Report
on
Road Safety Information Systems Development for Poland

Diagnosis and High Level Action Plan

FINAL

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ABBREVIATIONS

ANSV	Argentinian Road Safety Lead Agency (Agencia Nacional de Seguridad Vial)
AIS	Abbreviated Injury Scale
BDD	*Bank Danych Drogowych* - Road Data Bank
BDWIK	Roads and Bridges Research Institute's Integrated Transport Database
CDV	*Centrum Dopravního Výzkumu, v.v.i.* - Transport Research Centre in the Czech Republic
CEPIK	*Centralna Ewidencja Pojazdów i Kierowców* - Central Database of Vehicles and Drivers
CZRSO	Czech Road Safety Observatory
DGT	Spanish Directorate-General for Traffic
DRL	Daytime Running Lights
ERSO	European Road Safety Observatory
EC	European Commission
EU	European Union
ESIF	European Structural and Investment Funds
EuroNCAP	European New Car Assessment Program
EuroRAP	European Road Assessment Program
GDDKiA	General Directorate of National Roads and Motorways
GPS	Global Positioning System
GRSF	Global Road Safety Facility
GUS	Central Statistical Office
GUS BDL	General Data Base held by the Central Statistical Office
ICD	International Classification of Diseases
IMiGW	*Instytut Meteorologii i Gospodarki Wodnej* - Meteorology and Water Management Institute
iRAP	International Road Assessment Program
IRTAD	International Road Traffic and Accident Database/ International Traffic Safety and Analysis Group
ITD	Inspectorate of Road Transport
ITF	International Transport Forum
ITS	*Instytut Transportu Samochodowego* Motor Transport Institute
MAIC	*Ministerstwo Administracji i Cyfryzacji* - Ministry of Administration and Digitization
MAIS	Maximum Abbreviated Injury Scale
MI	Ministry of Interior
MID	Ministry of Infrastructure and Development
MoT	Ministry of Transport
NFZ	Narodowy Fundusz Zdrowia – National Health Fund
NIK	*Naczelna Izba Kontroli* - Supreme Chamber of Control
NIZP –PZH	*Narodowy Instytut Zdrowia Publicznego* - National Institute of Public Health (former PZH – Państwowy Zakład Higieny
NLA	National Lead Agency
NRSC	National Road Safety Council
NRSP	National Road Safety Program
OECD	Organization for Economic Co-operation and Development
OISEVI	*Observatorio Iberoamericano de Seguridad Via* - Ibero-American Road Safety Observatory

ONSV	*Observatorio Nacional de Seguridad Vial* - National Road Safety Observatory in Spain
PIU	*Polska Izba Ubezpieczycieli* - Polish Insurance Chamber
POBR	*Polskie Obserwatorium Bezpieczeństwa Ruchu* – Polish Road Safety Observatory
RDB	Road Data Bank (Bank Danych Drogowych)
RRSC	Regional Road Safety Council
RSC	Road Safety Council
RSCR	Road Safety Capacity Review
RSIS	Road Safety Information System
RSO	Road Safety Observatory
RUM	Road User Movement
SCRAS	Standing Committee on Road Accident Statistics
SEWIK	*System Ewidencji Wypadków i Kolizji* - Crash Injury Data Base held by Police
SEZAR	Road Events Registration System in Warminsko Mazurskie
SNRSC	Secretariat of National Road Safety Council
SPIs	Safety Performance Indicators
STRADA	Swedish Traffic Accident Data Acquisition
SWOV	Dutch National Road Safety Research Institute
TEN-T	Trans-European Networks - Transport
TERYT	Data Base on Administrative Units held by the Central Statistical Office
TRL	Transport Research Laboratory
WHO	World Health Organization
WORD	Voivodship Traffic Training Center
VRA	Voivodship Road Authority (ZDW – Zarząd Dróg Wojewódzkich)

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EXECUTIVE SUMMARY

Although improved from 2001 to 2013, Poland's road deaths improved at a slower rate than the rest of the EU, leaving Poland as one of the worst performing road safety countries in the EU. In consequence Poland sought help from the World Bank, which began work on road safety in Poland in 2012 with a Road Safety Management Capacity Review and assistance with development of a Road Safety Strategy and Action Plans. These projects have all been completed and highlighted the lack of systematic sound readily available data for road safety management as one of key problems hampering fact based and result focused approach to road safety in Poland. Thus the present review was initiated in order to address this core issue. Strong road safety leadership, advocacy, management, monitoring, delivery and refinement all require accurate, comprehensive, readily available data on final outcomes (deaths, injuries, crashes, collisions, and costs), intermediate outcomes (seat belt usage rates, speeding behavior, roadsides with appropriate barrier protection, etc.), underlying factors (road use, attitudes, beliefs), and outputs (safe road design and standards, sound vehicle inspections, enforcement, education and promotion). This demands the development of a comprehensive road safety observatory containing these data and the capacity to analyze them.

The review team drew evidence from a range of sources: international good practice, international manuals and guides on road safety data management, safe system principles, examination of the features of many databases, and extended interviews with representatives of many organizations across Poland at all levels of Government as well as non-government.

The review has generated commentary and suggestions on many aspects of road safety data management in Poland, such as:

1. Collection of crash data;
2. Defining outcomes for comparability and benchmarking;
3. Additional existing databases for inclusion in the Road Safety Information System;
4. Institutions which should have access to these data;
5. Analytical capabilities, responsibilities, and reporting;
6. Facilitating, engaging, and informing self-government;
7. Data linkages;
8. Additional regular data collections on intermediate outcomes;
9. Resourcing and contracting process required to efficiently manage the creation and maintenance of the recommended databases;
10. Analyses and uses of the databases;
11. Public access to data;
12. Ensuring the sustainable management and use of the databases;
13. Access to, and ability to use, a sound evidence base from research and experience.

While there are many strong elements of road safety data management in Poland, there are significant weaknesses, gaps, and inefficiencies which are described in the report. In summary, these include inaccuracies of data, lack of collection of some key variables, data

collection processes which require updating, lack of integration, coordination, and limited sharing of data, limited linkages of key data sources, lack of transparency, substantial duplication of effort, insufficient analytical capability or capacity to employ road safety data to develop policy and programs. However, a number of current developments align to present strong opportunities for advancement. These include increased understanding of the need to improve and co-ordinate road safety data, the improving capacity of the Secretariat of the National Road Safety Council to manage road safety, planned improvements and developments to a number of relevant databases, the addition of GPS devices to Police vehicles, the linkage opportunities arising from Poland's PESEL numbers (which must be used sensitively to protect privacy), EU co-funded project to develop tools for an observatory by the Institute of Motor Transport [1](ITS) and the Ministry of Administration and Digitization (MAiC) effort to improve government transparency by promoting open access to governmental and other public sector data.

The report identifies issues and suggests strategies and actions to overcome the issues identified. In essence, the ideal road safety data management solution for Poland is a crash and road safety data and information system which allows sustained, effective, efficient, fully informed management, delivery, evaluation, and performance monitoring of road safety. In order to achieve this the data and information must be sustainably stored, accurate, comprehensive and credible; should be amenable to international benchmarking; must be readily available to multiple stakeholders facilitating public scrutiny; must be expertly analyzed; and must be effectively used in the advocacy for, development of, public promotion of, assessment of, and monitoring of road safety activities. This is best achieved by an appropriately staffed Road Safety Information System (RSIS) held by the government National Lead Agency for road safety, as the primary leader and manager of road safety. The Information System should also produce annual report and regular update reports on road safety as well as specific reports on various aspects of road safety.

Data held by the observatory should include:

a. Final outcome level data, including the number of persons killed and injured by type of road users, type of roads, time, costs of crashes, etc.;
b. Intermediate outcome level data, including performance indicators, focusing on road user behavior (such as seat belt use and speed) and the safety of vehicles and infrastructure;
c. Underlying factors such as attitudes and beliefs of road users;
d. Contextual data, including exposure data such as population, the number of vehicle-km driven by type of road users; etc.

This report concludes with a suggested action plan for delivery of the above Road Safety Information System for Poland. The recommended action sequence is:

1. Seeking government approval and required legislation
2. Seeking sustainable funding

[1] –ITS is under the responsibility of the Government, but it operates independently from Government and is not part of the government structure.

3. Seeking expert assistance, including support from an EU country experienced in developing efficient data system
4. Working with the ITS and other partners to create cost-effective collaborative use of existing databases and softeware
5. Identifying key areas of change and improvements needed in databases
6. Establishing by the Secretariat of National Road Safety Council (SNRSC) database(s) collecting behavioral data and intermediate outcome variables
7. Establishing by SNRSC database and tools supporting implementation of NRSP
8. Begin the process of developing the comprehensive governmental RSIS
9. Recruitment and professional development of specialized SNRSC staff
10. Encouraging development of "watchdog" functions in relation to road safety data
11. Standardizing crash injury related definitions in the EU context
12. Further modernization and expansion of road safety data system

Immediate initiation of the above actions is recommended in order to begin development of the data system, which can support evidence-based and result oriented implementation of NRSP in Poland. Such a system can also become an international good practice for other countries facing road safety challenges.

A. INTRODUCTION

Road safety in Poland

Poland's road toll reduced from 5,534 in 2001, to 4,189 in 2011 (and reduced further to 3,357 in 2013). The EU average reduction in road deaths over the period 2001-2011 was 45%, compared with only 24% in Poland. In 2001 Poland's fatality rate was similar to those in Belgium and Estonia, and lower than the rates in Greece, Lithuania, Luxembourg and Portugal, but by 2013 all these countries had improved their road safety performance and although Poland improved as well (in 2013 the number of fatalities reached 3,357) it remains one of the EU countries with the highest fatality rate at around 9 per 100,000 population in 2013. This was an average fatality for EU countries in 2004, when Poland entered the EU. In 2013 the EU average fatality rate is around 5 per 100,000 population, which means that fatality rate in Poland is almost two times worse than EU average and around four times worse than best EU performers. It is clear from these figures that other EU countries with comparable levels of risk noted in early 2000 have made progress that Poland has failed to achieve. This relative worsening of Poland's position in the EU highlighted the need for urgent action.

