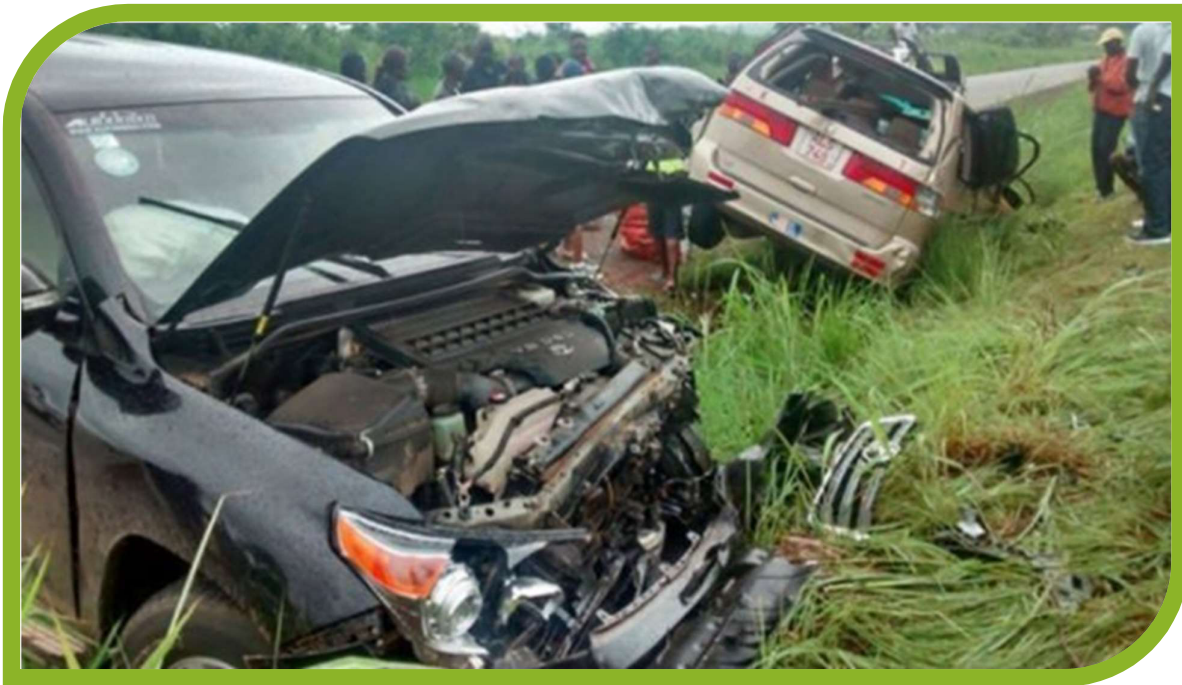


Pilot study to collect more robust accident data for Sierra Leone

Report on the Framework for Accident Data Collection and Management



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Abstract

The pilot study to collect more robust accident data for Sierra Leone aims to set up a methodology for road traffic crash data collection using sample data on a pilot basis, and to develop and implement an electronic data management system for road traffic crash data storage, analysis and retrieval for Low Volume Roads. This report provides a description of outcomes from:

- Recommended options for road traffic crash data collection suited to the needs of Sierra Leone.
- Proposed framework for pilot road traffic crash data collection under the project.
- Outline of proposed accident data management systems.

Based on an assessment of current practices adopted in Sierra Leone for Road Traffic Crash (RTC) data collection, management and analysis, a set of recommended options for future practices can be defined. Sierra Leone Police, Sierra Leone Road Safety Authority and Health services (hospitals and emergency centres) are involved in data collection activities. Sierra Leone Road Safety Authority, Statistics Sierra Leone and Sierra Leone Roads Authority are involved in data use (analysis) activities.

Recommended options refer to the following:

- Use of standardised RTC data collection forms by all Police forces and all health services.
- Collect data directly through electronic means.
- Use GPS tools to locate RTC on maps.
- Train Police officers and health services workers on how to collect and analyse data.
- Integrate all the data sources (Police, health services, others) into a unique database.
- Use of an accident data management system to support RTC data collection, management and analysis (including production of statistics and reports).

Key words

Crash; Data collection; Road; Safety; Accident data management system

Research for Community Access Partnership (ReCAP)

Safe and sustainable transport for rural communities

ReCAP is a research programme, funded by UK Aid, with the aim of promoting safe and sustainable transport for rural communities in Africa and Asia. ReCAP comprises the Africa Community Access Partnership (AfCAP) and the Asia Community Access Partnership (AsCAP). These partnerships support knowledge sharing between participating countries in order to enhance the uptake of low cost, proven solutions for rural access that maximise the use of local resources. The ReCAP programme is managed by Cardno Emerging Markets (UK) Ltd.

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Acronyms, Units and Currencies

€	Euro (€ 1.00 ≈ SLL 9,348.26)
\$	United States Dollar (US\$ 1.00 ≈ SLL 7,695.07)
ADB	Asian Development Bank
AfCAP	Africa Community Access Partnership
AsCAP	Asia Community Access Partnership
CADaS	Common Accident Dataset
GPS	Global positioning system
ITPSIP	Integrated Transport Policy, Strategy and Investment Strategy
LVRs	Low Volume Roads
MoHS	Ministry of Health and Sanitation
ONISR	French Inter-ministerial Observatory for Road Safety
PRSP-III	Third Poverty Reduction Strategy Paper
ReCAP	Research for Community Access Partnership
RTC	Road Traffic Crash
SLICOM	Sierra Leone Insurance Commission
SLRA	Sierra Leone Roads Authority
SLRSA	Sierra Leone Road Safety Authority
SLP	Sierra Leone Police
SSL	Sierra Leone Statistics
ToR	Terms of Reference
UNECA	United Nations Economic Commission for Africa
UK	United Kingdom (of Great Britain and Northern Ireland)
UKAid	United Kingdom Aid (Department for International Development, UK)
WB	World Bank
WHO	World Health Organization

Executive summary

Currently, there is no reliable road traffic crash (RTC) database in Sierra Leone. Though different sources of data exist, there is no standardised process or data collection, analysis and reporting. The information is collected in different ways, completely independent from each other.

The RTC data collection, management and analysis process involves Sierra Leone Police, Sierra Leone Road Safety Authority, Health Services, Statistics Sierra Leone and Sierra Leone Roads Authority.

RTC data collection framework for Sierra Leone refers to the situation in which information collected by Police forces and Health Services can be merged into a single national database and a follow-up of injured persons can be established.

Key actors that should be involved in the RTC data collection process are:

- **SLRSA:** collection of RTC data in the field, maintenance of the national database on RTC and analysis of data.
- **SLP:** collection of RTC data in the field.
- **Health services** (Hospitals, Emergency Centres, Mortuary Department): collection of data on persons injured.
- **SSL:** preparation of official statistics on RTC.
- **SLRA:** assessment of road infrastructure quality and safety conditions.

Two RTC data collection forms are recommended: one for Police Forces and one for Health Services.

The Police form has been developed based on the minimum set of RTC data elements recommended by WHO. Data elements are divided into four categories:

- Crash related elements, describing the overall characteristics of the crash.
- Road related elements, describing the characteristics of the road and associated infrastructure at the place and time of the crash.
- Vehicle related elements, describing the characteristics and events of the vehicle(s) involved in the crash.
- Person related elements, describing the characteristics, actions, and consequences relating to the people involved in the crash. These elements are to be completed for every person injured in the crash, and for the drivers of all vehicles (motorised and non-motorised) involved in the crash.

The Health form has been developed to allow for matching of information with those collected by Police forces, and thus to perform a follow-up of the persons injured in road crashes.

An accident data management system will be developed by adapting and integrating two already existing information systems: **SFINGE** and **Safety Manager**.

SFINGE is a web-based modular software allowing for:

- Collection of RTC data in the field (e.g. with a notebook or a smartphone) or simply for storage of data collected on paper.
- Analysis of RTC data to perform statistics and create reports based on various filters (e.g. date, road user, road, area, etc.).
- Geo-coding of data on maps (Google Maps and/or others) to locate the RTC on the road network.

Safety Manager is a web-based information system allowing for storage, management and detailed analysis of RTC.

1 Introduction

Based on the WHO's estimation (1), Sierra Leone had 1,661 road traffic crash fatalities in 2013 or 27.3 fatalities per 100,000 population, which is one of the worst figures in the world, ranking 160th among 179 countries/regions. The road fatality rate of 27.3 per 100,000 population also compares unfavourably with the average of 26.6 in the African region. Considering the current high growth in the number of vehicle registrations of above 19% per year (2), there is a high probability of further increase in road crashes in the country.

These figures are attributed to several factors such as excessive speeding in towns and cities and the operation of overloaded trucks on rural roads in poor condition. Overloaded goods trucks travelling on roads in poor condition easily get toppled due to a lack of stability causing Road Traffic Crashes (RTC). Even though motorcycle crashes may not have been recorded extensively, they are also a major cause of RTC fatalities in Sierra Leone.

Having established a policy to reduce the burden of premature deaths and disabilities caused by road traffic crashes in the country, the Government of Sierra Leone (GoSL) is seeking to ensure that appropriate strategies are applied to address road safety needs including road traffic crash situations on low volume rural roads.

To achieve this objective, a comprehensive RTC database is necessary to capture crash data and to provide a better understanding of the road safety needs on Low Volume Roads (LVRs) so that appropriate interventions can be applied.

The main objective of the study is to establish a framework for an efficient RTC data collection system on LVRs in Sierra Leone on a pilot basis.

Such a framework will capture all essential elements of RTC data requirements as a pilot/case study that will guide an expanded and sustainable RTC data collection on LVRs for the rest of the country to ensure data-led and evidence-based measures are taken to improve road safety.

This report provides the definition of a conceptual framework for RTC data collection and management. It especially provides detailed information on:

- Design of an RTC data collection format and tool
- Definition of the method for data collection.
- A conceptual framework for an RTC data management system with linkages between road traffic crash causal and mitigation factors based on an existing computerised road traffic data management system that could be customised for use in Sierra Leone.

2 Recommended options for road traffic crash data collection

Evidenced-based approaches lie at the heart of the most successful road safety polices – backed up by road traffic crashes and other road safety data. The availability of good quality data on road safety allows to precisely identify issues and to assess the effectiveness of potential road safety measures.

Currently, no reliable database on RTC is established in Sierra Leone. Different sources of data exist, but there is no standardised process or data collection form. The information is collected in different ways, completely independent from each other.

