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Extending the road safety research and development capacity in Morocco

R-2015-7

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A joint CNPAC, SWOV and RDW initiative

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Summary

During the Moroccan trade mission to the Netherlands in March 2013, a delegation of the Moroccan Ministry of Infrastructure and Transport and the National Committee for the Prevention of Road Traffic Accidents (CNPAC) visited the Dutch Institute for Road Safety Research (SWOV), the Dutch vehicle and driving license registration authority (RDW) and the Dutch Ministry of Infrastructure and the Environment.

Follow-up contacts between CNPAC and SWOV/RDW have resulted in CNPAC requesting the Netherlands to provide capacity and knowledge to contribute to the building of road safety expertise in Morocco.

Following this request from CNPAC, the Netherlands Enterprise Agency (formerly Agentschap Nederland) was approached via the Netherlands Ministries of Foreign Affairs and Economic Affairs to provide the necessary funding. This culminated in a project proposal being developed by SWOV, RDW and CNPAC which was formally approved by the Ministry of Foreign Affairs on 27 September 2013. The project was financed by the Dutch Ministry of Foreign Affairs as part of the Matra-South Programme that is carried out by the Netherlands Enterprise Agency (RVO).

The project plan involved the following activities:

- Start-up road safety seminar and kick off-meeting (December 2013);
- Drafting an inception report (Schermers et al., 2014) providing an outline for the planning, preparation and content of workshops and study visits (March 2014);
- Study visit to the Netherlands (June 2014) and two workshops/training sessions in the Netherlands and Rabat (April, June and October 2014);
- Preparing a final report (December 2014).

This report focuses on reviewing specifically the institutional management function of Research and Development (R&D). It concentrates on data supporting the R&D function with specific emphasis on enforcement and vehicle and to a lesser extent on (driver) registration and standards.

Overall, research, development and knowledge dissemination on road safety matters take place on an ad-hoc basis in Morocco. A dedicated road safety research programme, backed by sustainable funding sources and carried out by dedicated research staff is currently not present. This project is an example of one which focuses on capacity building and professional exchange but needs to be expanded to include all aspects of road safety. The feasibility of establishing a dedicated road safety research institute as an independent entity or as part of a future road safety agency needs to be further explored.

Effective R&D is dependent on good quality road safety data. The current data collection, analysis, validation and sharing mechanisms of road safety management information in Morocco are not optimal for effective management of crash prevention in the country. In most cases no

performance based criteria have been set for potential road safety indicators. This could however be due to the fact that benchmarks cannot be set because the necessary data is unavailable. Although there are state of the art registration systems, these are not always linked with other systems and/or attempts to integrate these have not been explored. A detailed review of these systems may be required to identify opportunities for exploiting this data to improve road safety management and to facilitate target setting.

It is recommended to improve the data exchange cooperation between the different stakeholders (e.g. DTRSR, CNEH, CNPAC, CNER, Police and Gendarme) to increase road safety. In various processes it was observed that the flow of information between the different institutions was complex or non-existent. The Dutch model can be used as an example of good practice.

This final report describes the results of these activities, and in addition to the above, formulates a number of recommendations and actions which are intended to assist road safety authorities in Morocco toward adopting a safe system approach for road safety management.

Contents

List of abbreviations

ANPR	Automatic Number Plate Recognition
CBR	Dutch Driver Testing Organisation (Centraal Bureau Rijbewijzen)
CIECA	The international organization of examination institutes
CISR	Comité interminstériel de la securité routière (Inter Ministerial Committee on Road Safety)
CJIB	Central Fine Collection Agency in the Netherlands; (Centraal Justitieel Incasso Bureau)
CNEH	Centre National d'Essai et d'Homologation (National Testing and Approval Centre)
CNER	Centre National d'Etudes et de Recherches Routières (National Centre for Studies and Highway Investigations)
CNPAC	Comité National de Prevention des Accidents de la Circulation (National Committee for the Prevention of Road Traffic accidents)
CPSR	Comité Permanent de la Securité Routière (Permanent Committee of Road Safety)
CRSR	Comité Regional de la Securité Routière (Regional Committee of Road Safety)
DR	Le Ministère de L'Equipement, du Transport et de la Logistique - la Direction des Routes (Department of Roads and Road Traffic)
DSI	Direction de Système d'Information
DTRSR	Le Ministère de L'Equipement, du Transport et de la Logistique - La Direction des Transport Routiers et de la Securité Routière (Department of Road Transportation Safety)
FNI	Ficher National d' Immatriculations
GDP	Gross Domestic Product
HGV	Heavy Goods Vehicle
LDV	Light Delivery Vehicle
METL	Ministère de l'Equipement, du Transport et de la Logistique (Ministry of Equipment, Transport and Logistics)
NMi	Institute Neerlandais de Métrology (The Dutch Metrology Institute NMi),
PSIU	Plan Stratégique Intégré d'Urgence (Integrated Strategic Emergency Plan)
PTI	Periodic Technical Inspection
R&D	Research and Development
RDW	Vehicle Technology and Information Centre RDW (Dutch vehicle and driving licence registration authority)
RSMS	Road Safety Management System
RVO	Netherlands Enterprise Agency
SWOV	Stichting Wetenschappelijk Onderzoek Verkeersveiligheid, Dutch Institute for Road Safety Research
WHO	World Health Organisation

1. Introduction

During the Moroccan trade mission to the Netherlands in March 2013, a delegation of the Moroccan Ministry of Infrastructure and Transport and the National Committee for the Prevention of Road Traffic Accidents (CNPAC) visited the Institute for Road Safety Research (SWOV), the Vehicle Technology and Information Centre (RDW) and the Ministry of Infrastructure and the Environment. The visit was prepared and facilitated by the Embassy of the Netherlands in Rabat, Morocco. On 13 March 2013, a small-scale seminar on road safety took place during which SWOV and RDW gave introductory presentations to the Moroccan delegation. Follow-up contacts between CNPAC and SWOV/RDW have resulted in CNPAC requesting the Netherlands to provide capacity and knowledge to contribute to the building of road safety expertise in Morocco. It is anticipated that through this transfer of knowledge the Moroccan authorities will be able to effectively implement parts of the Moroccan road safety plan which aims to decrease the number of fatal and serious injury road crashes.

Following this request from CNPAC, the Netherlands Enterprise Agency (formerly Agentschap Nederland) was approached via the Netherlands Ministries of Foreign Affairs and Economic Affairs to provide the necessary funding. This resulted in a project proposal being developed by SWOV, RDW and CNPAC which was formally approved by the Ministry of Foreign Affairs on 27 September 2013. The project was financed by the Dutch Ministry of Foreign Affairs as part of the Matra-South Programme that is carried out by the Netherlands Enterprise Agency (RVO).

A project inception report was drafted setting out the project team's understanding of the problems in Morocco relating to road safety in general and road safety research and vehicle and driver registration in particular. (Schermers et al., 2014). This report is the final report and presents all the project findings and recommendations.

1.1. Background

Road traffic injuries are the eighth leading cause of death globally (World Health Organisation, 2013), and the leading cause of death among young people aged between 15-29 years. According to the WHO 2013 report, 3778 persons were reported killed in road traffic crashes in 2010 in Morocco. Normally crash reporting and recording systems, underregistration etc. lead to an underestimation of the actual number of fatalities. Therefore, the WHO has developed a methodology to estimate actual numbers of crash fatalities. On this basis the WHO estimates that the figures for Morocco are more likely to be in excess of 5700 fatalities (World Health Organisation, 2013). Using these estimates the risk of being killed in traffic in Morocco is 18 fatalities per 100 000 inhabitants, slightly better than the average of 20.1 for middle-income countries. However, given the 3,832 registered fatalities (Ministère de L'Equipement et du Transport, 2012) and a population of 33 million (www.hcp.gov.ma), this figure is closer to 11.6 rather than 18 per 100,000 population.

The Moroccan Government has decided to let the World Bank evaluate its road safety strategy for the period 2003 – 2013.At present, the Moroccan Government has therefore developed only road safety 'orientations' for the period 2014 – 2016. These orientations have yet to be formally adopted by the Inter-ministerial Committee of Road Safety (headed by the Chairman of the Government); and can then form the basis of the next road safety strategy.

CNPAC is responsible for the implementation of axis No. 7 and No. 9 of the road safety strategy in Morocco, respectively on communication and awareness and on scientific research and technological intelligence. The "Direction des Transport Routiers et de la Securité Routière" (Department of Road Transportation Safety - DTRSR) is responsible for ensuring coordination between all partners in road safety, namely the control body, the "Direction des Routes" (Department of Roads and Road Ttraffic, DR), the Ministry of the Interior, the Ministry of Health, the Ministry of National Education and CNPAC. The strategy is focussed on 9 pillars, namely:

1. High level coordination;
2. Legislation;
3. Surveillance and vehicle inspection;
4. Training of drivers and driving licence systems;
5. Infrastructure;
6. Emergency and rescue;
7. Communication and sensitisation (awareness);
8. Education;
9. Research and development.

Evident from discussions with the Moroccan counterparts is the need to develop a better understanding on the research and development pillar which supports effective implementation and monitoring of the Moroccan road safety strategy. The following issues and topics are deemed particularly relevant:

- Road safety management, particularly at the local level (municipalities, cities, provinces): this includes monitoring, assessment and evaluation activities, and the development and implementation of safety performance indicators (so-called SPI's).
- Enforcement: surveillance, speed control, and vehicle inspection. Currently the Ministry of Infrastructure, Transport and Logistics is responsible for vehicle registration through registration centres, and is the only organisation that maintains the database for vehicle registration.

1.2. Outline of the study

The original project plan anticipated a Road Safety Management Capacity review as the general framework for conducting this study. The plan was developed in the absence of a written Terms of Reference and was based purely on interactions between SWOV/RDW and CNPAC. The primary tasks defined in the original project plan were to conduct an overview of road safety and vehicle register data, to assess the quality of this data and to determine the role of the various organisations involved in road safety management and give an overview of the procedures used.

During the kick-off meeting on 9 December 2013 at the offices of CNPAC, the preliminary project work plan was presented and discussed in detail. It was decided to fine-tune the proposal to focus on the Moroccan R&D capabilities, with a specific interest in the crash data and vehicle register data as primary input for R&D activities.

Initially the overall goal was to conduct a full scale road safety management capacity review which assesses all of the (6) institutional management functions listed on *p.9*. To avoid duplication with other projects, the kick-off meeting decided to focus on the R&D component without restricting that to only a review, but also to develop recommendations for improvement. Such recommendations will be related to initiating capacity building and technology transfer programmes. These aspects will be outlined in further detail in later chapters.

The project plan identified 5 activities:

1. Start-up road safety seminar and kick off-meeting (December 2013);
2. Drafting an inception report (Schermers et al., 2014) providing an outline for the planning, preparation and content of workshops and study visits (March 2014);
3. Study visit to the Netherlands (June 2014);
4. Two workshops/training sessions in the Netherlands and Rabat (April, June and October 2014);
5. Preparing a final report (December 2014).

To facilitate the review, the project plan adopted the safe system approach (Bliss & Breen, 2009; Koornstra et al., 2002; Wegman et al., 2008) as a framework for conducting the review.

The World Bank has developed guidelines to conduct road safety management capacity reviews (Bliss & Breen, 2009). The guideline provides a valuable point of departure for developing a problem definition for this project. Many of the issues discussed in the World Bank guideline are common to all countries and therefore also relevant to the Moroccan situation.

2. Overview of the World Bank implementation guidelines for road safety management systems

The Road Safety Management System (RSMS, see *Figure 2.1*), developed by the World Bank (Bliss & Breen, 2009), can be applied to all countries, irrespective of the status of development or road safety performance in a country. The procedures described in the World Bank guidelines provide a systematic framework to conduct a comprehensive country capacity review of road safety management. In this project the procedures were adapted to take into account the specific needs in Morocco and, as outlined by the project brief, to limit the review to management functions related to research and development. Since R&D are dependent on data covering the entire spectrum of road safety, the project also had to touch on aspects relating to knowledge dissemination at the institutional management function level and also at interventions and results, specifically pertaining to vehicles, drivers and final outcomes (crashes).

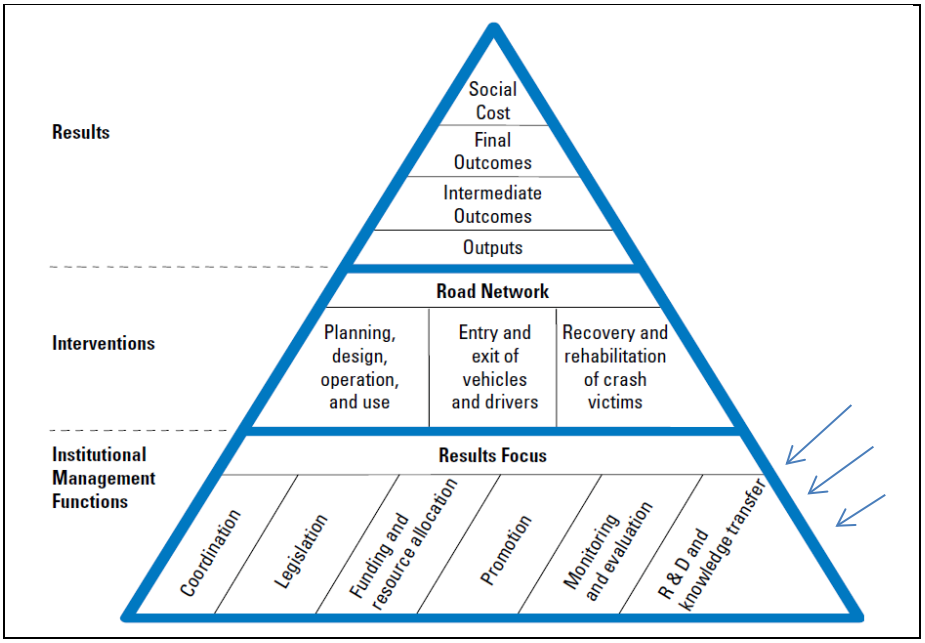

Figure 2.1. *Road safety management system (In Bliss and Breen, 2009. Sources: Breen and Bliss, Building on the frameworks of Land Transport Authority, 2000; Wegman, 2001, Koornstra et. al 2002; Bliss, 2004).*

The generic characteristics of the World Bank RSMS are (adapted from Bliss and Breen, 2009):

- The RSMS deals with road safety as a production process in the same fashion one would deal with the production of goods or services. This production process is depicted as a management system comprising three levels, namely institutional management functions which produce interventions that in turn produce results.

