896	629	569	1066	434	440	434	24	27	5519
2009/10	2315	1011	939	1451	504	523	484	39	11	7277
2011/12	5795	361	528	1453	240	325	104	34	52	8892
Average	2874	623	646	1233	410	400	340	29	27	6581
%	43.7	9.5	9.8	18.7	6.2	6.1	5.2	0.4	0.4	

Source: Traffic Accidents Record¹⁶, Traffic Directorate, Nepal Police, 2013

The above table is extracted from the Traffic Accidents Record provided by the Traffic Directorate of Nepal Police. It is evident that the reasons of majority of accidents are negligence by the driver and over speed which account for 43.7% and 18.7% respectively. Overtaking, high speed, overload, drinking and driving are also the negligence of the driver. Therefore, enforcement and awareness of the driver is lacking somewhere. Again, awareness is lacking regarding negligence of pedestrian and cattle driving on the road. But a clear cut analysis cannot be made with the above data.

Because of absence of dedicated lead agency for road safety, accident data base system is poor in the country. Generally DoR through its division offices keeps the locations of accidents. Considering a proper accident database system to be backbone of road safety engineering, collection of road accident information started in July 1995 with help of Traffic Police Office (TPO). DoR helped the TPO to design their own simple Road Accident Data System for nationwide accident database, which basically provides accident statistics but do not provide the necessary detailed information for accident analysis.

The safety record varies by locations of the country with disparate trends. The following summarizes the findings of RTAs in Nepal based on past research and monitoring¹⁷.

- About half of all the RTAs nationwide occur in the Kathmandu Valley alone where nearly half of the country's fleet ply.
- The severity of the RTA injuries in the Kathmandu Valley is less pronounced than in the rural areas.
- RTA fatalities amongst the vehicle fleet are higher in the regions outside the Kathmandu Valley.
- Pedestrians are the most vulnerable groups in road accidents because pedestrian-safety has not been considered.

¹⁷ Nepal Road Safety Action Plan 2013-20, Ministry of Physical Infrastructure and Transport, 2013

- People between 15 to 40 years of age are most affected in road-accident followed by those above 50 years.
- In the urban areas, there is significant number of motor-cycle accidents.
- In the rural areas, there are significant number of trucks and bus accidents.
- Bus accidents along the long-distance routes are of serious concern accounting for 13% and 31% of all the fatalities and serious injuries, respectively.
- Single bus accidents where the vehicle runs over the hill-roads represent the fatal RTAs of catastrophic proportions.
- About 30 to 40% of the accidents happen after sunset when traffic is low.
- Driver negligence, drunk driving, random roadside parking, reckless pedestrian crossing, poor road conditions, etc., were the major causes responsible for the accidents.
- Accidents tend to cluster at the following locations.
- Urban areas: intersections
- Highways: bridge approaches, intersections, and roadside built-up areas.
- From a conservative estimate, the economic loss from RTAs in Nepal was at least NRs.22.7 billion (US\$ 41.2 million) annually or 0.4 % of the GNP¹⁸ at 2007 price. When the accident under-reporting are adjusted, the loss was 0.8% of the GNP annually.

8. Current National Government Policy for Road Safety

The National Transport Policy 2001¹⁹ identifies road safety as one of the objectives in developing the transport infrastructures and services. However, there is no elaboration on the various road safety requirements within the Policy. National Transport Policy, 2002 in its policy no.9 says –“The construction, improvement and management of the means of transport shall be done in harmony with the traffic safety and environmental effect”.

DOR Institutional Position Paper was drafted in December 2006 by the Consultants under the World Bank aided Road Maintenance & Development Project (RMDP)²⁰ to strengthen the road sub-sector institutionally. This document details the institutional arrangement that the DOR wishes to evolve in Nepal over the coming decades. But this document has not been formally approved by the government.

It has been mentioned in Department of Roads (DoR) Vision statement that- “Substantial Reduction in Accident Rate²¹” and in Mission statement- "To Contribute towards the Betterment

¹⁸ Report: “Cost of Road Traffic Accidents in Nepal”; GoNDoR Road Connectivity Sector I Project (ADB Grant 0051-NEP); N.D. Lea (Canada) - CEMAT- Soil Test- TMS JV: 2008.