Improving the RTC data collection process is a key road safety management issue, especially by improving the reliability and completeness of the data on road crashes. In this regard a few recommendations could be adopted:

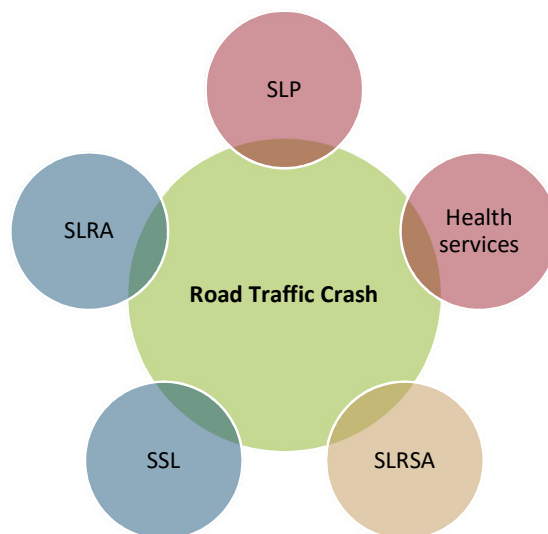
- Since RTC data collection is a demanding activity, that needs significant human and financial resources, a gradual process for its full set up should be adopted. This process could start with collection of all fatal road crash data (i.e. involving persons who died within 30 days after the crash) and with follow up of persons seriously injured in RTC through health services.

- A standardised RTC data collection form should be adopted by all Police forces, for collection of all fatal road crashes.
- A standardised RTC data collection form should be adopted by all health services in Sierra Leone (e.g. emergency centres, hospitals), for collection of data on persons seriously injured in RTC.
- The data on road crashes should preferably be collected through electronic means when the RTC occurs. This procedure would reduce data collection and data transfer errors.
- The use of GPS tools or of maps based on GIS (Geographical Information System) would increase the precision of the RTC localisation.
- Training activities should be organised for Police Officers during which they can improve their awareness about the importance of collecting RTC data and their expertise in performing this activity in the field.
- Training activities should be organised for health service (hospital, emergency centre, mortuary department, etc.) workers during which they can improve their expertise in collecting information on persons injured in an RTC.
- The Police Force should continue using their usual forms for prosecution purposes. However, statistical information should be collected using a new form.
- The RTC data collected from different sources (Police forces, health services) should be integrated between them into a unique database.
- An accident data management system should be developed allowing to support RTC data collection, management and analysis (including production of statistics and reports).

A description of the recommended process for RTC data collection and management is provided as follows. The recommended process has been presented to the Sierra Leone stakeholders during a workshop held in June 2018. Generally, the stakeholders agreed on the process. Details on the workshop outcomes are reported in the 1st Workshop Report. The key actors involved in the process (Figure 1) are:

- For collection of data:
 - Sierra Leone Police (Traffic Management and Road Safety Directorate), covering all the road categories on the national territory.
 - Sierra Leone Road Safety Authority, covering all road categories on a large part of the national territory.
 - Health Services, composed of hospitals, emergency centres and mortuary department, dealing with collection and storage of data on persons injured in RTC.
- For use of data:
 - Sierra Leone Road Safety Authority, as the entity in charge of managing road safety should host the national RTC database, manage and analyse.
 - Statistics Sierra Leone, as the entity in charge of issuing statistics at national level on several topics should include road traffic crashes.
 - Sierra Leone Roads Authority, as the entity in charge of managing road infrastructure development at national level will use the RTC data for road design/maintenance and as well as for the provision of safe road infrastructure.

Figure 1 Key actors involved in RTC data collection and management



2.1 Recommended definitions

It is highly recommended to adopt definitions standardised at national level for RTC, fatal and non-fatal injuries. For this, the definition of United Nations Economic Commission for Europe (UNECE) “Illustrated Glossary of Transport Statistics” (3) should be considered.

Table 1 provides the internationally agreed definitions for indicators related to road users (reported by WHO) and compares them with those currently used in Sierra Leone.

Currently, RTC fatalities in Sierra Leone are defined as persons killed immediately because of a road traffic injury. However, the definition also depends on the source of data. On the contrary, the international standards imply a follow-up (up to 30 days) of persons injured in road crashes, to check if they die after the RTC.

When dealing with the definitions of serious injuries and casualties, the situation is also different from the international standards. For serious injuries, there is no standard definition with Sierra Leone (i.e. different entities use different definitions). For casualties, there is no definition at all.

Table 2 provides the internationally agreed definitions for indicators related to road traffic crashes (reported by WHO) and compares them with those currently used in Sierra Leone. Currently, Sierra Leone does not use a standard definition for fatal crashes and for casualty crashes.

Table 1 Definitions for indicators related to road users

Category	Sierra Leone (current definitions)	WHO (internationally agreed definition)
Fatality	Died at scene	Person killed immediately or died within 30 days because of a road traffic injury.
Serious Injury	No standard definition	Injury that requires admission to hospital for at least 24 hours, or specialist attention such as fractures, concussions, severe shock or severe lacerations. The definition is nowadays gradually changing towards the use of MAIS 3+ practices.
Casualty	No definition	A person who has sustained physical injury because of an RTC (including death).

Table 2 Definitions for indicators related to road traffic crashes

Category	Sierra Leone (current definitions)	WHO (internationally agreed definition)
Fatal Crash	No standard definition	Any RTC resulting in a person killed immediately or dying within 30 days because of the crash
Casualty Crash	No standard definition	A person who has sustained physical damage because of an RTC (including death)

2.2 RTC data collection, management and analysis process

Recommended RTC data collection framework for Sierra Leone is depicted in Figure 2. It especially refers to the situation in which information collected by various entities (Police forces, Health services) can be merged into a single national RTC database and a follow-up of injured persons can be established.

Key actors that should be involved in the RTC data collection process in Sierra Leone are described as follows.