- The RSMS is a generic model that is neutral to country structures and cultures, which shape the way institutions function and goals are set and achieved.
- The management system can be used to review road safety management capacity and prepare related strategies and programmes, irrespective of the stage of road safety development.
- The RSMS can be applied to any land use/transportation system. The current and projected exposure to risk arising from that system is taken as a given. However, land use/transport trade-offs can be managed by considering these as options in the desired focus on results. These can then be addressed by interventions related to the planning, design, operation and use of the road network and the entry and exit of vehicles and road users to this network.
- The model takes the road network as its frame of reference (in other words, the road network facilitates the movements of goods and people and is where crashes take place). The interventions are directly associated with the road network and have strong spatial dimensions. The difference between this approach and models which focussed on specifically safer roads, safer vehicles and safer people is the fact that these models did not did not locate these in a network context. The model focuses safety interventions on network failures and near failures as is the case with for example air transport. In other words the road network is the driver and facilitator of change to improve safety.

Figure 2.2 shows the implementation stages recommended by the World Bank guidelines. This makes clear that the “Improving road safety in Morocco” project especially concentrates on the first stage of implementation. Consequently, the process described in the guideline, and specifically the checklists used for research related activities within the capacity review, were used as a basis for the structured interviews.

This report focusses on reviewing the institutional management function of R&D in particular. It concentrates on data supporting the R&D function with specific emphasis on enforcement and vehicle and (to a lesser extent) driver registration and standards. This data is needed to assess the situation in Morocco and to formulate points for improvement in all other layers and cells of the RSMS. In a sense R&D is all-encompassing and utilises data from all layers (Results, Interventions and Management Functions) to feed the development of the new strategies and plans.

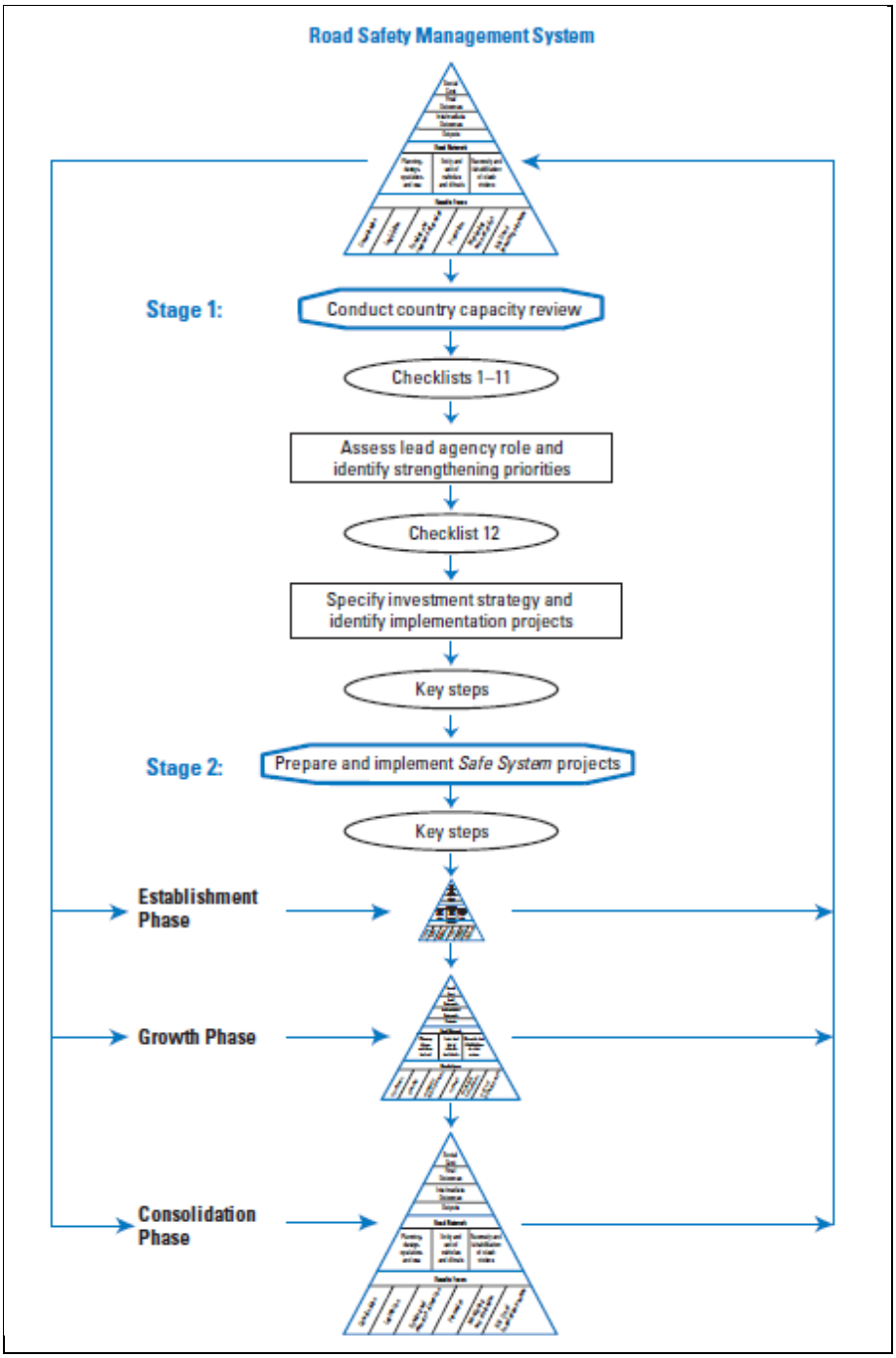

Figure 2.2. *Implementation stages (Bliss & Breen, 2009).*
Note : The triangles in Figure 2.2 are identical to those in Figure 2.1.

3. Review process

Research and development are central to the orientation of the new road safety strategy in Morocco. Improved R&D will enable a more effective implementation of the Moroccan road safety strategy. The development of knowledge on the following issues and topics are considered to be central parts of road safety strategy:

1. Road safety management, particularly at the local level (municipalities, cities, provinces). This includes monitoring, assessment and evaluation, and the development and implementation of safety performance indicators (so-called SPIs). SWOV is expert in knowledge on road safety management and the development of SPIs, and has had leading roles in a number of European projects in this area (e.g. SafetyNet, DaCoTa).
2. Enforcement: surveillance, speed control and vehicle inspection.

Currently various organisations are involved in vehicle registration and administration in Morocco. DTRSR supervises/is in charge of a countrywide network of 63 individual registration centres (Centres d'immatriculation). Enforcement is expected to be more efficient if the partners in the vehicle chain share more information.

The so-called "Road Safety Management Capacity Review" will be used as a general framework. This is heavily based on the Sustainable Safety vision (safe system approach) as developed in the Netherlands (Koornstra et al., 1992; Wegman & Aarts, 2006).

3.1. Project development and inception report

Initial interactions between CNPAC and other Moroccan officials and the project team revealed overlap between this project and other projects being prepared or already started in Morocco. Consequently the scope of this project was limited to focussing on road safety research and development and knowledge dissemination with a specific emphasis on road crash data and driver and vehicle registration.

A project was prepared (Schermers et al., 2014) to provide an outline of the problem and the study approach to be followed; the results were to be included in the inception report. The project comprises six primary tasks and although these tasks form the bulk of the work programme, an additional number of tasks will need to be executed to attain the objectives. The primary tasks (also representing the different project phases) described in this chapter are:

1. A status quo review;
2. Study visit to the Netherlands;
3. The development of a R&D plan incorporating monitoring systems for road safety management and enforcement;
4. Reporting;
5. Dissemination and consultation.

3.2. Status quo review

This task entailed reviewing and analysing the development of road safety research and development in Morocco with specific attention for the monitoring, assessment and evaluation of road safety management, of vehicle and driver testing standards and of traffic law enforcement. The review was carried out within the context of international best practice, and considers the relevant elements of the World Bank Global Road Safety Facility Road Safety Management System Framework (Bliss & Breen, 2009) as outlined in ISO 39001:2012 (E) (ISO, 2012). Furthermore, it is related to policy frameworks such as Sustainable Safety (Wegman & Aarts, 2006) and Vision Zero (Tingvall & Haworth, 1999).

The review was based on a combination of (international) literature review, structured interviews and or/workshops and an assessment of current data information systems, specifically road crash data reporting and collecting and vehicle and driver registration data. The review followed the steps outlined in the World Bank guidelines.

The literature review concentrated on reviewing a number of relevant documents, including:

- Road safety policy; strategies and implementation plans and including the Plan Stratégique Intégré d'Urgence (Integrated Strategic Emergency Plans - PSIUI, II and III);
- Regional Road transport policy and plans (including specifically road safety);
- Major City transport policy and plans (including road safety);
- Road traffic and transport legislation and regulations;
- Standards and guidelines applying to vehicle and driver licensing and testing (including professional drivers);
- Duties and responsibilities of stakeholders in road safety (organisation and roles);
- Traffic law enforcement policy, strategies and programmes;
- Programmes relating to critical offences (drink driving; speeding; seatbelt and helmet use etc.);
- Programmes, requirements and studies relating to vehicle and driver fitness, overloading, taxis and public transport vehicles;
- National/regional/local Road transport statistics (historical data relating to for e.g. vehicle population, traffic volumes, road network, public transport, modal splits, road crashes, etc.);
- Statistics relating to enforcement and trauma management and equipment (no. of traffic police, road and vehicle inspectors; ambulance personnel; trauma centres and staff, traffic law enforcement equipment and vehicles; standards applied etc.);
- Traffic enforcement and adjudication of traffic offences (enforcement programmes carried out; no. of fines issued per type, number paid/prosecuted; manpower deployed etc.);
- Protocols/guidelines/specifications/requirements relating to vehicle and driver registration and testing;
- Any other relevant and related documentation that will facilitate the review of road safety R&D in Morocco.

The above documentation was predominantly made available by the CNPAC and the Moroccan authorities.

The review of relevant documentation provided a reasonably complete (albeit initial) outline of road safety R&D practices in Morocco, the country that was documented in the inception report (Schermers et al., 2014).

The outcomes of the literature review formed the basis for the interviews or in-depth review with key stakeholders regarding road safety research and development as an institutional management function in a safe system context. The review was used to develop a deeper understanding of how R&D is conducted and how it supports road safety management in Morocco. It concentrated on the data systems used, especially regarding vehicle and driver standards and enforcement. The review involved the following organisations and key informers:

- CNPAC;
- DTRSR;
- DR;
- Comité Interminstériel de la Securité Routière (CISR - Inter Ministerial Committee on Road Safety);
- Centre National d'Essai et d'Homologation (CNEH - National Testing and Approval Centre);
- Centre National d'Etudes et de Recherches Routières (CNER - National centre for studies and highway investigations);
- Comité Permanent de la Securité Routière (CPSR - Permanent Committee of Road Safety);
- Comité Regional de la Securité Routière (CRSR - Regional Committee of Road Safety);
- (Traffic) Police;
- Regional Committees;
- Universities.

To develop a more fundamental understanding of road safety research in Morocco, a survey questionnaire (Appendix A) was developed using the amplifying questions from the inception report as input. Both personal (one-on-one) and group discussions and interviews with the key informers were held.

The final activity in the review process assessed the various (ICT) systems deployed and used by the Ministère de l'Equipement, du Transport et de la Logistique (Ministry of Equipment, Transport and Logistics, hereafter referred to as METL) and CNPAC in the management of road safety. Effective research and development cannot be achieved without good quality data and it is therefore of paramount importance to assess this capability in Morocco. The focus is on road traffic crash reports/records and the chain of enforcement. A review of current crash reporting and recording systems was carried out.

3.3. Study visit to the Netherlands

The review identified the predominant strengths and weaknesses of road safety related R&D activities in Morocco and allowed the project team to draw up a focussed programme for the study visit of the Moroccan delegation to the Netherlands. The study visit was planned over a three day period exposing the visiting delegation to both the practical and theoretical aspects of road safety management in general and road safety R&D in particular. The delegation were shown demonstrations of the traffic enforcement environment, the vehicle registration, testing and licensing environment, the driver training, testing and registration systems and the road crash data system in the Netherlands.

3.4. Development of a Research and Development plan

One of the central pillars of the new road safety strategy (PSIUIII) is Research and Development. Effective R&D supports effective implementation of the Moroccan road safety strategy. The Moroccan contacts expressed that their main needs concern the development of knowledge on the central themes of their road safety strategy:

1. Road safety management, particularly at the local level (municipalities, cities, provinces).Tthis includes monitoring, assessment and evaluation activities, and the development and implementation of safety performance indicators (so-called SPIs). SWOV provides expertise and knowledge on road safety management and the development of SPIs and has had leading roles in a number of European projects in this field (e.g. SafetyNet, DaCoTa).
2. Enforcement: Surveillance, control for speed, and vehicle inspection. In the Netherlands, one organisation, RDW, is responsible for the entire vehicle and driving licence register. The reliability of the vehicle and driving licence register is very high and the probability of being brought to justice after a traffic offence is high. The Dutch community demands this because of the clear relation between traffic offenders and crashes. Currently a large number of organisations are involved in the vehicle chain in Morocco, and many maintain a vehicle or vehicle-related database. DTRSR is responsible for the vehicle registration. It is clear how the various vehicle(-related) and license registrations work together. In the Moroccan approach the vehicle-owner is expected to take more initiative to keep his own registration accurate and it seems that the accuracy of the registrations can be improved. It is assumed that efficient implementation of enforcement can be addressed with the improvement of the functioning of the vehicle register. SWOV and RDW have expertise on how traffic enforcement activities can be conducted effectively, and have been involved in the evaluation of (Dutch and international) enforcement activities. RDW is the pivot in the supply of enforcement-related data from the driving licence and vehicle register.

Based on the status quo review, a Research and Development framework that focuses on monitoring, assessing and evaluating the efficacy of road safety management, enforcement and vehicle and driver testing and registration training was drawn up. This framework provides the blueprint with which METL can organize, manage and conduct road safety research on these subjects. It provides an outline on data requirements, describes the processes involved in R&D and describes the reporting role. In addition it

provides guidelines on developing actions plans and monitoring and evaluating them.

3.5. Reporting

Each of the primary tasks of the project was documented in a separate report constituting the following primary deliverables:

- Inception report (Schermers et al., 2014);
- Final report (the present report);

3.6. Dissemination and consultation

In the context of the project, this task was vital to the eventual outcome of the project. As has already been described in earlier tasks, the input of all relevant stakeholders was sought during the status quo review phase. Stakeholders were involved from the inception stage of the project and were individually approached (or collectively in the case of the workshop) and interviewed during the problem definition stage.

A concluding stakeholder workshop, involving representatives from all relevant stakeholder groups, was held mid-October 2014. The purpose of this workshop was to discuss the proposal for the R&D plan and to stress the importance development and training of skills in R&D. It also tested the levels of acceptance/resistance to these plans and established the future training needs.

