

1. Crash = f (several components of road traffic system)
= f (human factor \times vehicular factor \times road environment factor)
2. Crash risk = exposure \times probability \times severity
3. Public problem: public sector is essential... private sector can contribute but can not do all
4. 3E problem: Engineering \times Education \times Enforcement
5. Localised problem: globally, internationally, nationally, regionally and locally
6. Dynamic problem: changes over time

7. Shared problem: can only be solved by sharing the responsibility
8. Evidence based problem: data is essential (statistical analysis and probability --- not fundamental mathematical equations)
9. Human-based problem: difficult to predict
10. Can be reduced but difficult to eliminate
11. We all make mistakes.... we need to design **SAFE SYSTEM** to forgive those mistakes
12. Safer people, safer vehicles, safer roads and safer speeds

- ❑ Road safety management is a complex, integrated, dynamic and multi-dimensional problem
- ❑ Improvement in road safety requires actions on several fronts:
 - engineering and social science
 - education and public awareness
 - law and enforcement
 - health and emergency services, and
 - media and publicity campaigns

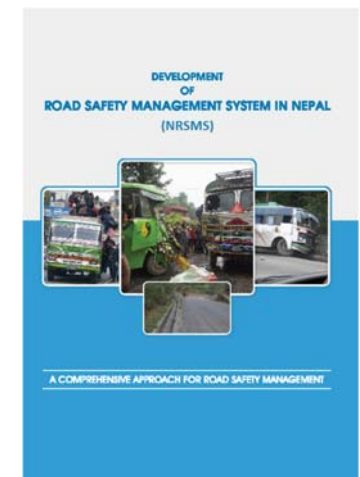
Just to name a few
- ❑ Actions on multiple fronts are required in a complex environment often with conflicting and competing interests
- ❑ A well-coordinated and concerted effort from all agencies working on these fronts is essential

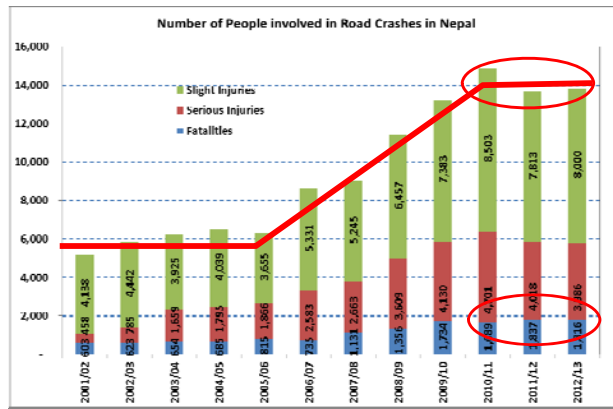


Photo Courtesy Subhash

Road safety is a shared responsibility. Every member of society can contribute to improve road safety.

- ❑ The **BIG PICTURE**
- ❑ Development of Nepal Road Safety Management System
 - **Component 1:** Database System
 - **Component 2:** Governance & Planning
 - **Component 3:** Pre-crash (Crash Prevention) Systems
 - **Component 4:** Post-crash (Management) System
 - **Component 5:** Crash Investigation System
 - **Component 6:** Road Safety Analysis & Research
- ❑ Concluding remarks





Approximately 5 people are killed, 11 people are seriously injured and 22 people are slightly injured in about 25 road crashes every day on Nepalese roads (1:2:4:5 ratios) (These figures may be underestimated... some studies have suspected more than double these figures)

- ❑ The reduction in road trauma was *not a key national objective* and road safety was *not considered as a major strategic area* in Nepal for a long time.....
- ❑ Interests have, however, increased *significantly during the last few years* in line with the **UN Decade of Action for Road Safety 2011-2020**
 1. Nepal Government's **National Road Safety Strategy 2013-2020 & National Road Safety Council (NRSC)**
 2. World Bank's **Road safety support project** (Global Road Safety Facility (GRSF) grant of US\$ 7.5million) (DOR)
 - Capacity strengthening (NRSC, legislations, pilots) and improved physical safety of RSDP roads
 3. Nepal India Regional Trade and Transport Project (NIRITP)'s **Road transport safety and axle load control project** (financed under the World Bank) (DOTM)
 - the legislative aspects, vehicular aspects, public awareness and road users

4. iRAP **Star Rating System- ADB** (being performed? completed 400km?)
 5. Development of **Crash Database System (CDS)** in Nepal (?)
 6. **DOTM Activities** (Adhikari, 2013):
 - revised drivers' curriculum and driving tests
 - established vehicle fitness test centre and revised route permits
 7. **DOR Activities** (SRN Road Safety):
 - Road Safety Unit, Road Design Standards
 8. **DOLIDAR Activities** (LRN Road Safety, RAP3):
 - NRSAS LRN Road Safety Action Plan 2013-15
 9. **Traffic Police Activities**
- And the list goes on...

- ❑ In spite of these activities, recent publications regarding **road safety situation in Nepal** have listed the following **issues**:

1. primary national focus on expanding road access to a greater number of districts,
2. lack of adequate institutional arrangements and legal frameworks for road safety,
3. lack of proper safety-related technical frameworks and policy documents,
4. lack of cooperation and coordination among fragmented road safety organisations,
5. insufficient funding and inefficient funding arrangements for road safety,
6. inadequate national standards for transport infrastructure design, construction and maintenance,
7. lack of proper actions on crash prevention system (driver licencing, public education, vehicle testing, law enforcement etc.),
8. lack of proper after-crash management system
9. inadequate data collection, management, analysis and reporting system,
10. lack of proper scientific research on road safety countermeasures, and
11. lack of proper National Road Safety Strategies: formulation, implementation & evaluation

भगवान कोइराला भन्द झाइभरको हत्केलामा धेरैको ज्यान
डोटी र बबरमहल दुर्घटनामा जिब्रो मात्र टोकने कि, सचिपने पनि?

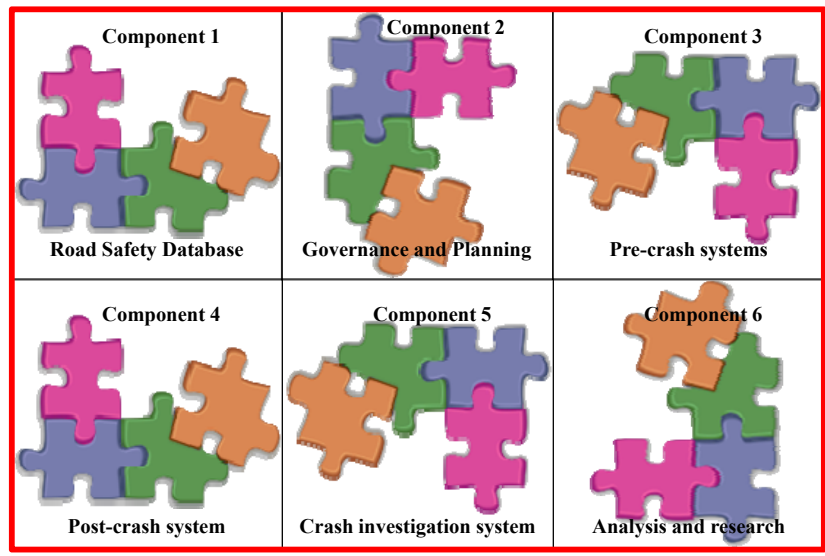
समाज दुर्घटनाको कारण साँचुरो बाटो र क्षमता बढि याउ
छतिवन बस दुर्घटनाको प्रारम्भिक अध्ययन

ENOUGH IS ENOUGH!
This is the time to think BIG!

भर्खरका झाइ दुर्घटना: केशव अधिकारी
विभिन्न शहरमा नै रेसिडु माघेर बाटो काटिदिनु

काठमाडौँ, असोज २८ (सेतोपाटी) - राजधानीको बबरमहलमा सोमबारसाँझ भएको सवारी दुर्घटनामा फरार भएका बस चालक चन्द्रबहादुर तामाङ पक्राउ परेका छन्।

- Component 1: Road safety database system**
 - Population, vehicle, drivers, traffic, roads and crashes
- Component 2: Governance & planning**
 - Institutional, funding, legal and technical frameworks
 - Road safety evaluation and improvement process
 - Road safety strategies
- Component 3: Pre-crash (crash prevention) systems**
 - **Safer road users:** road use rules, driver licensing system, public awareness and education campaigns, law enforcement
 - **Safer speeds:** speed limits and speed management system
 - **Safer vehicles:** crashworthiness/roadworthiness (vehicle inspection and maintenance)
 - **Safer roads:** road design and maintenance, traffic control devices, road safety audit, roadside hazard management
- Component 4: Post-crash (management) system**
 - Emergency response and treatments
- Component 5: Crash investigation system**
 - Road crash investigation, data collection, coding and recording
- Component 6: Road safety research and development**
 - Crash data analysis and countermeasure development



- The system needs to be developed *in stages*
 - Each component of the system can be developed *concurrently and mostly independently*
 - Once all the sub-systems or components are delivered a *full scale safety management system* will eventually be established
 - Example:
- Start from WHOLE to PARTS**
Fit together the PARTS to make the WHOLE
Identify the missing PARTS
Complete the WHOLE
-

Road Safety Management System in Nepal: **Timeframe**

- ❑ Start **NOW** (assemble all on-going road safety activities)
- ❑ Do **low-cost high-benefit project** activities (0-5 years)
 - Nil to smaller funds
- ❑ Do **medium term projects** (5-10 years)
 - Small to medium-sized funds
- ❑ Do **longer term projects** (>10 years)
 - Large funds
- ❑ Develop **full system** (20 years)
- ❑ Improve the system (continuous)



The **full development** of a Nepal Road Safety Management System as envisioned here may take **up to 20 years**. But the immediate and short to medium term projects under the system umbrella **will start giving results for incremental benefits** while building the management system over several years

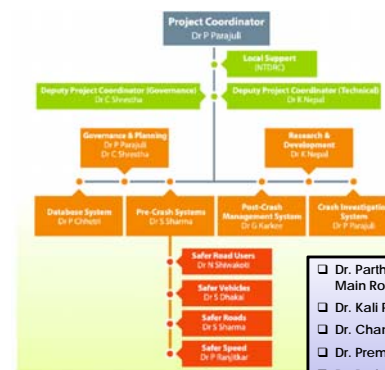
Road Safety Management System in Nepal: **Little Bit about progresses**

- ❑ A team of **national and international road safety experts and academics** have been tentatively formed (aiming to update as required)
- ❑ The team wants to **contribute to the community** it belongs
- ❑ The team has worked **voluntarily** up until now
- ❑ An **independent not-for-profit business entity** to authenticate the team's activities has been registered in Australia
 - **Sustainable Transport and Traffic Solutions (STTS)**
- ❑ The team aims to **work closely with Nepalese Road Safety Authorities and Stakeholders** (including interested international bodies)
- ❑ **Organized** workshops to collect and incorporate views and opinions

Road Safety Management System in Nepal: **Little Bit about progresses**

1. **BIG PICTURE proposal** has been completed and submitted to Government of Nepal (just before Earthquake 2015)
 - 6 components
 - 32 projects
 - 137 short-term projects
2. '**Project preparatory work proposal**' has been submitted to the Government of Nepal
3. Work on **crash database system** has been ongoing (involvement of various organizations)
4. '**Road safety audit**' training programs are under preparation (involvement of various organizations)

Team Structure/Responsibilities



- ❑ Dr. Partha Parajuli (Principal Engineer, Queensland Department of Transport & Main Roads, Australia)
- ❑ Dr. Kall Prasad Nepal (Senior Lecturer, Deakin University, Australia)
- ❑ Dr. Chandra Shrestha (Professor, Nepal Engineering College, Nepal)
- ❑ Dr. Prem Chhetri (Professor, RMIT University, Australia)
- ❑ Dr. Prakash Ranjitkar (Senior Lecturer, University of Auckland, New Zealand)
- ❑ Dr. Nirajan Shiwakoti (Senior Lecturer, RMIT University, Australia)
- ❑ Dr. Shyam Sharma (Region Traffic Engineering Manager, Oregon Department of Transportation, USA)
- ❑ Dr. Ganesh Karkee (Sr. Operations Engineer, Metropolitan Transportation Commission, USA)
- ❑ Dr. Shovakar Dhakal (Associate Professor, Asian Institute of Technology, Thailand)

Component 1: Database System Nepal Road Safety Divisions (NRSD)

- ❑ The challenges posed by road safety are different for different regions or for different types of roads of Nepal
- ❑ Are the administrative boundaries (or SRN/LRN responsibility) enough for road safety management system?
- ❑ Should we develop separate Nepal road safety divisions (NRSD) specifically for road safety in Nepal?
- ❑ Urban & Rural road safety?