¹⁹ National Transport Policy, Government of Nepal, 2001

²⁰ DoR Institutional Position Paper, Department of Roads, 2006

²¹ DoR Strategy, Department of Roads, 1997

of Living Conditions of the People through Effective, Efficient, Safe and Reliable Road Connectivity".

Specific training courses to the police personnel on traffic signs, driving, accident management and analysis, and enforcement were conducted by DoR through specialists under RTU. Training manuals were developed with intention that the trained persons would be able to train others - i.e. cascade training. Because of frequent transfer of police personnel a regular training activity is needed in the TPO. National road safety awareness campaigns and training programs regarding road safety are being conducted in joint collaboration of Department of Roads (DoR), Traffic Police, Schools and Local Authorities annually.

To strengthen the existing traffic management law and to make the traffic legislation to be more effective for enforcement, necessary amendments specifying speed limits and traffic signs were amended by the Department of Transport Management (DoTM).

Present resource allocation to road safety is inadequate. All stake holders are complaining for lack of resources to address the road safety issues and programs in their respective organizations. There are no comprehensive National road safety reports or impact evaluation reports of Government programs published in Nepal. Traffic Directorate of Nepal police only keeps the accident reports and provides if demanded.

9. National Road Safety indicators

There are various aspects involved in the road safety. Road safety is the combined effects of road users, road design, road safety regulations, and emergency response system. National indicators regarding road safety has been discussed below.

9.1 Road Users

Vehicle and Transportation Management Act, 1993 (VTMA) and VTM Regulations, 1998 have various provisions on roads safety aspects, some of them are:

- It is mandatory to wear a seat-belt; Traffic Police monitors and enforces its compliances.
- Motorcycle day time head light is not mandatory.
- Use of motorcycle helmets to the rider is mandatory but there is no standard of helmets defined.
- Use of child seat restraints in cars and child helmets for motorcycle is not mandatory hence not in use widely.
- Road safety education in schools is made compulsory by introducing road safety chapters in school level text books.
- Drinking and driving is prohibited by law and strong monitoring is being made by Traffic Police especially at night time. VTMA 1993 clause 164 prohibits drinking and driving.

Observation test and/ or breathalyzer tests are being applied to check drinking and driving. Traffic police conducts these tests randomly especially in evening and night time. Non

conformance of this provision will result cash fine to cessation of the driving license or route permit.

Bus, carrying passengers in long routes accidents are a major problem on highways as they account for mass killing or seriously injured. In most of the road accidents on highways poor road user behavior such as bad driving, drinking and driving, parking at road side, careless crossing by pedestrian are the main factors. Accidents are found to cluster at road intersections in urban area. In highways accident cluster are concentrated in near bridge approaches, intersections, and road side built-up area.

9.2 Safe Road Design

Department of Roads (DoR) and DoLIDAR are the two main institutions which are involved in engineering design and construction of roads. In Department of Roads, Road Safety Audit was introduced in 1995²² with the following key principles;

- Design of road for all road users,
- Provide a clear and consistent message to the driver and other road users,
- Encourage appropriate speeds and behavior through design and traffic signs,
- Reduce conflicting points in the road junctions and intersections,
- Make allowance in design for the bad or impaired driving,
- Create a forgiving road,

Road safety audit was considered to be a compulsory activity for all roads under construction or rehabilitation. DoR, Traffic Safety Unit (TESU) with the help from concerned project personnel, audited major strategic roads and about 1,200 km of National Highway. The road safety audit contributed very fruitful safety improvements, especially in road sections with higher rate of accidents. Based on the road safety audit experiences, performance evaluation, and feedback from the field results a detailed Road Safety Audit Manual was published in April 1997. Road safety audit at design stage has been made mandatory for new projects. However, there is lack of periodic evaluation of Traffic safety in highways.

Activities that Department of Roads involved are:

- Installing road signs and safety barriers at accident prone locations on various highways
- Zebra crossings, traffic lights and some over head crossing bridges are built and being used by the pedestrians in urban areas especially in capital city Kathmandu
- Constructing separate bicycle lane and footpath for pedestrian in major roads in Kathmandu
- There is separate bicycle lane in Jhapa Section of Mahendra Highway, but not being used.
- Maintenance activities on the road as well as road side maintenance for removing or cushioning roadside obstacles
- Activities for planting trees along road side and trimming these in certain intervals

²² Road Safety Audit Manual, Department of Roads, 1997

But there are various improvement works still to be carried out which are lagging behind because of lack of fund and institutional commitments. Similarly, sufficient safe crossings on highways could not be installed yet due to lack of fund.