4. R&D in a safe system context - International best practice

At the present time international best practice in the field of road traffic safety is dominated by what is known as the safe system approach (Bliss & Breen, 2009; Koornstra et al., 2002; Wegman & Aarts, 2006; Wegman et al., 2008). *Pillar A* of the UN Decade of Action (UN, 2010) relates to road traffic safety management in a safe system context and the World Bank guidelines (Bliss and Breen, 2009) and the international standard ISO 39001 on Road Traffic Management (RTM) Systems (ISO, 2012) provide a reference framework and describe the requirements to implement such a system.

The World Bank guidelines specify seven institutional management functions which are the responsibility of a lead agency, namely:

- Results focus;
- Coordination;
- Legislation;
- Funding and resource allocation;
- Promotion;
- Monitoring and evaluation;
- Research and development, and knowledge dissemination.

The guidelines specify a number of key issues and tasks for lead agencies and define the role of the agency for each of these. This project reviews and analyses the development of road safety research and development in Morocco with specific attention to the monitoring, assessment and evaluation of road safety management; vehicle and driver testing standards and of traffic law enforcement. The review is therefore restricted in scope and will only address those management functions which are currently the core activity of CNPAC, namely Promotion; Monitoring and evaluation and R&D. Obviously these functions cannot operate in a vacuum and are driven by an underlying goal to achieve objectives and therefore will also touch on the focus on results.

This chapter introduces the reader to these management functions but is by no means complete. The reader is therefore encouraged to read the underlying documentation listed in the references.

4.1. **Results focus**

The focus on results is the primary function for a lead agency and determines the strategic direction. It aligns policy, strategy and interventions with results which means that reliable and representative data systems are required that support a performance orientated approach to road traffic safety management.

Table 4.1 summarises the principal tasks directed at results and describes the role a lead agency should take in each of these tasks should it wish to comply with good practice.

Tasks	Lead Agency role
Appraising current road safety performance through high level strategic review	– Manage the process of governmental review of road safety performance; – Identify and bring together key stakeholders and partners that can and will deliver actual road safety results; – Initiate road safety capacity reviews and chair governmental road safety performance reviews; – Prepare reports, papers and bulletins reporting on road safety performance; – Achieve consensus on key problem areas in the road safety management system; – Follows up on agreed actions.
Adopting a far reaching road safety vision for the longer term	– Studies and proposes a long term and far reaching road safety vision; – Discusses the road safety vision with government and other partners and stakeholders and society as a whole; – Identifies the key partnerships needed within and outside government for promoting the vision; – Identifies the potential for high-level promotion and championing to underpin the road safety strategy; – Gets agreement on the vision and ensures that this is entrenched in legislation; – Gets agreement on shared responsibility which is implicit in the far-reaching vision and ensures that this is clearly defined in the national road safety strategy.
Analysing what can be achieved in the medium term	– Reviews key road safety problems and the potential for further improvements in consultation with government and other partners/stakeholders; – Draws on local and international research expertise in the reviews; – Identifies information needs for road safety strategy development; – Identifies the key elements of good practice results focus, system-wide safety interventions and improved institutional arrangements using country and international research; – Analyses long-term trends which could affect future road safety outcomes; – Carries out scenario planning and (computer) modelling to develop road safety strategies; – Carries out cost-effectiveness reviews and public acceptability studies of strategy interventions; – Consults with key governmental and other partners and stakeholders within the coordination hierarchy on the multi-sectoral strategy options.
Setting quantitative targets by mutual consent	– Sets up a road safety strategy unit within the lead agency; – Sets up technical support groups for the target-setting process; – Proposes and seeks agreement through its inter-governmental coordination arrangements on challenging but achievable targets for final outcomes, intermediate outcomes and institutional outputs at the national level; – In the longer term seeks agreement with regional and local governments on achievable road safety targets and achievable outcomes; – Publishes details of the targets and strategies in which the accountabilities of the different partners and stakeholders are also detailed; – Monitors and reports progress at regular intervals to all involved and adapts and refines intervention output levels where necessary.
Establishing mechanisms to ensure partner and stakeholder accountability for results	– Sets out the responsibility of the lead and other agencies to achieve specified road safety results (outcomes and outputs) in annual performance agreements; – Uses Memoranda of Understanding to underline agreements about the way in which the members work together inroad safety matters; – Sets performance-based road safety targets and delivery of results as a formal criterion in the performance-driven employment remuneration package of the lead agency Chief Executive and senior management team; – encourages outputs and contributions of a wider group of partners and stakeholders based on formal and published declarations of intent to carry out specific interventions which contribute to improved road safety results.

Table 4.1. *The role of the Lead agency in managing the results focus (adapted from Bliss & Breen, 2009)*

4.2. Promotion

Promotion relates to the process of communicating with the public on road safety matters and should be a core business of government and society to emphasize the shared social responsibility to develop, implement and support road safety improvement initiatives and interventions that aim at meeting stated targets.

The World Bank Guidelines identify seven primary tasks in which the lead agency responsible for road safety management has a role (*Table 4.2*).

Tasks	**Lead Agency role**
Promotion of a far-reaching road safety vision or goal	– Has the leading role in promoting the shared responsibility for achieving road safety results by creating and articulating a far-reaching vision and concepts for a safer road traffic system.
Championing and promotion at a high level	– Utilises every relevant opportunity to engage the President or Prime Minister in launching national targeted road safety strategies and programmes to ensure maximum political authority and publicity; – encourages all Ministers in the road safety partnership to play an active role in creating awareness about road safety challenges and promoting policy initiatives in the media; – Develops and nurtures a core group of leading senior professionals in the road safety field (leading academics, casualty surgeons, chief police officers, interested parliamentarians from all parties, community leaders, etc.) who advocate and forge support for important policy development.
Multi-sectoral promotion of effective interventions and shared responsibility	– Stimulates and invests in multi-sectoral promotion of the strategy and evidence-based interventions through existing and new road safety partnerships.
Leading by example with in-house road safety policies (e.g. safety culture)	– Devises fleet policies for the lead agency based on good practice and encourages wider use; – Specifies road safety demands in the transport contracts developed by the lead agency with organizations (e.g., car rental, taxi hire, road haulage companies).
Developing and supporting safety rating programmes and the publication of the results	– Contributes to the development and support of safety rating programmes and their organisation together with road user and consumer groups.
Carrying out national advertising	– Ensures that regular information is available and accessible on the key road safety problems as well as upcoming policy initiatives to achieve results; – Develops in-house capacity for road safety promotion as well as contracting out targeted road safety advertising in support of the major themes of the national road safety strategy.
Encouraging promotion at the local level	– Mobilises local leadership and support to help achieve road safety strategy goals; – Develops and funds targeted community road safety programmes and supports local road safety coordinators.

Table 4.2. *Lead Agency role in the promotion function (adapted from Bliss & Breen, 2009)*

4.3. Monitoring and evaluation

Monitoring and evaluation deal with the on-going and systematic measurement of road safety performance measures and indicators in order to assess and evaluate the efficacy of introduced measures and interventions.

The World Bank Guidelines identify three core tasks in which the lead agency has a dominant role (*Table 4.3*).

Tasks	**Lead Agency role**
Establishing and supporting data systems to set and monitor final and intermediate outcome and output targets.	– Establishes databases to identify and monitor final and intermediate outcomes and outputs; – Establishes and publishes the socio-economic cost of road traffic injuries; – Establishes central computerised transport and driver licensing registries to manage data on the number of vehicles and drivers on the road which are easily accessible for enforcement agencies; – Establishes travel patterns and exposure in the system of different types of road use through periodic national travel surveys (mobility surveys); – Establishes linkages between police reports and hospital admissions data or to assess levels of underreporting; – Establishes linkages between national causes of death statistics to assess and validate traffic fatalities; – Establishes or supports existing safety rating programmes on new cars and road networks which provide intermediate outcomes data; – Conducts before and after studies to establish the effectiveness of specific road safety measures and in-depth studies to ascertain contributory factors, and the causes and consequences of injury; – Establishes or adopts tools for local highway and police authorities to undertake data collection, analysis and monitoring techniques and database management.
Transparent review of the national road safety strategy and its performance.	– Conducts regular reviews of the progress of the national road safety strategy in achieving results; – Establishes transparent independent peer reviews of road safety management capacity in terms of results, interventions and institutional management functions; – Establishes a road traffic inspectorate to monitor the rate and quality of implementation of its road safety strategy; – Reports road safety results and progress made and make interactive crash data systems available on the Internet.
Making any necessary adjustments to achieve the desired results.	– Ensures that the results of monitoring and evaluation are presented and discussed at all levels of the road safety strategy coordination hierarchy to improve the focus on achieving results (see Results Focus section).

Table 4.3. *Lead Agency role in monitoring and evaluation (adapted from Bliss & Breen, 2009)*

4.4. Research and development and technology transfer

This is an integral and essential component of any road safety management system and relates to the timely identification of changes in the system, the development of new techniques and methods, the application of new knowledge and the transfer and application of knowledge to continually improve the efficiency and effectiveness of the system in order to keep meeting the desired results.

In terms of R&D and technology transfer, the World Bank Guidelines identify six primary tasks which the leading agency has a predominant role in and these are listed in *Table 4.4*.

Tasks	Lead agency role
Developing capacity for multi-disciplinary research and knowledge dissemination.	– Ensures in-house capacity for road safety research and management as well as contracting out to road safety research organisations as road safety activity increases; – Supports and develops key partnerships with independent road safety research organizations for a range of road safety management functions.
Creating a national road safety research strategy and annual program	– Establishes with its partners a national road safety research programme to address the needs of the road safety strategy with annual review of needs and consultation with external experts.
Securing sources of sustainable funding for road safety research	– Assigns specific annual budgets for road safety research for in-house and external research; – Establishes levies on motor vehicle insurance premiums in support of road safety research; – Encourages business sponsorship for public sector research.
Training and professional exchange.	– Employs a variety of means for training and knowledge dissemination including professional exchange and attendance at road safety courses, seminars and workshops.
Establishing good practice guidelines	– Develops in-house or contracts out to professional research organizations the production and dissemination of good practice guidelines which comprise a synthesis of universal road safety principles in specific areas of road safety, advice on the general means of applying them and illustrative case studies.
Setting up demonstration projects	– Develops and funds demonstration projects in areas which offer large potential for road casualty reduction and uses the successful results to roll-out the projects nationally.

Table 4.4. *Lead Agency role in the research and development and technology transfer (adapted from Bliss & Breen, 2009)*

5. Results of the status quo review

In accordance with the methodology outlined in the study proposal, a kick-off meeting was held on 9 December 2013 at the offices of CNPAC. During this meeting the project work plan was presented and discussed in detail. These discussions revealed that other similar and certainly related road safety projects were currently being conducted in Morocco. However, these all have their own terms of reference and will be carried out independently.

In view of these developments it was deemed neither advisable nor sensible to duplicate these efforts by initiating a full scale capacity review in this project without clearly knowing the mandates and terms of reference of these other initiatives. This project will therefore NOT cover all the institutional management functions required to be carried out by a lead agency (See *Chapter 2* and *Figure 2.2*) nor will it assess the capability of Morocco to be able to do this. The focus of the project is on the R&D capabilities of the country, with a specific interest in the crash data and vehicle register data as primary input for the R&D activities. Furthermore, the interventions and final outcomes will also be addressed from a R&D viewpoint only and focus on what is necessary to develop capacity and skills in this area.

The status quo review incorporates the stakeholder/key informant interviews and discussion. It supplements the statements and opinions of the various persons interviewed with key data found in the supporting local and international literature and study reports. The review is based on the pyramid reflecting a road safety management system as shown in *Figures 2.1* and *2.2* and first deals with results, followed by interventions and finally discusses the relevant institutional management functions (research and development and monitoring). Since there is no lead agency that is responsible for the overall road safety in the country, the review does not go into assessing the role of the lead agency.

The capacity review describes the road safety situation in Morocco as indicated by the final (numbers of crashes and fatalities) and intermediate outcomes (those issues that impact crashes and severity levels as final outcome). Then the interventions regarding the planning, design, operation and use of the road network, the control of vehicles and road users making use of that network are described and finally the treatment of crash casualties on that network is discussed. The review is completed by looking at issues relating to institutional management, with specific focus on the results, including perspectives on the (political) will to achieve stated goals; research, development and knowledge dissemination and touching on promotion; monitoring and evaluation.

5.1. Orientation

CNPAC is a leading road safety organisation in Morocco and is mentioned separately because of its central role. CNPAC is a public utility establishment founded in 1977. It is a legal entity, placed under the technical control of the METL and under the financial authority of the Ministry of Economy and Finances. In order to improve road safety, CNPAC, together

with the competent authorities, participates in studying and proposing, all measures intended to reduce the number of traffic crashes. CNPAC is also occupied with the education of the public and making materials available to the services in charge of road safety.

5.2. Population, road transport and road infrastructure in Morocco

Morocco covers an area of 710,850 km2 and has a population approaching 32 million people, more than half of which live in the urban areas.

The transport sector in Morocco is responsible for some 7% of the GDP, contributes to 15% of State budget revenue, employs 6% of the labour force and consumes 40% of the national energy produced (EuroMed Transport Project, 2010).

The road network covers some 61 000 kilometres, of which 41,105 km are asphalt surfaced (tarred). Of the asphalt roads 9,816 km are categorised as highways, 9,221 km as regional roads and 22,068 km as provincial roads (Ministère de L'Equipement et du Transport, 2012). About 800 km of the highways are dual carriageways (freeways or motorways) (EuroMed Transport Project, 2010).

The road network accommodates some 90% of the country's mobility need and 75% of the transport of goods requirements (excl. phosphates). Approximately 88 500 million vehicle kilometres are travelled on the paved network on a daily basis (67% on highways; 18% on regional roads and 14% on provincial roads).

Currently there are different estimates of the vehicle fleet in Morocco. These vary from 2.5 million registered vehicles (EuroMed Transport Project, 2010), 1,825 million of which are private cars (including LDV) and the remainder are commercial vehicles (buses and trucks), to 3.5 million (CNPAC, 2013). The latest WHO estimates indicate a vehicle fleet of 2,710,000 of which 1,976,172 are cars and 707,797 are buses and trucks (World Health Organisation, 2013). The vehicle fleet is relatively old; some 75% of the fleet are 10 years and older.

5.3. Organisation

5.3.1. *Road transport*

The overall responsibility for road transport rests with the Ministry of Equipment and Transport and Logistics (METL) which is responsible for the administration and regulation (legislation) of road transport. The following departments and agencies have a leading role in the organisation of road transport:

- Le Ministère de l'Equipement, du Transport et de la logistique (La Direction des Routes (DR) (Ministry of Equipment, Transport and Logistics, The Roads and Road Traffic Department (DR))
  This department is responsible for road network planning, design construction and maintenance. This includes drafting of specifications and standards, funding, contracting, monitoring and quality control.