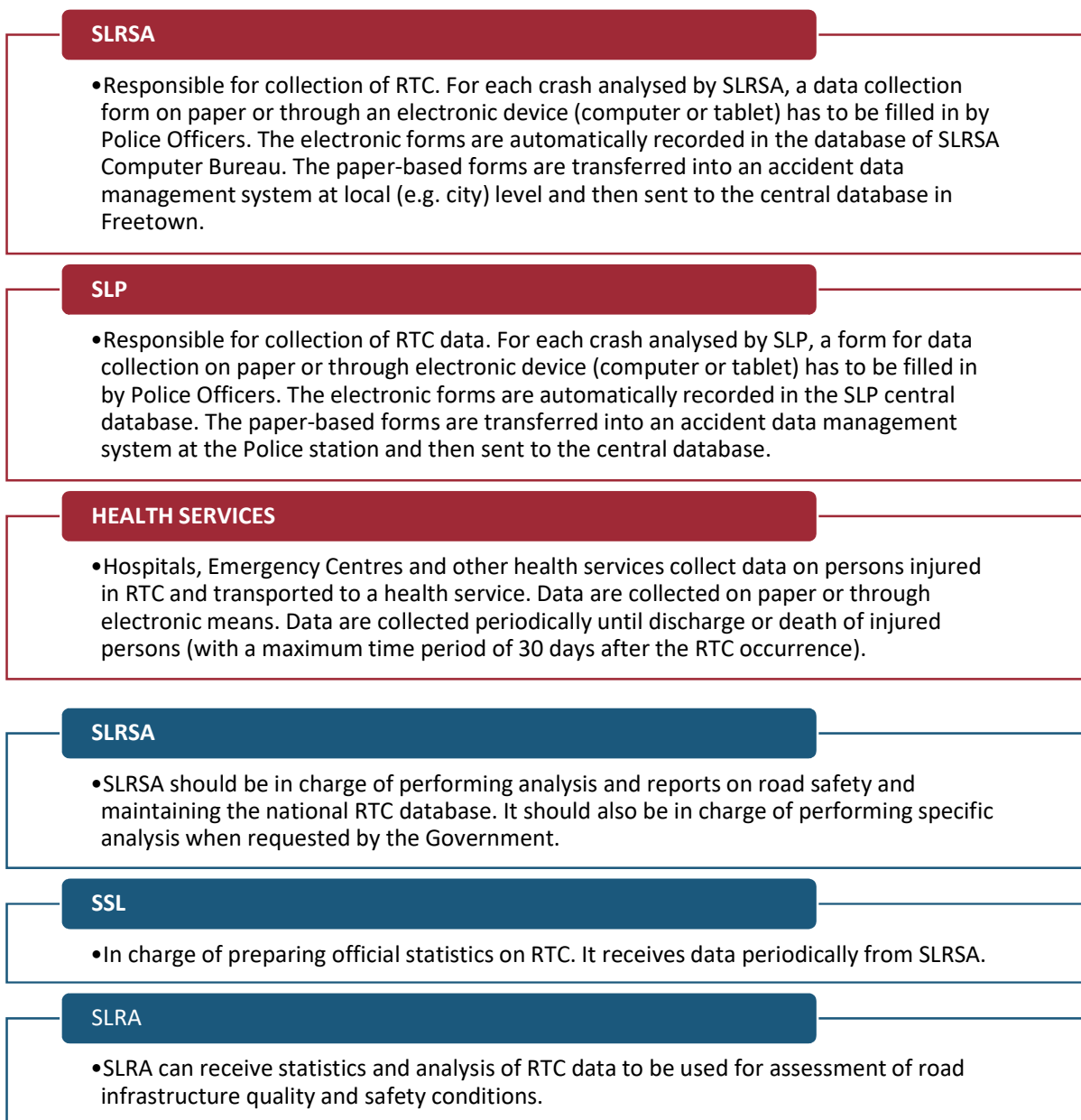


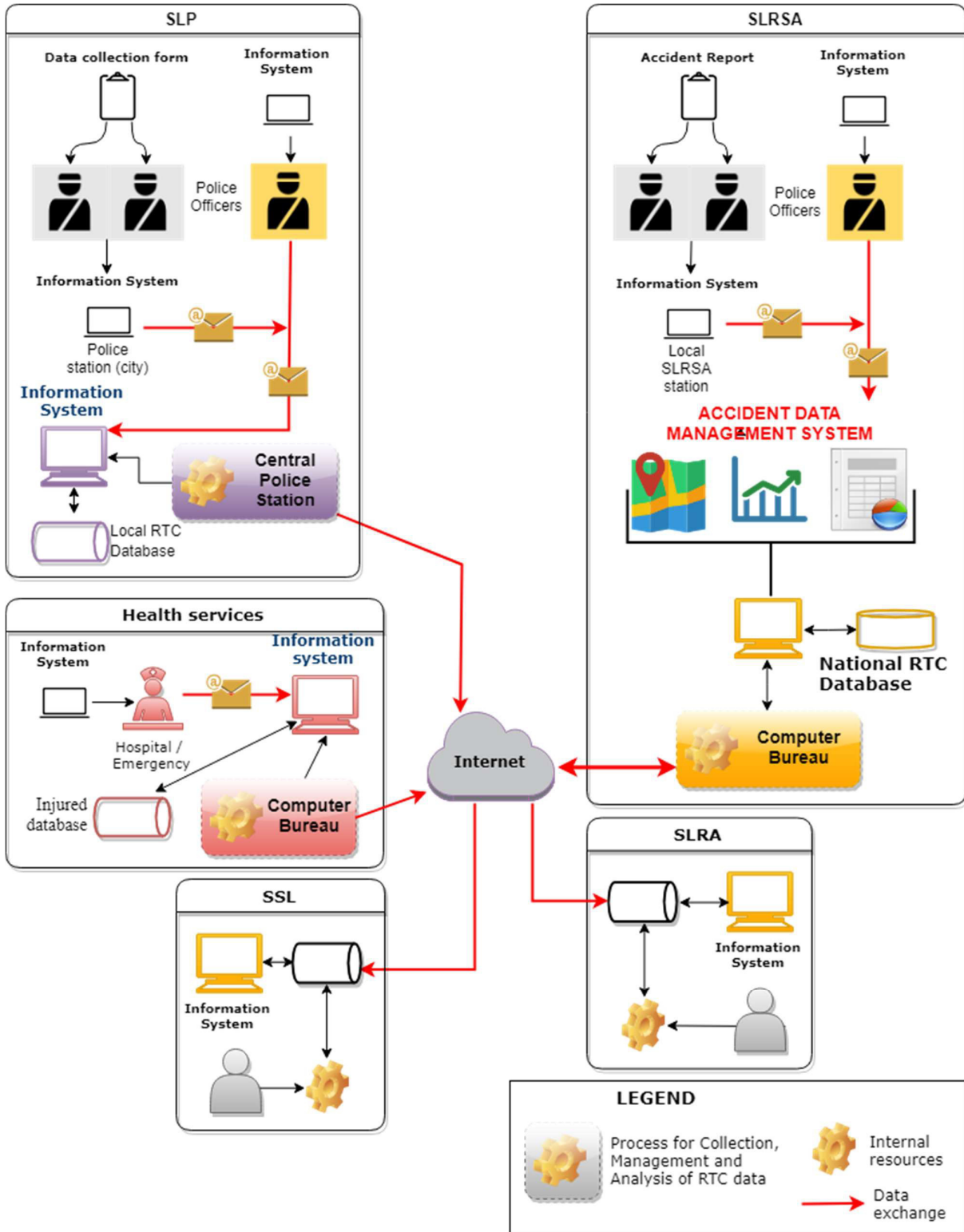
Figure 2 provides a schematic overview of how the entities involved in RTC data collection and management should interact. The various functions to allow this should be gradually activated, according to a roadmap implementation.

The whole process entails the centralisation of all the information at SLRSA. Data should be exchanged via web connections. Each entity involved in the RTC data collection and management process will be accredited for data access based on their role. For instance, Police should access uniquely the data that are useful for their normal activities (fines, prosecution of fault drivers, etc.). As general rule SLRSA should be the unique entity entitled to access the whole set of data collected in Sierra Leone. The terms and conditions to data access should be fixed by the Government of Sierra Leone based on the current legislative framework.

SLP, SLRSA and Health services should be mandated to provide periodically (e.g. each month) data on RTC and on persons injured. SLP and Health services should also receive consolidated data from SLRSA (e.g. after validation or update of injured persons' conditions).

SLRSA should be mandated to maintain the national road crash database, perform analysis, provide consolidated data and information to other stakeholders.

Figure 2 RTC data collection and management framework



2.3 Recommended roles and procedures

SLRSA

SLRSA officers are requested to analyse all the casualty RTC occurring on Sierra Leone roads. A set of standardised information must be collected for each RTC.

The proposed RTC data collection form is described in Section 3, including data element definitions.

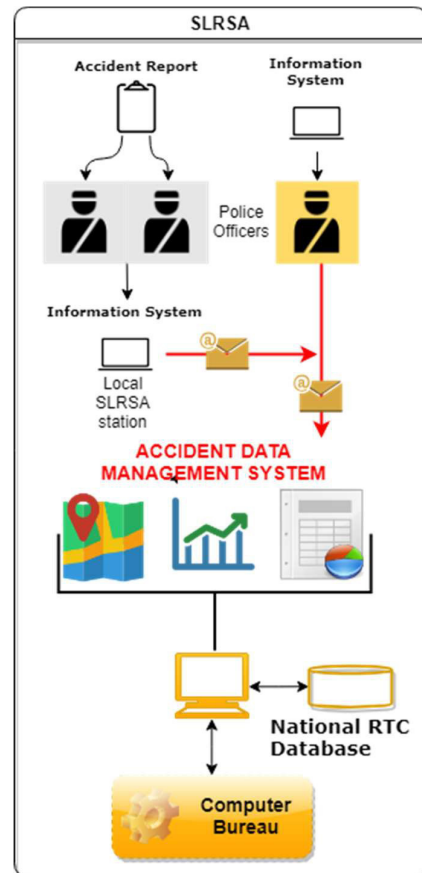
Within a maximum delay of 30 days after an RTC, the collected data must be recorded in the national database installed at SLRSA Computer Bureau. Two ways of collecting data could be possible, according to the conceptual scheme presented in Figure 3: on paper or through an information system (into which data is directly entered in the field).

Data collected on paper must be recorded into an information system installed at local SLRSA stations, within a maximum of 10 days. Data are then sent electronically to the Computer Bureau.

Data collected through electronic means are automatically forwarded to the Computer Bureau.

Data quality control is performed by Computer Bureau officers and requests of clarifications / updates are made to local stations. RTC information is included in the National Database only if validated by the Computer Bureau.

Figure 3 RTC data collection and management at SLRSA



Roles and activities of SLRSA Officers in the field (local stations)

Collection of RTC data

- A team of Police Officers (typically two officers) is in charge of collecting information by using paper forms or an information system

Transfer of data

- a. If data are collected through an information system, they are immediately sent to SLRSA Computer Bureau. The team can eventually complete the data when coming back to office.
- b. If data are collected on paper, they are successively recorded into the information system at the local station. The data recorded are sent to SLRSA Computer Bureau.

Control of RTC dossiers collected in the previous months

- A Supervisor should regularly control the forms. If a form is not finalised, the Supervisor should verify the reasons and take the necessary actions to complete it.

Finalisation and final update of the dossier

- Every month (e.g. on the 15th of each month), the Supervisor makes a communication to SLRSA Computer Bureau about the RTC occurred in the preceding month that can be considered finalised or not. Only the “finalised road crashes” will be included in the National Road Crash Database.

Provision of information on RTC

- Each data collection team must provide information on road crashes they collected to SLRSA Computer Bureau and to their Supervisor when requested.

Roles and activities of SLRSA Computer Bureau (national level)

SLRSA Computer Bureau activities should be related to three main aspects: i) Creation of basic knowledge elements and of their organisation; ii) Management of an information system; iii) Use of an integrated information system to perform analysis.

Daily activities

Update and maintenance of the information system

- Update of the software installed, backup of databases, server maintenance, interventions in case of problems, etc. This task should also include the update of manuals and documentation, the optimisation of the information system performances, the management of permits for new users of the information system (with different levels of authorisation).

Maintenance of the centralised (national) database

- Management and daily control of the correct functioning of the integrated, centralised data.

Recording of data

- Verification of data coming from different sources (i.e. verification of eventual errors or unclear situations in data) and merging of data (especially when they come from Police Forces and Health Services). This task includes the update of data with final consequences of persons injured in RTC.

Maintenance of the local web network

- Implementation of procedures to ensure that the hardware correctly supports databases, documents, resources and data files.

Monthly activities

Report on RTC data and on persons injured in road crashes

- A monthly report on the performance of the data collection process of Police forces and Health Services should be prepared for data quality control purposes.

Statistics on road crashes

- Based on consolidated data, statistical analysis should be performed every month with the following minimum details: means of transport involved, age groups, type of roads, type of accidents, trends and time changes of road crashes.

Annual activities

Preparation of official statistics on road crashes

- Standard statistics on RTC, based on consolidated data, should be established every year, with the following minimum details: means of transport, age groups, type of roads, type of accident, trends and time variation of road crashes.

On demand activities

Preparation of reports on road safety

- Specific report can be prepared putting emphasis on a road user (e.g. pedestrians, PTWs, bus drivers, ...) or on a geographical area (e.g. a city, a department, a Province) or on specific collision situations (e.g. use of seatbelts, use of helmets, speeding, ...).

Spatial analysis of data

- Preparation of maps of black spots, as well as the classification of road sections and of intersections based on road crash frequency.

Monitoring of actions

- Control of specific road safety interventions on the road network. The objective is to compare, using dedicated assessment methods, the changes in road crashes because of different interventions.

SLP

SLP officers are requested to analyse all the casualty RTC occurring on Sierra Leone roads. A set of standardised information must be collected for each RTC.

The proposed RTC data collection form is described in Section 3, including data element definitions.

Within a maximum delay of 30 days after an RTC, the collected data must be recorded in the national database installed at SLRSA Computer Bureau. Two ways of collecting data could be possible, according to the scheme presented in Figure 4: on paper or through an information system (directly on the field).

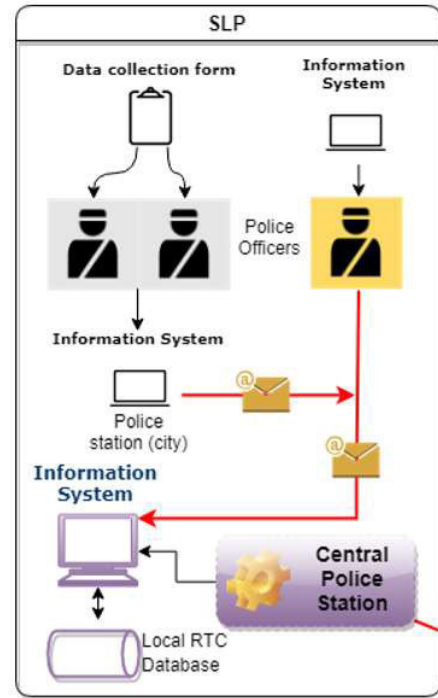
Data collected on paper must be recorded into an information system at Police stations (local level), within a maximum of 10 days. Data are then sent electronically to the Central Police Station, where the SLP database is hosted.