A detailed review of Poland's road safety situation is available in the Road Safety Management Capacity Review[2] finalized in mid-2013, and the findings of the review are not repeated here. Since that report, progress has been made in a number of areas. First, gradual but important changes have occurred in the Secretariat of the National Road Safety Council (SNRSC). It has been expanded in roles to take on some of the functions of a National Lead Agency for Road Safety (NLA); it has also been increased in staff numbers; and the position of the head of the SNRSC has been elevated in status from Unit Head to Director with the SNRSC becoming a full department in the Ministry of Transport. Second, management of the speed camera program has been strengthened. Third, the new Road Safety Strategy was developed in 2012/13, replacing GAMBIT. Fourth, the Motor Transport Institute (ITS) has employed EU funds to develop a partial road safety observatory, which nonetheless includes useful functional crash data mapping and analysis systems. More details on the latter development are provided later in this report.

Some notes on the recent road safety crash trends in Poland are also appropriate here, as an update. Road fatalities dropped in 2012 by 618 lives (or 14.7%). In 2013 fatalities dropped again by 214 lives (6%), and again in 2014, by 155 lives (4.6%). Poland has sustained improvement in road safety since 2011, with a total of 987 lives saved on Poland's roads, compared with the baseline of 2011, averaging a 7.8% decrease per year. This represents a substantial increase on the level of improvement achieved in the previous decade (which

[2] Job, McMahon, Czapski & Giemza (2013), http://imagebank.worldbank.org/servlet/WDSContentServer/IW3P/IB/2013/08/07/000445729_20130807135411/Rendered/PDF/783190WP0P12790ox0379800B00PUBLIC0.pdf

average a 2.4% annual reduction from 2001-2011, including a 7.2% increase in 2011). However, increased action is required to continue to drive deaths and serious injuries down.

Background

On the basis of Poland's road safety performance over the decade from 2001-2011, the Secretariat of Polish National Road Safety Council (SNRSC) and the Ministry of Transport requested assistance from the World Bank on road safety. The World Bank began working with the Polish Government on road safety, on two fronts. First, the World Bank provided support and technical assistance in preparation of a long-term Program/Strategy (the Program) as announced in 2012 by the Minister of Transport, who is a Chairman of the National Road Safety Council. Second the Bank has completed a national level Road Safety Management Capacity Review.

In January 2012 the Minister for Transport announced strong actions for road safety including the above work with the World Bank. The work by the World Bank began in June 2012, and in August 2012 changes were initiated for the speed enforcement program, with further announcements of expansion of the speed camera network in early 2013. Road safety awareness and awareness of speed enforcement was increased by these activities and the significant media coverage they generated, including coverage of presentations and interviews by the World Bank team. Although other factors may have contributed, the International Traffic Safety Data and Analysis Group (IRTAD) Road Safety Annual Report 2013, published by the OECD in May 2013[3], largely attributed the large drop in road deaths in 2012 to the implementation of the new speed camera system. As noted above, these improvements have been sustained and increased since 2012.

As part of these broad review processes the World Bank has been able to provide assistance to facilitate improvement towards international best practice in a number of specific areas of road safety. One key area identified as open to such improvement with the Bank's help, is the development of best practice in data collection, linkage, analysis, as well as policy development and prioritization of actions with an evidence base derived from the results of these information collection processes.

The Road Safety Capacity Review was able to identify limitations of road safety management based on a number of shortcomings of data and information quality, completeness, linkages, sharing and availability, analysis and use. Examples include fragmentation of databases, duplication of effort with multiple agencies creating or maintaining crash databases, absence of sound crash location records (by GPS) in the Police crash database, lack of open access to a number of databases, inability to link various databases, lack of statistical analysis capability in some Departments, failure to consider crash data in determining road safety works in some poviats and gminas, lack of cost-benefit analyses, and paucity of evaluation of programs. The present review provides a broader deeper review focused specifically on data

[3] IRTAD (2013) Annual Report

and information systems and issues. The review offers strategic solutions and tactics for Poland to address the issues identified, and provides an action plan to deliver the recommended solutions.

Objectives

The objective of present project is to provide strategic and management advice for the improvement of data and evidence usage in road safety management, delivery, and monitoring in Poland. Details of software or computing hardware are beyond the scope of the project.

The Road Safety Capacity Review identified the following objective of actions arising from the review: "to ensure that the necessary data collection, analysis, and research systems are in place in order to provide a strong evidence base for policy development, monitoring, evaluation, and refinement." In order to deliver this objective a number of recommendations were made, which are reproduced in Annex 1 along with the terms of reference for the current review. One of those recommendations was to "Establish a multi-sectoral data working group to oversee the development of data systems." The present report is designed to provide a key source of information and direction for that working group.

The present report is to facilitate and advise on key elements of data and information collection, management, access and use in order to ensure that the necessary data collection, analysis, and research systems are in place in order to provide a strong evidence base for policy development, monitoring, evaluation, and refinement. Best practice use of crash and other data for road safety will deliver benefits in a number of areas:

- evidenced based decision making will be facilitated, with better understanding of the nature and extent of various aspects of the road safety problems to be managed;
- effective monitoring of progress against set targets will be feasible; evaluations of the outcomes of projects will be possible allowing more efficient expenditure of road safety resources based on knowledge of what works;
- more effective communications to the community will be possible based on sound evidence of the nature of road safety issues and of successes, allowing the community a better understanding of the basis for decisions.

The following elements of road safety data and information are targeted within the review:

1. Good quality collection of crash data;
2. Broader ready access to, and analysis of, crash data;
3. Good quality collection of other data of critical relevance to road safety policy, programs and projects (e.g., vehicle speeds in various speed zones; seat belt wearing rates, roadside features, vehicle age and safety features, medical costs of treatment and rehabilitation of the injured);

4. Linkages of databases to allow issues relating to variables from more than one database to be researched and addressed (e.g., medical cost of crashes of various types, or relationships between road features and crash outcomes);
5. Good quality access and analysis of other data of critical relevance to road safety policy, programs and projects including development of relevant indicators for monitoring;
6. Sound development of policy, programs and projects based on the results of these data analyses;
7. Sustainable capability for Poland to maintain these databases and processes with only limited further input from the World Bank;
8. Access to a broad evidence base from international and national research and experience and good practice, which should inform action with a sound understanding of what works and what does not work to deliver real road safety;
9. Regular reporting processes on road safety
10. Independent watchdog processes for public scrutiny and accountability;

B. METHODS

The project includes extensive consultation with the key stakeholders: collectors, holders, analyzers, and users of road safety information. Thus, extensive interviews with many road safety stakeholders are a key source of relevant information. Further, features of existing databases, access provided and use of data when making road safety related decisions were examined. In addition, the team assessed models of successful crash and road safety data systems internationally.

These investigations provided a the deeper understanding of what information and data are collected, held, analyzed, and employed by whom, for whom, and for what purposes in Poland. This report provides commentary and recommendations based on this informed understanding and also considers:

- Good practice in access and use of data and evidence internationally;
- Safe system principles (which highlight the need for a range data to be available for policy development, covering the entire transport system including relationships between crashes, crash outcomes, and the other elements of the transport system: features of vehicles, speeds, road users, roads and roadsides).

This has generated commentary and recommendations on:

1. Collection of crash data;
2. Defining outcomes for comparability and benchmarking;
3. Proposed additional existing databases for inclusion in the Road Safety Information System;
4. Proposed agencies which should have access to these data;
5. Analytical capabilities, responsibilities, and reporting;

6. Facilitating, engaging, and informing self-government;
7. Proposed data linkages;
8. Proposed additional regular data collections on intermediate outcomes;
9. Resourcing and contracting process required to efficiently manage the creation and maintenance of the recommended databases;
10. Analyses and uses of the databases;
11. Public access to data;
12. Ensuring the sustainable management and use of the databases;
13. Access to, and ability to use, a sound evidence base from research and experience.

The term Observatory or Road Safety Observatory (RSO) is frequently used internationally for the type of comprehensive information system which is referred to in this report. To avoid confusion related to the meaning of this term, since in different countries and institutional contexts it may be understood differently, and to differentiate from the existing RSOs for the purpose of this report the term Road Safety Information System (RSIS) is used throughout this document and in relation to the development of modern and comprehensive road safety data system in Poland. The term RSIS[4] similarly to RSO should be understood as an organizational unit within road safety lead agency, which is in charge of systematic and continuous road safety monitoring, analysis and research (the latter two usually undertaken partly internally and partly outsourced or contracted out); RSIS should be sufficiently resourced to be able to:

- provide not only data and information on crashes sufficient to guide road safety activities and the locations at which they should occur, but also on behaviors, road features, vehicle safety ratings, crash costs (including emergency, medical and rehabilitation costs. loss of income and earnings, property damage, police time, etc.) and data to monitor the delivery of road safety programs (engineering measures which demonstrably improve road safety not maintain the road asset, policy changes, regulatory and enforcement activity, education and promotion) by all stakeholders,
- comprehensive analysis of data and regular reports of road safety outcomes such as deaths, injuries, and crashes
- comprehensive analysis of data, regular reports of road safety intermediate outcomes such as speeding, seatbelt use, child restraint use, helmet use, and other critical road safety related road use behaviors as well as attitudes and beliefs which may underpin road safety relevant behavior
- monitoring and reporting on road safety outputs such as education and promotion, enforcement, road and roadside safety features and developments
- Provide expert comment or feedback based on the available evidence on the proposed road safety initiatives, their result focus and indicators used for measuring their effectiveness.