Project 2.1 Development of Nepal Road Safety Divisions (NRSD)

[Component C1: Nepal Road Safety Information Management (NRSIM) and Database System]

- Objective:**
 - To develop Nepal Road Safety Divisions (NRSD)
- Description:**
 - Review and develop NRSD
 - Develop (electronic) spatial database (such as GIS maps) system with a number of divisions (to be called "Nepal Road Safety Divisions or NRSD") for the purpose of collating and consolidating all relevant data required for undertaking targeted road safety analysis
 - The safety divisions can be based on geography (e.g., existing regional, zonal and district boundaries or a reduced similar) or types of roads (SRN or LRN) or traffic volume (low, medium or high) or a combination of them
 - Road-based database system is preferred when separate road safety authorities are responsible for different types of roads
 - Base maps of these divisions are to be developed
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 1: Road Safety Management (Activity 6: Data systems)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (not directly listed as activity)
- Information Source:**
 - Population census and administrative boundaries
 - Road types: SRN or LRN
 - Government departments: DoTM, DoR and DoLIDAR
 - Traffic Police (TP) and other information sources
 - International best practices
- Outcome:**
 - Spatial Nepal Road Safety Divisions (NRSD) and (electronic) database system

Road Safety Divisions (NRSD): Example

Table 2: Fatalities by Police Region

Police Region	Year to Date to 7 September							Variation in 2014 from 2013		Variation in 2014 from the 2009 to 2013 Avg	
	2009	2010	2011	2012	2013	2014	no.	%	no.*	%	
Northern	48	25	19	25	26	27	1	3.8%	2	-5.6%	
Central	96	59	70	73	69	46	-23	-33.3%	-27	-37.3%	
Southern	51	42	38	39	63	45	-18	-28.6%	-2	-3.4%	
South Eastern	23	13	33	32	24	17	-7	-29.2%	-8	-32.0%	
Brisbane	27	25	20	18	16	22	6	37.5%	1	3.8%	

Table 3: Fatalities by Transport and Main Roads - Transport Region

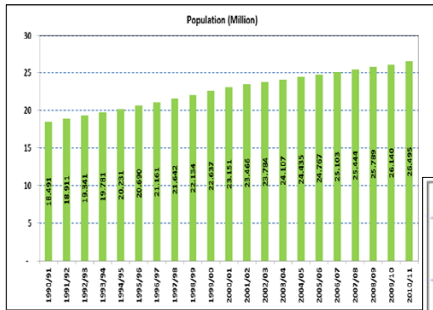
Transport and Main Roads - Transport Region	Year to Date to 7 September							Variation in 2014 from 2013		Variation in 2014 from the 2009 to 2013 Avg	
	2009	2010	2011	2012	2013	2014	no.	%	no.*	%	
Central	42	27	37	35	40	15	-25	-62.5%	-21	-56.6%	
Northern	48	25	19	25	24	27	3	12.5%	-1	-4.3%	
SEQ North	54	27	34	42	41	25	-16	-39.0%	-15	-36.9%	
SEQ South	48	45	55	51	45	36	-9	-20.0%	-13	-26.2%	
Southern	53	40	35	34	48	54	6	12.5%	12	28.6%	

Table 4: Fatalities by Transport and Main Roads - Roads Region

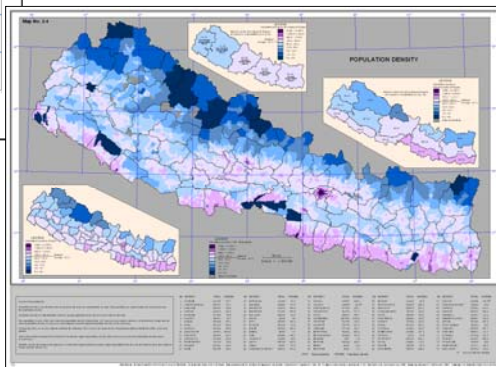
Transport and Main Roads - Roads Region	Year to Date to 7 September							Variation in 2014 from 2013		Variation in 2014 from the 2009 to 2013 Avg	
	2009	2010	2011	2012	2013	2014	no.	%	no.*	%	
Central Queensland	42	27	37	35	40	15	-25	-62.5%	-21	-56.6%	
Downs South West	24	26	14	16	40	33	-7	-17.5%	9	37.5%	
Metropolitan	32	27	27	21	15	22	7	46.7%	-2	-9.8%	
North Coast and Wide Bay/Burnett	75	44	49	56	53	42	-11	-20.8%	-13	-24.2%	
North Queensland	48	25	19	25	24	27	3	12.5%	-1	-4.3%	
South Coast	24	15	34	34	26	18	-8	-30.8%	-9	-32.3%	

(Source: Queensland Department of Transport and Main Roads)

Population Database



(Source: Central Bureau of Statistics, 2011)



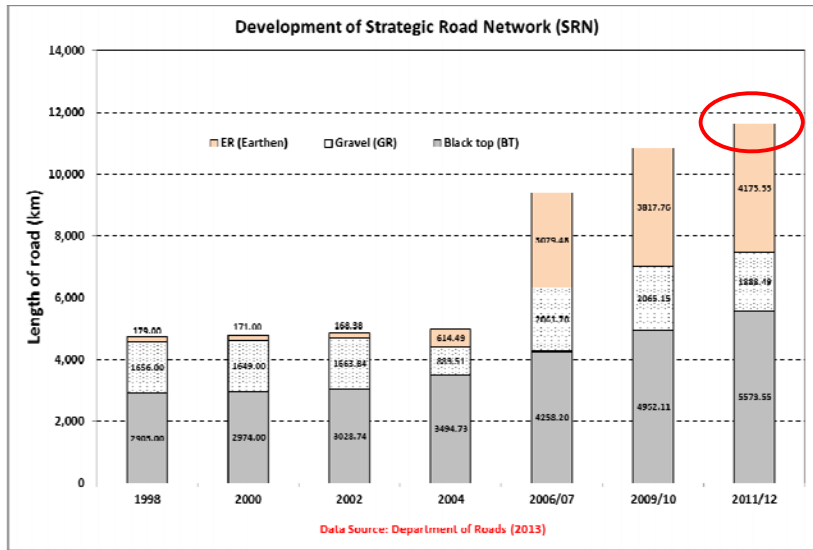
Component 1: Database System Population Database

Project 2.1 Development of Population Database

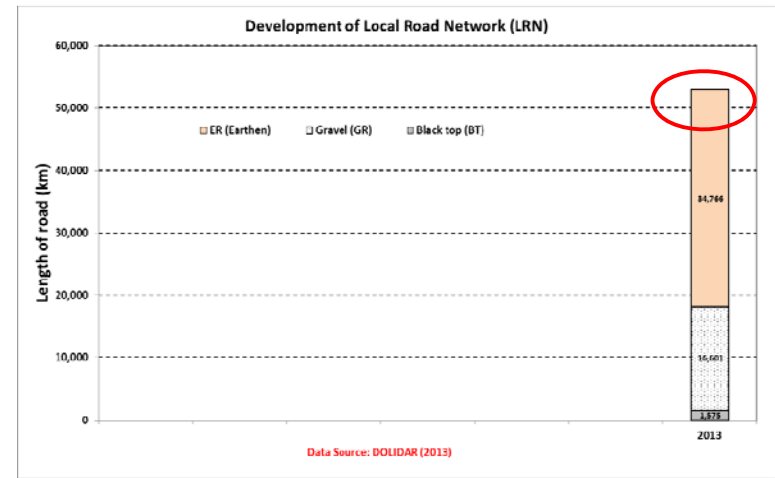
[Component C1: Nepal Road Safety Information Management (NRSIM) and Database System]

- Objective:**
 - To develop population database by Nepal Road Safety Divisions (NRSD)
- Description:**
 - Develop computerised database (such as GIS maps) system that collate population data by Nepal Road Safety Divisions (NRSD) (Create Base Population Data).
 - Time series and disaggregated (personal and socioeconomic characteristics) population data showing historical growths and future projections would be an added benefit.
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 1: Road Safety Management (Activity 6: Data systems)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (not directly listed as activity)
- Information Source:**
 - Nepal Road Safety Divisions (NRSD)
 - Administrative Boundaries
 - Population Census
- Outcome:**
 - Spatial and disaggregated (electronic) population database

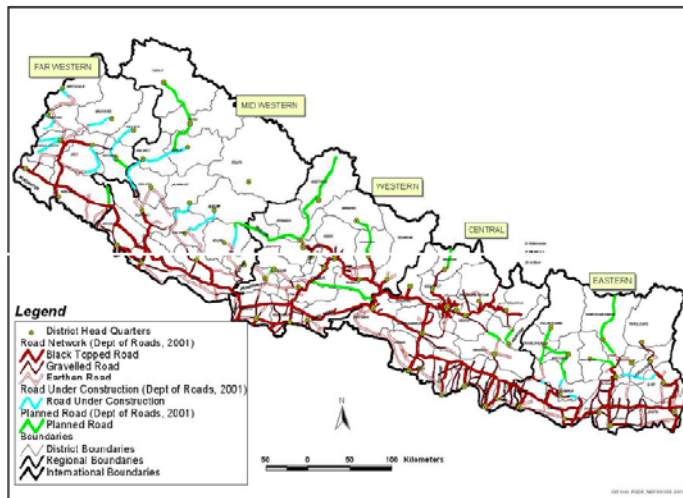
Expansion of Road Network in Nepal



Expansion of Road Network in Nepal



Transportation Network in Nepal



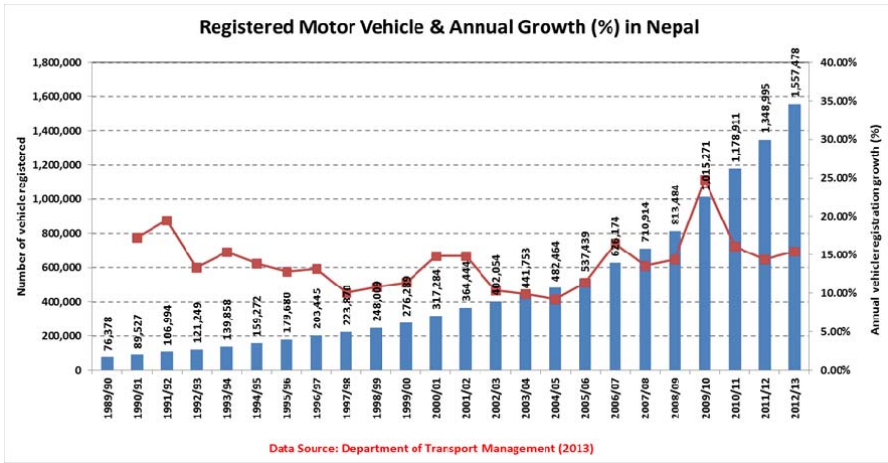
(Source: Department of Roads, online)

Component 1: Database System Road Inventory and Traffic Stream Database

Project 2.1 Development of Road Inventory and Traffic Stream Database
[Component C1: Nepal Road Safety Information Management (NRSIM) and Database System]

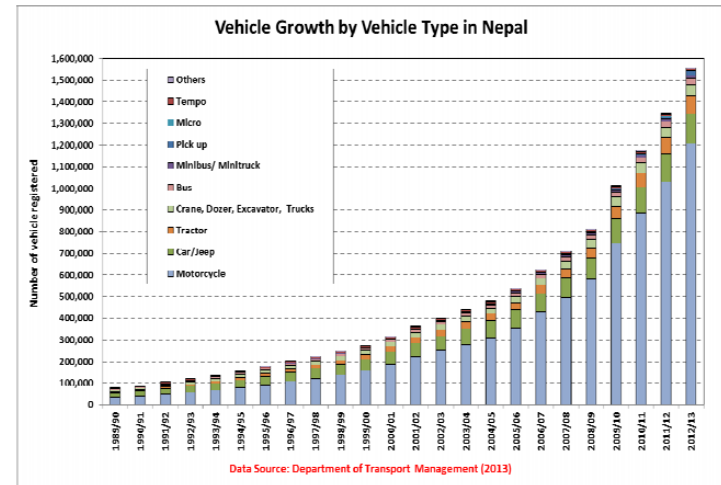
- Objective:**
 - To develop (electronic) road inventory and traffic stream database
- Description:**
 - Road inventory database:** Develop (electronic) database (GIS maps) that collate/consolidate strategic and local road network (SRN and LRN). Create base road network map starting from strategic roads of national, then regional and local significance gradually incorporating entire road network. Time series and disaggregated (posted speed limits, curves, grades, pavement types, lanes, shoulder, sight distance, road signs, line markings, safety barriers and other roadside furniture etc. that have impact on road safety outcomes) data showing historical changes and future projections would be an added benefit. Where speed limits are not sign posted, implement the system of doing so and keep records of these as and when implemented.
 - Traffic stream database:** Develop and implement the system of traffic volume (AADT, composition, intersection turning movements, pedestrian movements) and speeds (posted speed limits, spot speeds, space speeds) collection and storage (GIS maps) system (permanent counters at strategic locations and temporary counters as per specific need) to create traffic stream database using appropriate vehicle detection technologies (loop, video, P2P vehicle detection). Commence from basic information and gradually expand to all road elements.
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Activity 1: Road Safety Management (Activity 6: Data systems)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (not directly listed as activity)
- Information Source:**
 - Nepal road safety divisions or NRSID
 - Government departments: DOTM, DoR and DoLDAR
 - International best practices
 - Some inventory data may need to be collected, as and when necessary
- Outcome:**
 - Disaggregated and spatial (electronic) road inventory and traffic stream database