For standardization of traffic sign and road marking system, a Manual for Road Traffic Signs was prepared and approved in 1997. The Manual is in line with the international practices that set out in International Convention on Road Traffic, Geneva and Road Signs and Signals, Vienna. Besides, full-color posters illustrating the traffic signs were also prepared for road safety education purpose.

9.3 Vehicles

Vehicle and Transportation Management Act, 1993 (VTMA) and VTM Regulations, 1998 has provision of frequent and periodic inspection of vehicles. Initial and periodic inspections of vehicles are provisioned in VTMR 1998²³ as follows;

- Bus- 5 years driving permission after initial inspection then additional 3 years permission if meets the requirement in yearly periodic inspections.
- Mini bus- 8 years driving permission after initial inspection then additional 7 years permission if meets the requirement in yearly periodic inspections.
- Micro Bus- 5 years driving permission after initial inspection then additional 3 years permission if meets the requirement in yearly periodic inspections.

9.4 Road safety Data Base

The local traffic police keep the accident data and send it to the traffic directorate at central level. In case of fatal and serious injury accidents, the data can be verified by the hospitals but in case of light injury it could not be verified from the hospitals.

9.5. Emergency Response System

There is no exact division of geographical coverage for accident rescue activity. Generally the local traffic police and highway police provides rescue service to the event of accident. But local people and army man also carry out the rescue service.

Average response time for the accidents in Nepal depends upon the proximity of police post from the accident site. Generally it is 15 to 30 minutes in plain sections of highways and feeder roads and 30 minutes to one hour for hill and district roads. Urban accidents could be responded immediately.

9.6 Speed Limit and Compliance

Speed limit has been provisioned in Vehicle Management Act and Regulation in Nepal. In VTMR, 1998² following speed limit provision has been specified:

²³ Vehicle and Transport Management Act, 1993 and Vehicle and Transport Management Regulation 1998

- Bus, Mini Bus, Truck- 50 KMPH for hill roads and 70 KMPH for plain
- Car, jeep Van Pick up- 80 KMPH
- Tempo, Tractor scooter- 40 KMPH
- Motorbike- 50 KMPH

But the Maximum speed is limited to 40 KMPH for all kinds of vehicle in settlement area and DoTM can revise the limit of speed considering the condition of road and vehicle. Similarly the driver of a public vehicle has his duty to follow the time table to reach the destination as mentioned in rout permit for the convenience of passengers.

Even though speed limit provisions are legally binding in Nepal but the compliance of these provisions are rarely found in practice. Traffic Police has started checking compliances of speed limit using Radar gun in specific location having high rate of accident.

10. Nepal Road Safety Action Plan 2013-20

The UN Road Safety Collaboration (UNRSC) was established in April 2004 to better address road-safety issues globally and subsequently the UN Commission of Global Road-Safety issued a call for a decade of action to be dedicated to road-safety in its 2009 report²⁴. In 2010, the United Nations General Assembly adopted resolution 64/255, which proclaimed a Decade of Action for Road Safety. This proposed Decade of Action on road-safety has been endorsed by the UNRSC and a wide range of public figures. As a result, the UNRSC released the Global Plan for the Decade of Action for road-safety 2011 to 2020 in May 2011. The goal of the Decade (2011–2020) is to stabilize and reduce the increasing trend in road traffic fatalities, saving an estimated 5 million lives over the period.

The UN Global Action mandates member countries to develop their individual national plans for the decade (2011 to 2020) incorporating interventions under the following five pillars to road-safety.

- Road safety management
- Safer roads and mobility
- Safer vehicles
- Safer road users
- Post-crash response

In addition, the Global Action Plan recommends countries to develop their national action plans for the decade in a manner that is consistent or can be carried forward to the regional plans. Nepal is one of the active members of United Nations and also a signatory to the UNESCAP Meeting in Busan 2010, Republic of Korea, which required all the signatories to pledge a 35 percent reduction in both the number and casualties of Road Traffic Accidents (RTAs) within their respective countries. Nepal has already prepared its own **Road Safety Action Plan 2013-20** in recognition of this fact. Nepal's Road Safety Action Plan 2013-20 is in line to the Global

²⁴ Global Road Safety Status 2013, WHO, 2013

Action Plan¹⁷. All stakeholders are obliged to follow the Action Plan to improve and manage road-safety in integrated manner.