- Le Ministère de l'Equipement, du Transport et de la logistique (La Direction des Transports Routiers et de la Sécurité Routière (DTRSR) (Ministry of Equipment, Transport and Logistics, The Department of Road Transportation Safety (DTRSR)).
  This department is in charge of road transportation safety in general and also for the safety of vehicles and drivers in specific. It administers vehicle permits, registrations and testing and is responsible for driver licensing and testing. It has six divisions across the country, the Centre National dÉssai et d'Homologation (CNEH - National Testing and Approval Centres).
- The Department of Studies, Planning and Coordination.
  This department is responsible for the transportation information system, the planning and development of the road transport sector and for co-ordination between the various modes of transport in the country.

5.3.2. *Final outcomes - Road crashes and crash data*

Road crashes in Morocco are registered by the police and the Gendarme. According to officials at the DR, the registration rate of crashes is high with almost all crashes being recorded in the system. However, the exact rate is not known from the literature nor from discussions. It is a well-known and well-documented fact (Amoros, Martin & Laumon, 2006; Elvik & Mysen, 1999; James, 1991) that, worldwide, road crashes are generally underreported. Furthermore, there is a strong statistical relationship between the registration rate and the injury severity (the more serious the injury, the more likely it is to be registered). However, certain categories of crashes are affected more than others (for instance a crash between two cyclists is less likely to be registered than a crash between two motor vehicles). The location of crashes also has an influence: crashes occurring in remote, less accessible areas are likely not to be registered by the police. Therefore using hospital records to derive more accurate estimates of actual injury crashes is strongly recommended (Amoros, Martin & Laumon, 2006; James, 1991; Vis et al., 2011). In Morocco, hospital registration data is currently not used to corroborate the police registered crashes .

In 2012, 4,167 fatalities due to road traffic crashes were registered in Morocco (Ministère de L'Equipement et du Transport, 2012). In addition 12,251 persons were seriously injured and a further 90,099 sustained minor injuries. The registration rate is unknown at this stage and the actual number of persons injured in crashes may be higher than reported from the registered crashes as is evident from the latest WHO data.

The latest WHO data (which is based on the official Moroccan data source) report some 3778 registered fatalities in traffic crashes in 2010 (World Health Organisation, 2013). However, the WHO estimates that this figure is significantly lower than the actual number of fatalities. Given underreporting and limited checks of different crash data systems and records, the WHO has developed a methodology to estimate the actual number based on reported and recorded data. The WHO estimates the actual number of fatalities in Morocco to be closer to 5700, implying that nearly half of the estimated number of actual traffic fatalities are not recorded in the current system. Based on these WHO estimates, a mortality rate of 18 deaths/100,000 population has been calculated. Although this is lower than the average for the eastern Mediterranean region it is significantly higher

than that of countries in, for instance, the European region (generally less than 10 fatalities/100,000 population). However, assuming that the registered numbers reported by the Moroccan authorities are 100% correct then the mortality rate would be around 11.6 traffic fatalities/100,000 population in 2013 (3,832 fatalities, divided by 33 million population).

The largest proportion of crash fatalities are occupants of cars and light vehicles (37%) followed by pedestrians (27%) and riders of powered two- and threewheelers (20%). The majority of fatalities and seriously injured casualties occur on rural roads (upward of 70%).

5.3.3. *Historical development*

Over the period 2002 – 2012, registered road crashes have risen from 52,137 to 67,151, an increase of 29% (Ministère de L'Equipement et du Transport, 2012). Over the same period, the number of fatalities rose from 3,761 to 4,167, an increase of 11%. of the rise in fatalities is not constant and the trend reveals fluctuations with sudden decreases in certain years followed by increases in following years (See *Figure 5.1*). Overall, however, crashes reveal a relatively constant increase of around 2% per year.

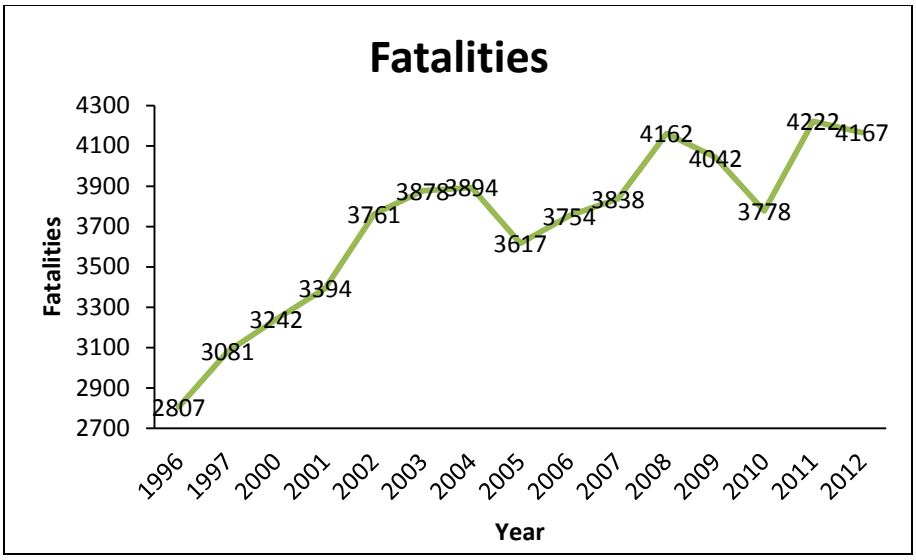

Figure 5.1. D*evelopment of traffic fatalities (1996-2012) (Ministère de L'Equipement et du Transport, 2012; Standing Committee on Road Safety, 2010).*

The number of registered injuries in Morocco shows a similar trend with a rise from 81,365 in 2002 to 102,350 in 2012 (*Figure 5.2*), an increase of 26%. Similar to fatalities the trend is upward with little indication of reversal.

As the registration rates over the years are unknown, it is unclear whether the data has been corrected for the effect of underregistration.

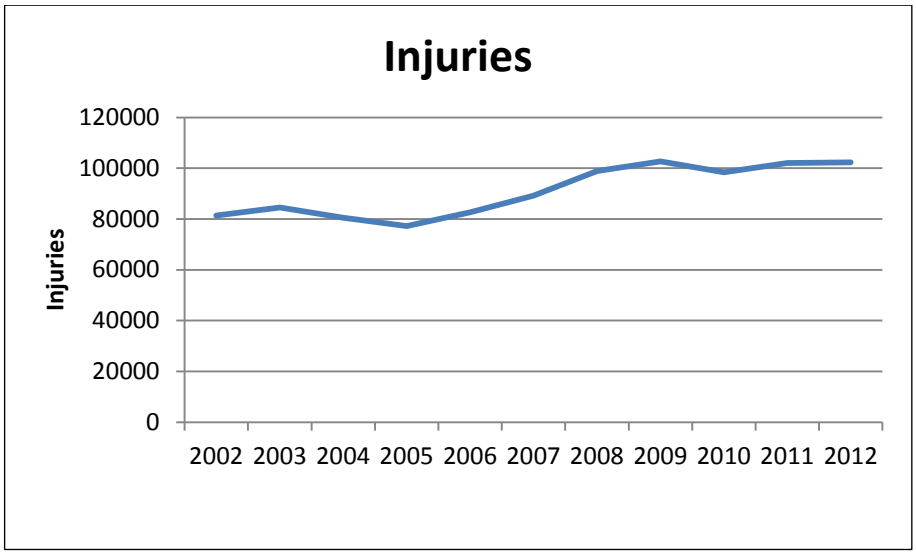

Figure 5.2. *Development of registered injuries in Morocco (Ministère de L'Equipement et du Transport, 2012).*

5.3.4. *High risk categories and prevalent crash types*

Passenger cars and motorcycles are the most common vehicles involved in crashes. Some 80% of crashes in rural areas involve a car or motorcycle. In urban areas, some 88% of crashes involve cars or motorcycles (with nearly 34% of these being motorcycles). A concern is that a significant proportion (35%) of all vehicles involved in crashes is older than 15 years. Some 27% of motorcycles involved in crashes are older than 9 years, whereas some 57% of cars in crashes are of the same age. Even considering the rapid advancement of technology in the automotive sector this implies that many cars and motorcycles on Moroccan roads do not have the latest technology such as state-of-the-art occupant protection, ABS and ESP. In Morocco it became compulsory to wear seatbelts in the front and rear seat of a vehicle in 2005. Since 2005, new vehicles must be fitted with rear seatbelts and all existing cars had to be (retro) fitted with rear seatbelts.

Pedestrians are a particularly high risk group with upward of 27% fatalities and more than 21% seriously injured in traffic crashes. Another high risk group are motorcyclists (20% of all fatalities and ca. 29% of all serious injuries). Considering that the modal share of especially motorcyclists is usually relatively small in many low/middle income countries (International Labour Organisation, 1992), this implies that they are disproportionality represented in the number of serious injuries and fatalities.

5.3.5. *Intermediate outcomes*

Intermediate outcomes have a direct bearing on the development of road crashes. These could also be called safety performance indicators (SPIs) and include aspects such as critical offences, road network safety performance ratings, vehicle safety performance ratings, road user performance ratings, etc. Most developed nations where a safe system approach has been adopted, apply structured monitoring programmes to

measure the development of these intermediate outcomes. Examples of these programmes are:

- Speed monitoring programmes;
- Alcohol monitoring programmes;
- Seat belt wearing monitoring programmes;
- Mobile phone use in traffic monitoring programmes;
- Road network safety evaluations (e.g. iRAP);
- Vehicle fleet safety rating programmes;
- Vehicle roadworthiness rating programmes;
- High accident location management programmes.

5.4. Interventions

5.4.1. *Planning, design, operation and use of the road network*

Although not an explicit part of this review, the road environment is an inextricable part of any road safety system. For this reason we cannot focus on the elements vehicle and driver and research and development as a management functions without paying some attention to the facilitating agent, the road.

The planning, design, operation and use of the road network (including terminal and other transport facilities) relate to the standards and guidelines for providing, maintaining, operating and managing the road network. For road safety it is of paramount importance that the network is provided with the necessary safety features to ensure the safety of the users and the safety between users. To facilitate this, road network designs must comply with safety standards, road users must comply with regulations to ensure safe operation, and road authorities must ensure that the roads are maintained at a level at which these standards are not compromised. From a safe system perspective the following points need to be adopted:

- Comprehensive safety standards and rules and performance targets for the planning, design, operation and use of roads;
- Aligning speed limits with safe system design principles;
- Ensuring that compliance regimes are in place and that users adhere to the safety rules and standards;
- That safety standards and rules take into account the specific needs of high risk road user groups.

A safe system approach provides a road environment where roads incorporate concepts such as Self Explaining Roads (SER) and Forgiving Roadsides. In other words: roads are designed and constructed in such a manner that the risk of crashes is minimised (i.e. the design of the road will not be directly attributable to a crash) and there where they do occur, the severity of the crash will be minimized. Roads typically have features such as adequate clear zones, no roadside hazards; breakaway constructions, safe barriers, no conflicts between opposing traffic, slow and fast traffic physically separated (in time and/or space), etc.

From an operational perspective, road users are restricted in their use of the network by prohibitions, speed restrictions and other legal frameworks, e.g.

controlling drink driving; driving hours; etc. A key concept in this thinking is the idea of a road network classification whereby speed limits are the logical result of the relationship between the function, form and use of the road. The Dutch Sustainable Safety system relies on five principles (Koornstra et al., 1992; Schermers & Vliet, 2001; Wegman & Aarts, 2006) which have been applied as functional requirements for each of the defined road categories (through roads, distributor roads and access roads in rural areas and distributor and access roads in urban areas). Each of these road categories has its own speed regime (120/100; 80 and 60 km/h in rural areas and 50 and 30 km/h in urban areas), which is the logical result of the interaction between the different road users and conflict types that can be expected or that occur. Such a road network incorporates safe design features, network structure and unique elements that make the road types clearly distinguishable to road users; and whereby they know what type of road it is, the speed limit, what interactions to expect and what types of road users and behaviours to expect. Fundamental to this is limiting large differences in the speed, direction and mass of road users.

5.4.1.1. Situation in Morocco

The DR is responsible for the national, provincial and regional road network in Morocco. The DR applies various road design standards, which have been developed for local conditions. Originally based on international standards, these have been adjusted and tailored to fit the Moroccan situation. Road designs are subject to road safety audit (pre-opening) although this is not mandatory.

Of note:

1. The road network has been classified. However, the functionality of the classification needs to be examined: i.e. is there synergy between the function, form and use of the roads, do the correct roads connect activity centres, does the traffic use these roads correctly and have these roads been correctly designed for that use?
2. There are procedures for the setting and posting of speed limits. However, the credibility of the speed limit does not play a role and is a factor that should be considered (Aarts et al., 2009).
3. There is a network classification system and design standards are applied to the various road classes. However, the classification systems is elaborate and consideration could be given to simplifying the system and reducing the number of road categories (Dijkstra, 2011; Schermers & Vliet, 2001; Wegman & Aarts, 2006).
4. Road maintenance programmes are in place and fed by regular inspections such as pavement condition assessments, visuals, quality of road signs and markings.
5. Vulnerable road users and facilities for these groups are not very well provided for in the rural areas, nor are there extensive guidelines covering the use of these facilities. A new programme (2014 - 2018) named PSAS is dedicated to the infrastructural safety of rural roads.

5.4.2. *Control over vehicles using the road network*

This aspect relates to the conditions under which vehicles can safely make use of the road network. The country is to set safety standards and rules and

enforce these to ensure that vehicles on its roads continually meet these safety standards.

Safer vehicles can for example be promoted by:
- Making certain safety features compulsory to vehicles using the road network;
- Encouraging manufacturers to provide standard safety features;
- Prohibiting certain vehicles;
- Campaigning among potential buyers to buy vehicles with higher safety ratings.

5.4.2.1. Tasks in the vehicle chain

In Morocco, DTRSR is the governmental body that is assigned to licensing vehicles is and carries out most tasks in the licensing process. DTRSR is also responsible for the administrative admission, transfer of ownership and suspensions of vehicles. CNEH is responsible for conducting periodic technical inspections (PTI) and vehicle approval for use on the public road.

Both organisations fall under the responsibility METL. METL is, among others, responsible for policy, supervision, legislation and regulation concerning road transport and road safety.

Morocco has a central motor vehicle register, called *le Fichier National d'Immatriculation (FNI)* which is maintained by DTRSR. The personal data of owner(s) and/or holder(s) is taken from the Carte Nationale d'Identité Electronique (CNIE) which must be handed over in case of (re)registration. The data in the FNI is not updated automatically when changes are made in the personal register of the Ministry of Internal Affairs (Ministère de l'intérieur). The registered owners/holders of vehicles are responsible themselves to inform the FNI at the Centres d'immatriculation about any changes in their (personal) data. Besides the technical information the register contains information about penalty points, open fines and the PTI status.