Vehicle Registrations and Annual Changes



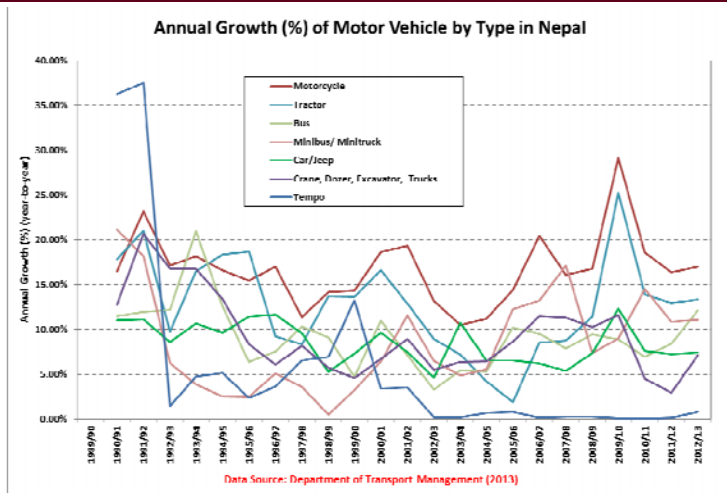
- ❑ There is no system of recording the aging vehicles which are phased out or scrapped (Government of Nepal, 2013)

Vehicle Registrations and Annual Changes



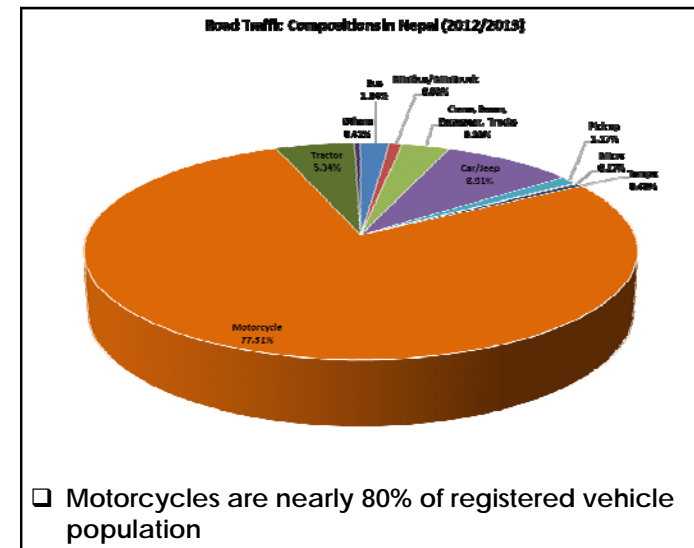
- ❑ There has been high growth-rate for motorcycles and light vehicles (car/jeep) in recent years

Vehicle Registrations and Annual Changes



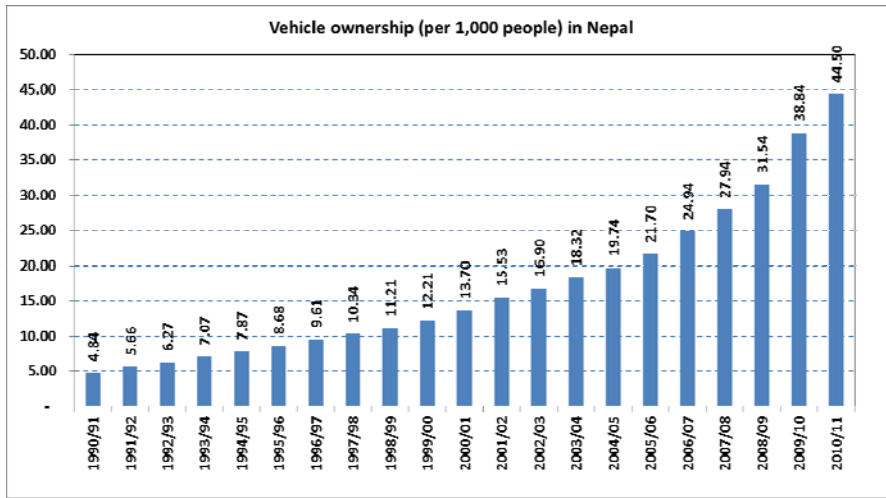
- ❑ Motorcycles growth rate is consistently higher than other modes

Vehicle Registration



- ❑ Motorcycles are nearly 80% of registered vehicle population

Vehicle Registration/Ownership



□ Vehicle ownership (total registered vehicles) is very low

Vehicle/Driver Registration

14. **Motor vehicle to be registered:** (1) A person, firm or company purchasing a motor vehicle or importing it from abroad or an agent selling or distributing a motor vehicle shall get the motor vehicle registered with the competent authority no later than fifteen days after the date of bringing it into Nepal upon paying customs duty.

(2) No one shall ply or cause to be plied any motor vehicle without getting it registered pursuant to Sub-section (1).

28. **Records of motor vehicle to be maintained:** The competent authority shall cause the details of each motor vehicle registered pursuant to this Act, including the name and address of owner, date of registration, and registration number, of the motor vehicle, name of motor vehicle manufacturer, model, year, engine number, chassis number, type and weight of the motor vehicle to be clearly mentioned in the register and maintain records of motor vehicles in an updated manner. The photograph of the owner of the motor vehicle must also be affixed on the concerned page of such a register.

56. **Renewal of driving license:** (1) A driving license shall have to be renewed within three months from the date of expiration of the period mentioned in the license pursuant to Sub-section (3) of Section 54.

Motor Vehicles and Transport Management Act, 2049 (1993)

Component 1: Database System Vehicle Registration/Ownership & Driver Licences

Project 2.1 Development of Road Vehicle and Driver Database

[Component C1: Nepal Road Safety Information Management (NRSIM) and Database System]

1. Objective:

- To develop (electronic) vehicle and driver database system

2. Description:

- Vehicle registration and maintenance database:** Develop (electronic) database system that collates up-to-date records of vehicle registration (types, purchases, transfers, inspections, maintenance and write-offs etc) (it is being developed by DoTM with funding from WB/ADB – provide international best practice advice for ongoing maintenance of the system being developed)
- Driver database:** Develop (or improve) drivers' licensing database system (registration, cancellations, infringements etc)
- Note:** Some of these data requirements should be made compulsory by law and should be consistent with the internationally accepted standards

3. Reference to UN Decade of Action for Road Safety 2011-2020

- Pillar 1: Road Safety Management (Activity 6: Data systems)

4. Reference to Nepal Road Safety Action Plan (2013-2020)

- Pillar 1: Road Safety Management (not directly listed as activity)

5. Information Source:

- Government departments (DoTM)
- Traffic Police

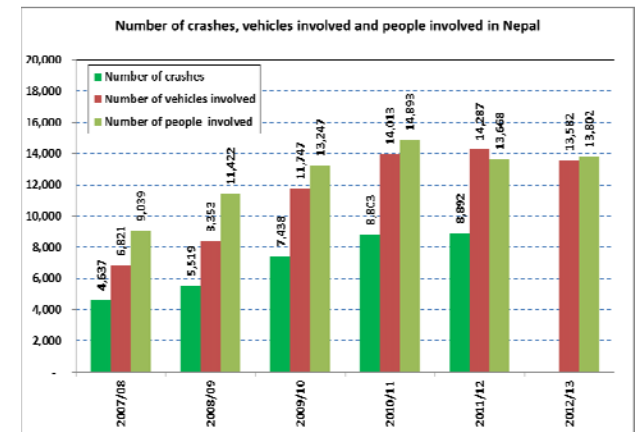
6. Outcome:

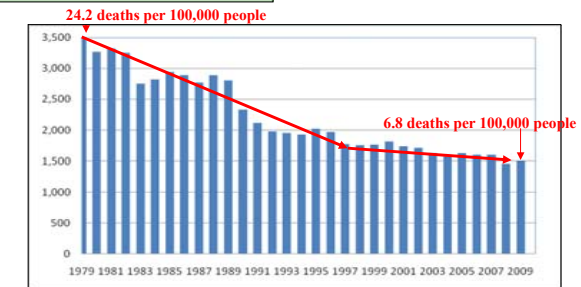
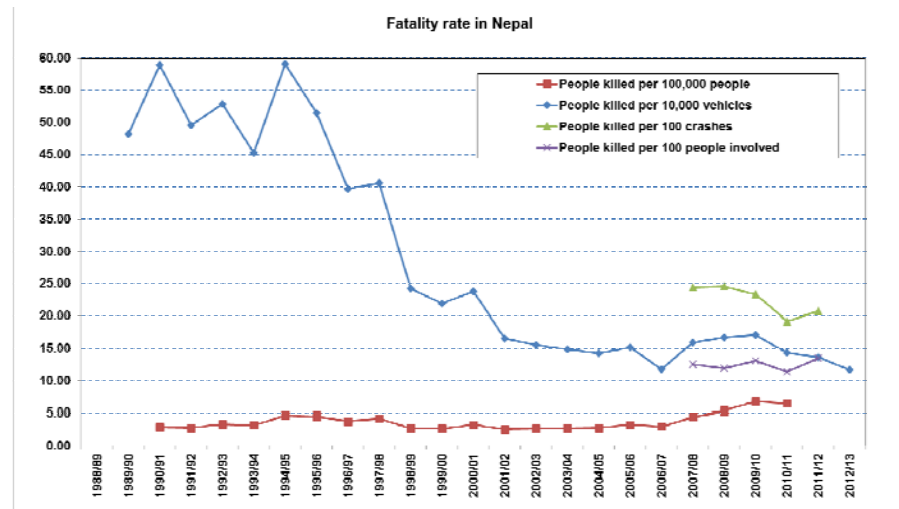
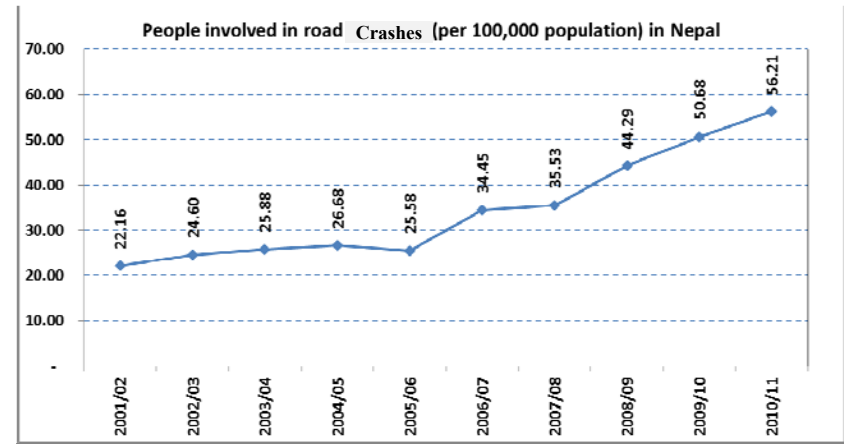
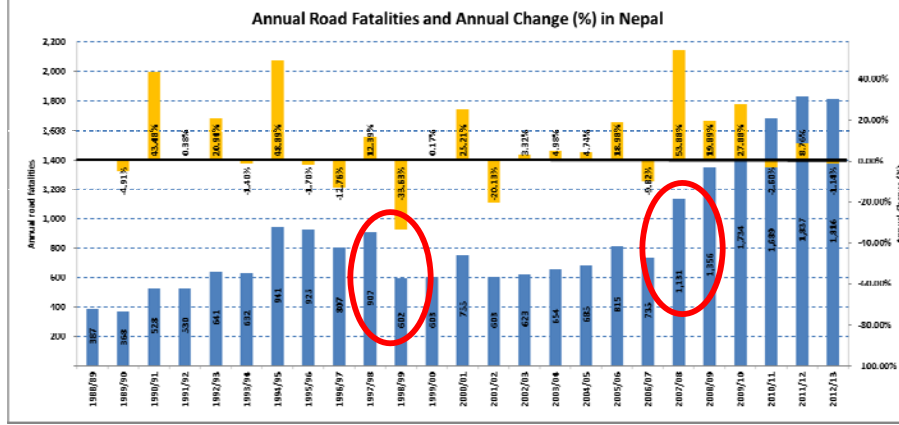
- Detailed (electronic) road vehicle and driver database

Nepal Road Crash Statistics

□ There seems to be confusion across different data sources regarding:

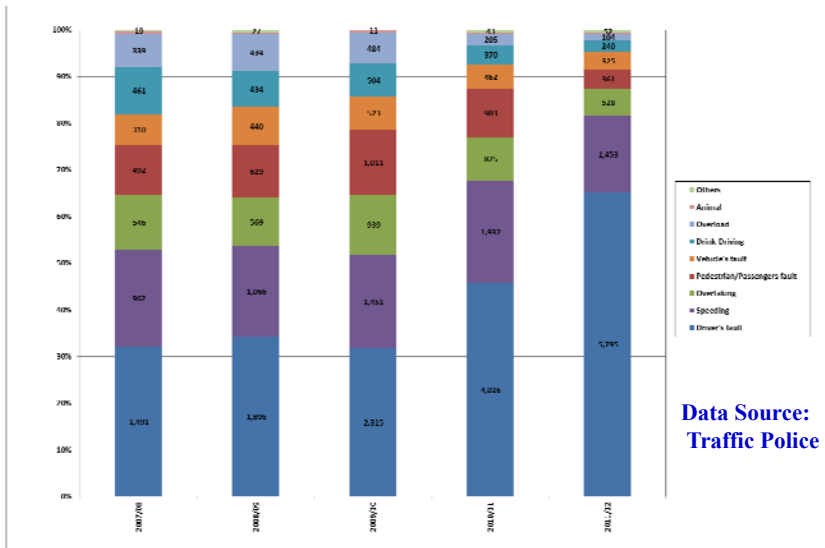
- the number of crashes
- number of vehicles involved
- number of people involved