Data collected through electronic means are automatically forwarded to the Central Police Station.

Data are sent periodically (every 30 days) to the SLRSA Computer Bureau (via web through information system).

Data quality control is performed by SLRSA Computer Bureau officers and requests of clarifications / updates are made to the Central Police Station. An RTC is included in the National Database only if validated by the SLRSA Computer Bureau.

Figure 4 RTC data collection and management at SLP



Roles and activities of SLP Officers in the field (local stations)

Collection of RTC data

- A team of Police Officers (typically two officers) is in charge of collecting information by using paper forms or an information system

Transfer of data

- a. If data are collected through an information system, they are immediately sent to the Central Police Station. The team can eventually complete the data when coming back to office.
- b. If data are collected on paper, they are successively recorded into the information system at the local station. Data recorded are then sent to the Central Police Station.

Control of RTC dossiers collected in the previous months

- A Supervisor should regularly control the forms. If a form is not finalised, the Supervisor should verify the reasons and take the necessary actions to complete it.

Finalisation and final update of the dossier

- Every month (e.g. on the 15th of each month), the Supervisor makes a communication to the Central Police Station about the RTC occurred in the preceding month that can be considered finalised or not. Only the “finalised road crashes” will be sent to SLRSA Computer Bureau.

Provision of information on RTC

- Each data collection team must provide information on road crashes they collected to the Central Police Station and to their Supervisor when requested.

Roles and activities of Central Police Station (national level)

Repository of data from local stations

- The information system installed at the Central Police Station automatically receives data from local police stations.

Data quality control

- A set of quality analysis should be performed for all the data received. The Central Police Station Officers are also in charge of verifying eventual duplication of data, missing information, contradictory information or important errors. The information system can support these activities through automatic verifications.

Transfer of data

- Data are sent periodically (every 30 days) to the SLRSA Computer Bureau via web connection.

Analysis of data

- Central Police Station can perform its own analysis of RTC by using the information system, with the aim of developing periodic statistics and of identifying the main road safety issues that could be enforced.

Health services

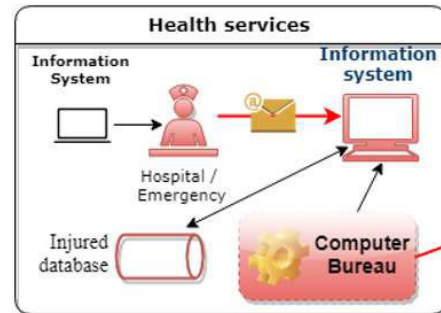
Health services (emergency centres, hospitals, mortuary department) should collect information on persons involved in RTC from their admission to the entity until their discharge from hospital, or death (if this happens within 30 days after RTC).

Data on injured persons (Figure 5) should be collected through an information system. Notes on patient situation can be taken on a daily basis on paper but they should be recorded in an information system without delay.

The proposed RTC data collection form for health services is described in Chapter 3, including data element definitions.

Data collected and periodically updated based on the physical conditions of the patients will be transferred to the national road traffic crash database (in SLRSA). This should be done after the patient discharge or death (or after the 30th day after RTC). A data quality verification should be performed at the SLRSA Computer Bureau by assessing if data are complete and coherent with data received from SLP and SLRSA about RTC collected on the field.

Figure 5 RTC data collection and management at health services



Roles and activities of Health Services

Collection of data on persons injured in road crashes

- Nurses (or Doctors) are in charge of collecting information by using paper forms or directly via an information system (to be installed in each hospital). Even when using paper forms, collected data should be recorded in the information system at hospital.

Transfer of data to the National RTC Database

- The collected data are sent to the National Road Crash Database (SLRSA Computer Bureau) periodically (e.g. each month).

Control of road crash dossiers

- A Supervisor should regularly control the road crash forms classified as completed. If a form is not finalised, the Supervisor should verify the reasons and take the necessary actions to complete it.

Provision of information on injured persons

- Data collection officers have to provide information on injured persons to their Supervisor when requested.

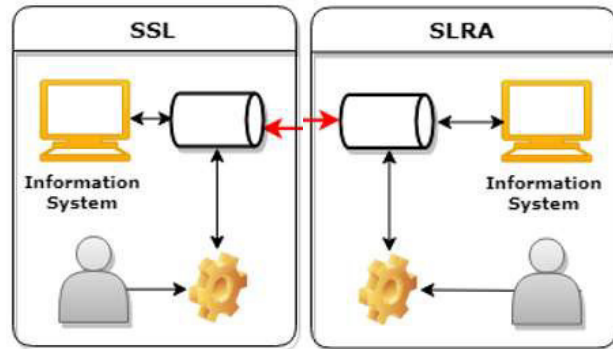
SSL and SLRA

SSL and SLRA are not directly involved in RTC data collection and management. However, they should be able to use the information on RTC to perform statistics (SSL) and to define strategies for road infrastructure treatment (SLRA).

SSL and SLRA should not participate to the quality control and validation of collected data. They should receive RTC data already validated by SLRSA Computer Bureau and can access the national database to perform their own analysis (Figure 6).

To perform their tasks, SSL and SLRA should be equipped with an information system allowing for RTC data analysis (i.e. same tool available at SLRSA Computer Bureau).

Figure 6 RTC data collection and management at SSL and SLRA



3 Framework for road traffic crash data collection

The current RTC data collection process in Sierra Leone does not allow for a complete collection of the typical information needed for road safety analysis. Currently only partial statistical analysis can be undertaken concerning the number of fatalities and of injuries, the type of road users and vehicles involved. Very little is known about the precise location of RTCs (needed to identify the blackspots across the country). There is not much information about the contributing factors to RTC either (needed to take evidence-based decisions on the interventions to be carried out to improve road safety).

A comprehensive and reliable RTC data collection process should allow for:

- The collection of a sufficient set of RTC data elements, needed for analysis.
- The use of a unique and standardised format for data collection by all entities involved in data collection.
- The establishment of reliable and agreed links between the stakeholders involved in road safety issues (SLP, SLRSA, health services).

A description of recommended framework for data collection and management is provided in Section 3.1. Two forms are recommended for RTC data collection: one for the Police Force and one for Health Services.

3.1 RTC data collection form for Police Forces

The Police form has been developed based on the minimum set of RTC data elements recommended by WHO. The proposed form is reported in Annex 1, together with detailed information on the data elements to be collected.

Minimum RTC data elements has been debated by different organisation around the world. A clear indication is reported in the publication from WHO “Data systems. A road safety manual for decision-makers and practitioners” (4), which focus mainly on requirements for low- and middle-income countries.

Minimum data elements should be selected considering the following criteria:

- Data elements and values must be useful for road crash analysis. These elements should be routinely collected when a road traffic crash occurs. Data that will not be used should not be collected.
- Data elements and values should be comprehensive and concise. Each variable must include a description and definitions of the possible data values.
- Data which are very difficult to collect should not be included, regardless of their value for road crash analysis.

Minimum set of RTC data elements recommended at international level has been discussed with SLRSA and SLP, as main entities in charge of data collection at the scene. Few changes were proposed to better comply with the situation in Sierra Leone.

Table 3 provides the data elements proposed for Sierra Leone. Data elements are divided into four categories:

- Crash related elements, describing the overall characteristics of the crash.
- Road related elements, describing the characteristics of the road and associated infrastructure at the place and time of the crash.
- Vehicle related elements, describing the characteristics and events of the vehicle(s) involved in the crash.
- Person related elements, describing the characteristics, actions, and consequences relating to the people involved in the crash. These elements are to be completed for every person injured in the crash, and for the drivers of all vehicles (motorised and non-motorised) involved in the crash.

Table 3 Data elements recommended for Sierra Leone Police forces

Crash related	Road related	Vehicle related	Person related
C1 - Identifier	R1 - Type of roadway	V1 - Vehicle number	P1 - Person ID
C2 - Date	R2 - Road functional class	V2 - Vehicle plate number	P2 - Occupant's vehicle number
C3 - Time	R3 - Speed limit	V3 - Vehicle special function	P3 - Pedestrian's linked vehicle number
C4 - City / place	R4 - Road obstacles	V4 - Vehicle manoeuvre	P4 - Date of birth (excluding drivers)
C5 - Location	R5 - Surface conditions		P5 - Sex (excluding drivers)
C6 - Crash Type	R6 - Junction		P6 - Type of road user
C7 - Impact type	R7 - Traffic control		P7 - Seating position
C8 - Weather conditions			P8 - Injury severity
C9 - Light conditions			P9 - Safety equipment
C10 - Crash cause			P10 - Pedestrian manoeuvre
			P11 - Alcohol use
			P12 - Drug use
			P13 - Blood group

Other data elements will be collected thanks to merging of RTC database with SLRSA existing databases, namely:

- Vehicle type (car, bus, truck, etc.).
- Vehicle make.
- Vehicle model.
- Vehicle model year.
- Engine size.
- Drivers' date of birth.
- Drivers' sex.
- Driving licence issue date.

3.2 RTC data collection form for Health services

The Health form has been developed to allow for matching of information with those collected by Police forces, and thus to perform a follow-up of the persons injured in road crashes. This is especially needed to implement the recommended definitions of:

- Persons dead: a person killed immediately or dies within 30 days because of a road traffic injury.
- Persons seriously injured in road crashes: injury that requires admission to hospital for at least 24 hours, or specialist attention such as fractures, concussion, severe shock or severe lacerations.

The proposed road crash data collection form for health services is presented in Annex 2, together with detailed information on the data elements to be collected.

Table 4 provides the data elements recommended for use by hospitals and emergency centres, when dealing with persons injured in RTC.