10.1 Strategy of Nepal Road Safety Action Plan 2013-20

Horizontal coordination amongst the stakeholders to manage road-safety has been poor in the past. Ad-hoc coordination was hampered with duplication of activities from parallel committees set up under different agencies while interventions been arbitrarily implemented. A National Road Safety Council was set up in Nepal during the nineties but this body has been defunct. There have been calls for the reviving council with expanded jurisdiction and resources.

Recently, lawmakers, senior bureaucrats and traffic police have mooted for the establishment of a high-level road management board to improve traffic management in the Kathmandu Valley. While the first emphasis of such body is traffic management, such measures do enhance road-safety as well and encourage horizontal coordination.

Nepal Road Safety Action Plan 2013-20 has proposed the detailed formulation of the road-safety strategy as one of the activity of this action plan. It also sets out the activities that concerned agencies need to implement to achieve the desired goals of reducing road traffic injuries and resultant economic losses in Nepal. As the first national action plan, it is anticipated that GoN will revise and update it in the future as necessary. However, the Action plan gives broad strategies to adopt for road-safety improvements²⁵ which are:

1. Ensure collaborative inputs from all the stakeholders to formulate an action plan incorporating the five pillars of road-safety and hence guarantee ownership.
2. To improve horizontal coordination, effectively manage the various interventions and champion road-safety issues, study the option of re-establishing a high-level NRSC with the legal authority to delegate various agencies.
3. Have the NRSC monitor the road-safety initiatives of different agencies. For some of the activities related to policy development, the NRSC will conduct the works in question itself.
4. Have the NRSC regularly disseminate its research findings, delegate specific responsibilities to the various stakeholders and legally mandate regular reporting requirements from them.
5. Enumerate the specific interventions required to reduce the RTA severity with reference to the good practices outlined in the UN Global Action Plan.
6. As a policy document developed and endorsed from the stakeholders, the concerned line agencies will follow this action plan to improve and manage road-safety in an integrated manner.
7. Amend the acts and regulations in order to accommodate road-safety requirements adequately and ensure an enabling policy.
8. Formulate a national target for RTA reduction. As signatory to the Busan Meeting, a target of 35~ 50 % reduction of RTA recommended by this meeting will form as a basis for setting the national target.

²⁵ Nepal Road Safety Action plan 2013-20, Government of Nepal 2013

9. To ensure funds for road-safety interventions, seek endorsement from the Ministry of Finance and the National Planning Commission to recognize the principle of the first-year of returns as a basis for investment decision, seek these agencies endorsement also to utilize the Roads Board Fund or to set a policy to mandatorily set aside a fixed portion (e.g. 10%) of the total cost of road-constructions to mobilize budget for road-safety interventions.
10. For maximizing the positive impact, prioritize interventions according to their effectiveness in mitigating the RTA severity at specific locations. For example, overloading control and random vehicle inspections of buses will be adopted at rural areas to reduce single bus accidents.
11. Pedestrian-safety will be prioritized in the road-safety planning and the interventions proposed.
12. Development of forgiving roads and infrastructures will be advocated through necessary guidelines, incorporation in the design standards, etc.
13. A mechanism to evaluate the outcome of various interventions will be developed in the near future.
14. Research and development, awareness for the public and stakeholders and trainings will be the integral part of the road-safety interventions.
15. To improve the RTA database, an inter-agency referral mechanism to identify potential accident-black spots will be adopted. For example, a hospital should immediately refer such potential black spots to DoR, traffic police, etc., based on the hospital's inference to its admission record for RTA injuries.
16. To develop in-house expertise and ensure commitments from the stakeholders, road-safety units will be formed at these agencies.
17. The activities relating to road-safety policy will also look into aligning them with the ISO traffic safety management standard -ISO 39001.
18. The establishment of a comprehensive injury-surveillance at the hospitals and health centers will be pursued to mitigate under-reporting of RTAs.
19. As this is the first national action plan, a monitoring mechanism to evaluate this plan will be developed and updated as necessary.