The RSIS deliverables can be and should be employed by the community, road safety stakeholders, and especially by the road safety lead agency to:

[4] This definition is the result of the analysis of some well-functioning observatories - among them the oldest European Observatory described in: Chapelon & Lassarre (2010) Road safety in France: The hard path toward science-based policy. *Safety Science. Vol 48, Issue 9*

- advocate for road safety and educate/inform the community on road safety risks
- monitor progress on road safety programs;
- provide advice to other stakeholders and government on road safety initiatives;
- formulate road safety policy;
- assign funding and resources effectively;
- formulate legislative proposals aimed at improved road safety or verify proposals prepared by other road safety stakeholders in relation to road safety parameters or performance indicators;
- provide guidelines and recommendations for key road safety stakeholders in relation to performance indicators road safety strategies, programs or specific measures;

Specific important feature of a fully resourced RSIS, which distinguishes it from other specialized road safety units, such as for example academic or research institutions, is its focus on making available as widely as possible all non-sensitive detailed data and knowledge for all road safety institutions, stakeholders and other professionals. In an ideal world the RSIS would also reach out to any non-specialized recipients of road safety data in a sympathetic way to provide data in an understandable form to maximize the reach and influence of the information at the RSIS's disposal (e.g., when needed, using simple terms and definitions and avoiding special professional jargon or going too deeply into sophisticated rules and detailed circumstances related to road crashes occurrence and consequences). This should include openly assisting the media with data enquiries.

In this report we are focusing and referring to national level Road Safety Data System, since based on international good practice, a well organized, operating and accessible national Road Safety Information System (often called Observatory) is of paramount importance to any lower level (self-government) observatories.

In addition it is worth clarifying that the Road Safety Observatory, which is currently being developed in Poland by the Motor Transport Institute (ITS) (and is currently limited in scope compared to the above description) is referred to in the text of this report as POBR (*pol. Polskie Obserwatorium Bezpieczeństwa Ruchu*) or POBR Observatory to avoid confusion with the meaning of the general term Road Safety Information System (RSIS) or Road Safety Observatory (RSO).

A. INTERNATIONAL EXPERIENCE IN ROAD SAFET DATA BASES

International Examples of Road Safety Data Systems and Observatories

International examples

Detailed descriptions of several examples of road safety databases or RSOs in different countries, such as: Australia, Sweden, The Netherlands, France, Spain, Czech Republic, and Argentina are provided in Annex 4. Below is Table 1, which summarizes key characteristics of several key international examples of RSOs.

Table 1: Characteristics of Key International RSOs

Country/ Data-base name	***Institution holding and operating the data bases (governmental/other)***	***Remarks on institutional setup***	***Integration*** *(i.e. crashes/vehicles/drivers/ /infrastructure/ health)*	***Remarks on data integration***	***Availability and access to data (open vs. limited, conditions)***	***Remarks on access to data***
Australia	National Government: Department of Infrastructure and Regional Development	Road safety is largely a state government responsibility in Australia. The Department holding the data is the national road safety agency to the extent that there is one	Partially	The national database is a collation of crash data supplied by each state government. National data are combined with health data to estimate costs of crashes. This is done by another Government agency- the Bureau of Infrastructure Transport and Regional Economics	Open access via the website	In common use by media and advocates
New South Wales (Independent state of Australia)	State Government: the NSW Centre for Road Safety (the lead agency)	Held by the lead agency for road safety	Crash data are integrated with the driver database on a research project basis, not a continuous basis. Crash data are linked with hospital data. Crash data are linked with road features data		Not open access. However, the Centre for Road Safety provides answers to questions from the media and stakeholders based on the database on a very regular basis. Annual and regular reports[5] on road crash	

[5] *See for example the following link from the NSW Centre for Road Safety:* http://roadsafety.transport.nsw.gov.au/downloads/dynamic/nsw-road-toll-daily.pdf

			by the Centre for Road Safety		statistics also available.	
Victoria (Independent state of Australia)	State Government-VicRoads and transport Accident Commission	Held by the lead agency for road safety	Yes. Crash data are linked with road features data by Vicroads		Open access to the data via the web; regular[6] and annual reports are available	
Sweden	Transport Safety Agency	Swedish Traffic Accident Data Acquisition (STRADA) is an official national road traffic accident information system	STRADA contains information on road traffic accidents and injuries, as reported by the police and the hospitals	The criteria for matching health and crash data are: same person identification numbers, the crash times differ no more than 24 hours, and that the crash locations are within a 1,000 meter radius	Yearly reports available to public, web-based system available for stakeholders	To access the web-based system user must be registered and participate in a one day course about the STRADA system
The Netherlands	Ministry of Transport and Environment's Centre for Transport and Navigation (DVS)	Name of the data basis: National road crash register (BRON)	The crash location is linked to the National Roads Register (NWB). Vehicle information is added using the vehicle registration as a basis	SWOV supplements the BRON data with data from the National Medical Register (LMR). This results in more reliable information about the real severity of injury sustained in traffic crashes.	Open access to the data via SWOV's website	The data, including medical severity based on the link with the LMR, is available on the SWOV website from 1993 onward.

[6] For example see the following link from the Transport Accident Commission of Victoria (State Government): http://www.tac.vic.gov.au/road-safety/statistics/road-toll-year-to-date

France	French National Road Safety Observatory (ONSIR)[7]	Database maintenance, on behalf of ONISR, is a part of the SETRA (technical service of the Ministry of Transport)			Ministries, research institutes	Published and available at ONISR web site: http://www.securiteroutiere.equipement.gouv.fr/infosref/observatoire/l-observatoire/l-observatoire-national-interministeriel-desecuri.html
Spain	Observatorio Nacional de Seguridad Vial (ONSV)	ONSV was operating between 2004 and 2012 within the structures of Spanish Directorate-General for Traffic (DGT)	Data from police was improved by incorporating data from health and forensic sources	Undertaken regularly in the city of Barcelona	Open access to the data	

Key conclusions and lessons which can be drawn for development of an efficient RSIS in Poland are:

1. Locating databases and RSIS in the NLA or relevant Ministry ensures better stability of functioning including financing (particularly if combined with a stable road safety funding system).

2. Clear responsibility and a strong legal mandate for collection and maintenance of the database are important

3. Strong effort should be made to develop IT systems, enabling roads safety managers or coordinators to assess the roads safety status and effectiveness of undertaken efforts, allowing refinement of programs and continuous improvement in road safety through fact based policies and actions and a primary result focus.

[7] ONSIR is in charge of centralizing and analyzing the data gathered by the various ministries involved in road safety as well as of distributing the results. See: http://www.securiteroutiere.equipement.gouv.fr/infosref/observatoire/observatory.html

4. Police crash data and reports are essential, but alone not sufficient for a comprehensive systematic approach to road safety, under which, multiple data sources should be used for objective research and analysis improving results focus of policy actions and measuring impact of road safety activities. Crash data should be supplemented by health data (from hospitals or individuals health records, using dedicated methods for example based on PESEL number) but also vehicles and drivers' data, road infrastructure status and traffic data.

5. Indirect road safety indicators related to road user behaviors are crucially important for any RSIS, so it is necessary to undertake regular and representative observational surveys, store the results and make them easily accessible on line via the web.

6. Well informed policy has to be pursued in relation to road safety by thorough and transparent analysis of a breadth of data and information.

7. Continuous improvements in methods and tools for collection, storage, analysis and monitoring of all key road safety data and parameters related to road safety management are necessary to deliver sustainable improvements in road safety.

8. The RSIS must be sustainably resourced to perform these functions.

International recommendations on road safety data systems

A number of international manuals, reports, and strategies identify sound international practice on road safety data systems and their use. These include:

1. the World Health Organization's (2008) *Data systems: A road safety manual for decision-makers and practitioners*;
2. the World Health Organization's (2009) *Global Status Report on Road Safety*;
3. the World Bank's (2009) *Country guidelines for the conduct of road safety capacity reviews;*
4. the IRTAD's (2011) *Reporting on Serious Road Traffic Casualties*;
5. the United Nations Road Safety Collaboration's (2011) *Global Plan for the Decade of Action on Road Safety 2011-2020*.

These documents identify a number of core recommendations for road safety data systems which are germane to the current review of data systems in Poland, including those listed below:

- the road safety observatory should be held by the government road safety lead agency;
- The safe systems approach to road safety should be adopted, and such approach is facilitated by sound road safety data collection and management processes;

- "In managing for improved road safety results, the foremost and pivotal institutional management function is *results focus."*[8] A results focus demands good road safety data;
- Government should establish and support national and local systems to measure road traffic deaths, injuries and crashes and improve the quality of road safety data collected;
- Safety data should be aggregated at national level, analyzed and published by a lead national agency for road safety. The agency should be able to monitor road safety performance, based on key indicators, and provide objective assessments of progress and impacts of interventions to those in charge of designing and implementing the road safety strategy;
- Police data should remain the main source for road crash statistics. However, because of underreporting problems and possible biases police data should be complemented by hospital data, which are the next most useful source (as used in Sweden and New South Wales-Australia);
- Data linkages between police, transport and health services should be improved to address underreporting;
- A complete picture of casualty totals from road crashes is needed to fully assess the consequences of road crashes and monitor progress;
- Use of the 30-day definition of road traffic death should be encouraged along with standardized terminology for classifying the severity of non-fatal injuries;
- The assessment of the severity of injuries should preferably be done by medical professionals, and not by the police officer at the scene of the crash;
- Medical staff should be trained in order to systematically classify (road traffic) injuries using ICD International Classification of Diseases and to assess severities with indices such as the Abbreviated Injury Scale (AIS) or the Maximum Abbreviated Injury (MAIS). This information - without personal information - should be made readily available for statistical purposes, policymaking and research;
- Having an internationally agreed definition of "serious" injuries will help the safety research community to better understand the consequences of road crashes and to monitor progress. Given the existing knowledge and practices, IRTAD proposes to define a 'seriously injured road casualty' as a person with injuries assessed at level 3 or more on the Maximum Abbreviated Injury Scale i.e. "MAIS3+".