Table 4 Preliminary data elements recommended for Sierra Leone health services

CRASH RELATED	PERSON RELATED
C1 - Identifier	P1 - Person ID
C2 - Date of RTC	P2 - Name
C3 - Time of RTC	P3 - Sex
C4 - Date of admission	P4 - Date of birth
C5 - Time of admission	P5 - Type of injury
C6 - RTC location	P6 - Final diagnosis (at discharge)

4 Outline of proposed accident data management system

The accident data management system will be developed by adapting and integrating two already existing information systems: **SFINGE** and **Safety Manager**. These systems have been designed with the aim of supporting the activities of the entities involved in road traffic crash data collection, management and analysis. They have been developed in Italy and are currently used by thousands of Police Officers for their activities. They have also been recently adapted to Cameroon local conditions.

SFINGE is a web-based modular software supporting activities of **police forces, health services**, road safety technicians and policy-makers. It allows for:

- Collection of RTC data in the field (e.g. with a notebook or a smartphone) or simply for storage of data collected on paper – Figure 7.
- Analysis of RTC data to perform statistics and create reports according several filters (e.g. date, road user, road, area, etc.) – Figure 8.
- Geo-coding of data on map (Google Maps and/or others) to locate the RTC on the road network – Figure 9.

Figure 7 Screenshot of data collection through SFINGE

Accident du 24/11/2015 12:00

Lieu: VIA DEL SASSONE VIA DEI LAGHI
 Résultat: Blessé
 Véhicules impliqués: 2
 Piétons impliqués: 3
 Passagers impliqués: 2

Revue de la issues et de les incongruences

Priorité	Question	Actions
1	Le nombre de véhicules indiqué ne correspond pas au nombre de véhicules définis	Correct
1	Le nombre de passagers indiqué ne correspond pas au nombre de passagers définies	Correct
1	Le nombre de piétons indiqué ne correspond pas au nombre de piétons définies	Correct
1	Les conséquences de l'incident ne sont pas compatibles avec les gravité des blessures des personnes impliquées	Correct

Figure 8 Screenshot of data analysis through SFINGE

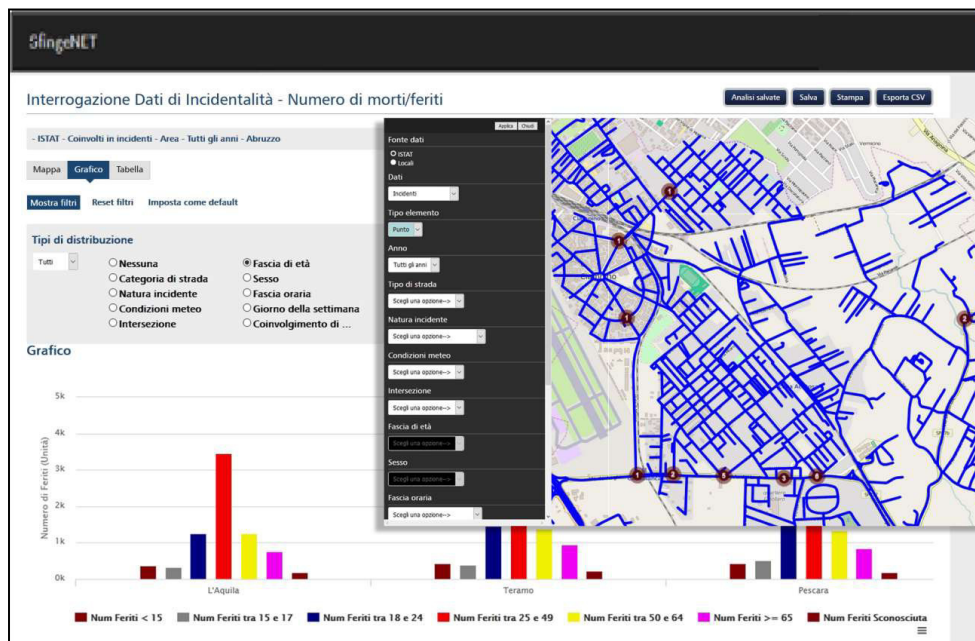
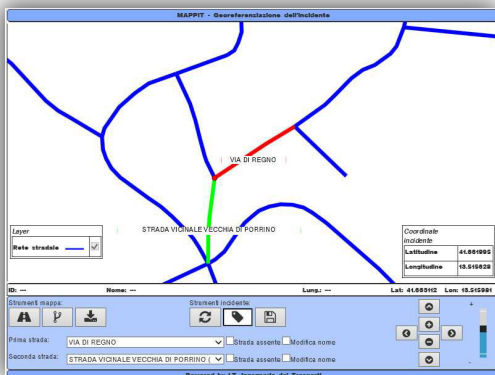


Figure 9 Screenshots of data location through SFINGE



Dati locali

Comune: CARRAPINO (RM)

Località/Frazione:

Luogo dell'incidente: Rotatoria

Caratteristica intersezione: Intersezione a T

Regolazione dell'intersezione: Segnale precedenza

Localizza su cartografia

Safety Manager is a web-based information system allowing for storage, management and detailed analysis of RTC, as well as planning of road safety mitigation strategies (Figure 10). It is normally used by entities in charge of managing road safety databases and of performing analysis (e.g. **SLRSA**). It receives the data from SFINGE (through a simple communication protocol), as well as from any other data sources (e.g. SLRSA databases on vehicle registration and driver licences). It includes the following features:

- Storage of data, allowing to export and import data from different data sources (police forces, health services, external databases, etc.).
- Management of databases, for updating and maintaining road traffic crash data and data from other sources (e.g. road infrastructures, traffic flows).
- Road safety analysis, allowing for elaboration of graphs, maps, tables, statistical analysis of road traffic crashes, setting of road safety targets, development of strategies, etc. – Figure 11.
- Selection of mitigation strategies, including the identification of critical road elements, classification of road traffic crashes, selection of crash patterns and crash causes, identification of mitigation strategies and cost-benefit analysis.

Figure 10 Screenshots of Safety Manager

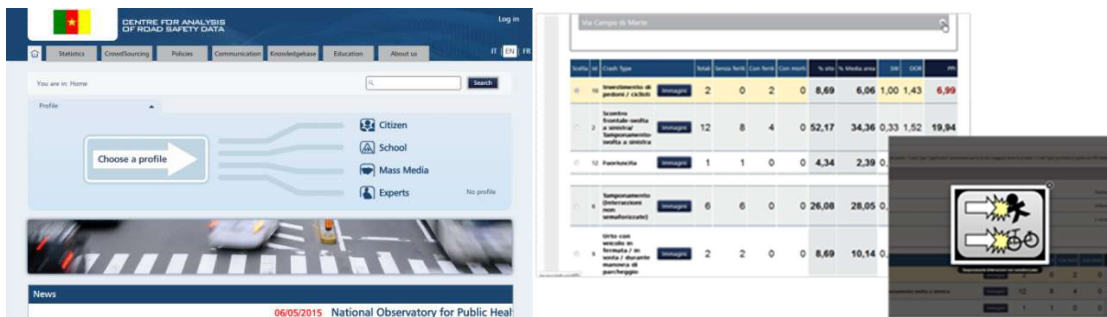
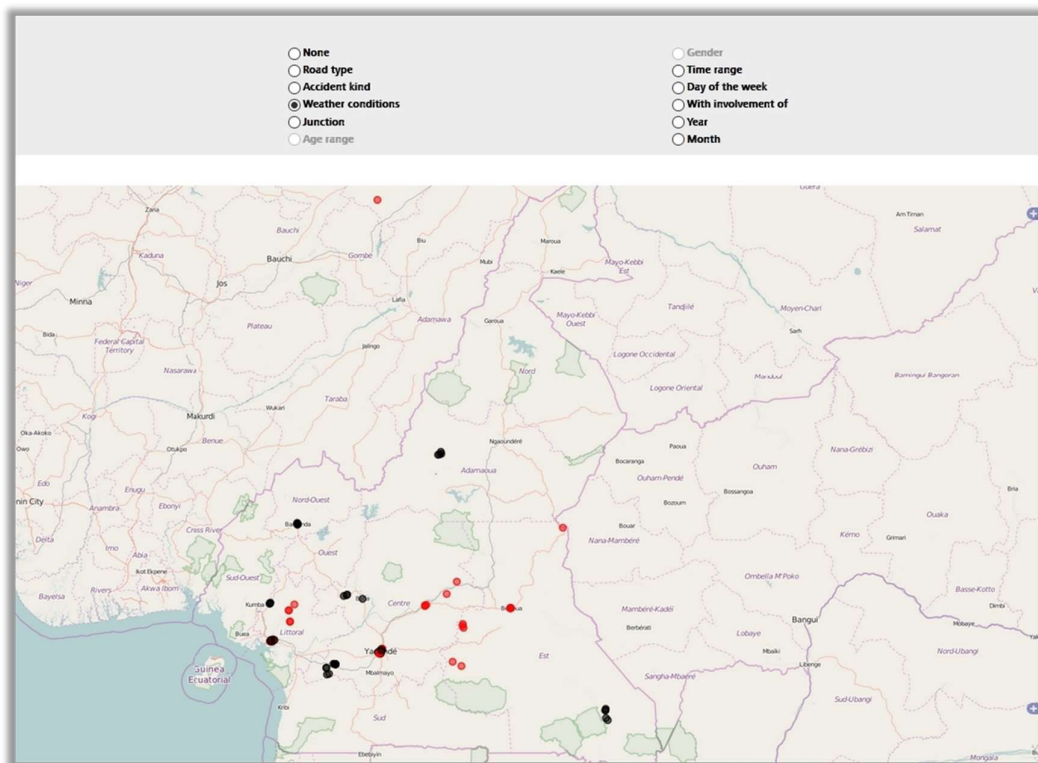


Figure 11 Screenshots of analysis on map in Safety Manager



Each entity involved in the RTC data collection, management and analysis process has different needs and should thus be able to perform different activities. Table 5 provides an overview of the software that could be installed at the entities premises and of the features (software modules) to be used.

Accident data management system features are outlined in Figure 12 and Figure 13. Both software provides possibilities for being used on normal personal computer and on mobile devices (tablet, smartphone).