10.2 Pillar 1: Road Safety Management

The Objectives of Pillar 1 are to set up a mechanism to improve capacity to manage road-safety through adoption of UN legal instruments, creation of regional road-safety instruments, Improvement of horizontal coordination amongst stakeholders, Development of sustainable road-safety strategies and accident reduction targets and improvement of accident data collection and research. The following activities are planned to achieve above mentioned objectives:

- Establish the National Road Safety Council with sweeping authority.
- Train stakeholders
- Amend the Vehicle & Transport Management Act 1993 (VTMA 1993), Local Self Governance Act 1999 (LSGA 1999) and develop various guidelines.
- Develop a national road-safety strategy and implementation modality.

- Reliably, scientifically compile, analyze the RTA statistics and research on countermeasures

10.3 Pillar 2: Safer Roads and Mobility

The objective of this pillar is to improve the inherent safety of the road networks for all road-users, especially the most vulnerable groups (e.g. pedestrians, bicyclists and motor-cyclists). This will be achieved through Adoption of UN and international standards for the design of safe roads, road safety audits and assessment and incorporating safe design practice during design, construction and operation of roads. Following activities are envisaged above objectives:

- Develop road-safety audit manual for non-strategic roads and gradually enforce safety audits in all roads (strategic and non-strategic).
- Introduce compliance policy for safety audits recommendations (strategic and non-strategic roads).
- Develop design guideline for safer roads and construct required infrastructures.
- Investigate accident black spots for all road types and construct appropriate countermeasures.
- Enforce work-zone safety from construction to defect-liability period in all road project contracts.
- Establish road-safety units in DoLIDAR and valley municipalities.
- Train stakeholders on safe roads and safety-audits.

10.4 Pillar 3: Safer Vehicles

The objective of this pillar is to promote the universal adoption of both the active and passive technologies that are available for safe vehicles through the harmonization with the global standards, publicity and incentives for the consumers in their adoption. The activities envisaged are:

- Develop and implement a safe-vehicle guideline through a task force including the following:
- Develop and introduce standards for safe vehicles, spares.
- Amend VTMA 1993, VTMR 1997 and develop national transport policy to reinforce safer vehicles.
- Review route-permit procedure.
- DoTM institutional development.
- Financial incentives to promote in-vehicle safety devices.
- Improve vehicle inspection procedure.
- Research major public vehicle accidents, school bus safety and initiate mitigation.
- Basic repair and maintenance training for public vehicles.

10.5 Pillar 4: Safer Road Users

The objective of this pillar is to develop comprehensive programs to improve road-user behavior through sustained and stronger enforcement of traffic rules, sustained road-safety awareness

campaigns, increased efforts to improve the use of seat-belts and helmets, reduce drunk-driving and other risky behaviors, introduce better speed control and heavy penalty to undisciplined road-users including pedestrians. To achieve these objectives, following activities are necessary:

- Amend VTMA 1993, VTMR 1997 to invigorate safe road-users
- Strictly enforce the rules on the seat-belts, helmets use, and public transport safety and develop comprehensive code-of-conduct for all road-users
- Public awareness campaign and research for all road-users
- Include road-safety education in school curriculum with regular revisions
- Train drivers and other road-user.
- Improve driving license procedure scientifically
- Establish road-safety units in the Department of Transport Management and institutional development of the traffic police
- Construct modern driving training centers and capacity enhancement

10.6 Pillar 5: Post Crash Response

The objectives of this pillar are to improve the post-crashes response, improve capacity of the health-care systems to provide emergency treatments and long-term rehabilitation for crash victims. Activities envisaged to achieve these objectives are:

- Introduce toll-free telephone number for RTA emergencies.
- Develop ambulance policy for post-accident treatments and emergency treatment training
- Develop strategy and introduce revolving fund for RTA victims and disabled.
- Open Trauma Care Centers and train for RTA injured.
- Research and prioritize treatments for serious injuries from RTAs .
- Develop; introduce comprehensive injury surveillance system in hospitals, health centers.
- Establish road-safety unit in the Ministry of health and Population and institutionally enhance it.
- Develop ambulance network along the major highways, urban and rural roads.