The most recent description of international best practice in road safety data management comes from IRTAD's (2013) *Buenos Aires Declaration on Better Safety Data for Better Road Safety Outcomes*. This document makes 12 recommendations, of which 11 are relevant to Poland (the other relating to Latin American countries joining OISEVI). These 11 recommendations are reproduced verbatim below:

1. Reliable crash, contextual and exposure data are essential elements to understanding, assessing and monitoring the nature and magnitude of the road safety problem, to setting ambitious and achievable safety targets and to design and implement effective policies.

[8] Bliss & Breen (2009)

2. A minimum set of data is required to analyze road safety. It includes not only safety data but also contextual data. While further work is needed on methodology to collect data, it is recommended that data is collected at four levels:
   a. Final outcome level data, including the number of persons killed and injured by type of road users, type of roads, time, etc.;
   b. Intermediate outcome level data, including performance indicators, focusing on road user behavior (such as seat belt use and speed) and the safety of vehicles and infrastructure;
   c. Underlying factors such as attitudes and beliefs of road users;
   d. Contextual data, including exposure data such as population, the number of vehicle-km driven by type of road users; etc.

   It is recommended that countries also collect data on costs of road crashes and the quality of policies and their implementation.

   Safety data should be aggregated at national level, analyzed and published by a lead national agency. The agency should be able to monitor road safety performance, based on key indicators, and provide objective assessments of progress and impacts of interventions to those in charge of designing and implementing the road safety strategy.

   In several countries, a road safety information system, under the auspices of a lead road safety agency or a lead ministry, is in charge of data collection and analysis. This model has proven to be a good institutional setting to raise the profile of road safety and encourage policy actions but in monitoring performance, maintaining objectivity is crucial in order to arrive at credible conclusions.

   Regular monitoring and analysis of key road safety risk factors (for example, the frequency of drivers exceeding speed limits, the proportion of drivers and passengers not wearing seatbelts, drink-driving rates, helmet wearing rates, etc.) should be undertaken. The results of monitoring should be made publicly available at regular intervals and used, if appropriate, to adapt the road safety strategies in place.

   At a broader level, the relationship between road safety performance and economic development needs to be understood over both the long term and over the shorter term in relation to the business cycle. Several economic factors may influence road safety including unemployment rate and the level of consumption and production. These factors could influence both traffic volume (level and composition) and road user behavior. Over the business cycle there is evidence of a relationship between economic growth and road safety. Generally, when economic growth declines and when unemployment increases fewer people are killed on the roads. However, the mechanisms are imperfectly understood and further research is needed on the causal relationships involved.

   The international community should work towards harmonization of data, including common definitions on the main indicators. Most countries have now adopted the 30 day definition to define a fatality; other countries are strongly encouraged to do the same.

   Fatality data are not sufficient to understand road safety problems fully. Information on injury crashes is essential for a more complete picture of road safety. Increasing use of information on injuries should be made in international comparisons. IRTAD proposes to define a “seriously injured road casualty” as a person with injuries assessed

at level 3 or more on the Maximum Abbreviated Injury Scale i.e. "MAIS3+". While this definition is accepted by a large part of the scientific community, more work is needed to develop a common methodology for collecting injury data. Analysis of less serious injury crashes (MAIS1 and MAIS2) are also meaningful, moreover, data on the impact of traffic injuries in terms of quality- or disability-adjusted life years (DALYs) is needed and will require adoption of a common approach.

Police data will remain the main source for road crash statistics. However, because of under-reporting problems and possible bias (for example with differing rates of reporting by vehicle type), police data should be complemented by hospital data. This requires a linking procedure between police and health data. Detailed information on linking procedures, covering a broad range of sources, can be found in the IRTAD report "Reporting serious road traffic casualties".

Some IRTAD countries are making effective use of methodologies to forecast outcomes over the short term and project trends over the long term. Systematic use of such projections is recommended in setting targets and assessing performance against targets.

Benchmarking between countries is a useful process to generate a dynamic for road safety improvement and learn from each other. Progress has been made in developing methodologies for benchmarking and efforts should be continued towards an agreed approach for benchmarking road safety performance internationally.

The recommendations of the present report are consistent with the international recommendations and lessons described above, which are extended and applied in the Polish situation in this report.

B. FINDINGS OF THE REVIEW

Context for Data Collection in Poland

European Union and other external influences

European Union policy sets requirements for road safety management. As a member of the EU, Poland is obliged to follow EU specific policies. EU road safety policy is described in the document entitled *Towards a European road safety area: policy orientations on road safety 2011-2020*[9]. EU road safety policy proposes to continue with the target of halving the overall number of road deaths in the European Union by 2020 starting from the baseline of 2010. The target announced in 2013[10] for Poland for 2020 is consistent with this EU target.

The EU document also provides a general governance framework and objectives for the implementation of European road safety policy which should guide national and local road safety strategies. These include directions for monitoring and thus data requirements:

- Priority to monitoring the full and correct implementation of the EU road safety policies and requirements by Member States;
- Setting up an open cooperation framework between Member States and the Commission to implement road safety policy and monitor the progress achieved.

Three separate areas of EU funding currently occurring in Poland are critically relevant to the present road safety data considerations:

1. A Road Safety Observatory (POBR), is being developed by the Motor Transport Institute and being supported by EU funding;
2. Health sector is in the process of developing an improved database for patients, including crash victims, which is being funded by the EU and will include better coding of injuries;
3. The Ministry of Administration and Digitization (MAIC) has EU funding for developments in government data management processes which *inter alia* aim to increase access to data.

It is important that proposed RSIS developments for in Poland aim to capture the value of these pieces of EU funded work.

Effective use of continuing assistance for road safety from the World Bank and other external road safety donors (the EU, and funds from Switzerland and Norway) will also be facilitated by sound data systems to monitor progress and report on results of supported projects and programs.

[9] COM (2010) 389

[10] Announced on 9 January 2013 by the Ministers of Transport and the Interior at launch for consultation of National Road Safety Program

The OECD, in particular IRTAD, is an important influencer for road safety data processes. Both the SNRSC and the ITS are members of IRTAD, which co-ordinates and collates road safety data from many countries including Poland. IRTAD is able to assist with setting up partnership arrangements to assist countries improve their road safety data management.

Government and Road Safety Management within Poland

To be successful in Poland road safety must be managed and delivered at all levels of government. Road safety projects, monitoring, record keeping, data collection, and data usage must occur across the National Government, 16 voivodships, 374 poviats, and 2479 gminas. Thus, data access and collection considerations must include these four levels of government, all of which own and manage roads. All should have access to relevant road safety data for monitoring and management decisions, and all should be subject to independent performance monitoring.

Data Systems in Poland

Availability of good road safety data is an essential element in meeting the requirements of a results focused approach to road safety management. The Road Safety Management Capacity Review found that Poland does not have a well-coordinated road safety data system. The present review allowed a more comprehensive deeper understanding of road safety data systems, analyses, and uses in Poland.

Specific findings are grouped under the key areas of review focus as listed in the Methods section.

1. Collection of crash data in Poland - Police Crash Database: SEWIK

The Police Crash database is a pivotal database for road safety management, delivery and monitoring. Thus, it is considered in some detail below.

The system of crash data collection in Poland has many positive features, including the most critical elements of collection. Most importantly, crash data collection is uniform across the country, is managed by the one organization (national police), is systematically collated at a national level, is available to Police at self-government levels from the most immediate rounds of data collection, and is available to some organizations albeit though them creating their own crash data systems based on Police data supplied at intervals. However, a number of areas of potential improvement have been identified during the review process.

Data Collection processes by Police

Process issues

Police are uniquely well placed to collect relevant data at the scene of a crash because they are the only people who should be called to attend all significant crashes and collisions, and because Police must, in any case, record a significant amount of data for possible legal proceedings subsequent to the crash. Furthermore, it is too costly and ineffective for government to create and resource a separate group of people for the purpose of crash data collect at crash scenes. Crash data collection by Police is considered international best practice and is recommended by IRTAD.

In Poland, data are collected by Police at the scene of the crash via a paper form. The information recorded on the form is usually entered into the crash database few days later by another person usually at the poviat level Police Unit. This dual processing has three clear disadvantages:

- It adds greater risk of entry errors,
- It does not facilitate recording of GPS location at the time the Police are at the crash scene[11], and
- It does not allow for guidance from a computer based system which can ensure each piece of information is entered before the user can move to the next field and which can limit entries to appropriate answers.

Precision in crash data collection for sustainable improvement

In countries and independent states (in federal countries) with sound road safety records further improvement comes with greater precision of road safety management and this requires greater precision in the available data and wide and inventive use of it. Sustained success in road safety management will largely depend on the availability of such data precision in Poland. Sound examples of this precision arise in the areas of accuracy of recording of crash information by Police, crash location recording and the recording of the movements of those involved which led to the crash, among other details.

Recent NIK report on Police role in road safety[12] and confidential interviews with Police officers reveal serious concerns with the reliability of the SEWIK data. Practices admitted to by Police include recording information for the convenience of completing the form even if they do not know the information to be correct, recording crashes (events in which someone was injured) as collisions (i.e., events in which no one was injured) to avoid paperwork, and even on occasion recording single vehicle head-on into obstacle fatal crashes as suicides in order to avoid paperwork and keep numbers down. Sound practice in other countries is that deaths are only excluded as suicides if there is clear direct evidence such as a suicide note, or a coronial enquiry determines that the death was a suicide. Additional issues arise from cases

[11] Experience in Australia shows that without such a prompt Police often neglect to record GPS details at the crash scene, and may erroneously record these later at a different location.
[12] Detailed title + web link

where hospitals refuse to provide information on patient status to Police. In these cases, Police report entering into the database "whatever seems reasonable".