Table 5 Accident data management system by entity

Entity	Software	Features
SLP	SFINGE	Data collection
		Data storage (local)
		Data transmission
		Data analysis
Health services	SFINGE	Data collection
		Data storage (local)
		Data transmission
		Data analysis
SLRSA	SFINGE	Data collection
	SAFETY MANAGER	Data storage (national)
		Data quality check
		Data merging
		Data analysis
SLRA	SAFETY MANAGER	Data analysis
SSL	SAFETY MANAGER	Data analysis

Figure 12 Outline of SFINGE modules

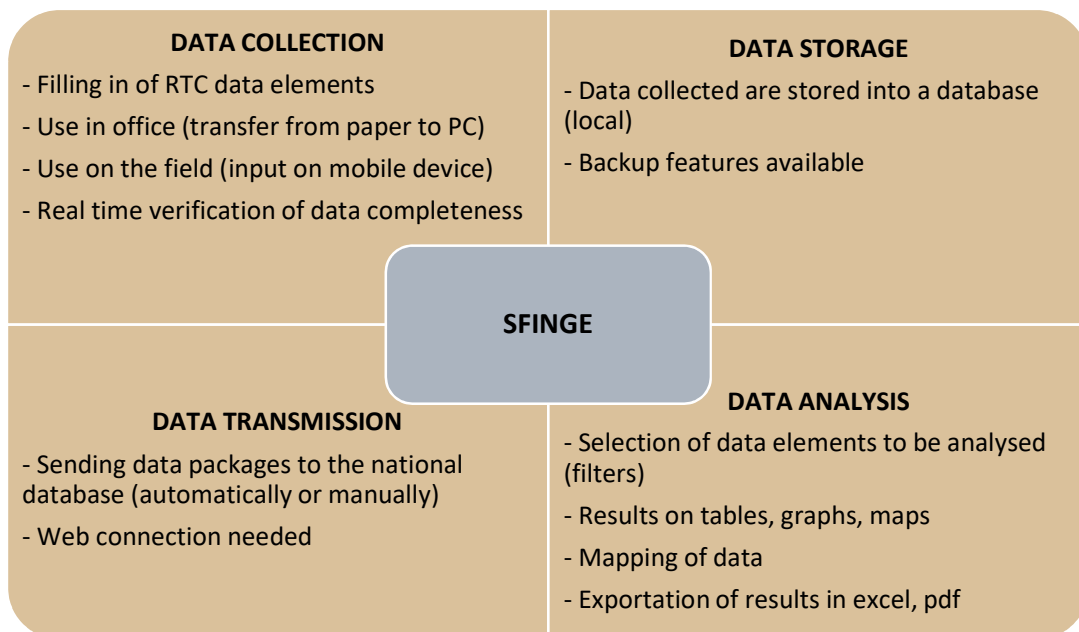
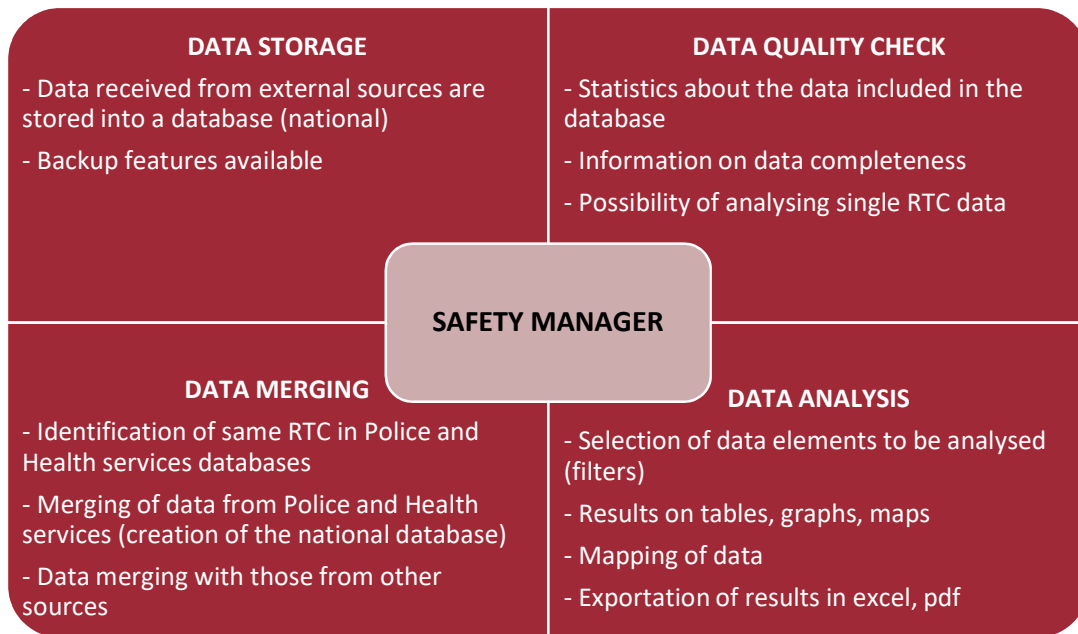


Figure 13 Outline of SAFETY MANAGER modules



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- (4) WHO, 2010. Data systems: a road safety manual for decision-makers and practitioners. WHO Library Cataloguing-in-Publication Data, World Health Organisation. Available at: http://apps.who.int/iris/bitstream/10665/44256/1/9789241598965_eng.pdf

6 Annex 1 – Description of Police Accident data collection form and data elements

ROAD TRAFFIC CRASH DATA COLLECTION FORM - POLICE FORCES

CRASH RELATED INFORMATION																		
Information about Officer compiling the form		C1 - Crash ID			C6 - Crash Type			1	2	3	4	5	6	7	8			
Name		C2 - Date			C7 - Impact type			1	2	3	4	5	6	7	8	9	10	11
Designation		C3 - Time			C8 - Weather cond.			1	2	3	4	5	6	7				
Police station of		C4 - City / place			C9 - Light conditions			1	2	3	4	5	6					
Service no		C5a - Location			C10 - Crash cause													
Signature		C5b - GPS longitude																
		C5b - GPS latitude																

ROAD RELATED INFORMATION																					
R1 - Type of roadway		1	2	3	4	5	6	7	8	R4 - Road obstacles		YES		R5 - Surface conditions		1	2	3	4	5	6
R2 - Road functional class		1	2	3	4			NO		R6 - Junction		1	2	3	4	5	6	7	8		
R3 - Speed limit				UNK				R7 - Traffic control		1	2	3	4	5	6	7	8				

VEHICLE RELATED INFORMATION [VEH 1]																															
V1 - Vehicle number			V3 - Vehicle special function			1	2	3	4	5	6	7	V2 - Vehicle plate no			V4 - Vehicle manoeuvre			1	2	3	4	5	6	7	8	9	10	11	12	13

VEHICLE RELATED INFORMATION [VEH 2]																															
V1 - Vehicle number			V3 - Vehicle special function			1	2	3	4	5	6	7	V2 - Vehicle plate no			V4 - Vehicle manoeuvre			1	2	3	4	5	6	7	8	9	10	11	12	13

VEHICLE RELATED INFORMATION [VEH 3]																															
V1 - Vehicle number			V3 - Vehicle special function			1	2	3	4	5	6	7	V2 - Vehicle plate no			V4 - Vehicle manoeuvre			1	2	3	4	5	6	7	8	9	10	11	12	13

PERSON RELATED INFORMATION [PER 1]																				
P1 - Person ID		P5 - Sex		1	2	3	P9 - Safety equipment		1	2	3	4	P13 - Blood group							
P2 - Occupant veh no		P6 - Type of road user		1	2	3	4	5	P10 - Pedestrian manoeuvre		1	2	3	4	5	6	P14 - Person name			
P3 - Pedestrian veh no		P7 - Seating position		1	2	3	4	5	P11 - Alcohol use		1	2	3	4						
P4 - Birth date		P8 - Injury severity		1	2	3	4	5	P12 - Drug use		1	2	3	4						

PERSON RELATED INFORMATION [PER 2]																				
P1 - Person ID		P5 - Sex		1	2	3	P9 - Safety equipment		1	2	3	4	P13 - Blood group							
P2 - Occupant veh no		P6 - Type of road user		1	2	3	4	5	P10 - Pedestrian manoeuvre		1	2	3	4	5	6	P14 - Person name			
P3 - Pedestrian veh no		P7 - Seating position		1	2	3	4	5	P11 - Alcohol use		1	2	3	4						
P4 - Birth date		P8 - Injury severity		1	2	3	4	5	P12 - Drug use		1	2	3	4						

PERSON RELATED INFORMATION [PER 3]																				
P1 - Person ID		P5 - Sex		1	2	3	P9 - Safety equipment		1	2	3	4	P13 - Blood group							
P2 - Occupant veh no		P6 - Type of road user		1	2	3	4	5	P10 - Pedestrian manoeuvre		1	2	3	4	5	6	P14 - Person name			
P3 - Pedestrian veh no		P7 - Seating position		1	2	3	4	5	P11 - Alcohol use		1	2	3	4						
P4 - Birth date		P8 - Injury severity		1	2	3	4	5	P12 - Drug use		1	2	3	4						

ROAD TRAFFIC CRASH DATA COLLECTION FORM - POLICE FORCES

LEGEND

C6 - Crash Type	1	Crash with pedestrian	C7 - Impact type	1	No impact	C8 - Weather conditions	1	Clear		
	2	Crash with parked vehicle		2	Rear end		2	Rain		
	3	Crash with fixed obstacle		3	Head on		3	Fog, mist, smoke		
	4	Non-fixed obstacle		4	Angle – same dir		4	Sleet, hail		
	5	Animal		5	Angle - opposite dir		5	Severe winds		
	6	Single vehicle crash/non-collision		6	Angle - right		6	Other		
	7	Crash with two or more vehicles		7	Angle - no dir specified		7	Unknown		
	8	Other crashes		8	Side by side - same dir	C9 - Light conditions	1	Daylight		
R1 - Type of roadway	1	Motorway / freeway		R2 - Road functional class	9		Side by side - opposite dir	2	Twilight	
	2	Express road			10		Rear to side	3	Darkness	
	3	Urban road, two way			11		Rear to rear	4	Dark - street lights unlit	
	4	Urban road, one way	1		Principal arterial	5	Dark - street lights lit			
	5	Road outside a built up area	2	Secondary arterial	6	Unknown				
	6	Restricted road	3	Collector	R6 - Junction	1	At-grade, crossroad			
	7	Other	4	Local		2	At-grade, roundabout			
	8	Unknown	V3 - Vehicle special function	1		No special function	3	At-grade, T or staggered junction		
R5 - Surface conditions	1	Dry		2		Taxi	4	At-grade, multiple junction		
	2	Slippery		3		Vehicle used as bus	5	At-grade, other		
	3	Wet, damp		4		Police / military	6	Not at grade		
	4	Flood		5		Emergency vehicle	7	Not at junction		
	5	Other		6		Other	8	Unknown		
	6	Unknown		P5 - Sex	1	Male	R7 - Traffic control	1	Authorized person	
V4 - Vehicle manoeuvre	1	Reversing	2		Female	2		Stop sign		
	2	Parked	3		Unknown	3		Give-way sign or markings		
	3	Entering or leaving a parking position	P6 - Type of road user	1	Driver	4		Other traffic signs		
	4	Slowing or stopping		2	Passenger	5		Automatic traffic signal (working)		
	5	Moving off		3	Pedestrian	6		Automatic traffic signal (out of order)		
	6	Waiting to turn		4	Other	7		Uncontrolled		
	7	Turning		5	Unknown	8		Other		
	8	Changing lane	P7 - Seating position	1	Front	P8 - Injury severity	1	Fatal injury		
	9	Avoidance manoeuvre		2	Rear		2	Serious / severe injury		
	10	Overtaking vehicle		3	Not applicable		3	Slight / minor injury		
	11	Straight forward / normal driving		4	Other		4	No injury		
	12	Other	P10 - Pedestrian manoeuvre	1	Crossing		5	Unknown		
	13	Unknown		2	Walking on carriageway	P11 - Alcohol use	1	Yes		
P9 - Safety equipment	1	Seatbelt / Helmet worn	3	Standing on carriageway	2		No	P11 - Drug use	1	Yes
	2	Seatbelt / Helmet not worn	4	Not on carriageway	3		Not applicable		2	No
	3	Not applicable	5	Other	4		Unknown		3	Not applicable
	4	Unknown	6	Unknown	4	Unknown	4		Unknown	