11. Actions Taking Forward

There are some initiatives taken by the Government of Nepal which shall give immediate visible impacts on Road Traffic Safety. Government of Nepal has increased the budget for traffic safety awareness and improving engineering features of the roads. Bilateral and multilateral donor agencies are also coming forward to put the emphasis on reducing traffic accident in Nepal. Asian Development Bank (ADB), World Bank (WB), DFID of UK, Japan International Cooperation Agency, Government of India, etc. are providing Technical as well as physical Assurances to improve Road Safety Status of the country. In addition, Nepal Roads Board has allocated some money for traffic safety which shall be increased by next fiscal year. Some of the initiatives towards improving Traffic Safety status in Nepal are:

- Trauma Hospital in Kathmandu with the assistance of Government of India will be in operation immediately

- DoTM is planning to franchise vehicle inspection system to private party
- Traffic Police is tightening enforcement of prohibition of drinking and driving in cities all over country
- Department of Roads is planning to enforce threshold of 10.2 metric ton axle load threshold as stipulated in Management of Large Vehicle Policy 2007 involving DoTM, Transport Entrepreneurs Association and Traffic Police by next year
- Road Safety Status of 700 km of high risk corridors on major highways being identified and design the counter measures under the Technical Assistance of Asian Development Bank (ADB)
- DoR engineers, Consultants, Traffic Police and people from other concerned agencies will be trained for safety evaluation of roads under ADB Technical assistance
- Department of Roads is constructing footpaths and railing for Separation of pedestrians and vehicles in major roads of Kathmandu valley
- Department of Road is constructing Separate Bicycle track and service lane in major roads like Maitighar Tinkune
- Private stakeholders are coming forward for installing of Street Lighting with inverter and beautification by plantation of ornamental trees and flowers in Durbar Marga
- Disable friendly footpath are constructed in some of the improved roads in Kathmandu
- New Traffic Signals are to be established in 16 major junction of Kathmandu valley under ADB assistance
- National Road Safety Secretariat has been established
- Discussion with different stakeholders and study of different aspects of vehicle and Traffic Management Act and Regulation has started
- Budget allocated for traffic safety shall be distributed to DoTM, DoR and Traffic Police
- Government has already started a new licensing system franchising physical facilities from the private parties all over the country
- Traffic Police has started checking compliances of speed limit using Radar gun in specific location having high rate of accident

12. Risks and Challenges

Nepal Road Safety Action has many conditions of uncertainties and risks. Some of the risks are already identified and presented in the Action Plan. The challenge for any effective plan is how to manage these risks at the beginning to achieve the objectives with minimal disruption. Some of the risks identified are:

- Lack of required autonomy and authority to effectively operate the National Road Safety Council
- Possibility of inadequate budget and manpower resources to the Council
- Inadequate budget provision for every training of all stakeholders
- Targeted individuals excluded in the trainings
- Omissions of the provisions required in the amended Acts
- Difficulties encountered in enforcing the amendments of Acts and Regulations
- Required provisions omitted in National Road Safety strategy and strategy lacking legal standing

- Lack of long-term horizontal coordination between agencies.
- Road-safety audit manual for non-strategic roads not formulated
- Safety audits not enforceable in all roads lacking legal mandate
- Compliance policy for safety audits recommendations may lack legal mandate
- Traffic Safety Audit recommendation not complied in absence of legal mandate
- Lack of authority and difficulty enforcing work-zone safety
- Standards for safe vehicles, spares inadequately prepared, failure to enforce or Difficulty or deficiency in monitoring
- Delay or difficulty in amending act, regulation.
- Omission of required safety provisions in the amended act, regulation
- Omission of required safety issues in the national transport policy.
- Difficulty including in the school curriculum or inadequate preparation
- Weak coordination between hospitals, health-centers and agencies.
- Database system ineffective, unscientific
- Database inaccessible, non-transparent

13. Conclusion

Skilled human resource, proper plan and working modality, availability of necessary fund, adequate legal provision and its enforcement, awareness in all road users and proper coordination are the essentials of road safety management.

National Road Safety Action Plan 2013-20 has already been approved by the Government. The existing NRSC will be revitalized with higher authority to delegate and implement its various activities. To give it a legal standing, this council will be backed with the necessary Act. This council will have the power to delegate all the stakeholders and request regular reporting required for monitoring the road-safety interventions. The council should be headed at the minister-level as it ensures higher priority that the council activities demands in terms of budget provisions and manpower resources allocations. It is anticipated that all the stakeholders act in a coordinated way to enhance the road safety in the country.

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