The ideal record of crash location is by standard GPS coordinates[13]. Location recording based on distance markers, i.e. via the nearest kilometer record along the road is not sufficiently accurate for many road safety actions. For example, black spot infrastructure treatments require more precise records of crash locations to know where within a kilometer of road the crashes are occurring and thus what infrastructure features need to be changed and where. A steady rollout of standard GPS devices in Police cars in Poland offers the opportunity to resolve this issue through GPS recording of crash locations.

The current Police crash database has some sound information in it, and is appropriately detailed on a number of factors (see Annex 2 for a list of the data collected and the forms used for this purpose). The database, quite understandably, is designed primarily to meet the needs of Police. However, there are a few factors where improvement would be of considerable value to allow greater understanding of problems, management and delivery of road safety. An example that illustrates this kind of database shortage is the description of crash type or the movements which led to the crash. The current SEWIK database allows the types listed below:

Collision of moving vehicles:
- Head-on
- Side
- Rear

Driving into:
- Pedestrian
- Immobile vehicle
- Tree
- Pole, sign
- Railway barrier
- Pothole, bump
- Animal
- Protective barrier

Vehicle overturned

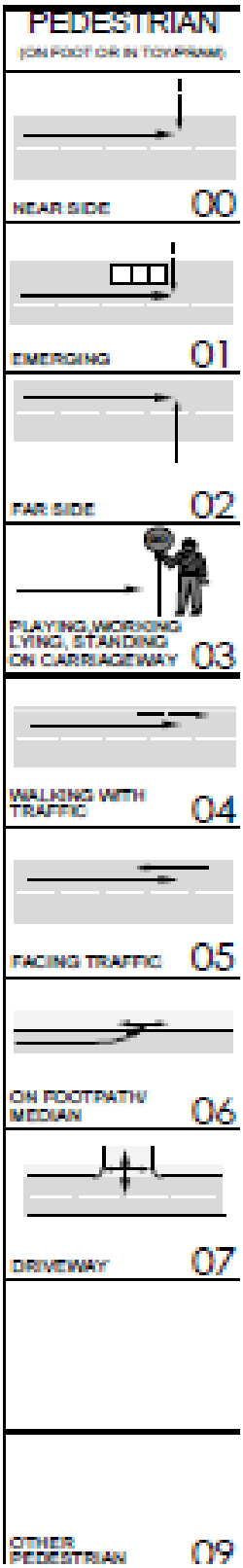
Accident with passenger

Other

[13] There are several standards for providing GPS coordinates so it would be desired to use one agreed standard for the Police across Poland; ideally such standard should be used also by other emergency services in Poland;

While more information may be obtained through careful consideration of a crash diagram or a written description of events, this extra information is not readily accessed and is not coded so that it can be subjected to statistical analysis. Moreover given that the quality of diagram or description largely depends on the level of professionalism of Police staff and general shortage of specialized road traffic Police officers there is significant room for mistakes, which may result in difficulties during court proceedings and errors in interpretation of the conditions and causes of crashes. The Polish Accident Form contains a much smaller and less detailed list for classifying the movements involved in a crash than international best practice, and is not sufficient to soundly and fully inform road safety delivery. For example crashes involving pedestrians are all of the one type- drive into a pedestrian. In reality such crashes may differ significantly also often resulting in different legal interpretations. So without more precise details any interpretation of crash data involving pedestrians is uncertain and can lead to misleading conclusions and inefficient suggestions for improvements. The crash coding system in New South Wales (Australia) could serve as an example of good practice in this respect. It distinguishes between seven types of pedestrian crash (as well as a category for "other" pedestrian crash) depending on the movements involved including turning movements by cars as well as behaviors by pedestrians, as shown in Figure 1. The state of Victoria (Australia) has a similarly detailed set of crash types for pedestrian crashes. This level of detail is critical to addressing many elements of road safety. For example, the treatment required to improve pedestrian safety at an intersection with many pedestrian crashes is quite different if the vehicles involved in the crashes are moving straight ahead versus turning left or right, or if the pedestrians are emerging from behind parked vehicles to cross the road or walking along the road. Annex 3 provides the crash type coding details or road user movement (RUM) codes for the state of New South Wales.

Figure 1: The types of pedestrian crashes distinguished in crash recording by Police in New South Wales (Australia)



There is no regular in depth training for all police officers involved in reporting data from road accidents on entering data and no detailed written instruction on filling in the paper based Accident Form. The completion of the Form is based only on a formal regulation by the Chief Commander of Police[14]. There are many inconsistencies in completing the forms by individual police officers often resulting in inadequate records. Moreover, it is quite likely that due to police staff

[14] Regulation on methods and form of Police statistics related to road incidents (pol: *Zarządzenie Komendanta Głównego Policji w sprawie metod I form prowadzenia statystyki zdarzeń drogowych*)

rotation and road safety reporting often provided by non-specialized police officers dealing with road crashes (particularly in remote or rural areas) statistics collected by police may not precisely reflect many circumstances of road crashes, resulting in inadequate crash statistics based on some key police entered parameters. This is a common problem to varying extents even in high-performing road safety countries. However, the extent of it can be minimized. Regular in depth training, preferably supplemented by detailed guidelines providing practical examples and guidance on how to resolve many typical problems with crash reporting faced in practice seems therefore necessary for data quality assurance.

Based on interviews and a sample of Accidents Forms it is also apparent that there are issues with the identification of causal factors in crashes. While speed is under-estimated as a factor in serious crashes in most countries[15] limiting the information about the likely causes to speed only combined with very general data about crash type and movements of crash participants may additionally distort the crash statistics.

Although Police reports that the crash database serve their purposes and thus they see no immediate necessity for refinement, it is necessary to communicate and collaborate with Police in identifying the value of refinements to the system for management of other aspects of road safety.

2. Defining outcomes for comparability and benchmarking

As it is widely recognized people may die of injuries received in a road crash some days after the crash. The international convention, and best practice is to follow-up on this possibility and to include deaths in the crash database if they occur within 30 days of the crash and are caused by the injuries received in the crash. The 30 day follow-up ensures that relevant deaths are included, allows for a fuller picture of crash costs, and provides for international comparability for benchmarking road safety performance.

Although this rule is formally adopted in Poland it is not clear that 30 day follow-up of deaths (as required in international best practice) is occurring regularly in relation to the Police crash database. Stakeholders interviewed have provided quite different views on this issue, which indicate that while the 30 day follow-up check does occur in many cases, these may be restricted particularly to cases where there is interest in prosecution (i.e., someone other than the person with serious injuries to be follow-up is likely to be found responsible for the crash and that person is still alive). On occasion the hospital also refuses to release information about condition of the victim to police officers who are therefore unable to accurately record injuries in the crash database. Since crash data is currently not linked with health records or hospital data this may result in underreporting of some fatalities. International good practice demonstrates that fatalities and serious injuries data accuracy and reliability can be greatly improved by verifying the number of fatalities using health sector data.

[15] Job (2013)

The second area in which international standards could be adopted to improve measurement and comparability is the definition of a serious injury. To our knowledge hospital records in Poland include mostly ICD injury data, and IRTAD recommends that a 'seriously injured road casualty' be defined as a person with injuries assessed at level 3 or more on the ICD Maximum Abbreviated Injury Scale i.e. "MAIS3+", as assessed by a medical practitioner. This problem has been recognized at the EU level and there are ongoing works on EU-wide standard definition for serious injuries for the purpose of road safety statistics. The adoption of precise definitions of level of injuries, on one hand with internationally recognized standards and on the other hand with classification used for health statistics would add precision to what is called a serious injury. Training police officers in understanding and using such definitions with adding more detailed data on type of injuries collected at a road crash scene would increase adequacy of data on road safety injuries.

3. Existing databases for use in the Road Safety Information System

A number of additions databases are needed to effectively manage and deliver road safety. The most immediately relevant to Police collected crash data is health/hospital data, which supplement the crash data with more detail on injuries, and provide a second source of data from crashes which may be missed (not reported) to Police, as recommended by IRTAD, and as used for example in Sweden and in New South Wales (Australia).

Health Statistics

The World Health Organization (WHO) reports on World Health Statistics[16] in an annual compilation of health-related data for its 194 Member States. This report includes a rating of the quality of the health database of the country as well as rating of progress towards Millennium Health Goals. WHO rates Poland's health data quality as low. This is a disappointing result for Poland, which could reasonably be expected to hold a better quality health records database. As a point of comparison, for the countries in Europe, WHO rated 16 countries as having a High quality database, 24 as Medium, and 11 as Low quality.

Research on reasons for hospitalization [17] has been conducted in Poland since mid-1970s[18]. mainly by two institutions: the National Institute of Public Health (*Narodowy Instytut Zdrowia Publicznego*, NIZP-PZH) covering general hospitals and the Institute for Psychiatry and Neurology (*Instytut Psychiatrii i Neurologii*) – covering psychiatric hospitalization. Studies conducted by these entities do not include persons hospitalized in military and police hospitals.

The main source of information are individual patient's information sheets (separate for patients of general hospitals and for patients of psychiatric hospitals), filled in for every

[16] WHO (2012)
[17] Based on: Gorynski (2009)
[18] http://www.statystyka.medstat.waw.pl/wyniki/wyniki.htm

patient leaving a hospital. Information sheets include demographic characteristics of the patient (sex, date of birth, place of residence), detailed information about the hospital stay, including names of wards in which the patient was treated, as well as dates of admission and discharge, name of main illness and coexisting illnesses, and in case of death, reasons for death; also, types of surgeries and procedures applied, as well as type of discharge procedure. Information on the psychiatric information card also includes marital status, source of livelihood, level of education and level of disability. Individual patient's information sheets employed in hospitalization research do not include the patients' identification data.