Table 6 Description of crash related data elements

#	Element name	Definition	Data type	Comment
C1	Crash identifier	Unique identifier (e.g. a 10-digit number) within a given year that identifies a particular crash	Character string	
C2	Crash date	Date (day, month, year) on which the crash occurred	Numeric (DDMMYYYY)	If a part of crash date is unknown, the respective places are filled in with 99 (for day and month). Absence of year result in an edit check.
C3	Crash time	Time at which the crash occurred	Numeric (HH:MM)	Midnight is defined as 00:00 and represents the beginning of a new day
C4	City / Place	The municipality or the place in which the crash occurred	Character string	
C5	Location	Exact location at which the crash occurred. Route name and GPS coordinates.	Character string Latitude / Longitude coordinates	If GPS is not available, street name, reference point, distance from reference point and direction from reference point.
C6	Crash type	First injury or damage-producing event of the crash.	Numeric	See Table 7 for data values
C7	Impact type	Indicates the manner in which the road motor vehicles involved initially collided with each other. The variable refers to the first impact of the crash if that impact was between two road motor vehicles.	Numeric	See Table 8 for data values
C8	Weather conditions	Prevailing atmospheric conditions at the crash location, at the time of the crash.	Numeric	See Table 9 for data values
C9	Light conditions	The level of natural and artificial light at the crash location, at the time of the crash.	Numeric	See Table 10 for data values
C10	Crash cause	Prevailing cause of the crash.	Character string	Short description of the main crash causes (e.g. speeding, vehicle failure, driver failure, etc.)

Table 7 Data values for “Crash type”

#	Definition
1	Crash with pedestrian: Crash between a vehicle and at least one pedestrian
2	Crash with parked vehicle: Crash between a moving vehicle and a parked vehicle. A vehicle with a driver that is just stopped is not considered as parked.
3	Crash with fixed obstacle: Crash with a stationary object (i.e. tree, post, barrier, fence, etc).
4	Non-fixed obstacle: Crash with a non-fixed object or lost load.

#	Definition
5	Animal: Crash between a moving vehicle and an animal.
6	Single vehicle crash/non-collision: Crash in which only one vehicle is involved, and no object was hit. Includes vehicle leaving the road, vehicle rollover, cyclists falling etc.
7	Crash with two or more vehicles: Crashes where two or more moving vehicles are involved.
8	Other crashes: Other crash types not described above.

Table 8 Data values for “Impact type”

#	Definition
1	No impact between motor vehicles: There was no impact between road motor vehicles. Refers to single vehicle crashes, collisions with pedestrians, animals or objects.
2	Rear end impact: The front side of the first vehicle collided with the rear side of the second vehicle.
3	Head on impact: The front sides of both vehicles collided with each other.
4	Angle impact - same direction: Angle impact where the front of the first vehicle collides with the side of the second vehicle.
5	Angle impact - opposite direction: Angle impact where the front of the first vehicle collides with the side of the second vehicle.
6	Angle impact - right angle: Angle impact where the front of the first vehicle collides with the side of the second vehicle.
7	Angle impact - direction not specified: Angle impact where the front of the first vehicle collides with the side of the second vehicle.
8	Side by side impact - same direction: The vehicles collided side by side while travelling in the same direction.
9	Side by side impact - opposite direction: The vehicles collided side by side while travelling in opposite directions.
10	Rear to side impact: The rear end of the first vehicle collided with the side of the second vehicle.
11	Rear to rear impact: The rear ends of both vehicles collided with each other.

Table 9 Data values for “Weather conditions”

#	Definition
1	Clear
2	Rain
3	Fog, mist or smoke
4	Sleet, hail
5	Severe winds
6	Other weather condition
7	Unknown weather condition

Table 10 Data values for “Light conditions”

#	Definition
1	Daylight: Natural lighting during daytime
2	Twilight: Natural lighting during dusk or dawn
3	Darkness: No natural lighting, no artificial lighting

#	Definition
4	Dark with street lights unlit: Street lights exist at the crash location but are unlit
5	Dark with street lights lit: Street lights exist at the crash location and are lit
6	Unknown: Light conditions at time of crash unknown

Table 11 Description of road related data elements

#	Element name	Definition	Data type	Comment
R1	Type of roadway	Describes the type of road, whether the road has two directions of travel, and whether the carriageway is physically divided. For crashes occurring at junctions, where the crash cannot be clearly allocated in one road, the road where the vehicle with priority was moving is indicated	Numeric	See Table 12 for data values
R2	Road functional class	Describes the character of service or function of the road where the first harmful event took place. For crashes occurring at junctions, where the crash cannot be clearly allocated in one road, the road where the vehicle with priority was moving is indicated.	Numeric	See Table 13 for data values
R3	Speed limit	Legal speed limit at the location of the crash	Numeric	nnn: The legal speed limit as provided by road signs or by the country's traffic laws for each road category, in kilometres per hour (km/h). 999: The speed limit at the crash location is unknown
R4	Road obstacles	The presence of any person or object which obstructed the movement of the vehicles on the road. Includes any animal standing or moving (either hit or not), and any object not meant to be on the road. Does not include vehicles (parked or moving vehicles, pedestrians) or obstacles on the side of the carriageway (e.g. poles, trees).	Numeric	1) Yes: Road obstacle(s) present at the crash site. 2) No: No road obstacle(s) present at the crash site. 3) Unknown: Unknown presence of any road obstacle(s) at the crash site.
R5	Surface conditions	Condition of the road surface at the time and place of the crash	Numeric	See Table 14 for data values
R6	Junction	Indicates whether the crash occurred at a junction (two or more roads intersecting) and defines the type of the junction.	Numeric	See Table 15 for data values

#	Element name	Definition	Data type	Comment
		In at-grade junctions all roads intersect at the same level. In not-at-grade junctions roads do not intersect at the same level.		
R7	Traffic control	Type of traffic control at the junction where crash occurred. Applies only to crashes that occur at a junction	Numeric	See Table 16 for data values

Table 12 Data values for “Type of roadway”

#	Definition
1	Motorway/freeway: Road with separate carriageways for traffic in two directions, physically separated by a dividing strip not intended for traffic. Road has no crossings at the same level with any other road, railway or tramway track, or footpath. Specially sign-posted as a motorway and reserved for specified categories of motor vehicles.
2	Express road: Road with traffic in two directions, carriageways not normally separated. Accessible only from interchanges or controlled junctions. Specially sign-posted as an express road and reserved for specified categories of motor vehicles. Stopping and parking on the running carriageway are prohibited.
3	Urban road, two-way: Road within the boundaries of a built-up area (an area with sign-posted entries and exits). Single, undivided street with traffic in two directions, relatively lower speeds (often up to 50 km/h), unrestricted traffic, with one or more lanes which may or may not be marked.
4	Urban road, one-way: Road within the boundaries of a built-up area, with entries and exits sign-posted as such. A single, undivided street with traffic in one direction, relatively lower speeds (often up to 50 km/h).
5	Road outside a built-up area: Road outside the boundaries of a built-up area (an area with sign-posted entries and exits).
6	Restricted road: A roadway with restricted access to public traffic. Includes cul-de-sacs, driveways, lanes, private roads.
7	Other: Roadway of a type other than those listed above.
8	Unknown: Not known where the incident occurred.

Table 13 Data values for “Road functional class”

#	Definition
1	Principal arterial: Roads serving long distance and mainly interurban movements. Includes motorways (urban or rural) and express roads. Principal arterials may cross through urban areas, serving suburban movements. The traffic is characterized by high speeds and full or partial access control (interchanges or junctions controlled by traffic lights). Other roads leading to a principal arterial are connected to it through side collector roads.
2	Secondary arterial: Arterial roads connected to principal arterials through interchanges or traffic light-controlled junctions supporting and completing the urban arterial network. Serving middle distance movements but not crossing through neighbourhoods. Full or partial access control is not mandatory.
3	Collector: Unlike arterials, collectors cross urban areas (neighbourhoods) and collect or distribute the traffic to/from local roads. Collectors also distribute traffic leading to secondary or principal arterials.
4	Local: Roads used for direct access to the various land uses (private property, commercial areas etc). Low service speeds not designed to serve interstate or suburban movements.

Table 14 Data values for “Surface conditions”

#	Definition
1	Dry: Dry and clean road surface
2	Slippery: Slippery road surface due to existence of sand, gravel, mud, leaves, oil on the road. Does not include snow, frost, ice or wet road surface
3	Wet, damp: Wet road surface. Does not include flooding
4	Flood: Still or moving water on the road
5	Other: Other road surface conditions not mentioned above
6	Unknown: The road surface conditions were unknown

Table 15 Data values for “Junction”

#	Definition
1	At-grade, crossroad: Road intersection with four arms.
2	At-grade, roundabout: Circular road.
3	At-grade, T or staggered junction: Road intersection with three arms. Includes T intersections and intersections with an acute angle.
4	At-grade, multiple junction: A junction with more than four arms (excluding roundabouts).
5	At-grade, other: Other at-grade junction type not described above.
6	Not at grade: The junction includes roads that do not intersect at the same level.
7	Not at junction: The crash has occurred at a distance greater than 20 metres from a junction.
8	Unknown: The crash location relative to a junction is unknown.