The regional departments, de Direction Général de la Sureté National and the Gendarmerie Royale, have no online access to this register. They work with a copy and in case of doubt or need for actuality, central points within the organisations can have online contact. Information about insurance and tax are not part of the FNI. The responsible ministries keep their own administrations.

Based on the "code de la route", the registered owner and/or hirer/user is responsible for traffic offences, paying taxes, paying fines, applying penalty points and for being insured. In case of a road side inspection the driver is held responsible for a possible traffic offence . The driver will have to pay and will incur penalty points if at fault. If the vehicle is caught on radar, the owner will have to pay the fine. If not the driver, the owner has the possibility to forward the fine and the penalty points to the responsible driver. The adjudication of fines is not well-documented and it is not certain which proportion of issued fines are actually paid, dealt with in court, or otherwise.

If the person in question denies having driven the vehicle, the registered owner/holder has to pay the fine(s). When the offence registered by radar is

committed with a truck, the registered owner/holder can give the names of the driver, the dispatcher and the receiver of the goods. All of these (legal) persons have a shared responsibility.

The Minister of Interior maintains a separate register of stolen vehicles.

Organisation of IT
DSI (Direction de Système d'Information) carries out the technical maintenance of the central motor and driving licence register for DTRSR.

Within METL, DSI is responsible for most of its hardware and software. DSI also maintains the ICT for both the vehicle and driving licence registers. In 80% of the cases DSI works for DTRSR. Projects are contracted and sometimes experts are hired in. All regional offices of the DTRSR are connected to the central database. Modifications carried out by the regional offices are processed real time and on-line. How the registration system is organized (in one centre, which also supports the applications at the prefectures) was not investigated.

Organisation of International activities
In addition to what is mentioned in *Section 5.2.2.1*, METL is responsible for all international aspects related to vehicles and driving licences. The Ministry consults other ministries, particularly the Ministry of Internal Affairs, with regard to issues relating to vehicle registration and driving licences crime. Morocco is not a contacting partner of WP29 (Harmonization of Vehicle Regulations) of the ECE. Morocco is considering participation because its legislation is to a large extent based on WP29 of the ECE.

5.4.2.2. Vehicle approval

Policy, legislation and supervision concerning both type approval and other technical inspections of vehicles are the responsibility of the METL (DTRSR). The supervision task and is delegated to Centres d'immatriculation and CNEH.

Vehicle approvals are conducted by the CNEH.The legal basis is the code de la route 52-05. The vehicle regulations are based on ECE regulation from WP29. Also standards like the American Federal Motor Vehicle Safety Standards (FMVSS) and the Canada Motor Vehicle Safety Standards (CMVSS) are accepted.. New vehicles with a European Type Approval are admitted in Morocco without further testing. Individual vehicles undergo an administrative test (Certificate of Conformity) and mass and dimension are checked. Imported vehicles may not be older than five years (date of first registration) with one exception: a Moroccan citizen older than 60 years who resettles in Morocco may, only for that one instance, import a vehicle between 5 and 10 years old. Morocco does not have a facility for crash testing and issuing type approvals of new vehicles.

5.4.2.3. Licensing

The administrative activities for licensing vehicles are the responsibility of DTRSR and the Centres d'immatriculation. Each Centre d'immatriculation has a direct online connection to the central vehicle registration which is held by the DTRSR (see also *Section 5.2.2.1*, 'Organisation of IT').

The licensing system is vehicle- and department-based. Change of vehicle ownership cannot be registered unless there is a valid PTI and outstanding fines on the vehicle are paid. DTRSR keeps up the administration of these fines (Bureaux de Opposition). When a vehicle owner moves from one region to another, the vehicle is transferred to another region, but keeps the same license number and number plates. The owner must register the vehicle at the DTRSR in the new region.

Vehicle owners are required to report their personal details (name and address) and any changes to the *Centre d'immatriculation*. Omissions and abuses are subject to strict sanctions, such as high fines and imprisonment.

Registration
DTRSR registers all motor vehicles, such as passenger vehicles, commercial vehicles and lorries, motorcycles, agricultural tractors and trailers above 750 kg. New motorcycles of more than 50cc are currently being registered although regulation is presently being developed for the registration of new mopeds below 50cc.

For some years, Morocco has been using credit card type registration and licensing documents. The documents have a chip on the cards containing technical vehicle information and information on the vehicle and the owner like penalty points. Drivers must have this document on them when driving the vehicle. The police forces can access the information on the chip by using a special reader.

First registration
Around 163,185 new vehicles and 424,145 imported (second hand) vehicles were registered in 2013[1].

The license plate stays on the vehicle during the entire lifespan of the vehicle. The vehicle is registered on the name of the owner or the holder of the vehicle. In the case of long-term hire or leasing (i.e. longer than two years), the vehicle is registered in the name of the user. The carte grise will then include both the name of the owner (the rental or leasing company) and the name of the user. A carte grise may list several names. First vehicle registrations and transfers of ownerships are carried out by the DTRSR. To obtain a carte grise, owners or holders have to provide details related to a buying contact, insurance and tax declaration. They also have to pay for the document. However, unpaid fines may lead to a situation where vehicles cannot be transferred, so that the Centre d'immatriculation will not issue a new carte grise.

Changes
Around 379,000 changes are entered into the vehicle register every year.

Suspension
There is no official temporary suspension procedure. Owners who wish to take their vehicle off the road can request a cancellation of the carte grise. In such cases the vehicle will not be registered as demolished.

Deregistration

[1]Source: DTRSR 2014

Every year around 1,120 vehicles are deregistered, Deregistration means that the status of a vehicle in the vehicle registration database is changed, for instance from active to scrapped or exported.

There is a statutory obligation to deregister demolished vehicles, but in practice this rule is rarely applied. When a certified expert declares that a vehicle has been seriously damaged in a crash, it can be deregistered. There is currently no procedure to change the status of a vehicle in the vehicle database when a vehicle is exported.

5.4.2.4. Registration numbers and number plates

The alphanumeric characters on the number plate consist of three elements. A group of one to five digits, followed by one or two Arabic letter(s) followed by one to or two numbers. The letter(s) corresponds with the city were the vehicle was registered.

Currently DTRSR sets only the standards for the dimensions and size of the number plates. Local entrepreneurs produce the license plates. In practice the quality (and the reliability) of the licence plate is not sufficient. This leads to difficulties with for instance the ANPR. The use of false number plates is a serious offence in Morocco, punishable by up to three months imprisonment.

5.4.2.5. Vehicle taxes and fees

Periodic tax

A differentiated tax (also called the 'vignette') is obligatory for all motor vehicles. The tax charge depends on the capacity (in horsepower) of the vehicle. The charges are set by the Ministry of Finance. In recent years, the average annual tax charge for an average passenger vehicle has been 750 Dirham. Vehicle owners can stop paying tax once a motor vehicle is not used on public roads. However, should the owner wish to drive the vehicle on public roads again, he must then pay all the tax back-payments for the period the vehicle was not used on public roads plus a fine.

Registration fee

A registration fee is charged on the issue of the carte grise (both for the initial carte grise and for any amendments). This fee depends on the vehicle's output (in horsepower) and engine type (diesel, petrol etc.). The fees are set by the region, and the earnings also go to the regions.

The registration fee applies for all vehicles, with the exception of those belonging to the corps diplomatique.

A supplementary fee, called the 'taxe parafiscale', is charged on the issue of a carte grise for a commercial vehicle or lorry. This fee depends on the vehicle's weight, and ranges from 270 Dirham for vehicles weighing up to 3,500 kg to 2,550 Dirham for those weighing more than 11,000 kg.

5.4.2.6. Insurance

A sticker on the front window indicates that the vehicle is insured. Drivers must have the insurance document with them when driving the vehicle, so that they can present it to the authorities on request. When applying for a

carte grise, owners or holders do not have to provide proof of insurance. The central motor vehicle register does not record insurance details.

5.4.2.7. Tracing and enforcement

Tracing and enforcement are the responsibility of different police forces. The gendarmerie (outside the built up area) and the police (inside the built up area) carry out regular road side inspections. Both technical and driving proficiencies are checked. The police have no online access to the databases of the DTRSR. The police and gendarmerie have a copy of the vehicle database and they can contact DTRSR about, among other things, updates, PTI, Motor vehicles tax and insurance issues. Plans are being elaborated to establish an online connection.
There is a separate DTRSR inspectorate that conducts road side inspections on driving and resting times (tachograph) and the speed limiter.

5.4.2.8. Periodic Technical inspections

In Morocco, Annual Periodic Technical Inspections (PTI) for passenger cars are compulsory after five years. Commercial vehicles and taxis are subject to annual inspection. Buses are inspected every six months. The PTI is divided among five commercial organisations including DEKRA and SGS. The inspections are conducted in PTI stations that only carry out the PTI. Maintenance and repair are carried out by private workshops. About 250 inspection centres carry out the PTIs. Every year, 2,081 million vehicles have to be inspected because they're older than 5 years or due to change of ownership. Every station works with one or more "lines". Each line one can do no more than 20 inspections per day on light vehicles or 13 on heavy vehicles. If the vehicle passes the inspection, a sticker is positioned on the inside of the front window. The information on the sticker includes the next inspection date.

The CNEH supervises the PTI stations in four different ways:

- Random audits on the equipment, building, staff and vehicles that were checked;
- Annual audits;
- Statistical checks on the numbers of vehicles inspected;
- Independent audits by Veritas.

Being a PTI inspector requires a middle level technical education plus a special PTI training. Every year, a qualified inspector needs to pass a proficiency training.

The percentage of vehicles that are not compliant (rejected after the first inspection) is 2,7%. The number of vehicles that are not compliant after repair is unknown. Driving without a PTI on the public road is an offence and can lead to high fines and scrapping of the car.

The percentage of crashes caused by a mechanical failure is not known. According to rough estimates expressed during project meetings in Rabat approximately 10% of crashes are the result of vehicle defects. Especially older cars (more than 12 years) are involved in crashes (Ministère de L'Equipement et du Transport, 2012). In different European studies the

average contribution of vehicle defects to the cause of crashes is considered to be approximately 6% (SWOV, 2012).

5.4.3. *Control of road users using the road network*

This aspect concerns specifically the conditions which determine how road users can safely move around the road network. Interventions typically set the safety standards and rules and continuing compliance requirements that will ensure the safety of the individual road user but also that of fellow road users.

5.4.3.1. The driving licence chain

The main partners in the execution of tasks in the driving licence chain are the 63 *Centres d'immatriculation*: regional licensing authorities that which issue driving licences. They fall under the supervision of the DTRSR.

Training, testing and licensing

Morocco does not have a "supervised driving" system as is presently used in many European countries in. After passing the theory test in Morocco, learners must have at least 3000 kilometres' driving experience and complete a minimum of 20 hours of driving lessons at an accredited driving school. In addition they must take part in educational meetings which also have to be attended by the supervisor and official driving instructor. When these conditions are met, the learner may apply for a the practical examination. The practical examination is carried out on a circuit (to test parking skills) and on a fixed part on public roads (to test vehicle control, driver skills and rules of the road). Plans are made to carry out the test on public roads only.

If the learner passes, he or she is issued with a temporary driving licence, which contains 24 points. For each offence one point is deducted. After two years the licence can be exchanged for a permanent licence at the prefecture, provided not all the points have been used.

Driving tests are administered by civil servants at the DTRSR. Driving schools are accredited by the prefect. Their operations and the quality of training are supervised by the METL.

Moroccan citizens or foreign nationals legally residing in Morocco can take the driving test for category B. The applicant must justify his physical and mental abilities by a medical certificate and have a minimum age of 18 years. The candidate must submit an application before being trained at a driving school certified by the METL. METL has the right to check the functioning of the school. The review is supported by officials under the TEM.

Driving licences are issued on a plastic card with a chip and a security system. The chip contains dynamic information like the points of the driving licence. The driving licence is not an official identification document. In 2013 306,692 new driving licences were issued. The driving licence is valid for 10 years and renewal is subject to a medical examination.

A foreign licence can be converted into a Moroccan licence subject to the existence of a recognition agreement between Morocco and the country that issued the foreign licence.
The conversion of foreign driving licences takes place at the Centres d'immatriculation, if there is a treaty with the nation of origin.

The central driving licence register, called *Le Ficher National de Permis de Conduire,* is maintained by the DTRSR. The information in the register covers the various driving licence categories, the loss of driving licence points, and the reasons for suspension. A photograph is part of the registration. The right of inspection is free of charge.

5.4.3.2. Registration of offences

A driving licence point system is being operated. Every experienced driving licence holder starts with 30 points whereas inexperienced (new) drivers start with 24. Points are deducted when offences are committed. The total number of deductions every year is not known. The point totals are recorded in the central database and on the driving licence. The holder is informed of a deduction in writing. If the holder commits no offences over a three-year period, any deducted points are restored. To have points restored before that time, a driving licence holder can take a driver education course for three days, at a cost of 700 Dirham. This option can be taken up once every two years.

Driving licence holders can lose their licences in two ways, either by legal sentence or by deduction of points. It is not known how many drivers per year lose their driving licence due to suspension or d point deduction.

5.5. Relevant institutional management functions

As mentioned in *Chapter 2*, there are six institutional management functions that are relevant to a safe system approach to road safety management. A full capacity review would assess each of these functions to determine if a country can implement the necessary interventions that could affect the final outcomes (and reduce crashes). However, this project is limited to research and development. Since R&D is reliant on good quality data, there is a direct link with the function of monitoring and evaluation; therefore this function is also assessed. Other management functions such as those relating to funding, coordination, legislation and promotion are not dealt with in this report.

5.5.1. *Monitoring and evaluation*

Regarding monitoring, evaluation and research the World Band guidelines (Bliss and Breen, 2009) define good practice as:

- Establishing and supporting data systems to set and monitor final and intermediate outcomes and output targets;
- Ensuring transparent review of the road safety strategy in terms of results, interventions and institutional management functions;
- Making any necessary adjustments to interventions and institutional outputs needed to achieve the desired results.

5.5.1.1. Establishing supporting data systems

To facilitate monitoring of road crashes and enable effective road safety research and development, the following data, covering the entire road network (not just national roads), should be collected and administered:

- Crashes;
- Critical offences;
- Traffic volumes, speeds and classification ;
- Enforcement (tickets issued/offence; payments; exemptions);
- Vehicle licensing and roadworthiness;
- Driver licensing and fitness;
- Road geometry.