The data collection system assumes submission of hospitalization sheets for general hospitals in electronic format (in line with electronic data transfer standard), via voivodship Center for Public Health, to NIZP-PZH, while psychiatric hospitalization information sheets are submitted, mostly in hardcopy, directly to Institute for Psychiatry and Neurology. The Institutes process the data on countrywide and voivodship level. In 2004, a total of 87% of hospitals in Poland have participated in hospitalization surveys, in 2007 it was 92% of the hospitals. Total number of records pertaining to persons discharged from hospitals in 2004-2006 was over 6, 5 million.

In cases in which the patient is hospitalized as a result of a crash, the patient's record includes, besides the information about the main reason for hospitalization, information about type of crash. Traffic crashes are entered along with their V00-V99 codes (as per International Statistical Classification of Diseases and Related Health Problems ICD-10). The codes cover circumstances of traffic crashes, including:

- pedestrian injured in a crash
- cyclist
- motorcycle driver and passenger
- user of three wheel vehicle
- user of a car
- user of a delivery van
- user of a heavy vehicle (e.g. TIR truck)
- user of a bus
- other (animal, rail vehicle, industrial vehicle, agricultural vehicle, special vehicle)
- floating vessels
- aircraft
- other, unspecified

For these types of crashes, participants' injuries are specified, in line with three character categories of ICD-10, from S00-T99 codes group.

There were numerous, yet only partial and rather unsuccessful attempts to link crash and health data. Main problems faced in the process were related to lack of reliable detailed health data in convenient electronic form and difficulties in accessing health records but also the absence of other parameters (such as for example PESEL) to automatically link crash and

health data, difficulties in accessing health data, unreliable data on crash location adding difficulty to identify which hospitals treated those injured in road crashes and strict general privacy and data protection laws. The most recent effort to use health records for road safety related research was made in 2013 and repeated in 2014 (following an early draft of the present report), when upon SNRSC's initiative IBDiM prepared a cost estimate of road crashes in Poland, which was subsequently published by the NRSC. NIZP (National Public Health Institute/pol. Narodowy Instytut Zdrowia Publicznego, former PZH - National Institute of Hygiene/pol. Państwowy Zakład Higieny) has managed to link a sample of health data with road safety but it was done in relation to assessing some average unit health service cost estimates for injuries rather than linking crash and health data for example for verifying the number of injuries report by Police using health records.

In addition there are also significant issues with the health system data, as reflected in the WHO rating of it. The problem of victim injury classification (as minor injury, serious injury) still exists in the hospitals. Since hospitals in Poland receive refunds depending on services provided, they may "stretch" the severity of injures and treatment in order to receive extra payment. Thus, it would be useful to improve health statistics in Poland to ensure that the process of collecting individual health records/hospital data includes all fatalities and injuries resulting from road crashes.

Vehicle and driver registration systems

The Road Traffic Act describes vehicle and driver registration systems, which are under the control of the Ministry of Interior. CEPIK is the Ministry of Interior data base, which includes a central database that collects data and information about vehicles and their owners. CEPIK includes information about people with driving license as well as information about people who lost their license or have a driving ban. The CEPIK database also includes information about licensed driving instructors, licensed driving schools, licensed examiners and examination centers. The data are gathered by various public institutions which are responsible for: issuing of driving licenses (poviats), vehicle registration (poviats) and inspection of technical state of vehicles (Vehicle Inspection Stations in whole Poland monitored by poviats). Because the system has sensitive personal information about drivers and vehicles, the detailed data can only be accessed by a limited set of public institutions. Other institutions have to apply to the Ministry of Interior in order to obtain the access to data or aggregated data without sensitive elements. The Ministry of Interior is currently in the process of redesigning and modernizing the CEPIK system in order to include new elements required by recent changes in the Road Traffic Act. This presents an opportunity to make the new CEPIK system compatible with other road safety databases in order to better analyze various data which are relevant to evidence based road safety policy actions and research.

Roads features databases

<u>National roads</u>

GDDKiA hold a database of features of roads (Bank Danych Drogowych – Road Data Bank), which is valuable for assessment of the contributions of some road features to crashes. The database contains only the data on national roads and motorways (about 5 percent of all roads in Poland). It appears to have good information on the key road infrastructure technical parameters, surface condition (rutting, roughness, etc.) but does not contain some core geometric information important for safety considerations (straight versus curve, curve radius, vertical curvature).

Moreover, the database is not coordinated with GPS or other geographical coordinates (it uses the location data, which are not compatible with any modern digital mapping tools and geographical identification system). However, GDDKiA is in the process of preparation for modernization of their location system and implementation of this system in their Road Data Bank and other GDDKiA internal systems.

GDDKiA is also collecting and storing a lot of traffic data from permanent traffic measurement stations and has access to all traffic data collected for the purpose of electronic tolls. Traffic data can be used for some road safety research though it has only limited use for managing road safety. GDDKiA is currently in the process of preparing a complex project related to traffic management on national roads and is planning to implement it over the next few years using EU funding. It is ready to involve all key stakeholders in a discussion on specific needs, which offers an opportunity for SNRSC to obtain access to data, which may be relevant for road safety related analysis and research.

Self-government roads

Many self-government road administrations have developed infrastructure databases containing data on their respective networks, but there is no nationwide standard for such systems, so specific technical systems vary significantly, which limits their potential use only to local analysis. The Road Safety Lead Agency may however over time promotes good examples of local solutions and facilitates exchange of good practices with local road safety databases between self-governments. These systems should be compatible.

Several commercially available software tools supporting general road infrastructure data bases and road asset management have been developed by Polish and foreign companies, and are offered to road administrations. Many self-governments (such as many large municipalities or voivodships), have implemented such systems and in some cases even outsourced such services to commercial partners. This legacy may significantly complicate establishment of linkages between crash data and data on self-government managed road infrastructure. Hopefully, over time, some standard format for data exchange between different commercial systems and national RSIS could be developed. This may hopefully facilitate at least establishing semi-automatic linkages in relation to self-government roads and help self-governments in diagnosing and addressing their specific infrastructure related road safety problems.

Road Safety Observatory - POBR – Polskie Obserwatorium Bezpieczeństwa Ruchu

The Motor Transport Institute is in the process of finalizing road safety observatory – POBR based on the concept developed in 2006 for which IT infrastructure and supporting tools have been co-financed from EU funds. Table 2 provides a list of the databases, which the Motor Transport Institute is planning to include in its Observatory. These are all relevant and appropriate to a sound road safety database, though as outlined in this report, many other data sources are also desirable or critical.

Table 2: The proposed databases for the Observatory by the Motor Transport Institute

Status	Type	Source	Categories
Available	Accidents and collisions	Police Headquarters - SEWiK	As per the Road Incident Information Sheet
Available	Population as per TERYT	GUS	sex, age
Available	number of vehicles	GUS - BDL	voivodships, poviats
Available	roads by voivodship	GUS	voivodship roads, poviat roads, municipal urban and non-urban roads
Available	Traffic measurements	GDDKiA	GPR for national and voivodship roads
Available for implementation in Stage II	Geometry of national roads	GDDKiA Roads Data Bank (BDD)	data on number of carriageways, traffic lanes (number, width), kilometer count of built-up areas, roads safety equipment
Available for implementation in Stage II	Speed measurements	GDDKiA	speed measurements from fixed stations
Available	Drivers	CEPiK	number of drivers licenses by sex and age category
Potential/planned	Drivers	CEPiK	PESEL, number of drivers certified (with various types of certifications), age, sex
Potential/planned	Traffic	ITD/Police/City	Location for automatic

	supervision	Guards	supervision devices (photo traps, red light running), number and amount of penalties, data on recorded excessive speed
Potential/planned	Data on victims of road accidents	Health services, GUS, Police Headquarters - SEWiK, National Public Health Institute PZH	PESEL, ICD-10, injuries as per MAIS scale, deaths as a result of road accidents, medical procedures applied
Potential/planned	Roads by poviats, municipalities and towns	GUS/self-government units	Length of roads in poviats, municipalities, towns, by road managers
Potential/planned	Weather conditions	IMiGW	data about temperature and precipitation from weather stations
Potential/planned	TEN-T and European roads	GDDKiA	accurate data on routes of roads, by national road numbers and kilometer count
Potential/planned	Voivodship roads	voivodship authorities /Transprojekt	graph of voivodship roads network
Potential/planned	Expenditures on roads safety activities	Ministries, GDDKiA, local authorities	data on cost of roads investments, training, campaigns etc.

Source: Secretariat of National Road Safety Council /Motor Transport Institute (ITS), November 2013

The POBR Observatory was conceived in 2006 by Motor Transport Institute (ITS) with the original assumption that it would become a Polish national RSIS. It was expected to become a comprehensive web based road safety data-base and knowledge center, primarily for road safety professionals and public sector institutions (governmental and self-government). After a long delay in implementation resulting from different administrative and procurement related problems POBR became operational in mid-2014, but with quite limited data available so far, comprising primarily as indicated in the above table: SEWIK crash data (thoroughly verified by ITS), general statistical data from GUS, partial data from GDDKiA and partial data on drivers from CEPIK managed by MI).

POBR is composed of two main elements:

- POBR Observatory internet portal[19] comprising interactive road crashes map, some general road safety data, publicly available reports, basic road safety knowledge and useful links;
- POBR Observatory road safety data warehouse, containing detailed road safety, including some of the data listed in the above table.