Source: National Road Safety Strategy 2011-2020, Australia

Nepal Road Crash Statistics



Data Source:
Traffic Police

Component 1: Database System Nepal Road Crash Database for Public Use

Project 2.1 Development of Nepal Road Crash Summary Statistics for Public Use

[Component C1: Nepal Road Safety Information Management (NRSIM) and Database System]

- Objective:**
 - To develop summary road crash statistics and (electronic) database for public use
- Description:**
 - Develop (electronic) crash database (preferably interactive online) system for public use. The system should contain summary information (limited but valid) that help general public to have an overall knowledge on road safety and help decide safe courses of actions.
 - Develop fact sheets such as *Fatal Five Fact*
 - Use these facts for public education and road safety campaigns
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 1: Road Safety Management (Activity 6: Data systems)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (not directly listed as activity)
- Information Source:**
 - Government departments: DoTM, DoR and DoLIDAR
 - Traffic Police
 - Other information sources
- Outcome:**
 - Summary Nepal road crash statistics and (electronic) database system

Project 2.1 International Comparisons and Benchmarking

[Component C1: Nepal Road Safety Information Management (NRSIM) and Database System]

- Objective:**
 - To compare available road safety indicators with other high-income, middle-income and low-income countries
- Description:**
 - Perform a thorough analysis of available road safety indicators in Nepal and compare them with international statistics to clearly identify the state of art of road safety situation in Nepal
 - This helps develop Nepal road safety strategies, policies and programs
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 1: Road Safety Management (Activity 6: Data systems)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (not directly listed as activity)
- Information Source:**
 - National data sources
 - International data sources
- Outcome:**
 - Nepal road safety standing globally for planning

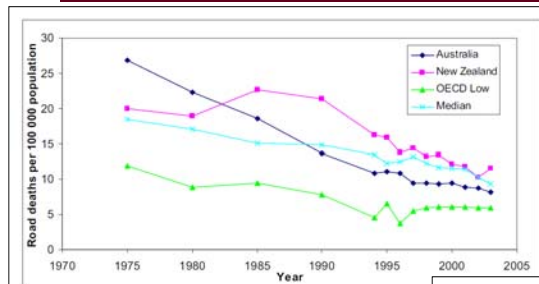
Access CrashStats

Accept the terms for the use of PUBLIC CrashStats [here](#)
 This will take you to the PUBLIC CrashStats application.

Accept the terms for the use of RESTRICTED CrashStats [here](#)
 (This will take you to the RESTRICTED CrashStats application, which contains cropped images of police accident forms and can only be accessed with a valid user id and password. This application is not available to the General Public.)



Monitoring Road Safety Progress: Australian Example



(Source: National Road Safety Strategy 2011-2020, Australia)

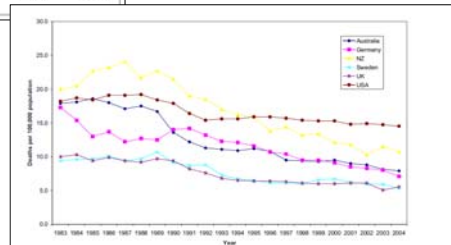


Figure 3.2: Road deaths per 100,000 population in Australia, New Zealand and selected countries 1983-2004

Component 1: Database System Safety Information Management System

Explore options to strengthen Nepal Road Safety Information Management System (NRSIMS)

Project 2.1 Strengthening and Privatisation of NRSIM System

[Component C1: Nepal Road Safety Information Management (NRSIM) and Database System]

- Objective:**
 - To explore options to strengthen NRSIM and database system
- Description:**
 - Based on the outcome and level of success on creating individual database system for each element of road use management, develop and implement a comprehensive Nepal Road Use Information Management (can be branded as NRUIIM) system or revamp existing NRSIM to include roads of lower significance/urban roads) for use in comprehensive NRSIMS.
 - Explore options for privatisation of NRUIIM system and develop business model for sustainable management of NRUIIM system. Each agency internal or external to the department to purchase road use management data for research and consulting works. Government to contribute/top up.
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 1: Road Safety Management (Activity 6: Data systems)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (not directly listed as activity)
- Information Source:**
 - Existing national system
 - International best practices
- Outcome:**
 - A robust NRSIM or NRUIIM systems

Component 2: Governance & Planning Institutional Framework

Who are involved in managing road safety in Nepal now? (National Road Safety Council?)

- Department of Roads (DoR) for Strategic Road Network (SRN)
- DoLIDAR for Local Road Network (LRN)
- Roads Board Nepal (note: does not specify categories of roads)
- Department of Transport Management (database?)
- Traffic Police (law enforcement)

Project 3.1 Development of Institutional Framework for Road Safety Management in Nepal

(Component C2: Governance and Planning)

- Objective:**
 - To develop a comprehensive organisational structure for road safety in Nepal
 - To ensure that there is a robust institutional framework to support the development and sustained implementation of the proposed Road Safety Management System
 - To develop leadership and commitment to road safety in Nepal
- Description:**
 - Undertake review of existing institutional arrangements for road safety management system with the objective of identifying institutional vacuum
 - Develop an effective and efficient institutional framework and organisational structure (national, regional and local levels) for road safety management in Nepal considering both existing system and international best practices
 - The system should specify responsibilities, accountabilities, liabilities and duty of care of all levels of the organisational structure
 - Establishment of an independent and all powerful Nepal Road Safety Commission which brings together all parties and activities being done and expected to be done in road safety areas in Nepal may be an option. Legal provisions should be made to inform the Commission of any road safety activities in Nepal. Composition of the Commission needs to be carefully worked out.
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 1: Road Safety Management (Activity 2: Lead Agency)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (Activity A1): Establish the National Road Safety Council with sweeping authority, Activity A2: Train stakeholders
 - Pillar 4: Safer Road Users (Activity D7): Establish road safety units in the DoTM and institutional development of the Traffic Police
 - Pillar 5: Post-crash Response (Activity E7): Establish road safety unit in the MoIP and institutionally enhance it
- Information Source:**
 - National existing arrangements
 - International best practices
- Outcome:**
 - Robust institutional arrangements for road safety in Nepal

Component 2: Governance & Planning Funding Framework

- What is the current funding model?
- What is the best funding model for Nepal?
- Can we have sufficient funding?

Project 3.1 Development of Funding Framework for Road Safety in Nepal

(Component C2: Governance and Planning)

- Objective:**
 - To develop a funding framework (model) for comprehensive road safety
 - To ensure that there is a robust funding framework to support the development and sustained implementation of the proposed Road Safety Management System in Nepal
- Description:**
 - Undertake review of existing funding arrangements (revenue and expenditure streams) for implementing road safety measures with a view to identifying funding gaps and develop potential options for generating road safety funds to support the implementation of engineering (infrastructure based) and non-engineering (non-infrastructure based) measures for improving road safety in Nepal.
 - For example, fines from speeding tickets, parking tickets and other traffic, traffic infringements (drink driving, hooning and violation of any other road rules such as red light running) can go directly to Road Safety Fund created for the purpose of improving road safety.
 - Red light cameras, permanent cameras, point to point speed cameras, portable cameras (camera detected offence program, a non-engineering based road safety measures) can be installed and used to improve road safety by detecting speeding motorists which will also provide much needed fund dedicated to improving road safety.
 - Develop a detailed funding framework and its institutional arrangements for comprehensive road safety initiatives
 - Funding system should be based on road safety facts and figures.
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 1: Road Safety Management (Activity 5: Funding)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (not directly listed as activity)
- Information Source:**
 - National existing arrangements
 - International best practices
- Outcome:**
 - Robust funding model for road safety and defined allocation of expenditure for road safety programmes

Funding Framework: New Zealand Example

Box 1: Management structure of road safety in New Zealand

In 1993 New Zealand's Land Transport Safety Authority (L TSA) was established. The L TSA reports to a Board appointed by the Governor-General on advice of the Minister of Transport. The L TSA is charged with land transport safety at reasonable cost and manages the government's interest in safety of the road network, the national vehicle fleet, and the railways.

Funding for the L TSA primarily comes from road user charges. Direct funding to the organization is around US\$120 million per annum and comes from the National Roads Fund (41%), users of the transport system (55%) and the Crown Agent (4%). The National Roads Fund (Transfund New Zealand) receives money from road user charges, motor vehicle registration and licensing fees and a portion of the excise duties levied on petrol, LPG and CNG sales. Users of the transport system provide revenue in the form of driver license fees, safety standard fees and fees, toll fees, and the sale of road safety materials (see Land Transport Safety Authority 2004).

The Board of L TSA has 8 to 9 members all from private sector appointed by and reporting to the Minister of Transport. The organizational structure consists of five operational groups: Policy

and Planning, Partnerships and Programmes, Regulatory Services, Corporate Services, and People and Culture. At the national level, L TSA works collaboratively with the government transport sector, the wider government sector, and industry groups to develop practical land transport solutions. At the regional level, L TSA works with regional government, territorial local authorities and communities to ensure effective joint working relationships and to establish a common commitment to achievable transport solutions.

On December 1, 2004 Land Transport New Zealand (LTNZ) was formed to take the responsibility for land transport funding and promote land transport safety and sustainability, replacing Transfund New Zealand and L TSA. The move was a result of a new transport strategy to improve the government's role to operate in a more integrated and collaborative fashion (Transport Legislation Bill 2004).

Besides L TNZ, the Ministry of Transport oversees the Road Safety Trust that provides funding for road safety projects and research out of revenue received from the sale of personalized vehicle registration fees. The normal annual turnover is US\$3.2 million (Road Safety Trust 2005). In addition, there are several local road safety organizations in New Zealand that can apply for financing of local road safety schemes through L TNZ or the Road Safety Trust.

Financing Road Safety (Source: Global Road Safety Partnership)

- National/local government support (taxpayers)
- Fees for selected road safety services/traffic fines
- Safety fund, safety trust (e.g., New Zealand)
- Levies on licences and insurance premiums
- Private sector contributions
- Community contributions

Source of Funding	Advantages	Disadvantages
Surcharges on motor fuel	Low level of evasion Low collection fee	Difficulty to raise fuel prices
Surcharges on weight-distance charges	Accepted as user charge	High level of evasion
Surcharges on compulsory vehicle insurance fees	Best related to road safety	High level of evasion
Surcharges on vehicle licensing fees	Low collection fee	High level of evasion
Surcharges on road tolls	Low level of evasion Accepted as user charge	Toll roads form only a small part of the road network
Contribution by private sector	Can complement road safety financing and can make use of private sector management and efficiency	Can only provide limited amounts and may not be sustainable
Development loans and grants	Can initiate effective road safety programmes and financing schemes	Not sustainable

Funding sources for Low Income Countries

Source: gtz (2006) The Road Safety Cent

Component 2: Governance & Planning Legal Framework

- What are existing legal documents related to road safety in Nepal?
- Who is responsible for developing Acts, Rules, Regulations and Guidelines?
- How are these documents legalised?
- What are the mechanisms for amendments?
- How can we make sure the consistency across different documents?

Project 3.1 Development of Legal Framework: Road Safety Acts, Rules and Regulations

(Component C2: Governance and Planning)

- Objective:**
 - To amend, redevelop and propose road safety Acts, Rules and Regulations
 - To ensure that there is a robust legal framework to support the development and sustained implementation of the proposed Road Safety Management System.
- Description:**
 - Undertake review of existing legal framework for road safety management system with the objective of identifying legislative vacuum
 - Develop robust legal framework considering prevailing acts rules and regulations and international best practices.
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 1: Road Safety Management (Activity 1: Agreements and conventions)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (Activity A3): Amend Motor Vehicles and Transport Management Act 2049 (1993), Local Self Governance Act, 2055 (1999) and develop various guidelines
 - Pillar 3: Safer Vehicles (Activity C2): Amend VTMA 1993 and VTMR 1997 and develop national transport policy to reinforce safer vehicles
 - Pillar 4: Safer Road Users (Activity D1): Amend VTMA 1993 and VTMR 1997 to invigorate safer road-users
- Information Source:**
 - National existing arrangements
 - International best practices
- Outcome:**
 - Nepal Road Safety Legal Documents (Acts, Rules and Regulations of International Standards

Component 2: Governance & Planning Technical Framework

- ❑ What are existing **technical documents** related to road safety in Nepal?
- ❑ Who is **responsible** for developing and maintaining these documents?
- ❑ How can we **make sure the consistency across different documents** developed by different organisations?

Project 3.1 Development of Technical Framework: Road Safety Documents & Resources

(Component C.2: Governance and Planning)

1. Objective:

- To develop a comprehensive set of road safety documents and resources
- To ensure that there is a robust technical framework to support the development and sustained implementation of the proposed Road Safety Management System

2. Description:

- Undertake review of reference materials and publications available in fragmented forms used in Nepal (research reports, manual, guidelines, policy and planning documents, acts, rules regulations, directives) with the objective of consolidating into a single database or library of road safety reference/resource materials for use in managing road safety system in Nepal.
- Identify gaps in the studies and propose such studies as a part of the Road Safety Management System. It is recognised that not all studies could be done at the beginning. Studies can be identified, prioritised and a programmed in a holistic manner with forward planning and programming to include in the short to medium to long term road safety management plans.