Crashes

Morocco has road crash data available from 1968 onward. The crash database is housed at the Directorate Roads (specifically CNER) who is the custodian of the system. Extensive crash data statistics are published annually, typically in April of each year. These are based on crash data as reported and recorded by the police and the Gendarme. The basis of reporting is a manually completed crash report form. The crash forms from the brigades Gendarmerie Royale and Service des Accidents de la circulation (police) are sent to their central location in Rabat and are then sent to CNER where they are captured onto the system. A specially appointed commission (with representatives of the Roads Authority, the Gendarme, the police, CNPAC and DTRSR) meets at the end of every month to provisionally validate the crash data of the previous month. Every April the provisional data is consolidated. It is claimed that police visits every crash and that all crashes are reported. However, this cannot be verified, because there is no reliable information on the actual registration rates.

The validity of injuries as recorded by the police must also be questioned. Although police are expected to visit the hospitals and establish the true extent of the injuries and to correct this on the forms, it has not been researched to what degree this is carried out. The crash data system is not linked to hospital data and injury levels recorded on the crash forms are not corrected using hospital records of injuries.

As is the case with most crash management systems, crash locations are not always accurately recorded, often because road names are not known, there are no kilometre markers, or because the location is simply not filled in. Although CNER follows up on incomplete forms by contacting the relevant police region and officer involved, there is still a certain degree of inaccuracy related to the data. This is not the case for roads outside the cities where all roads have kilometre markers (although that is no guarantee that the locations are accurately filled in).

Critical offences

Discussion with key informers and stakeholders revealed that certain traffic offences are enforced. These include speeding, seat belt wearing, red light violations and stop and yield control violations. However, these critical road safety indicators are not periodically monitored to establish the actual effect of enforcement nor are targets set for critical offences. Critical offences,

offences that have been found to have a causal relationship between type of offence and road crashes, have not been targeted as part of the national road safety policy, nor have strategies been developed to manage these rates. Monitoring of critical offences is part of the remedial treatment of blackspots and often surveys to measure offence rates are carried out at such locations. However, these are not part of a monitoring programme and are ad-hoc and generally one-off.

During the past five years, a number of evaluations have been carried out of various campaigns aimed at certain critical offences. These include measuring the effect of campaigns aimed at increased seat belt wearing and helmet use.

Traffic volumes, speeds and classification

A comprehensive traffic counting programme is run by the Department of Roads and Road Traffic (DR). The road network comprises some 60,000 kilometres of National, provincial and regional roads of which 41,000 kilometres are paved. There are 138 permanent counting stations with classification capabilities and 500 periodic traffic counting stations. There are also 13 Weigh In Motion (WIM) stations. Vehicle speeds are not systematically measured. DR does not have a road management system (RMS). DR has a road database in which traffic and crash data is stored.

The traffic counting data is used to estimate the total mobility (annual vehicle-kilometres travelled) on each of these road networks. This data is reported annually (Ministère de l'Equipement et de Transport;Direction des Routes, 2013).

Traffic volumes on local authority roads are not centrally available, nor are they periodically counted. The calculation of risk rates on urban roads requires an assessment of what is available and how best to access and use these traffic counts.

Enforcement

Law enforcement is part of the overall road safety strategy and is directed at both vehicle and driver. The enforcement programmes are not informed by critical offence monitoring nor are the efficacy of enforcement activities measured. It is unknown what proportion of fines issued is paid (no records of the total number of fines per offence issued were made available nor is known which proportion of these are paid or result in demerit points on driving licences being incurred).

Enforcement of speeding remains a priority and local research has suggested that the current programmes have had a short term effect in reducing overall speeding levels (paper presented by Mr A. Chahidi at the Conference on 10 December 2013). Changes to the law regarding the use of radar enforcement in 2012 saw the early gains being lost. In 2013 the law was amended again and the effect of speed enforcement was evident once more with lower offence rates than in the year before. However, precisely how these studies were carried out is not clear, nor were they well documented.

Vehicle licensing and roadworthiness

Based on the review of the quality of the vehicle licensing system, a number of observations and improvements were developed.
In various processes it was observed that the flow of information between the different Moroccan institutions was complex. In many cases the vehicle owner must take action. In the Netherlands as soon a person has become the owner of vehicle he is obliged to register himself in the RDW register, The former owner also needs to do this, because otherwise he remains responsible for all obligations connected to the vehicle. RDW is the official organisation that maintains the only vehicle register in the Netherlands. RDW takes care that all entitled stakeholders are informed of any changes in the registration process. RDW selects cases of non-compliance with for instance the periodic technical inspection and sends them to the fine collection agency. In short: one organisation, RDW, is at the centre of the vehicle chain with many stakeholders and is responsible for:

Licensing and approval

- Licensing and approval of vehicles and vehicle parts for entry into the Dutch and European market in accordance with technical specifications.

Supervision and control

- Supervising companies approved by the RDW. Performing checks on the technical state of vehicles in connection with safety and environmental requirements.

Registration and information provision

- Collecting, storing, processing and managing information about vehicles, their owners and vehicle documentation. Providing information on this data.

Issuing documents

- Issuing documents related to vehicles and their owners or holders.

To ensure effective and efficient procedures, a study to improve the cooperation and the division of activities in the Moroccan vehicle chain should be considered. The vehicle owner being required to inscribe in different registers should be limited to one register.
Although no in-depth study was made of the PTI system and the quality of the motor vehicle fleet, Morocco seems to have a good legal basis to carry out the PTI. Several control mechanisms also seem to be reasonably well developed. However, a high percentage of non-compliant vehicles are observed on the roads. Even taxis which are under a strict inspection regime have broken lights, have worn tyres or poorly aligned wheels. Given the high number of older vehicles that are involved in crashes, it is recommended to intensify the exchange of knowledge between RDW and CNEH regarding periodic inspections and vehicle approval.

CNEH was found to lack reliable technical and owner information of vehicles that are offered for registration in Morocco. Exploring the possibilities of cooperation with RDW is recommended to improve the quality management of this data. As explained during the study visit, RDW maintains a database containing most of the technical details of motor vehicles that are licensed in Europe. RDW is willing to investigate a cooperation in this regard.

EUCARIS is a network of vehicle registration authorities that exchange vehicle-related data, for example whether a vehicle is stolen or scrapped. Access to this network can help both Morocco and Europe in fighting vehicle and driving licence crime. The conditions for Morocco to access EUCARIS are being investigated. One requirement is that Morocco must comply with the European directives for privacy and data security.

Vehicle dynamics can chance after a serious crash. Vehicles that are repaired after a serious crash need special attention from the vehicle authority. Badly repaired vehicles can have adverse consequences on safety. The automated control of damaged vehicles ensures that deformations of the vehicle were repaired according to the rules of the art and are within the limits accepted by the manufacturer. Given the average vehicle age and the quality level of repair, it could be investigated if such a control can, at this stage, contribute to road safety.

During their visit, the Moroccan delegation was surprised to see so few police at the roadside in the Netherlands. The digital enforcement policy is the explanation for this observation. PTI, tax, insurance, fines are all enforced by automatic comparison of linked registers.

Before the Netherlands could achieve a high level of road safety, in combination with limited roadside inspections, supporting legislation and organisational issues had to be completed. Roadside inspections can generate income. With a centralized collection and distribution system, the revenues do not necessarily flow back to the stakeholders that contributed the most. Despite the fact that police presence on the roads is relatively limited, substantial numbers of traffic fines [2] are still issued as a result of extensive automated enforcement.

It should be noted that speed enforcement is a means to achieve road safety, not the objective (SWOV, 2013). Therefore cameras should only be placed at dangerous locations to maintain the support of the public. Otherwise the public will see the cameras as a means to generate state income.

The Dutch Ministry of Justice presented the enforcement information at its traffic control center. It showed the criteria for placing speed cameras and red light cameras based on the numbers of crashes, fatalities and injuries. The speed checks that are carried out in the Netherlands by the Regional Traffic Enforcement Teams usually take place on roads that meet three criteria:

1. a relatively large number of crashes on a road section;
2. a clear or at least plausible link between crashes and speed; and
3. a relatively high percentage of speed offenders (SWOV, 2014).

Such a procedure is also recommended for Morocco.

The Public Prosecution Service showed the benefits of average speed checks (also called section control in the Netherlands) instead of fixed point speed enforcement. Cameras with Automatic Number Plate Recognition

[2] http://www.rijksoverheid.nl/nieuws/2013/02/28/aantal-verkeersboetes-in-2012-bijna-gelijk-aan-2011.html

(ANPR) are used for average speed checks, and measure the average speed driven over a certain distance, between two fixed points along a road. Under the right conditions average speed measurements can have benefits. For example, average speed checks can considerably increase the distance over which control has an effect, meaning that controls have a more sustainable behavioural effect (Goldenbeld, 2005).

Speed checks should be announced in advance to have preventive effects on speeding. Drivers will be much more inclined to reduce their speed if they know that they have a 100% chance of receiving a fine.

The Dutch Metrology Institute (NMI), an independent Dutch institute specialised in testing, certification, calibration and training in the field of metrology and games, estimated that automated traffic control represents 95% of all control actions in the Netherlands. Only 5% are made by manned mobile speed enforcement cameras. Properly calibrated systems are needed for adjudication; systems that are not calibrated and certified will lead to many appeals in court.

The Dutch Central Fine Collection Agency (CJIB) can work very efficiently due to the supporting legislation in the Netherlands. Their presentation showed that for the Ministry of Justice CJIB sent more than 10 million fines just for speeding. It is recommended to study in detail the Moroccan legislation in this field.

The central processing office (CVOM) of the Ministry of Justice explained the appeal process. Without proper legislation the enforcement system will be challenged by appeals. This will lead to delays in processing and a larger proportion of fines being declared not admissible or incorrect.

The issuing of vehicle licence plates is controlled by the DTRSR to a limited extent. As a consequence, characters used on the plates vary in size. Automated licences plate readers in for instance speed cameras, have trouble reading different sizes. Many traffic offences therefore need manual processing, for instance because the Arabic letters could not properly be detected and processed by the computer. It is recommended to tighten the process of license plate issuing, use and de-registration.

Discussion revealed that license plates do not always correspond with the vehicle or owner of the car. Exact data on the reliability of the vehicle license register could not be provided, but there appears to be a fair chance that offenders can avoid payment. It is recommended to identify the weak points in the vehicle registration process and to look for improvements

DTRSR in Rabat was visited. Interviews and demonstrations at DTRSR provided insight in the vehicle and driving licence process. Although driving licence and vehicle registration card are very modern and both have a chip, vehicle registration cards need to be checked manually for unpaid traffic fines. It is recommended to initialise a study into how to digitize these cards and the checking process. Taking into account the type of labour (very precise) and the high workload, a conversion of the paper files to digital ones could be considered.

Vehicles with unpaid traffic fines cannot be transferred to another owner. The impression was raised that when vehicle owners sell their vehicle, they do not inform DTRSR to avoid payment of the traffic fines.

Discussion with experts indicates that they are of the opinion that traffic fines should be imposed and paid within a reasonable time. A traffic offender does not get the feedback (learn) from the fine when he or she can wait until the car is sold. It is recommended to impose and collect the fine as soon as possible, without waiting for the vehicle being sold. This will also improve the reliability of the vehicle register.

Driver licensing and fitness

In the Netherlands, The Dutch Driving Test Organisation (CBR) is the examination and licensing centre. CBR is an organization that was created in 1927 by the Dutch Ministry of Transport to ensure proper education and carry out testing for all driving licence categories (A, B, C, D and E). The agency is also responsible for testing candidates applying for professional licenses for:

- Transportation of dangerous goods;
- Taxis and ambulances;
- Aviation (knowledge test only);
- Navigation canal, river and lake (theoretical exam only).

Both the Netherlands and Morocco have a stricter demerit point system for novice drivers, irrespective of their age. fall under a heavier penalty point regime. The Netherlands have no general demerit point system for older drivers, but have had a rather simple demerit point system for novice drivers since 2002[3]. The driving skills of those who, , When a novice driver commits three serious offences in the five years after having obtained the driving licence, his skills are tested. This test is compulsory and if the driving skills prove to be insufficient, the entire driving test must be taken again.

Discussions with CNPAC revealed that crash statistics of novice drivers in Morocco show a peak in crashes two years after the licence is issued. A likely reason is that new drivers postpone driving for two years because they are afraid to lose the driving license due to being ‘caught’ and collecting too many demerit points.

Since June 2011, the Netherlands has also used a demerit points system for drink-driving. This means that the driving licence is suspended if a driver is convicted for driving under the influence for the second time in five years, irrespective of the number of years of driving experience. This is done only if the blood alcohol content (BAC) exceeds 1.3‰ the second time. Once the suspension has been served, the driver must pass the official driving test again before being allowed back on the road..

CBR contributes to guidelines regarding driver licenses in Europe, by participating in CIECA (the international organization of examination institutes). Morocco has been invited to consider possible participation. Getting involved in CIECA can improve the knowledge exchange between Morocco and other counties and is therefore recommended.

[3] Presentation given during the study tour in June 2014

During their study visit to the Netherlands, the Moroccan delegation met with young owners of driving schools who are of Moroccan descent. They offered to share their experience to support the driver training in Morocco.

In a Dutch television show, traffic offenders were captured with a hidden video system installed in a police car. The producer wanted to produce the same type of programme in Morocco. This is an attempt to raise social awareness. These kinds of programmes are not common in Morocco, but possibilities could be explored.

Road geometry

DR has a database that contains data on roads themselves (geometry), traffic volumes, crashes and additional information about the road like the quality of the road surface, friction etc. etc. The Department carries out bi-annual inspections of the road network and has a classification system for the quality of the road surface.

This data is currently not routinely used in road safety analyses but is available for that purpose.

5.5.1.2. Ensuring transparent assessment of the road safety strategy

Since the introduction of PSIU I, Morocco has targeted a goal of a5% annual reduction in fatal crashes. The statistics (*Section 5.3.3*) indicate that this target has not been met (especially if measured over the longer term). A number of policy reviews have been conducted and reported (presentation Mr A. Chahidi, 10 December 2013), but these show that implemented initiatives have a limited and certainly not lasting effect on (fatal) crashes. Although a general strategic direction is evident, the goals are general in nature and therefore difficult to effectively monitor and evaluate, especially in terms of effect on the number of crashes.

5.5.1.3. Making necessary adjustments to interventions and institutional outputs

This is not done at the present time. Annual road crash statistics are produced by DR but these are no more than general statistics and do evaluate policy directives or strategic initiatives. Investments in road safety are not routinely assessed in terms of their benefits, nor is there a clear understanding of the effects of the various road safety initiatives.