POBR data can be accessed in two ways:

- online via POBR Observatory portal with two levels of accessibility: (i) basic one for any user with no registration required, with materials available being regular publications, reports and basic road safety statistics and knowledge; and (ii) advanced access for registered users who open an account (users have to register online, provide some justification for access to POBR and wait for ITS authorization and password); advanced access for the time being gives users access to detailed road map with all crashes located on the map and some basic characteristics of each crash);
- direct access to road safety data warehouse containing detailed road safety data stored on ITS servers; such access is possible only via workstations located in the ITS dedicated premises and upon ITS authorization based on user request with justification confirmed in writing by the institution interested in data that the applicant is representing.

Until now little input has been sought from key road safety stakeholders in the process of development and implementation of POBR Observatory with ITS being in charge of all the project development and management function, though late 'consultation' (information to stakeholders) was undertaken. SNRSC has taken some initiative during POBR implementation in the second half of 2013 to invite representatives of several key stakeholders to better understand the scope, process of POBR development and the role it can play in improving results focus, but this initiative has not been institutionalized so far in any way by for example creation of POBR Consultation Group, allowing key road safety stakeholders to maximize use of POBR data and express expectations related to their specific fields of interest.

For example the extent to which all relevant government agencies and other road safety stakeholders will have perpetual open and convenient access to the POBR Observatory data is also not yet clear and is a pivotal issue to improve the benefits from POBR.

Given difficulties faced so far by ITS in obtaining some data from Governmental institutions it is quite unlikely that POBR Observatory can be significantly expanded and used for linking different data available in Government. Such difficulties are understandable and could have been expected since ITS is an organization outside Government (although subordinated to and partly financed by MID) hence it is not authorized legally to obtain sensitive and perhaps in some cases personalized data from government agencies.

[19] http://www.obserwatoriumbrd.pl/pl/

As mentioned earlier the EU financial support was provided for establishing POBR including purchasing hardware and software. However, it was provided with the condition of at least five years of non-commercial use of POBR, since EU co-funded assets cannot be used to generate direct revenues to the beneficiary. Thus, access to POBR data should be free of charge for at least 5 years. Moreover EU funds cannot be used for covering of POBR running costs so such costs are expected to be covered by ITS or ITS may seek funds from the Polish Government. The long-term funding and sustainability of the ITS maintenance and operations of the POBR Observatory (beyond just 5 years) are very uncertain and should be addressed to avoid the problem witnesses with the Czech observatory, which was discontinued when EU funding was no longer available

It is clear that POBR Observatory is a useful tool in facilitating some road safety research and its functionalities should be further developed. It may however benefit from wider and easier access particularly to the data warehouse (preferably even online) and involvement of representatives of key road safety stakeholders who can benefit from POBR in further development of its functionalities. It seems unlikely that full functionality can be developed by an institution which is not fully within government.

Other road safety data bases – national, regional and local level

Analysis of national, regional and local level road safety databases currently operated in Poland as well as consultations with their users and administrators have allowed drawing some general conclusions illustrating the current situation in scope of gathering and disseminating information about roads safety status. The most important ones are as follows (see also tables 3 and 4):

- The main objective of road incidents databases functioning currently in Poland is to analyze and monitor safety in a specific area or roads network. An important element of this analysis is the ability to assess the effectiveness of actions and plan new measures to improve safety;
- Most databases collect information about all incidents, including collisions (exceptions are found mostly in central level databases, e.g. GDDKiA);
- The main source of data about road incidents is the police database SEWIK, although there are some databases on a local level, where initiatives are undertaken to supplement the databases with data from insurance companies;
- There is no crash database in Poland which is supplemented with information from hospitals pertaining to persons hospitalized as a result of road accidents;
- Some databases conduct a verification procedure. It is performed based on incident information sheets and is not executed as "desktop research". The task is often contracted to an external company, in very few cases, the databases use data verified by one another;
- Updating is usually undertaken once a year (first half of the year);
- In most cases, the database is maintained by the given institution and administered by 1 or 2 people, who, besides working on the database also have other duties;
- All of the databases provide access to collected information. In some cases it is a formalized process, in some part of the data is available online, in others data can be accessed without any special procedures;

- Most of database administrators do see the need to link the databases. In case of road managers, it is natural to link the road incidents database with road register, traffic organization or roads safety facilities databases;
- Most of database administrators see the need to develop their databases further, so that they would facilitate detailed and objective safety analyses (precise information about locations (GPS), enabling visualization of incidents on maps, enabling input of information about applied roads safety measures and equipment, improving the modules for online access to databases).

Table 3. Main characteristics of selected databases of road events in Poland - national level.

Level	**National**	
Name	Crashes on national roads	Database of Road Events
Website	-	-
Owner	General Directorate of National Roads and Highways (GDDKiA)	Foundation for Development of Civil Engineering
Objective	Obtaining information about level of risk on national roads, analysis of effectiveness of undertaken actions	Obtaining information about level of risk on roads countrywide (for the purpose of scientific research)
Scope of data collected	Data on road crashes (not including collisions) from national roads countrywide	Data on road events (including collisions) countrywide
Data source	SEWIK	SEWIK GDDKiA
Are the data verified?	Yes (detailed verification by employees in branches)	Yes (locations obtained from GDDKiA database)
Updating frequency	Once a year	Once a year
Number of persons involved	2-3 persons, plus verification – a few people in the branches	1 person

Monthly maintenance cost	2-3 full time position plus verification once a year	½ time position
Are data made available to third parties?	Yes - free of charge	Yes - free of charge
Is there a need for database development?	Yes – mostly in scope of improved data quality (GPS, etc.)	Yes
Is there a need for connecting the database with other databases? Which?	It is already connected with roads data bank and databases of roads safety programs	Yes – with roads register database, as well as data locating programs
Other comment		Data should be verified at the national level and then everybody would be working on a uniform database

Source: World Bank analysis

Table 4. Main characteristics of selected databases of road events in Poland – regional and local level

Level	**Regional**			**Local**
Name	Road Events Database	SEZAR – Road Events Registration System	Warmińsko-Mazurskie Road Safety Observatory	Roads and road events database and register
Website	www.baza.fril.org.pl	-	www.obserwatorium.word.olsztyn.pl	http://portalmapowy.umelblag.pl/pm/gui/
Owner	Pomorskie Road Safety Council	Voivodship Roads Authority in Olsztyn	Voivodship Drivers Training Center (WORD) in Olsztyn	Municipality/City of Elbląg

Objective	Making roads safety data available to all interested users	Obtaining information about level of risk in the region (on all types of roads)	Granting access to roads safety knowledge and data to all users, roads safety status monitoring	Obtaining data for the purpose of assessing the roads safety status and analysis of effectiveness of undertaken actions
Scope of data collected	Data on road events (not including collisions) in Pomorskie voivodship	Data on road events in Warmińsko-Mazurskie voivodship (plus some data on participants: age, gender, etc.)	Data on road events in Warmińsko-Mazurskie voivodship, indices	Data on road events (including collisions) in the city (excluding the beltway, which is an express road)
Data source	SEWIK	SEWIK	SEWIK, GUS, voivodship Roads Authority in Olsztyn	SEWIK, Elbląg City Office
Are the data verified?	No (only obvious errors are removed)	Yes (detailed verification by employees in branches)	Yes (data being used is verified by Voivodship Road Authority - VRA in Olsztyn)	There is no need (events in the city have exact locations)
Updating frequency	Once a year	Once every six months	Once a year	Once a year
Number of persons involved	2 persons	1 persons (approx. half-time) plus verification – a few people twice a year	1 person	Database is updated and maintained by external entities (selected by way of a tender)
Monthly maintenance cost	2 full time positions	Approximately ½ time position plus verification – a few people twice a year	1 full time position	Outsourcing (there is a need for one full time position in the City Office)
Are data made available to third parties?	Yes – all data can be accessed over the Internet	Yes – free of charge (students, teachers, designers)	Yes – all data can be accessed over the Internet	Yes – some of the data can be accessed over the Internet (location and type of event)
Is there a need for database development?	Yes. Works are in progress.	Yes – there is no module for events visualization on maps	Yes - there is no module for events visualization on maps	No

Is there a need for connecting the database with other databases? Which?	Yes – e.g. with traffic measurements database, medical database	Yes – with roads register database and traffic organization database	Yes – the regional Observatory should be connected to the national one (POBR)	It is already connected. It is included in the roads register database, which uses, among other things, orthophotomaps and video recordings from roads inspections
Other comments		A database should not be maintained from behind a desk only. Verification of locations and comparison to incident information sheets are necessary		Until 2012, annual reports on roads safety were prepared, however this was discontinued due to cost. There is a risk, that the road events database will be discontinued for the same reason

Source: World Bank analysis

Other databases

A number of other datasets are collated for higher level analyses and reporting. However, these analyses are of limited value for road safety. For example, the Central Statistical Office is seen by other stakeholders as holding road safety data and conducting useful analyses of it. However, meetings with the Central Statistical Office revealed that they obtain relevant road safety data from other sources in quite simplified form and publish those numbers in aggregated form without any value adding analysis.

The Health & Hygiene Institute presents analyses of vehicle crash victim data from health sources, but does not distinguish between crashes which occur on public roads versus other areas, and thus the data may include many crashes which are not *road* crashes. Therefore, these analyses have limited applicability to road crashes as opposed to accidents with vehicles on farms, in factories, depots, and private driveways. When this issue was raised, the Health & Hygiene Institute reported that they have limited interest in this aspect of the data although they are involved in some analysis in the context of estimating cost of road safety crashes in Poland published by SNRSC[20]..

This attitude from the Health & Hygiene Institute highlights a broader problem for road safety data work in Poland (and indeed elsewhere): many stakeholders in road safety only

[20] undertaken by Roads and Bridges Institute (IBDiM) upon request of and contract with SNRSC

have road safety as a secondary interest and their primary focus on other activities and outcomes dominates their consideration of road safety. This is also true for: GDDKiA which has the primary focus of maintaining the road asset and keeping traffic flowing; Police, with the primary focus on crime and prosecuting drivers not collecting road safety information at crashes; numerous research institutes with a primary focus on obtaining research funding and publishing scientific or research papers and reports; governments and self-governments with a primary focus on being re-elected and giving the community what they ask for; and medical institutions with a primary focus on patient care not the provision of data on crash victims.