3. Reference to UN Decade of Action for Road Safety 2011-2020

- Pillar 1: Road Safety Management (Activity 6: Data systems)

4. Reference to Nepal Road Safety Action Plan (2013-2020)

- Pillar 1: Road Safety Management (not directly listed as activity)

5. Information Source:

- National existing documents
- International best practices

6. Outcome:

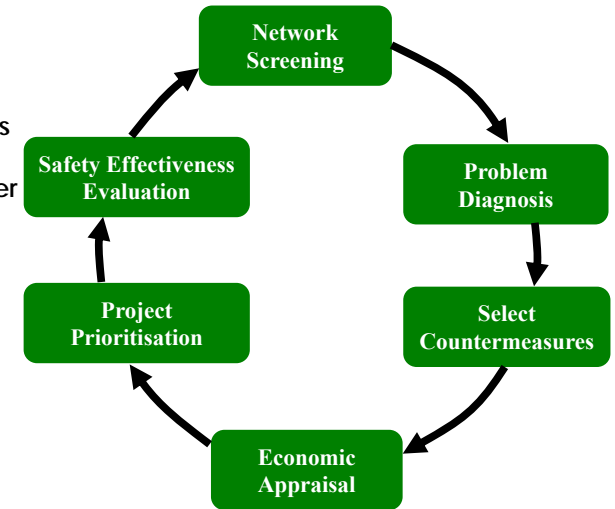
- A comprehensive (electronic) database or library of road safety documents and resources

Component 2: Governance & Planning Road Safety Evaluation and Improvement Process

- ❑ A comprehensive road safety improvement and evaluation process should be established in order to tackle **existing site specific road safety issues** in a systematic way

- ❑ References:

- Highway Safety Manual (2010)
- Guide to Road Safety (2009)



Highway Safety Manual (2010)

Component 2: Governance & Planning Road Safety Evaluation and Improvement Process

Project 9.1 Development of Nepal Road Safety Evaluation and Improvement (NRSEI) Process

(Component C2: Governance and Planning)

1. Objective:

- To develop Nepal Road Safety Evaluation and Improvement (NRSEI) process

2. Description:

- Develop a systematic Nepal Road Safety Improvement and Evaluation Process
 - Strategy development and target setting
 - Road network screening
 - Identification of crash locations (black spots)
 - Project prioritisations
 - Problem diagnosis
 - Countermeasure selection
 - Designing a safe remedial treatment
 - Economic appraisal (justifying the expenditure)
 - Implementation
 - Safety effectiveness monitoring and evaluation (cross-sectional comparison, before-and-after comparison)

3. Reference to UN 5 Pillars of Global Actions for Road Safety

- Pillar 1: Road Safety Management (not specifically listed as an activity)

4. Reference to Nepal Road Safety Action Plan 2013-2020

- Pillar 1: Road Safety Management (not specifically listed as an activity)

5. Information Source/Persons Involved:

- Crash analysis experts, academics and researchers
- Road and traffic authorities

6. Outcome:

- A robust Nepal Road Safety Evaluation and Improvement (NRSEI) process

Cost Components	Fatal Accident	Injury Accident
Lost output	NRs. 328,335	NRs. 27,008
Medical cost	NRs. 149,383	NRs. 40,219
Vehicle damage	NRs. 64,567	NRs. 64,567
Administrative cost	NRs. 884	NRs. 884
Pain, grief and suffering	NRs. 65,667	NRs. 5,402
Average cost per casualty-acc*	NRs. 609,236	NRs. 138,479

Cost of Damage Only RTA

Urban	NRs. 27,300
Rural	NRs. 59,240

Source: ND LEA Inc. (2008)

Fatality:	\$3,180,598*
Serious injury:	\$316,869*
Injury:	\$17,511*

*Adjusted to current 2011 Quarter 3 prices.

Source: BITRE, Australia (2009)

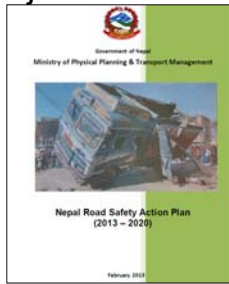
An Australian human life is valued 500 times a Nepalese life!

Road Safety Evaluation and Improvement Process

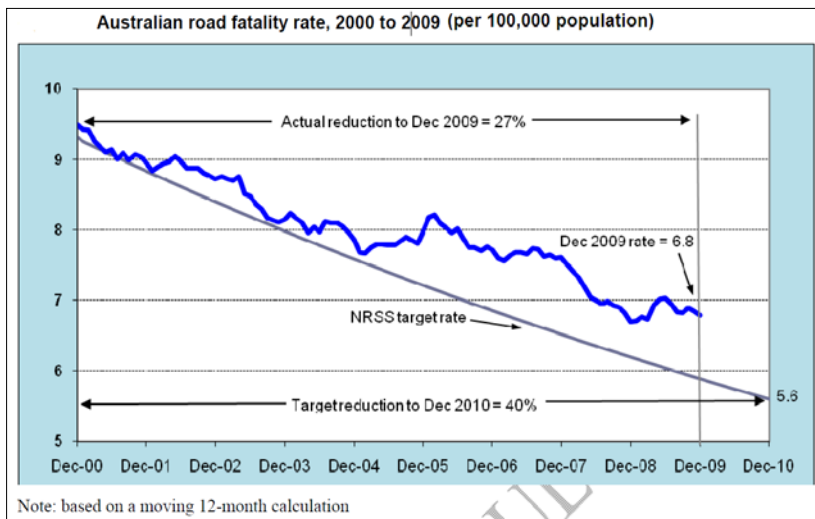
PROJECT	BEFORE CRASHES (5 Yrs)	AFTER CRASHES	SRS ALLOCATION	SRS EXPENDITURE
Curumbin Creek Road (Bienvenue Drive to Galleon Way)	10 (2/yr)	1 (21mths) (0.35/yr)	\$250,000	\$210,000
Mount Lindsay Arterial Road (Ormskirk Street intersection)	21 (4.2/yr)	1 (18mths) (0.3/yr)	\$50,000	\$36,000
Cabootture - Brible Island Road (Bestmann Road intersection)	20 (4/yr)	2 (25mths) (0.83/yr)	\$160,000	\$160,000
Gladstone - Benaraby Road (North of Boyne Island intersection)	10 (2/yr)	3 (22mths) (1.1/yr)	\$600,000	\$416,000
Beaudesert - Beenleigh Road (south of Flagstone Creek)	3 (0.6/yr)	1 (22mths) (0.37/yr)	\$500,000	\$533,000

Queensland Example: Performance Evaluation

- ❑ Guides the efforts to reduce road deaths and injuries
- ❑ Should be
 - scientifically modelled,
 - continually revised,
 - closely monitored, and
 - objectively evaluated
- ❑ Four terminologies
 - **vision:** 'desired direction of future road safety'
 - **target or mission:** 'an outcome expressed in quantitative terms'
 - **strategy:** 'a coordinated set of actions (plans) designed to achieve a specific result or set of results in a specified period'
 - **(action) plan:** 'an expression of the strategy over a shorter period'
- ❑ Government of Nepal (2013)
 - **Nepal Road Safety Action Plan 2013-2020**



	Nepal Road Safety Action Plan 2013-2020	International Examples
Mission	"Safe road-infrastructures and services backed with effective post-crash response and conducive environment resulting in little or no casualties from the road crashes"	"no person should be killed or seriously injured on Australia's roads" – Australia "avoiding an increase in road fatalities" - Norway "sustainable safety" - The Netherlands 'vision zero'- Sweden
Targets/ Missions	i. To mitigate the loss of life, properties and economic loss from road crashes ii. To complement the broader mission of the National Strategy on the Prevention and Control of Violence, Injuries and Disabilities iii. To meet the targets of the UN Decade of Action iv. To provide a common framework for stakeholder agencies to implement the various interventions required to mitigate road crash outcomes	i. to reduce the annual number of road crash fatalities by at least 30% ii. to reduce the annual number of serious road crash injuries by at least 30% - Australia



Source: National Road Safety Strategy 2011-2020

Project 10.1 Incorporation of Road Safety in National Planning and Policy
(Component C2: Governance and Planning)

- Objective:**
 - To incorporate road safety as a part of national planning policy and programmes
 - To incorporate road safety as an integral part of transport sector policy and programmes
- Description:**
 - Review and revise Transport Sector Policies (for example, National Transport Policy 2068 (2011)) incorporating road safety requirements such as banning aging vehicles in the country, control road-access based on vehicle dimension etc.)
- Reference to UN 5 Pillars of Global Actions for Road Safety (2011-2020)**
 - N/A
- Reference to Nepal Road Safety Action Plan 2013-2020**
 - N/A
- Information Source/Persons Involved:**
 - Transport and road safety experts, academics and researchers
 - Road and traffic authorities
 - Government departments
- Outcome:**
 - Road safety aspects at all levels of national planning policy and programmes

Project 10.1 Development of Nepal Road Safety Strategy (NRSS)
(Component C2: Governance and Planning)

- Objective:**
 - To develop Nepal Road Safety Strategy or NRSS
- Description:**
 - Develop a realistic Nepal Road Safety Strategy or N-RSS (to be implemented, monitored and evaluated at frequent intervals, say 5 years or 10 years)
- Reference to UN 5 Pillars of Global Actions for Road Safety**
 - Pillar 1: Road Safety Management (Activity 3: National Strategy)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (Activity A(4): Develop a national road safety strategy and implementation modality)
- Information Source/Persons Involved:**
 - Crash analysis experts, academics and researchers
 - Road and traffic authorities
 - Government departments
- Outcome:**
 - Nepal Road Safety Strategy (NRSS)

Component 2: Governance & Planning Nepal Road Safety Strategy and Evaluation

Project 10. 1 Development of Indirect Strategies to Enhance Road Safety Outcomes

(Component 2: Governance and Planning)

1. **Objective:**
 - To develop indirect strategies to enhance road safety outcomes
2. **Description:**
 - Develop indirect strategies to enhance road safety outcomes
 - Sustainable transport urban planning (urban and rural)
 - Travel demand management
 - Land-use planning
3. **Reference to UN 5 Pillars of Global Actions for Road Safety**
 - Pillar 2: Safer Roads and Mobility (Activity 2: Indirect Strategies)
4. **Reference to Nepal Road Safety Action Plan 2013-2020**
 - N/A
5. **Information Source/Persons Involved:**
 - Crash analysis experts, academics and researchers
 - Road and traffic authorities
 - Government departments
6. **Outcome:**
 - Indirect strategies to enhance road safety outcomes

Component 3: Crash Prevention System Crash Prevention System: Nepal Road Rules

- ❑ Road Users Guide (सडक प्रयोगकर्ता निर्देशिका) is available
- ❑ This guide needs to be revised and updated (make it free and easy!)

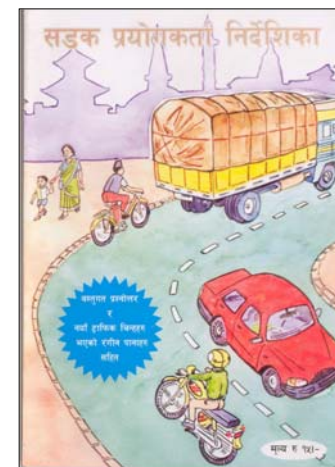


Photo Courtesy Adhikary (2013)



Photo Courtesy Pradhan (2013)

Component 3: Crash Prevention System Nepal Road Rules



Photo courtesy Subhash (2014)



Project 4.1 Crash Prevention System: Development of Nepal Road Rules

(Component C: Pre-crash Systems)

1. **Objective:**
 - To develop Nepal Road Rules
2. **Description:**
 - Review the existing 'Road Users Guide' and enhance it based on local and international experiences (rename it as Nepal Road Rules as term 'guide' does not seem to be strong enough)
 - Develop several simplified versions of the rules both for public awareness and for drivers' education, training and licencing
3. **Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 4: Safer Road Users (Activity 2 - Activity 6: Laws, Regulations and Rules)
4. **Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 4: Safer Road Users (not specifically listed as an activity)
5. **Information Source:**
 - National existing documents
 - International best practices
6. **Outcome:**
 - A comprehensive set of Nepal Road Rules and its simplified versions for several purposes

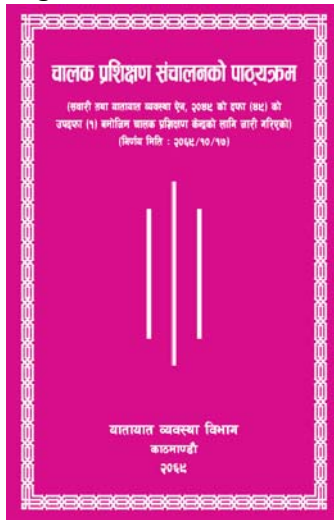
Crash Prevention System: Motorcycle Protective Clothing



Component 3: Crash Prevention System

Crash Prevention System: Graduated Licensing System

Existing Driver Education and Licensing system



Component 3: Crash Prevention System

Crash Prevention System: Graduated Licensing System

Existing licensing system needs to be reviewed, revised & updated

Project 4.1 Crash Prevention System: Graduated Licensing System

(Component C3.1: Pre-crash Systems: Safer Road Users)