Table 16 Data values for “Traffic control”

#	Definition
1	Authorized person: Police officer or traffic warden at intersection controls the traffic. Applicable even if traffic signals or other junction control systems are present.
2	Stop sign: Priority is determined by stop sign(s).
3	Give-way sign or markings: Priority is determined by give way sign(s) or markings.
4	Other traffic signs: Priority is determined by traffic sign(s) other than ‘stop’, ‘give way’ or markings.
5	Automatic traffic signal (working): Priority is determined by a traffic signal that was working at the time of the crash.
6	Automatic traffic signal (out of order): A traffic signal is present but out of order at time of crash.
7	Uncontrolled: The junction is not controlled by an authorized person, traffic signs, markings, automatic traffic signals or other means.
8	Other: The junction is controlled by means other than an authorized person, signs, markings or automatic traffic signals.

Table 17 Description of vehicle related data elements

#	Element name	Definition	Data type	Comment
V1	Vehicle number	Unique vehicle number assigned to identify each vehicle involved in the crash	Numeric, sequential two-digit number	
V2	Vehicle plate number	Plate number of the vehicle	Numeric	Allows for merging with vehicle registration database of SLRSA
V3	Vehicle special function	The type of special function being served by this vehicle regardless of whether the function is marked on the vehicle	Numeric	See Table 18 for data values
V4	Vehicle manoeuvre	Controlled manoeuvre for this motor vehicle prior to the crash	Numeric	See Table 19 for data values

Table 18 Data values for “Vehicle special function”

#	Definition
1	No special function: No special function of the vehicle.
2	Taxi: Licensed passenger car for hire with driver, without predetermined routes.
3	Vehicle used as bus: Passenger road motor vehicle used for the transport of people.
4	Police / military: Motor vehicle used for police / military purposes.
5	Emergency vehicle: Motor vehicle used for emergency purposes (includes ambulances, fire service vehicles, etc.).
6	Other: Other special functions, not mentioned above.
7	Unknown: It was not possible to record a special function.

Table 19 Data values for “Vehicle manoeuvre”

#	Definition
1	Reversing: The vehicle was reversing.
2	Parked: Vehicle was parked and stationary.
3	Entering or leaving a parking position: The vehicle was entering or leaving a parking position
4	Slowing or stopping: The vehicle was slowing or stopping
5	Moving off: The vehicle was still and started moving. Does not include vehicle leaving or entering a parking position.
6	Waiting to turn: The vehicle was stationary, waiting to turn.
7	Turning: The vehicle was turning (includes U-turns).
8	Changing lane: The vehicle was changing lane.
9	Avoidance manoeuvre: The vehicle changed its course to avoid an object on the carriageway (including another vehicle or pedestrian).
10	Overtaking vehicle: The vehicle was overtaking another vehicle.
11	Straight forward / normal driving: The vehicle was moving ahead away from any bend.
12	Other
13	Unknown

Table 20 Description of person related data elements

#	Element name	Definition	Data type	Comment
P1	Person ID	Number assigned to uniquely identify each person involved in the crash	Numeric (two-digit number, nn)	The persons related to the first vehicle will be recorded first. Within a specific vehicle, the driver will be recorded first, followed by the passengers. Allows the person record to be cross-referenced to crash, road and vehicle records to establish a unique linkage with the Crash ID (C1) and the Vehicle number (V1).
P2	Occupant's vehicle number	Unique number assigned for this crash to the motor vehicle in which the person was an occupant (V1)	Numeric (two-digit number, nn)	Allows the person record to be cross-referenced to the vehicle records, linking the person to the motor vehicle in which they were travelling
P3	Pedestrian's linked vehicle number	Unique number assigned for this crash to the motor vehicle which collided with this person (V1). The vehicle number assigned under (V1) to the motor vehicle which collided with this person	Numeric (two-digit number, nn)	Allows the person record to be cross-referenced to the vehicle records, linking the person to the motor vehicle in which they were travelling
P4	Date of birth (excluding drivers)	Indicates the date of birth of the person involved in the crash.	Numeric (date format – dd/mm/yyyy, 99/99/9999 if birth date unknown)	
P5	Sex (excluding drivers)	Indicates the sex of the person involved in the crash	Numeric	1) Male. 2) Female. 3) Unknown.
P6	Type of road user	This variable indicates the role of each person at the time of the crash	Numeric	See Table 21 for data values
P7	Seating position	The location of the person in the vehicle at the time of the crash	Numeric	1) Front 2) Rear 3) Not applicable 4) Other 5) Unknown
P8	Injury severity	The injury severity level for a person involved in the crash	Numeric	See Table 22 for data values
P9	Safety equipment	Describes the use of occupant restraints, or helmet use by a motorcyclist.	Numeric	See Table 23 for data values
P10	Pedestrian manoeuvre	The action of the pedestrian immediately prior to the crash	Numeric	See Table 24 for data values
P11	Alcohol use	Verified abuse of alcohol	Numeric	1) Yes 2) No 3) Not applicable

#	Element name	Definition	Data type	Comment
				4) Unknown
P12	Drug use	Verified use of drugs	Numeric	1) Yes 2) No 3) Not applicable 4) Unknown
P13	Blood group	Person blood group	String character	xxx : blood group 999 : unknown
P14	Person name	Name of the person involved in RTC	String character	

Table 21 Data values for “Type of road user”

#	Definition
1	Driver: Driver or operator of motorized or non-motorized vehicle. Includes cyclists, persons pulling a rickshaw or riding an animal.
2	Passenger: Person riding on or in a vehicle, who is not the driver. Includes person in the act of boarding, alighting from a vehicle or sitting/stranding.
3	Pedestrian: Person on foot, pushing or holding a bicycle, pram or a pushchair, leading or herding an animal, riding a toy cycle, on roller skates, skateboard or skis. Excludes persons in the act of boarding or alighting from a vehicle.
4	Other: Person involved in the crash who is not of any type listed above.
5	Unknown: It is not known what role the person played in the crash

Table 22 Data values for “Injury severity”

#	Definition
1	Fatal injury: Person was killed immediately or died within 30 days, because of the crash.
2	Serious/severe injury: Person was hospitalised for at least 24 hours because of injuries sustained in the crash.
3	Slight/minor injury: Person was injured and hospitalised for less than 24 hours or not hospitalised.
4	No injury: Person was not injured.
5	Unknown: Injury severity was not recorded or is unknown.

Table 23 Data values for “Safety equipment”

#	Definition
1	Seatbelt / Helmet worn
2	Seatbelt / Helmet not worn
3	Not applicable
4	Unknown

Table 24 Data values for “Pedestrian manoeuvre”

#	Definition
1	Crossing: The pedestrian was crossing the road.
2	Walking on the carriageway: The pedestrian was walking across the carriageway facing or not facing traffic.

#	Definition
3	Standing on the carriageway: The pedestrian was on the carriageway and was stationary (standing, sitting, lying etc).
4	Not on the carriageway: The pedestrian was standing or moving on the sidewalk or at any point beside the carriageway.
5	Other: The vehicle or the pedestrian was performing a manoeuvre not included in the list of the previous values.
6	Unknown: The manoeuvre performed by the vehicle or the pedestrian was not recorded, or it was unknown.

7 Annex 2 – Health services data collection form

ROAD TRAFFIC CRASH DATA COLLECTION FORM - HOSPITALS

CRASH RELATED INFORMATION					
Information about person compiling the form		C1 - Crash ID			
Name		C2 - Date of crash			
Designation		C3 - Time of crash			
Hospital of		C4 - Date admission			
Service no		C5 - Time admission			
Signature		C6 - Location			
PERSON RELATED INFORMATION					
P1 - Person ID		P4 - Birth date			
P2 - Person name		P5 - Type of injury	1	2	3 4 5 6
P3 - Sex		P6 - Final diagnosis	1	2	3
		P7 - Date exit			

LEGEND					
P5 - Type of injury	1	Spinal Injury	P6 - Final diagnosis	1	Dead
	2	Head Injury		2	Serious injury
	3	Leg Fracture		3	Non-serious injury
	4	Multiple Fracture			
	5	Minor			
	6	Other			

Table 25 Description of crash related data elements

#	Element name	Definition	Data type	Comment
C1	Crash identifier	Unique identifier (e.g. a 10-digit number) within a given year that identifies a particular crash	Character string	
C2	Crash date	Date (day, month, year) on which the crash occurred	Numeric (DDMMYYYY)	If a part of crash date is unknown, the respective places are filled in with 99 (for day and month). Absence of year result in an edit check.
C3	Crash time	Time at which the crash occurred	Numeric (HH:MM)	Midnight is defined as 00:00 and represents the beginning of a new day
C4	Admission date	Date (day, month, year) on which the person has been admitted to the health service	Numeric (DDMMYYYY)	
C5	Admission time	Time at the person has been admitted to the health service	Numeric (HH:MM)	Midnight is defined as 00:00 and represents the beginning of a new day
C6	Location	Location at which the crash occurred. Route name, city.	Character string	Street name, reference point

Table 26 Description of person related data elements

#	Element name	Definition	Data type	Comment
P1	Person ID	Number assigned to uniquely identify each person involved in the crash	Numeric (two-digit number, nn)	Should be the same ID used by Police forces in their data collection form
P2	Person name	Name of the person involved in RTC	String character	
P3	Sex	Indicates the sex of the person involved in the crash	Numeric	1) Male. 2) Female. 3) Unknown.
P4	Date of birth	Indicates the date of birth of the person involved in the crash.	Numeric (date format – dd/mm/yyyy, 99/99/9999 if birth date unknown)	
P5	Type of injury	This variable indicates the type of injury occurred to the person	Numeric	See Table 27 for data values
P6	Final diagnosis	This variable indicated the final diagnosis of the person involved in the crash after all the treatments in the health services	Numeric	1) Dead 2) Serious injury 3) Non-serious injury
P7	Date exit	Date (day, month, year) on which the person has been left to the health service	Numeric (DDMMYYYY)	

Table 27 Data values for "Type of injury"

#	Definition
1	Spinal Injury
2	Head Injury
3	Leg Fracture
4	Multiple Fracture
5	Minor
6	Other