5.5.1.4. Summary/assessment

Although Morocco has various information systems, these are mainly stand-alone systems serving a specific purpose. Effective road safety management requires a comprehensive information platform containing data of crashes, vehicles, drivers, enforcement and adjudication, traffic (speeds, volumes etc.). Since monitoring is an essential component of a management system, this data needs to be accurate, current and reliable. Much of this data is not readily available (e.g. at the local authority level) and it is anticipated that initially such a system will be developed using data on the national (rural) road network. As this data serves many end-users it may be logical to establish a central unit/agency responsible for data collection, validation and quality control. This would seem to fit in logically with the DR activities.

The current data collection, analysis, validation and sharing mechanisms of road safety management information in Morocco are not optimal for effective management of crashes in the country. In most cases no performance-based criteria have been set for potential road safety indicators but this could be due to the fact that benchmarks cannot be set because of lack of necessary data. Although there are state of the art registration systems, these are not always linked with other systems or have no attempts been made to integrate these systems. A detailed review of the systems may be required to identify opportunities for exploiting this data to improve road safety management and to facilitate target setting.

5.5.2. *Research and development and knowledge dissemination*

The institutional management function relating to research and development and knowledge dissemination is defined as "the systematic and on-going creation, codification, transfer and application of knowledge that contributes to the improved efficiency and effectiveness of the road safety management system to achieve the desired focus on results" (Bliss and Breen, 2009).

This institutional management function is vital to all effective road safety management systems. It provides the means to develop, design, guide and implement national strategies aimed at reducing the number of road deaths and serious road injuries, irrespective of the challenges posed by growing mobility and exposure to risk.

Good practice regarding research and development and knowledge dissemination is characterised by the following dimensions:

- Developing capacity for multi-disciplinary research and knowledge dissemination;
- Creating a national road safety research strategy and annual programme;
- Securing sources of sustainable funding for road safety research;
- Training and professional exchange;
- Establishing good practice guidelines;
- Setting up demonstration projects.

Although the PSIU strategies list specific actions and initiatives which were delegated to the relevant line departments without explicitly naming monitoring and evaluation as a task for any of the actions. Evaluation or research were not integral to the overall policy. Consequently, a co-ordinated road safety research programme is not evident in Morocco. A number of organisations such as CNPAC do conduct education and promotion campaigns and in some cases monitor the effect of these campaigns. However, research into underlying causes of the road safety problem in the country or research aimed at explaining the development of certain trends or effects of programmes is not routinely carried out.

5.5.2.1. Summary/Assessment

Research, development and knowledge dissemination on road safety issues take place on an ad-hoc basis in Morocco. A dedicated road safety research programme, backed by sustainable funding sources and carried out by dedicated research staff is currently not apparent. This project is an example

of one which typifies capacity building and professional exchange but needs to be expanded to include all aspects of road safety. The feasibility of establishing a dedicated road safety research institute as an independent entity or as part of a future road safety agency needs to be further explored.

Cooperation between the different road safety stakeholders was most frequently mentioned by far as the key to improve road safety. The presence of representatives of so many Moroccan organizations (DTRSR, CNEH, CNPAC, CNER, Police and Gendarme) was warmly welcomed. This cooperation is promising and should be preserved and expanded.

6. Status quo in relation to international best practice

This chapter gives an overview of *Chapters 4* and *5* and compares what is regarded as international best practice (based on the concepts of Bliss & Breen) to the situation as observed by the project team in Morocco. It is, however, important to point out that in this instance "best practice" regarding what the lead road safety agency's role should be, is based on a combination of theory and current practice in many countries. At this point in time, most countries (including those already applying a safe system approach) would not meet all the criteria set out as best practice for such a lead agency. Such best practice illustrates an ideal situation which may not be attainable for most countries. Nevertheless, the evaluation methodology does provide insight into particular strengths and weaknesses and it is the aim of the evaluation to identify those that can be improved in the short term and that will lead to quick-wins whilst building capacity in the other areas so as to improve overall road safety management within the systems framework.

6.1. Results focus

Results focus is the primary function of road safety management (and consequently a main task for a lead agency or for the organisations responsible for road safety) and determines the strategic direction. It aligns policy, strategy and interventions with results and implicit in this are reliable and representative data systems supporting a performance orientated approach to road traffic safety management. *Table 6.1* gives an overview of the situation in Morocco as compared to what a lead agency should be doing if a safe system concept were applied.

Tasks	Lead Agency role	Status in Morocco
1. Appraising current road safety performance through high level strategic review	– Manage the process of governmental assessment of road safety performance.	– There is no department that has this as a specific task.
	– Identify and bring together key stakeholders and partners that can and will deliver actual road safety results.	– The key stakeholders are known but are not an active part of the process, nor are there formal agreements assigning roles and responsibilities.
	– Initiate road safety capacity assessments .	– The World Bank initiates the first assessment.
	– Chair governmental road safety performance assessments.	– There is an Inter-Ministerial committee although such assessments have not been reported.
	– Prepare reports, papers and bulletins reporting on road safety performance.	– In exceptional cases such reports have been prepared..
	– Achieve consensus on key problem areas in the road safety management system.	– Road safety initiatives and programmes are not structurally monitored.
	– Follow up on agreed actions.	– Key problem areas are defined in national strategies and developed by responsible agencies. However, not all

Tasks	Lead Agency role	Status in Morocco
		parties are involved in road safety management and hence actions are segmented.
2. Adopting a far reaching road safety vision for the longer term	– Study and propose a long term and far reaching road safety vision.	– At present a long term strategy is being developed. The previous PSIU was the result of joint collaboration between DTRSR/CNPAC and Road Departments.
	– Discuss the road safety vision with government and other partners and with stakeholders and society as a whole.	– Local authorities and other partners are not routinely consulted, nor are other ministries-these should be formally “contracted” .
	– Identify the key partnerships needed within and outside government for promoting the vision.	– This is done on an ad-hoc basis and is certainly not inclusive. The theme committees set a basis but the key partnerships must be further developed by the Lead Agency.
	– Identify the potential for high-level promotion and championing to underpin the road safety strategy.	– The inter-ministerial committee is responsible although its role in setting the targets and monitoring is not evident.
	– Get agreement on the vision and ensure that this is entrenched in legislation.	– The ministerial decree (204-266) of 2006 is aimed at this but does not clearly define the different roles and responsibilities.
	– Get agreement on shared responsibility which is implicit in the far-reaching vision and ensure that this is clearly defined in the national road safety strategy.	– The new strategy is being developed but it is unclear whether formalized agreements (SLAs) form part of this. Judging from the past this is not common practice.
3. Analysing what can be achieved in the medium term	– Assess key road safety problems and the potential for further improvements in consultation with government and other partners/stakeholders.	– There is a strategy but it is not evidence-based, nor are goals clearly defined or based on research. It is the product of consultations between stakeholders.
	– Draw on local and international research expertise in the reviews.	– Not done at present.
	– Identify information needs for road safety strategy development.	– An assessment of road safety management systems is currently being initiated through the World Bank .
	– Identify the key elements of good practice results focus, system-wide safety interventions and improved institutional arrangements using national and international research.	– Not structurally/routinely done. The quality of road safety management data is fragmented and not optimally utilised. International best practice is adopted on an as needs/ad-hoc basis.
	– Analyse long-term trends which could affect future road safety outcomes.	– The data systems supporting such analyses are adequate but not complete.
	– Carry out scenario planning and (computer) modelling to develop road safety strategies.	– Modelling and scenario planning are not part of current practice.

Tasks	Lead Agency role	Status in Morocco
	– Carry out cost-effectiveness reviews and public acceptability studies of strategy interventions.	– Not done at present.
	– Consult with key governmental and other partners and stakeholders within the coordination hierarchy on the multi-sectoral strategy options.	– This is a task of the inter-ministerial committees although this is not evident in the strategies or in their implementation. The role players are very much restricted to within the department responsible for road transport.
	– Appoint an institute to identify and close the deficiencies in the vehicle and driving licence chain.	– Vehicle owners and drivers find opportunities to escape their obligations. As a consequence road safety measures are less efficient.
	– Close the gap between the legislation and everyday practice.	– For instance the PTI legislation is well elaborated but in practice many non-compliant cars are seen on the roads.
	– Establish an international exchange of data and best practises.	– Technical vehicle details are difficult to verify with source (like for instance RDW's type approval database).
	– Facilitate the exchange of road safety-related data between national institutes.	– Several examples were found (PTI, insurance, fines) where information was not or not easily accessible for entitled institutes.
	– Establish a driver training that prepares for every day traffic.	– A fixed route to examine drivers can lead to insufficiently trained driving skills. Heavy penalties for juvenile drivers can lead to more crashes after the term of restrictions is past.
4. Setting quantitative targets by mutual consent	– Set up a road safety strategy unit within the lead agency.	– There is currently no such unit nor is there a central lead agency. The responsibilities are shared but fragmented.
	– Set up technical support groups for the target-setting process.	– As above.
	– Propose and seek agreement through its inter-governmental coordination arrangements on challenging but achievable targets for final outcomes, SPIs and institutional outputs at the national level.	– As above, final outcomes are monitored, but the degree of achieving set goals not managed.
	– In the longer term seek agreement with regional and local governments on achievable road safety targets and achievable outcomes.	– Currently not coordinated as there is no single point of responsibility.
	– Publish details of the targets and strategies in which the accountabilities of the different partners and stakeholders are also detailed.	– Not done at present.
	– Monitor and report progress at regular intervals to all involved and adapt and refine intervention output levels where necessary.	– As above.

Tasks	Lead Agency role	Status in Morocco
5. Establishing mechanisms to ensure partner and stakeholder accountability for results	– Set out the responsibility of the lead and other agencies to achieve specified road safety results (outcomes and outputs) in annual performance agreements.	– Informal roles are stipulated but no formal agreements have been entered into by the partners/stakeholders.
	– Use Memoranda of Understanding (MoU) to underline agreements about the way in which the members work together on road safety issues.	– Without a single body that is responsible this is not currently possible in Morocco.
	– Set performance-based road safety targets and delivery of results as a formal criterion in the performance-driven employment remuneration package of the lead agency Chief Executive and senior management team.	– Not part of the current practice in Morocco (complete situational analyses are not (regularly) carried out).
	– Encourage outputs and contributions of a wider group of partners and stakeholders based on formal and published declarations of intent to carry out specific interventions which contribute to improved road safety results.	– Currently not common practice to have performance contracts/SLAs for specific stakeholders.

Table 6.1. *Lead agency role in a safe system approach and the Moroccan situation.*

6.2. Promotion

Promotion deals with the process of communicating with the public on road safety matters. It should be a core business of government and society to emphasise the shared social responsibility to develop, implement and support road safety improvement initiatives and interventions that aim at meeting stated targets. *Table 6.2* gives an overview of what is regarded as best practice compared to the current practice in Morocco.

Tasks	Lead Agency role	Status in Morocco
1. Promotion of a far-reaching road safety vision or goal	– Play the leading role in promoting the shared responsibility for achieving road safety results by creating and articulating a far-reaching vision and concepts for a safer road traffic system.	– CNPAC has a leading role in promoting road safety although its efforts are somewhat curtailed and do not cover the full spectrum of road safety (concentrate on education and enforcement and then only certain themes within each discipline).
2. Championing and promotion at a high level	– Utilise every relevant opportunity to engage the President or Prime Minister in launching national targeted road safety strategies and programmes to ensure maximum political authority and publicity.	– This is not a structural task. The Inter-ministerial committees are informed and take the lead in this.
	– Encourage all Ministers in the road safety partnership to play an active role in creating awareness of road safety challenges and to promote policy initiatives in the media.	– Not all ministries are represented nor is road safety high on the list of priorities within those ministries (e.g. Ministry of Health).

Tasks	Lead Agency role	Status in Morocco
	– Develop and nurture a core group of leading senior professionals in the road safety field -leading academics, casualty surgeons, chief police officers, interested parliamentarians from all parties, and community leaders who advocate and forge support for important policy development.	– This is not part of the activities currently supported by CNPAC.
3. Multi-sectoral promotion of effective interventions and shared responsibility	– Stimulate and invest in multi-sectoral promotion of the strategy and evidence-based interventions through existing and new road safety partnerships.	– Not currently the model by which road safety activities are planned and implemented in Morocco.
4. Leading by example with in-house road safety policies (e.g. safety culture)	– Devise fleet policies for the lead agency based on good practice and encourage wider use. – Specify road safety demands in the transport contracts developed by the lead agency with organisations (e.g., car rental, taxi hire, road haulage companies).	– There are no specific in-house policies and if these exist they are not used as case in point examples for industry and public. – Not part of current contracts.
5. Developing and supporting safety rating programmes and the publication of the results	– Contribute to the development and support of safety rating programmes and their organisation together with road user and consumer groups.	– Not part of the current approach.
6. Carrying out national advertising	– Ensure that regular information is available and accessible on the key road safety problems as well as on upcoming policy initiatives to achieve results. – Develops in-house capacity for road safety promotion as well as contracting out targeted road safety advertising in support of the major themes of the national road safety strategy.	– As mentioned under (1), this task is performed by CNPAC . – As mentioned under (1), this task is performed by CNPAC.
7. Encouraging promotion at the local level	– Mobilise local leadership and support to help achieve road safety strategy goals. – Develop and fund targeted community road safety programmes and support local road safety coordinators.	– CNPAC is active at national level and has limited contact with local levels. – National programmes only, local initiatives the responsibility of local levels.

Table 6.2. *Promotion: international best practice and the current state of affairs in Morocco.*

6.3. Monitoring and evaluation

Monitoring and evaluation deal with the on-going and systematic measurement of road safety performance measures and indicators in order to assess and evaluate the efficacy of introduced measures and interventions.

Table 6.3 compares the role of what a lead agency should be doing and what is being done in Morocco at present.

Tasks	Lead Agency role	Status in Morocco
1. Establishing and supporting data systems to set and monitor final and intermediate outcome and output targets.	– Establish databases to identify and monitor final outcomes and SPIs and their outputs.	– Various databases are maintained in Morocco, each by a different organisation and not always accessible to all. SPI's are not formalised, only crashes monitored and maintained.
	– Establish and publish the socio-economic cost of road traffic injuries.	– These have not been established. Statistical Value of Life (SVOL) not known.
	– Establish central computerised transport and driver licensing registries to manage data on the number of vehicles and drivers on the road which are easily accessible for enforcement agencies.	– Driver and vehicle register maintained by DTRSR. However, system not on-line but licence or vehicle can be retrieved when fined and controlled.
	– Establish travel patterns and exposure in the system of different types of road use through periodic national travel surveys (mobility surveys).	– Seldom carried out.
	– Establish links between police reports and hospital admissions data so as to assess levels of underreporting.	– Not linked and cannot be done with the present system.
	– Establish links between national causes of death statistics to assess and validate traffic fatalities.	– CNER is responsible for the crash database but has no access or means to the hospital records. The police do the follow-up check to see if casualties have died.
	– Establish or support existing safety rating programmes on new cars and road networks which provide SPIs.	– No rating system exists. CNEH applies EU rules/standards and type approval based on manufacturer specification.
	– Conduct before and after studies to establish the effectiveness of specific road safety measures and in-depth studies to ascertain contributory factors, and the causes and consequences of injury.	– Not structurally carried out at present.
	– Establish or adopt tools for local highway and police authorities to undertake data collection, analysis and monitoring techniques and database management.	– This is done on an as-needs basis and is determined by each department according to wish.