- Objective:**
 - To develop and implement graduated licensing system in Nepal
- Description:**
 - Review the existing 'licensing system'
 - Develop a graduated licensing system (L, P and O)
 - Specify durations of formal training (through authorised trainers) and experiences at various stages of the licensing
 - Written tests, computerised simulation tests, open-space manoeuvring tests and practical on-road tests should cover extensive knowledge and skills a driver require to drive on Nepalese roads (Nepal Road Rules)
 - The licensing system for public and commercial vehicles should be tougher.
 - The driving tests should be run through government departments (not through law enforcement bodies).
 - Develop programs for L-platers and P-platers
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 4: Safer Road Users (Activity 8: Graduated Licensing System)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 4: Safer Road Users (Activity D(6): Improve driving licence procedure scientifically, Activity D(8): Construct modern driving training centres and capacity enhancement]
- Information Source:**
 - National existing system
 - International best practices
- Outcome:**
 - A robust driver licensing system



- Learner Permit Knowledge Test (written/computerised) (≥ 16 yrs)
 - plate for 3-12 months
- Hazard Perception Test (≥18 yrs)
- Drive Test
 - P plate for 1 years
 - P plate for 3 years
- Open licence



Component 3: Crash Prevention System

Crash Prevention System: Public Education

Project 4.1 Crash Prevention System: Public Education and Awareness

(Component C3.1: Pre-crash Systems: Safer Road Users)

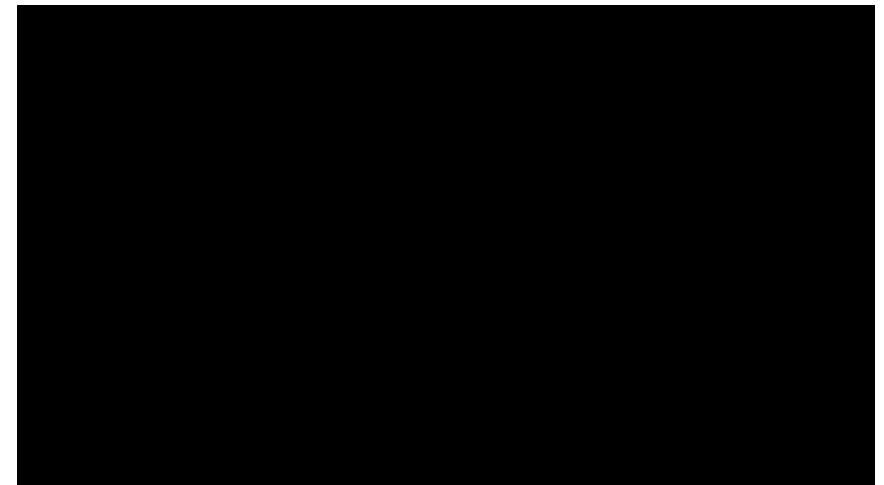
- Objective:**
 - To develop and implement a set of public education and awareness campaigns on road safety
- Description:**
 - Projects related to education, awareness, behavioural change, road rules to control fatal five (DUI - driving under the influence of alcohol or drug, speeding, driving without wearing seat belts, distracted driving, driving while fatigue etc.) - start with slogans such as 'Tired Drivers Die' – it is about stopping anarchies on roads to save lives
 - Examples: slogans, TV advertisement and debate, social media campaigning, school campaigns, on-road safety demonstrations, road safety training facilities for kids on parks and schools etc.
 - Conduct research on community attitudes towards road safety
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 4: Safer Road Users (Activity 1: Awareness and Public Education)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 4: Safer Road Users (Activity D(3): Public education campaign and research for all road users, Activity D(4): Introduce road safety education in school curriculum with regular revisions, Activity D(5): Train drivers and other road users]
- Information Source:**
 - National existing system
 - International best examples
- Outcome:**
 - A set of effective public education and awareness campaigns on road safety



Source: Poudyal (2013)



Crash Prevention System: Public Awareness & Education



Motor Vehicles and Transport Management Act, 2049 (1993)

164. **Power to transport inspector or police to impose fine on the spot.** (1) Notwithstanding anything contained elsewhere in this Act, the transport inspector or a police officer not lower than the rank of sub-inspector of police may punish on the spot a person who commits the following offence **for the first instance with a fine of Twenty Five Rupees to Fifty Rupees** a person who commits the following offence for the second instance with a fine of **Fifty Rupees to One Hundred Rupees** and a person who commits the following offence for the third instance or more with a fine of **One Hundred Rupees to two hundred rupees**:

- Driving a motor vehicle contravening the traffic signs or signals;
- Stopping a motor vehicle at such place or time as may be prohibited for such standing;
- Turning a motor vehicle or using sound-signal at a place where such turning or sound-signal is prohibited;
- Driving a motor vehicle on the wrong side of a road;
- Driving a motor vehicle from the opposite side on a

Traffic Police (online)

क्रमांक	विवरण	दण्ड
1	सडकको कुनै नियमनामाको विरुद्धमा चल्दा वा अन्य कुनै नियमनामाको विरुद्धमा चल्दा	१. २५०० रु. २. ५००० रु. ३. १०००० रु.
2	सडकको कुनै नियमनामाको विरुद्धमा चल्दा वा अन्य कुनै नियमनामाको विरुद्धमा चल्दा	१. ५००० रु. २. १०००० रु. ३. २०००० रु.
3	सडकको कुनै नियमनामाको विरुद्धमा चल्दा वा अन्य कुनै नियमनामाको विरुद्धमा चल्दा	१. ५००० रु. २. १०००० रु. ३. २०००० रु.
4	सडकको कुनै नियमनामाको विरुद्धमा चल्दा वा अन्य कुनै नियमनामाको विरुद्धमा चल्दा	१. ५००० रु. २. १०००० रु. ३. २०००० रु.
5	सडकको कुनै नियमनामाको विरुद्धमा चल्दा वा अन्य कुनै नियमनामाको विरुद्धमा चल्दा	१. ५००० रु. २. १०००० रु. ३. २०००० रु.
6	सडकको कुनै नियमनामाको विरुद्धमा चल्दा वा अन्य कुनै नियमनामाको विरुद्धमा चल्दा	१. ५००० रु. २. १०००० रु. ३. २०००० रु.
7	सडकको कुनै नियमनामाको विरुद्धमा चल्दा वा अन्य कुनै नियमनामाको विरुद्धमा चल्दा	१. ५००० रु. २. १०००० रु. ३. २०००० रु.
8	सडकको कुनै नियमनामाको विरुद्धमा चल्दा वा अन्य कुनै नियमनामाको विरुद्धमा चल्दा	१. ५००० रु. २. १०००० रु. ३. २०००० रु.
9	सडकको कुनै नियमनामाको विरुद्धमा चल्दा वा अन्य कुनै नियमनामाको विरुद्धमा चल्दा	१. ५००० रु. २. १०००० रु. ३. २०००० रु.
10	सडकको कुनै नियमनामाको विरुद्धमा चल्दा वा अन्य कुनै नियमनामाको विरुद्धमा चल्दा	१. ५००० रु. २. १०००० रु. ३. २०००० रु.

- one-way road;
- Driving a motor vehicle of unworthy condition;
- Driving a motor vehicle in excess of the determined speed;
- Driving a motor vehicle at night without turning lights on;
- Driving a motor vehicle after consumption of liquor;
- Parking a motor vehicle at a public place in such a way as to cause obstruction to others;
- Driving a motor vehicle at a place or hour prohibited for such driving;
- Driving a motor vehicle without a number-plate;
- Driving a motor vehicle of which weight is more than the determined weight at a place for which the limit of weight of a motor vehicle is determined;
- Driving a motor vehicle without fastening the seat-belt or without using the helmet;
- In the event of determination of the number of people to be seated or kept in or the weight of goods to be loaded in a motor vehicle, driving a motor vehicle carrying passengers or goods exceeding such determined number or weight;
- Refusing to accept a passenger by the driver of a public motor vehicle;
- Driving a motor vehicle by charging fares at a rate exceeding the fixed rate of fares;
- Driving a motor vehicle recklessly;
- Driving a public motor vehicle without obtaining the route permit; or



(\$1,605 cost to be paid by offender)

- ❑ Enforcement of the laws and regulations is also essential for behavioural change of road users
- ❑ A rigorous system to enforce road traffic laws required
- ❑ Note: Traffic fine should be set to a deterrent level (can we introduce variable fines system for Nepal?)

Project 4.1 Crash Prevention System: Law Enforcement
(Component C3.1: Pre-crash Systems: Safer Road Users)

- Objective:**
 - To develop a rigorous Nepal road traffic laws enforcement system
- Description:**
 - Develop a rigorous Nepal road traffic laws enforcement system
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 4: Safer Road Users (Activity 4 – Activity 6)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 4: Safer Road Users [Activity D(2): Strictly enforce the rules on the seatbelts, helmets use, public transport safety and develop comprehensive code-of-conduct for all road users]
- Information Source:**
 - Traffic Police
 - National existing system
 - International best examples
- Outcome:**
 - A rigorous Nepal road traffic laws enforcement system

Value of fines

The amount a person is fined depends on the offence they commit and the number of penalty units attributed to it. The current value of a penalty unit is \$147.61 (as at 1 July 2014). For example, if an offence carries two penalty units, the total fine is \$295. The value of a penalty unit is set annually by the Department of Treasury and Finance (DTF), and is updated on 1 July each year. More information about fees and fines is available on the [DTF website](#).

- ❑ Design speeds information along SRN available
- ❑ Speed limits by vehicle type is also available
- ❑ There is no comprehensive speed signage and speed management system

Design Speeds, km/h				
Road Class	Plain	Rolling	Mountainous	Steep
I	120	100	80	60
II	100	80	60	40
III	80	60	40	30
IV	60	40	30	20

Speed Limit (km/hr)

गति निर्मित गर्ने (सुभावा) कि. मी. प्रति घण्टा	बस्ती क्षेत्र	धुन्दा सडक
सवारीको किसिम		पहाडी सडक
ट्रेम, ट्रेक्टर	५०	५०
कार, जीप, भ्यान, पिकअप, मोटरसाइकल	५०	८०
मिनीबस, मिनीट्रक तथा जीप, भ्यान वा पिकअप	५०	८०
५ टनभन्दा बढी तौलको	५०	५०
बस, ट्रक वा अन्य सवारी ५० टनभन्दा बढी	५०	५०
तौलको	५०	५०
यी अधिकतम गतिसीमाहरू स्थानीय गतिसीमा बिन्दु र सडकको अवस्था अनुसार फरक गर्न सकिन्छ, तर बढी होइन।		



Source: ekantipur.com



Project 4.1 Crash Prevention System: Development of Speed Limits and Speed Management System

(Component C3.2: Pre-crash Systems: Safer Speeds)

- Objective:**
 - Develop and implement speed limits and speed management system
- Description:**
 - Review the existing 'Speed Limits' and 'Speed Management System'
 - Utilise road inventory, traffic stream and Road Safety Audit (Project#3.9) results to develop a comprehensive speed management system and speed limits on all roads in Nepal based on local practices and international experiences.
 - Establish an institutional framework to implement and monitor motorists' compliance to speed limits and speed management system
 - Develop projects and programs related to speed management and control
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 4: Safer Road Users (Activity 2: Speed Limits)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 4: Safer Road Users (not specifically listed as an activity)
- Information Source:**
 - National existing documents
 - International best practices
 - Road safety audit results
 - Traffic Police
- Outcome:**
 - A comprehensive national speed limits and speed management system



Source: ekantipur.com



Photo Courtesy Traffic Police

- ❑ Vehicle factor contributes to crashes due to unsafe vehicles, worn tyres & brakes (about 5-15%). **Initial and periodic vehicle inspections** help to reduce road crashes. These inspections include:
 - **Roadworthiness:** development of vehicular safety checking and rating system (brakes, lights, tires, crash avoidance systems: ESC, ABS, alerting systems)
 - **Mass, size and other safety compliances** e.g., licence to carry passengers...etc.



Photo Courtesy Traffic Police



Photo Courtesy Subhash (2014)

17. **Road worthiness certificate to be issued:** (1) Prior to registering any motor vehicle pursuant to Section 16, the competent authority shall, subject to the criteria prescribed pursuant to Section 23, examine such a motor vehicle as to whether it is in good condition that it can be plied and register such a motor vehicle only when it is in good condition that it can be plied and issue the certificate of registration. In so issuing the certificate of registration, the certificate of road worthiness of such a motor vehicle shall also be issued to the owner of such a motor vehicle.
(2) The road worthiness certificate issued pursuant to Sub-section (1) shall have to be affixed on the motor vehicle.

Motor Vehicles and Transport Management Act, 2049 (1993)



Project 4.1 Crash Prevention System: Vehicle Inspection and Roadworthiness

(Component C3.3: Pre-crash Systems: Safer Vehicles)

1. Objective:

- To develop and implement a system for vehicle inspection and roadworthiness

2. Description:

- Develop and implement a comprehensive testing and inspection system for all vehicles for their roadworthiness, mass and sizes and capacity to carry passengers and goods. The system should be tougher for public and commercial vehicles
- Develop and implement NCAP ("New Car Assessment") programmes
- Enforce laws that prohibit the use of unsafe vehicles/manufacture vehicles without specific safety features Control and Anti-Lock Braking Systems
- Develop projects related to vehicle inspection, control, technology, what kind of vehicles seat belts, air bags, condition check, regular check

3. Reference to UN Decade of Action for Road Safety 2011-2020

- Pillar 4: Safer Vehicles (Activity 1-Activity 7)

4. Reference to Nepal Road Safety Action Plan (2013-2020)

- Pillar 4: Safer Vehicles [Activity C(1)-C(8)]

5. Information Source:

- National existing system
- International best examples

6. Outcome:

- A comprehensive vehicle testing and inspection system



Photo Courtesy Adhikary (2013)



Photo Courtesy Adhikary (2013)

- Road factor contributes to crashes due to **poor delineation, unsafe and substandard road geometry** (steep downgrade, severe curves), **poor pavement surface condition** (polished aggregate, wet pavement) and **visibility** (poor sight distance, lighting conditions) (about 25-35%):



Photo Courtesy Poudyal (2013)



Photo Courtesy Subhash (2014)



Source: Decoded Stuff (online)



Photo Courtesy Adhikari (2013)

Project 4.1 Crash Prevention System: Road Design and Maintenance

(Component C3.4: Pre-crash Systems: Safer Roads)

1. Objective:

- To update and revise road design and maintenance standards

2. Description:

- Review and update existing road design standards through road safety perspectives
- Develop and implement road maintenance standards
- Develop a system to continuously review road design and maintenance standards utilising local practices and international evidences. The road maintenance should be of top-most priority. Road and traffic authorities should be made punishable by law for non-standard designs and for not maintaining the roads to a safe level.

3. Reference to UN Decade of Action for Road Safety 2011-2020

- Pillar 2: Safer Roads and Mobility (Activity 3 and Activity 4: Standards for New and Existing Roads)

4. Reference to Nepal Road Safety Action Plan (2013-2020)

- Pillar 2: Safer Roads and Mobility [Activity B(3)]: Develop design guideline for safer roads and construct required infrastructures]

5. Information Source:

- National existing standards
- International best examples

6. Outcome:

- Nepal road design and maintenance standards and monitoring system



Source: Photos of Nepal (online)



Source: Creation Umesh (online)

☐ Traffic Signs Manual (1997) was prepared and approved



Project 4.1 Crash Prevention System: Traffic Control Devices

(Component C3.4: Pre-crash Systems: Safer Roads)

1. **Objective:**
 - To develop 'Manual of Traffic Control Devices'
 - To develop a system to enforce laws to implement traffic control devices
2. **Description:**
 - Review and update existing Traffic Signs Manual (1997)
 - Priority 1: Regulatory devices (signs/signals/markings) for regulating flows
 - Priority 2: Warning devices
 - Priority 3: Information or guidance devices
 - Develop a system to enforce laws to implement traffic control devices
 - Develop a system to continually review 'Manual of Traffic Control Devices' utilising local practices and international evidences. Road and traffic authorities should be made punishable by law for not using or for incorrectly using traffic control devices.
3. **Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 2: Safer Roads and Mobility (Activity 3 and Activity 4: Control Devices for New and Existing Roads)
4. **Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 2: Safer Roads and Mobility (Activity B(5): Enforce work zone safety from construction to defect-liability period in all road project contracts)
5. **Information Source:**
 - National existing manuals and laws
 - International best practices
6. **Outcome:**
 - Nepal Manual of Uniform Traffic Control Devices and enforcement system



Source: Photos of Nepal (online)

Safety at Road Construction Zones



Source: Indiana DOT (online)

☐ Road Safety Audit Manual was published in April 1997

☐ How is this manual used?

Project 4.1 Crash Prevention System: Development of Road Safety Audit System

(Component C3.4: Pre-crash Systems: Safer Roads)

1. **Objective:**
 - To develop and implement Road Safety Audit process
2. **Description:**
 - Develop a compulsory comprehensive road safety auditing process for both existing and new roads. Develop road safety tools/checklists to be used for auditing process. Develop a system to train expert road safety auditors.
 - Road Safety Audit projects:
 - Develop Road Safety Audit Policy
 - Develop Manual of Road Safety Audit-review existing and improve
 - Develop training manuals and training programs for auditors
 - Develop auditors' licencing system
 - Systematic safety audit, safety impact and/or road assessment policies and practices in place
 - Develop tools such as NepRAP (similar to AusRAP, EuroRAP)
 - Develop tools such as NepRAM (similar to ANRAM)
3. **Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 2: Safer Roads and Mobility (Activity 3 - Activity 5: Auditing System for New and Existing Roads)
4. **Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 2: Safer Roads and Mobility (Activity B(1): Develop road safety audit manual for non-strategic roads and gradually enforce safety audits in all roads (strategic and non-strategic roads), Activity B(2): Introduce compliance policy for safety audits recommendations (strategic and non-strategic roads))
5. **Information Source:**
 - National existing manuals and laws
 - International best practices
6. **Outcome:**
 - Nepal Road Safety Auditing System

Crash Prevention System: Roadside Hazard Management

- ❑ A particular type of crashes can be reduced by managing roadside hazards (for example, **run of the road crashes**)
- ❑ Access control, delineation measures, **roadside safety barriers** are some of the measures that help reduce the road crashes

Project 4.1 Crash Prevention System: Roadside Hazard Management

(Component C3.4: Pre-crash Systems: Safer Roads)

1. Objective:

- To develop and implement roadside hazard management system

2. Description:

- Develop and implement roadside hazard management system utilising road safety auditing results and utilising guidelines for Nepal road safety measures. Research on using local materials and resources should be given the top most priority.
- Develop access control and rationalisation strategy for implementation along the existing and future road corridors. Develop policy to strictly enforce access control measures to and from arterial roads,

3. Reference to UN Decade of Action for Road Safety 2011-2020

- Pillar 2: Safer Roads and Mobility (Activity 3: Hazard Management System)

4. Reference to Nepal Road Safety Action Plan (2013-2020)

- Pillar 2: Safer Roads and Mobility (not directly listed as an activity)

5. Information Source:

- National existing manuals and laws
- International best practices

6. Outcome:

- Nepal Roadside Hazard Management System



Photo Courtesy Subhash



Source: Austroads (2008)

Crash Prevention System: Roadside Hazard Management



Source: Austroads (2008)

Component 4: Pre-crash Management System Post-Crash Management System

- ❑ The objective of developing post-crash management system is to **reduce the damage or injury through improved emergency management**, to treat injuries and save lives
- ❑ It can be done by formulating robust post-crash management system
- ❑ The system should use advanced technologies and healthcare system



(Source: Queensland Department of Transport and Main Roads)



Component 4: Pre-crash Management System Post-Crash Management System

Project 5.1 Development of Nepal Post-Crash Management System (NPCMS)

(Component C4: Post-crash System)

1. Objective:

- To review and update or develop a robust Nepal Post-crash Response and Management System to treat injuries and save lives

2. Description:

- Review and update or develop an effective and efficient emergency response and management system after the road crash
- Review and update or develop documents (strategy, policy, directives, manual, guidelines, forms, checklists) for Nepal Post-crash Response and Management System
- This should include emergency communication systems, rescue management, pre-hospital and hospital care systems, long-term care systems, salvaging and towing away damaged vehicle and restoration of roads and traffic control devices
- Establishment of post-crash response units at strategic locations along SRN, helicopter/flying doctors, ambulance, tow truck, emergency vehicles, trauma centres, road rules regarding duty of drivers in case of crashes (witness or direct involvement) are some important components of the system.

3. Reference to UN 5 Pillars of Global Actions for Road Safety

- Pillar 5: Post-Crash Response [Activity 1–Activity 7]

4. Reference to Nepal Road Safety Action Plan (2013-2020)

- Pillar 5: Post-Crash Response [Activity E(1)–Activity E(8)]

5. Information Source:

- National existing systems
- International best practices

6. Outcome:

- A robust Nepal Post-Crash Management System (NPCMS)

Component 5: Crash Investigation System Crash Investigation and Recording System

Existing System (both in English & Nepali)

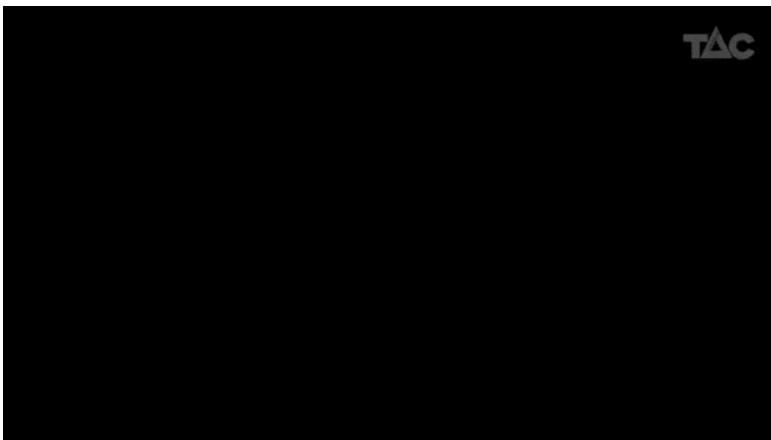
Component 5: Crash Investigation System Crash Investigation and Recording System

Project 6.1 Development of Nepal Road Crash Investigation System (NRCIS)

(Component C5: Crash Investigation and Database System)

- Objective:**
 - To develop a robust Nepal road crash investigation system (NRCIS)
- Description:**
 - Develop and implement crash investigation policy
 - Develop a rigorous Nepal road crash investigation system (NRCIS) involving several levels of road safety institutions and expertise. The system should answer the questions: where, how, what, when, who and why?
 - Set up systematic training programs to prepare expert road crash investigators. Graduated licencing system may be required for different levels of expertise.
- Reference to UN 5 Pillars for Road Safety**
 - All Pillars 1-5
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 2: Safer Roads and Mobility [Activity B(4): Investigate accident black spots for all road types and construct appropriate countermeasures]
- Information Source:**
 - Road and traffic authorities: DoTM, DoR, DoLIDAR
 - Traffic Police
 - Existing national system
 - International best practices
- Outcome:**
 - A robust Nepal road crash investigation system (NRCIS)

Crash Investigation and Recording System



Component 5: Crash Investigation System Crash Investigation and Recording System

Project 6.1 Nepal Road Crash Data Collection, Coding and Recording System

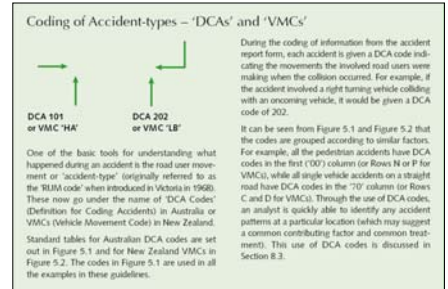
(Component C5: Crash Investigation and Database System)

- Objective:**
 - To develop unified Nepal Road Crash Data Collection, Coding and Recording System
- Description:**
 - Develop Nepal Crash and Severity Classification (NCS) System based on severity (fatal, hospitalisation or serious injury, minor injury, medical treatment (collectively called FSI crashes), PDO (property damage only) crashes (use of consistent definition (e.g., if a person dies within 30 days of hospitalization resulting from injury sustained in road crash, the crash in this case is defined as fatal), Number of casualties (head count) vs number of casualty crashes.
 - Develop Nepal Crash Coding (NCC) System using best international examples and local requirements (similar to DCA codes in Australia) for use in engineering purpose (e.g. run-of the road, head on, rear end, side swipe, pedestrian hit, hit object).
 - Update the existing 'Road Accident Record' (RAR) form based on international examples and local conditions in consultation with Traffic Police (similar to QPRIME system in Queensland). This will be primarily meant for the purpose of Police charge, court case legal matters, coroner enquiry, insurance, dispute resolution, penalty, infringement etc. Rename it 'Nepal Road Crash Record' (NRCCR).
 - Develop and enforce legal requirements for crash data reporting.
 - Utilise computerised and advanced internet technologies to collect, code and record crash data.
- Reference to UN Decade of Action for Road Safety 2011-2020**
 - Pillar 1: Road Safety Management [Activity 6: Data systems]
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (not specifically listed as an activity)
- Information Source:**
 - Road and traffic authorities: DoTM, DoR, DoLIDAR
 - Traffic Police
 - Existing national system
 - International best practices
- Outcome:**
 - Unified Nepal Crash Data Collection, Coding and Recording System

Australian Example:

Minimum reporting requirements
Have all the following crash categories reported:

- fatal crashes (one or more persons killed or died within 30 days)
- injury crashes (one or more persons injured)
- non-injury crashes above threshold values which may vary across jurisdiction, plus those where the property owner is not present.