Tasks	Lead Agency role	Status in Morocco
2. Transparent review of the national road safety strategy and its performance.	– Conduct regular reviews of the progress of the national road safety strategy in achieving results. – Establish transparent independent peer reviews of road safety management capacity in terms of results, interventions and institutional management functions. – Establish a road traffic inspectorate to monitor the rate and quality of implementation of its road safety strategy. – Report road safety results and progress made and make interactive crash data systems available on the Internet.	– No integral and overall evaluation is carried out. Each department reports its own activities. – Not carried out to date, the World Bank is initiating one such study at present. – CNER partially has this role although not integrated with the judiciary and police systems. – Per department and not centrally available to all parties via website or internet (not interactive).
3. Making any necessary adjustments to achieve the desired results.	– Ensure that the results of monitoring and evaluation are presented and discussed at all levels of the road safety strategy coordination hierarchy to improve the focus on achieving results (see *Section 6.1*).	– Partially dealt with by the inter-ministerial committees but a lack of a comprehensive and cohesive strategy with clearly set goals and targets. This results in a fragmented approach.

Table 6.3*. Monitoring and evaluation: international best practice and the current state of affairs in Morocco.*

6.4. Research and development and knowledge dissemination

This is an integral and essential component of any road safety management system and relates to the timely identification of changes in the system, the development of new techniques and methods, the application of new knowledge and the transfer and application of knowledge to continually improve the efficiency and effectiveness of the system in order to keep meeting the desired results.

Table 6.4 gives a comparison of international best practice regarding a lead agency role regarding research and development and current practice in Morocco.

Tasks	Lead Agency role	Status in Morocco
1. Developing capacity for multi-disciplinary research and knowledge dissemination.	– Ensure in-house capacity for road safety research and management as well as contract out to road safety research organisations as road safety activity improves. – Support and develop key partnerships with independent road safety research organisations for a range of road safety management functions.	– Research is not carried out nor do the responsible departments have the necessary expertise or capacity to conduct this. Ad hoc research conducted by consultants – There is limited contact and co-operation with research institutes or universities. There is currently no specific institute conducting road safety research
2. Creating a national road safety research strategy and annual program	– Establish, together with partners, a national road safety research programme to address the needs of the road safety strategy with annual	– There is no programme. This collaboration project aims to identify initial opportunities to build capacity in this area

Tasks	Lead Agency role	Status in Morocco
	review of needs and consultation with external experts.	
3. Securing sources of sustainable funding for road safety research	– Assign specific annual budgets for road safety research for in-house and external research; – Establish levies on motor vehicle insurance premiums in support of road safety research; – Encourage business sponsorship for public sector research.	– This will need to be carried out and is not currently provided for other than for ad-hoc research projects
4. Training and professional exchange.	– Employ a variety of means for training and knowledge dissemination including professional exchange and attendance at road safety courses, seminars and workshops.	– No formal cooperation and exchange programmes exist
5. Establishing good practice guidelines	– Develop in-house or contract out to research and professional organisations the production and dissemination of good practice guidelines which comprise a synthesis of universal road safety principles in specific areas of road safety, advice on the general means of applying them and illustrative case studies.	– Guidelines are developed by consultants and generally adopted from other countries and are not based on research input from Moroccan studies.
6. Setting up demonstration projects	– Develop and fund demonstration projects in areas which offer large potential for road casualty reduction and use the successful results to roll-out the projects on national scale.	– Small scale demonstration projects are initiated but generally not based on results from local research.

Table 6.4. *Research and development: International best practice versus current state of affairs in Morocco.*

7. Conclusions and Recommendations

7.1. Road Safety Research and Development

Overall, research, development and knowledge dissemination on road safety matters take place on an ad-hoc basis in Morocco. A dedicated road safety research programme, backed by sustainable funding sources and carried out by dedicated research staff is currently not present. This project is an example of one which typifies capacity building and professional exchange but needs to be expanded to cover all aspects of road safety. The feasibility of establishing a dedicated road safety research institute as an independent organization or as part of a future road safety agency needs to be further explored.

7.2. Road Safety Management

Although Morocco has various information systems in operation, these are in fact all stand-alone systems serving a specific purpose. For road safety management to be effective, a comprehensive information platform containing data relating to crashes, vehicles, drivers, enforcement and adjudication, traffic (speeds, volumes etc.) is advised. In the Netherlands a system like this is being built. Since monitoring is an essential component of a management system, this data needs to be accurate, current and reliable. Much of this data is not readily available (e.g. at the local authority level) and it is anticipated that initially such a system will be developed around data on the national (rural) road network. As this data serves many end-users it may be logical to establish a central unit/agency responsible for data collection, validation and quality control. This would seem to logically fit in with the activities of the DR.

The current data collection, analysis, validation and sharing mechanisms of road safety management information in Morocco are not optimal for effective management of crashes in the country. In most cases no performance based criteria have been set for potential road safety indicators but this could be due to the fact that benchmarks cannot be set because the data needed to set them are not available. Although there are state of the art registration systems, these are not always linked with other systems, nor have possibilities to integrate these systems been explored. A detailed review of the systems may be required to identify possibilities for using this data to improve road safety management and to facilitate target setting.

It is recommended to improve the data exchange cooperation between the different stakeholders (like DTRSR, CNEH, CNPAC, CNER, Police and Gendarme) to increase road safety. In various processes it was observed that the flow of information between the different institutions was complex or non-existent. The Dutch model, for instance, can be used as good practice.

Road safety inspections or systematic assessments from a road safety engineering perspective are not routine. Inspections are generally carried out as part of pavement management and maintenance programmes but do not include specific road safety elements. Target setting based on (safety

performance) indicators is not included as part of the overall road safety improvement plan nor are these monitored .

In addition to these more general points we recommend the following activities; the list is not exhaustive.

- Develop a comprehensive strategy based on harder targets, both in terms of crashes and intermediate outcomes;
- Develop a critical offences monitoring strategy and programme;
- Initiate studies focused on checking the crash registration rates;
- Develop systems to link hospital data and crash data to prevent underregistration and to validate severity;
- Identify high risk locations and secure funds to address these blackspots;
- Set targets and design programmes for addressing high risk locations;
- Develop an integrated quality control system for road design (audit guidelines; courses etc.);
- Driving tests can be improved by testing candidates on a random route containing normal traffic conditions instead of using a fixed route.

7.3. Enforcement

Although they do not appear to be systematically reported, certain critical offences in Morocco are monitored. The following offences are monitored at locations which crash data have identified as high risk locations:

- Speeding;
- Seat belt wearing;
- Helmet wearing (motorcycles);
- Red light violations;
- Stop and yield sign violations.

We recommend to develop a strategy and programme for monitoring critical offences.

With regard to vehicle registration and enforcement, it was observed that vehicle owners and drivers seem to be able to find opportunities to escape their obligations such as paying fines. As a consequence enforcement measures are less efficient or effective. The legal basis for improvement of the cooperation between the various parties involved in the vehicle chain should be explored and enforcement bodies should have online access to all relevant data at all times. It is recommended to: investigate to what extent drivers and vehicle owners can avoid fines and other enforcement measures; investigate to what extent this hinders enforcement; investigate possible improvements such as tightening the legal basis for enforcement, improved data- exchange and access to data for all authorities involved and/or improvement of the relevant registrations such as linking the registration of vehicle holders/owners and the central population register.

Technical vehicle details are difficult to verify without reliable sources such as, for instance, the RDW type approval database in the Netherlands. Despite the legal position of PTI, many vehicles do not seem to comply with the PTI requirements.

It is recommended to benefit from the international network to enhance the reliability of the technical and ownership information of vehicles that are offered for registration in Morocco. It is recommended to explore cooperation with RDW. As explained during the study visit, RDW maintains a database that contains most of the technical details of motor vehicles that are licensed in Europe. RDW is willing to investigate a cooperation in this field.

It is recommended to explore obtaining access to EUCARIS, not only regarding road safety, but also regarding vehicle crime EUCARIS is a network of vehicle registration authorities that exchange vehicle related data; for instance when a vehicle is stolen or scrapped. Access for Morocco can help both Europe and Morocco to fight vehicle and driver license crime. The conditions for Morocco are being investigated. Morocco must comply for instance with the European directives for privacy and data security.

It is recommended to to improve the effectiveness of PTI. Currently, a high percentage of non-compliant vehicles appear to be on the road. Even taxis that are under a strict inspection regime often appear to have malfunctioning head and taillights, worn tires, poorly aligned wheels and ill-functioning seatbelts. Given the high number of older vehicles that are involved in accidents, it is recommend to intensify the knowledge exchange between RDW and CNEH.

Heavily damaged vehicles that are repaired need to be given special attention. Automated control of damaged vehicles ensures that deformations of the vehicle were repaired according to the rules of the art and are within the limits accepted by the manufacturer. Given the average vehicle age and the quality level of repair, it could be investigated if such a check can, at this stage, contribute to road safety.

It is furthermore recommended to use clear national criteria for placing speed cameras and red light cameras based on the number of crashes, fatalities and injuries. Before investing in automated systems, supporting legislation must be in order. Without proper legislation the enforcement system will be challenged by appeals and lead to processing delays. In addition, when using such equipment it is strongly recommended to use properly calibrated systems to prevent the legal systems being overloaded with appeals.

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Appendix A Amplifying questions/Interview questionnaire

SWOV/RDW/CNPAC Interview Questionnaire
for the stakeholder interviews for Morocco road safety research and development review

Date 31/03/2014	Person Interviewed:
Interviewer: GS/MH	Title and position:
	Company
	Address
	Telephone number

SECTION A : RELATED TO A PROPOSED ROADS AGENCY

Questions	**Responses**				
	Yes	**No**	**Partial**	**In preparation**	**Elaborate answer**
Is road safety a national priority and does it have the support to justify (the establishment of) a road safety management system based on safe systems thinking?					
What are the underlying causes that have prevented past attempts to redress the road safety problems in Morocco					
What are the road safety R&D capabilities of Morocco?					
Is there a lead agency and what is its role (who are the main stakeholders, coordinators and administrators)?					
What resources are dedicated to road safety R&D?					

SECTION B: RELATED TO ROAD CRASH AND RELATED DATA

Questions	Responses				
	Yes	No	Partial	In preparation	Elaborate answer and name sources to prove statement
Are the current data and data systems adequate to support the effective management of road safety in Morocco? If not, what is necessary in order to make these suitable?					
Are there barriers or risks that prevent the use or limit the availability of data for use in road safety management? (are there barriers preventing inter-departmental sharing, legal constraints, issues relating to privacy etc.)					
What sort of data is required by your department for effective management of your core tasks?					

Section C: Related to the planning, design, operation and use of the road network

Questions	Responses				
	Yes	No	Partial	In preparation	Elaborate answer and name sources to prove statement
Have comprehensive safety standards and rules and associated performance targets been set for the planning, design, operation and use of roads (National, provincial and municipal) ?					
Has a systems approach been adopted in the planning and classification of the road network?					
Who sets speed limits and how are these determined?					
Are speed limits compliant with the concepts of safe and credible and aligned with safe system design principles?					
Are the applied safety standards and rules monitored for compliance and are remedial programmes the result?					
What traffic and safety management instruments and tools are deployed to ensure optimal levels of road safety are provided?					
Do existing resources have the necessary skills and training to effectively manage road safety of the road network?					

Section D: Related to the vehicles and road users on the road network (Based on Meeting at DTRSR)

Questions	Responses				
	Yes	No	Partial	In preparation	Elaborate answer and name sources to prove statement
Have comprehensive safety standards and rules and associated performance targets been set to govern the use of vehicles and safety equipment (such as safety helmets) on public roads? (including compliance testing of new vehicles; crash testing etc.)					
As above but directed at all road users and drivers of vehicles?					
Is there a system to test the ongoing compliance of vehicles and safety equipment to specified safety standards and rules? (including the effect of annual roadworthiness testing on safety; vehicle repair, parts management and compliance etc.)					
As above but directed at drivers of vehicles					
Do the adopted and applied safety standards meet the needs of high risk user groups and are performance targets set and monitored? (e.g. are vehicles fitted with pedestrian friendly bonnets etc.)					
Do the specified safety standards and rules and related compliance regimes address the priorities of high risk road user groups?					

Section E: Related to Monitoring and evaluation and research and technology transfer

Questions	Responses				
	Yes	No	Partial	In preparation	Elaborate answer and name sources to prove statement
For all road categories, are sustainable systems in place to collect and manage data on road crashes(fatality and injury outcomes, related road/environment/vehicle/road user factors) and mobility (traffic counts, road network length, modal split and vehicle use, etc.) to monitor and evaluate the set targets?					
For all categories of roads are there sustainable systems in place to monitor and manage data on road network traffic and critical offences (speeding, alcohol, seat belt usage, helmet wearing, etc.) to measure the performance against set targets.					
Are all roads regularly inspected and checked for compliance against safety (design) standards and is there a programme of remedial engineering in place?					
For all road types is there a monitor of implemented remedial treatments resulting from engineering, police, educational, promotional, driver training, vehicle testing or other intervention?					
For each category of post-crash service (pre-hospital, hospital or long term care) are systematic and regular surveys undertaken to assess adherence to standards and set targets?					
Are attitudinal surveys on road safety interventions structurally and regularly undertaken to monitor the performance of stated targets?					
Do all participating departments and agencies have open access to all data collected?					
How is the R&D programme developed and implemented?					
Which organisations are responsible and participate in R&D and is this centrally co-ordinated?					

SECTION F: LAW ENFORCEMENT AND POLICING

Questions	Responses				
	Yes	No	Partial	In preparation	Elaborate answer and name sources to prove statement
Are there law enforcement programmes targeting specific offences?					
Are these programmes based on data review and which data are those?					
Are these programmes periodically reviewed and do they have targets that are monitored?					
Are police officers trained adequately trained to perform their duties?					
Is the equipment for traffic law enforcement adequate and regularly calibrated?					
Are offences followed up and is there a monitor of offences issued and cases adjudicated (ie do we know what proportion of fines issued lead to admission of guilt/payment)					
Are there targets set for the number of fines issued for specific offences?					

SECTION G: OTHER MATTERS

Questions	Responses				
	Yes	No	Partial	In preparation	Elaborate answer and name sources to prove statement