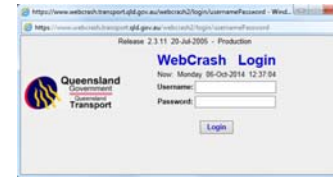


Nepal Road Crash Investigation and Recording System: Australian Example

0	1	2	3	4	5	6	7	8	9
PEDESTRIAN on foot, in bicycle	INTERSECTION vehicles from opposite approaches	VEHICLES FROM OPPOSING DIRECTIONS	VEHICLES FROM ONE DIRECTION	MANOEUVRING	OVERTAKING	ON PATH	NON-COLLISION, ON STRAIGHT	NON-COLLISION, ON CURVE	MISCELLANEOUS
OTHER 000	OTHER 100	OTHER 200	OTHER IN SAME LANE 300	OTHER 400	UTURN 500	OTHER 600	OTHER 700	OTHER 800	UTURN 900
1 NEAR SIDE 001	THRU-THRU 101	HEAD ON 201	REAR-END 301	LEAVING PARKING 401	HEAD ON 501	PARKED 601	OFF CARBONWAY TO LEFT 701	OFF CARBONWAY RIGHT BEND 801	FELL FROM VEHICLE 901
2 EMERGING 002	RIGHT-THRU 102	THRU-RIGHT 202	LEFT-REAR 302	PARKING 402	OUT OF CONTROL 502	DOUBLE PARKED 602	OFF CARBONWAY TO RIGHT 702	OFF CARBONWAY LEFT BEND 802	VEHICLE ON ROAD 902
3 FAR SIDE 003	LEFT-THRU 103	RIGHT-LEFT 203	RIGHT-REAR 303	PARKING VEHICLES ONLY 403	PULLING OUT 503		LEFT OFF CARBONWAY INTO OBJECT 703	UP HILL BEND INTO OBJECT 803	HIT TRUCK 903
4 REAR END VEHICLE STANDING ON CARBONWAY ON	THRU-RIGHT 104	RIGHT-RIGHT 204	VEHICLES IN PARALLEL LANES 304	REVERSING IN TRAFFIC 404	CUTTING IN 504	CAR DOOR 604	ROD OFF CARBONWAY INTO OBJECT 704	OFF LEFT BENDED OBJECT 804	HIT RAILWAY SIGN FUTURE 904
5 WALKING WITH TRAFFIC 005	RIGHT-RIGHT 105	THRU-LEFT 205	LANE SWING RIGHT 305	REVERSING INTO LANE CHANGE 405	PULLING OUT IN LANE 505	HIT PERMANENT OBSTRUCTION 605	OUT OF CONTROL ON CARBONWAY 705	OFF HILL BEND OFF CARBONWAY 805	HIT ANIMAL OFF CARBONWAY 905
6 FACING TRAFFIC 006	LEFT-RIGHT 106	LEFT-LEFT 206	LANE SWING LEFT 306	LEAVING DRIVEWAY 406	OVERTAKING RIGHT TURN 506	HIT ROADWORKS 606	LEFT TURN 706	SIDE CONTROL TURNING LEFT ON SIGN 806	PARKED VEHICLE RUN AWAY 906
7 DRIVEWAY 007	THRU-LEFT 107	U-TURN 207	LANE CHANGE LEFT 307			HIT TEMPORARY OBSTACLE ON CARBONWAY 407	RIGHT TURN 707	TRAFFIC CONTROL TURNING LEFT ON SIGN 807	VEHICLE MOVEMENTS NOT KNOWN 907
8 ONLY FOOTWAY 008	RIGHT-LEFT 108		RIGHT TURN LEFT 308			ACCIDENT ON PARKING PLACE 608	TRAFFIC SIGNAL 708		
9 REMOVABLE OBSTACLE ON FOOTWAY 009	LEFT-LEFT 109		LEFT TURN LEFT 309			HIT NORMAL 609			
						LOAD HIT VEHICLE 609			

Component 5: Crash Investigation System Nepal Road Crash Database System

- Investigation of crash data requires a **centralised, verified, detailed and audited crash data**
- Currently, **Traffic Police keep the hardcopy database (not easily accessible for general public)**
- It is important to **make these verified database public**

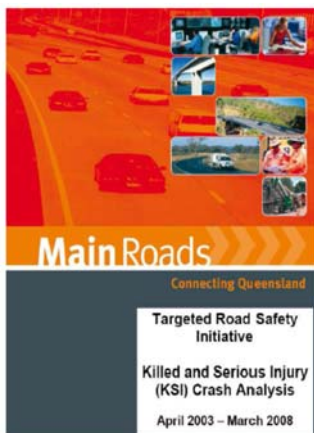


Project 7.1 Development of Nepal Road Crash Database System (NRDCS)

(Component C5: Crash Investigation and Database System)

- Objective:**
 - To develop a centralised (computerised) and detailed Nepal road crash database system (NRDCS) for research, analysis and road safety purposes. This archive should contain only verified and cross-checked database.
- Description:**
 - Develop a computerised database system that collates up-to-date records of crash statistics. The records should be as detailed as possible and frequently updated. The recordings should be made compulsory by law and should be consistent with the internationally accepted standards.
 - Develop road crash database system (similar to RoadCrash2 or WebCrash in Queensland) for use in engineering analysis.
 - Others (e.g., Database for Fatal Crash Investigation recommendations and actions taken, Database for Road Safety Audit recommendations and actions taken, road elements contributing to crashes - risk factors - e.g. length of road side barriers, median, shoulder width, substandard curves)
 - Develop a computerised database system of all collected crash data that can be extracted as per users' necessities. Provide an option to upload scanned versions of original data collection forms so that data can be rechecked as required.
- Reference to UN Decade of Action on Road Safety 2011-2020**
 - Pillar 1: Road Safety Management (Activity 6: Data systems)
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 1: Road Safety Management (not specifically listed as an activity)
- Information Source:**
 - Government departments: DoTM and Traffic Police
 - Other information sources
 - Data to be regularly collected, as and when required
- Outcome:**
 - Disaggregated (electronic) road crash database

Nepal Road Crash Database System



Segment	Date	Location	Distance to	Distance to	Distance to	Description	Location Road Section	Distance	Width
1	2003-04-01	...	...	...	...	...	...	...	...
2	2003-04-01	...	...	...	...	...	...	...	...
3	2003-04-01	...	...	...	...	...	...	...	...
4	2003-04-01	...	...	...	...	...	...	...	...
5	2003-04-01	...	...	...	...	...	...	...	...
6	2003-04-01	...	...	...	...	...	...	...	...
7	2003-04-01	...	...	...	...	...	...	...	...
8	2003-04-01	...	...	...	...	...	...	...	...
9	2003-04-01	...	...	...	...	...	...	...	...
10	2003-04-01	...	...	...	...	...	...	...	...

Use of Crash Database for Road Safety Program Development: Example from Queensland, Australia

Component 6: Road Safety Analysis and Research Nepal Road Safety Research and Development

- Road safety research is a **must for all aspects of road safety**
- Decision concerning the road safety measures need to be based on **information about:**
 - the number of accidents
 - when and where accident occurred
 - the road user groups that are involved
 - the factors that contribute to accidents and
 - the measures that can be taken to reduce the number of accidents or injury severities
- Information should be based on **scientific research**

Project 11.1 Road Safety Research and Development

(Component C6: Research & Development)

- Objective:**
 - To perform crash analysis and develop Nepal road safety measurement statistics
 - To conduct research covering a wide range of issues related to road safety in Nepal
- Description:**
 - Analyse crash data to develop a set of road safety performance statistics.
 - Analyse crash data and statistics to determine the causes of crashes. It is easier to develop countermeasures once the causes of crashes are known.
 - Develop visual and graphical user interfaces (such as GIS map) of analysed crash data and their statistics. This will help to prioritise projects for treating road crash locations.
 - Develop costs of crashes for Nepal. These costs should be periodically updated.
 - Develop models of crashes for road crash prediction at different types of road facilities (e.g., intersections and roadways)
 - Develop Nepal crash reduction or modification factors (CMFs).
 - Develop Nepal road safety performance functions (SPFs).
 - Investigate key crash types and develop countermeasures.
 - Develop a set of crash reduction countermeasures (examples of such measures are discussed in Chapter 8).
 - Perform research in all aspects of road safety in Nepal.
- Reference to UN 5 Pillars of Global Actions for Road Safety**
 - All pillars 1-5
- Reference to Nepal Road Safety Action Plan (2013/2020)**
 - Pillar 1: Road Safety Management [Activity A(5): Reliably, scientifically compile, analyse the RTA statistics and research on countermeasures]
 - Pillar 2: Safer Roads and Mobility [Activity B(4): Investigate accident black spots for all road types and construct appropriate countermeasures]
 - Pillar 5: Post-crash Response [Activity E(5): Research and prioritise treatments for serious injuries from RTAs]
- Information Source/Persons Involved:**
 - Crash analysis experts, academics and researchers
 - Road and traffic authorities
 - Journals and publications
 - Books and reports
- Outcome:**
 - Scientific approach to road safety research and development

- In order to develop Nepal road safety countermeasures, the all contributing factors (the human factor, vehicle and road environment) should be taken into account

Project 8.1 Development of Nepal Road Safety Measures (NRSM) or Treatments

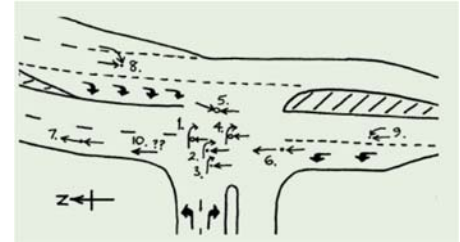
(Component C2: Governance and Planning)

- Objective:**
 - To develop a set of Nepal Road Safety Measures (NRSM) or treatments
- Description:**
 - Select, research, trial, modify and specify effective and efficient Nepal Road Safety Measures (N-RSM) based on local evidences and international best practices
 - Develop *Manual of Nepal Road Safety Measures (NRSM)* for crash reductions (crash treatment types or reference materials based on international best practice and gradually improve them based on their usefulness in local conditions). Trial a few key selected treatments which have large effect in improving safety.
 - Develop policy for including safety benefits in road project evaluation methodology (if not done now – if there is one, review it and improve)
- Reference to UN 5 Pillars of Global Actions for Road Safety**
 - Pillar 2: safer roads and mobility
 - Pillar 3: safer vehicles
 - Pillar 4: safer road users
- Reference to Nepal Road Safety Action Plan (2013-2020)**
 - Pillar 2: Safer Roads and Mobility [Activity B(4): Investigate accident black spots for all road types and construct appropriate countermeasures]
- Information Source/Persons Involved:**
 - Crash analysis experts, academics and researchers
 - Road and traffic authorities
 - Journals and publications
 - Books and reports
- Outcome:**
 - A set of Nepal Road Safety Measures (NRSM) or treatments for all crash types

Project 8.1 Development of Nepal Road Safety Measures (NRSM) or Treatments Documents

(Component C2: Governance and Planning)

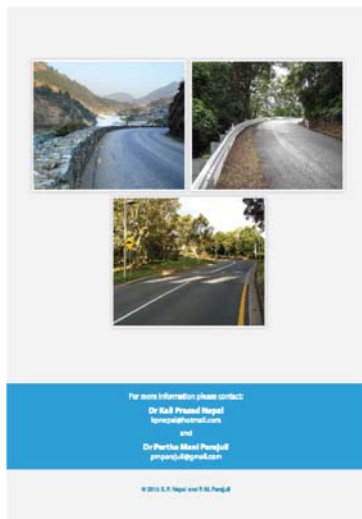
- Objective:**
 - To develop documents for Nepal Road Safety Measures (NRSM) or treatments
- Description:**
 - Develop guidelines for installing road side barriers (types, warrants, where, what, how?)
 - Develop standard specifications for guard rails: W Beam, Three Beam, End terminal treatments, delineation, deflection zones etc., installation details, maintenance requirements, regular check)
 - Develop guidelines for median barriers (as above) including crash cushion
 - Develop specifications for median barriers (as above)
 - Develop guidelines for the provision of passing lanes (covering all technical aspects such as warrant, analysis, criteria, types, minimum length, geometric requirements etc.)
 - Develop standard specifications of works for implementing passing lanes (treatments at taper, length of tapers, traffic signs, chevron etc.), line marking, road side painting etc.)
 - Develop guidelines (criteria/warrants for installing etc.) and standard specifications for Wide Centre Line Treatment (WCLT): a well-tested and cost effective, low cost alternatives to physical barriers
 - Develop guidelines for implementing gateway treatments at rural towns
 - Develop guidelines for installing pedestrian crossings at urban arterial roads
 - Develop guidelines for installing motorcycle friendly guard rails
 - Other countermeasures (treatments), crash reduction factors, safety benefits into the road project evaluation, risk assessment, speed management and control, crash reductions and control, specifications and standards of safety elements – road side barriers, median barriers, intersection treatments, run off the road crashes, head on and rear end, pedestrian and cyclist/ motorcyclists
- Reference to UN 5 Pillars of Global Actions for Road Safety**
 - Pillar 2: safer roads and mobility
 - Pillar 3: safer vehicles
 - Pillar 4: safer road users
- Information Source/Persons Involved:**
 - Crash analysis experts, academics and researchers
 - Road and traffic authorities
 - Journals and publications, books and reports
- Outcome:**
 - A set of guidelines/specifications to Nepal Road Safety Measures or treatments



Treatment of crash location

Concluding Remarks

- If we fight 'road safety problem in Nepal' from all 6 fronts, we will reach somewhere
- Approach to road safety
 - 'Proactive' approach NOT 'Reactive' approach
- Terminologies
 - 'Crash' NOT 'Accident'



QUESTIONS???