A number of other databases are also relevant. Crash related health data are held by Ambulance Emergency Service (*pol. Pogotowie Ratunkowe*), National Health Fund, and other medical institutions. Tables 3 and 4 provide a summary of the most relevant national and self-government databases, with information on the databases summarized in the Table 4.

4. Agencies which should have access to road safety data

The Road Safety Management Capacity Review found that crash data are not systematically shared to facilitate analysis and best use of evidence. This means that a strong evidence base for diagnosis and treatment of the road safety problem is lacking. At national level there is a basic analysis that is sufficient to indicate key priorities and that illustrates trends and crash types, but in-depth analysis that would lead to a better understanding of the reasons for Poland's road safety record is lacking. Of particular relevance is an apparent lack of analysis of the contribution of policy changes and other factors to the trend in casualties over time.

Although Police share the crash data in installments of data sent to certain institutions, the crash database is primarily a functional tool for Police and so direct access to it is not feasible. However, the lack of a shared database results in duplication. Roads and Bridges Research Institute has been developing for a long time its own integrated transport database (BDWIK), and a road safety observatory is being developed by the Motor Transport Institute, which also holds a crash database; GDDKiA holds its own crash database; Gdansk and Krakow Universities hold a joint crash database; and other universities also hold such databases. All of these databases use SEWIK data made available by the Police to all these institutions upon their request.

It is important that the RSIS crash database should be openly accessible and should provide a sound and easily useable resource for road safety crash data analysis by many stakeholders, including governmental, self-governmental, academia, research institutes, NGOs but also journalists and general public.

Road safety data, which is collected by public sector partners should be openly accessible and free of charge. "Ownership" of crash (and other road safety related) data should not be a source of income earned from the data. Road safety is too important to the community and to the broad economy of Poland for this to occur. Road safety related data should be "owned" (managed, validated, sustained, analyzed, and made publicly readily available for all users

and key stakeholders engaged in advocacy or road safety delivery) by the National Lead Agency (NLA) within Government responsible for road safety.

A key outcome to be socialized within the Lead Agency as well as other stakeholders involved in road safety is a strong results focus, identified as critical in the World Bank's guidelines of road safety management. Road safety management should focus on what it can measure in relation to road safety and what it can be measured on as performance indicators illustrating its degree of success in improving road safety. Thus, sound crash and other data facilitate an improved results focus.

5. Analytical capabilities, responsibilities, and reporting

Analysis to produce a strong evidence base for action and monitoring of results of road safety programs are insufficient, leading to inefficiency in prioritization and evaluation of outcomes. It is critical that this be corrected.

Strong analytical capability is required from staff of the Lead Agency as well as research institutions. Staff are required within the Lead Agency with expert statistical analysis skills, research skills to understand what the most fruitful questions are and the explorations needed to tease out an understanding of each road safety issue as strategy, policy and intervention considerations arise. In addition, it is necessary to ensure sustainable long term technical and upgrade support of the databases of the entire RSIS, whether outsourced or in house.

Part of the current role of Police is to prepare monthly summaries and annual reports from the crash data. This function should ultimately be taken over by the Road Safety Observatory and the Lead Agency for road safety (SNRSC), which should provide public reports.

Other government agencies at both the national and self-government levels, institutes and universities should also have access to the data, research and analytical capability, and could be commissioned by the Lead Agency to undertake specific analyses which are beyond the workload of Lead Agency staff. However, the Lead Agency must ultimately have significant in-house analytical capability rather than relying exclusively on outsourcing on a regular basis because experience of managing road safety shows that fast turnaround on data needs will be required on occasion, and data snooping requires close informal discussion on a regular basis between policy developers or program deliverers with the statistical analysis staff. In good international practice, statistical analysis staff are key members of road safety project teams.

6. Facilitating, engaging, and informing self-government

Despite the existence of Regional Road Safety Councils (RRSCs) (*pol. Wojewódzkie Rady Ruchu Drogowego*), the Road Safety Management Capacity Review found that self-

governments reported that they do not support road improvement works based on road safety alone. Often they may just add a little road safety feature to road works approved for other reasons. Traffic flow considerations dominate expenditure planning, even in the building of new roads, and gminas report that apparent road safety improvement works are more likely to be based on complaints and representations from residents than on crash data analysis. Thus, while some voivodships maintain a results focus on road safety management, generally self-government road safety expenditure is delivering to a sub-optimal level. It is also proposed in the NRSP that the RRSCs should be supported by an executive secretariat and a research unit, and that at poviat and commune/municipal (particularly in larger cities or communes) level the RSCs should have similar management functions and coordination role locally. Access to a sound Road Safety Observatory is a condition for success of these processes.

Data are collected by Police at the time of the crash and are first collated at the level of each poviat, the combined to provide data at the level of each voivodship, and then at the National level at Police Headquarters in Warsaw.

This process of upward collation is unusual, but has the advantage that the crash data are available more immediately at three of the four administrative levels- the levels most relevant to Police administrative processes. In addition, the crash data are available to the relevant self-government levels for analysis and use in road safety management. These data are used by Police management at each level, and sometimes by self-government (notably, voivodships). However, all is not positive about this process:

1. The upward marching collation process means that the poviats and voivodships have the collected data as they go up the line. However, essentially, this process relies on each self-government to create and maintain their own local database of crashes. It is not clear that this is an effective long term strategy for self-government crash data usage, because it is not clear how, if at all the data are stored and compared over time for analysis of trends and evaluation of projects.
2. It was apparent during the review that gminas appear to be more responsive to local community views and submissions than to crash data. One reason for the lack of use of crash data may be the lack of analysis of it at the gmina level. Galvanizing the 2479 gminas into road safety action based on crash data for their roads may be greatly facilitated by provision of gmina level data, which the current process does not appear to provide in the way they are provided for the poviats and voivodships. Police operating at local levels appear to consider the crash data in their enforcement processes. However, the gminas themselves appear to give little consideration to these data.
3. While the process is valuable and apparently time saving, it does create extra work in each self-government for the data to be used effectively for road safety.

A key finding of the Road Safety Management Capacity review was that self-governments (with a few noteworthy exceptions such as Warminsko-Mazurskie voivodship) are not sufficiently interested and motivated to systematically deliver road safety. Sound centralized

nationwide crash data available for internal use, tracking of trends, and for external monitoring may improve road safety motivations.

SNRSC has undertaken recently some works on the development of an initial concept of the network of regional road safety observatories in Poland (largely based on positive experience of the development of Warminsko-Mazurskie Observatory). While the network of regional observatories, for example located in each of the voivodships and hosted by the respective Marshalls Offices (which are also in the current system chairing Voivodship Road Safety Councils) would be a very good idea, given that many Marshalls did not demonstrate commitment to road safety and did not take so far much initiative to improve road safety in their respective regions it may be difficult to implement a comprehensive network quickly. However, subject to available funding SNRSC (and future NLA) may gradually promote creation of some analytical capacity in the regions by providing training and possibly free of charge online access to key RSIS databases containing regional data once central RSIS is ready. This should also become part of the NLA cooperation with regional partners and gradually stimulate some more result based road safety activities at the regional level. At the same time it could become an important step in medium- to long-term development of RSIS.

A more efficient process in the short-term would most likely be to create a centralized national database, which has data fields for each gmina, poviat and voivodship, and make the national database directly available to all self-governments for analysis, possibly along with periodic automatically generated reports for each. A number of strong road safety jurisdictions operate such data systems directly available to the public and to self-government. This revised process has the advantages for self-government road safety ownership and management that:

1. Even without strong analytical capability, the automatically generated reports would provide an evidence base for action for all self-governments;
2. gminas would be able to obtain data and reports at their level for the first time;
3. The self-governments would have historical data available for analysis within their own area of control, to review crash trends and identify problems;
4. The self-governments would have historical data available for evaluations of projects and interventions;
5. The self-governments would be able to make comparisons between their own performance and that of neighboring self-governments rather than being limited to access to data from their own areas as is the case now;
6. The media and public could also access these data and make comparisons of self-governments, facilitating the much needed public accountability and public demand for road safety, and thus more consistent motivation to deliver road safety across self-government.

7. Data linkages

Linkages of road safety related databases provide a rich source of information not only for research but for the direct management and delivery of road safety. This is not occurring effectively in Poland. While there is a great potential to develop linkages of the hospital data and the police data, there is no strong motivation to do so. Police are not a research body and this is not their role. Health researchers do the analyses they need for their own research interests. Thus, the lack of drive to achieve sounds linkages arises from the lack of a lead agency for road safety, the agency which would benefit from the improved understanding of crashes and better data on crashes for leadership and management purposes.

Core road safety funding, strategy, policy and intervention decisions can and should be guided by sound data from linked datasets for better benefits from the limited resources available for road safety delivery. For example:

- decisions about engineering treatment of roads will be informed by linkages between crash details and the engineering features of the roads at the locations of the crashes (some of which are already held by GDDKiA). As a detailed example: Certain crash types are clearly less severe than others - 9% of crashes into protective barriers resulted in a fatality, whereas 25% of crashes into tress resulted in a fatality. This contrast shows the value of protective barriers, and could be used for this point. The 9% is also for all barriers, and thus if the analysis was separated for barrier type, the wire rope barriers may turn to be safer than the other barriers for car occupants.
- decisions about driver licensing policy and penalties for violations will be better informed by information relating driver records to subsequent crash history. For example, research from the link of the crash and the drivers license databases in New South Wales, Australia, showed that speeding penalties were a strong predictor of subsequent serious crash by young drivers[21], and this information led to the new policy that provisional drivers lost their licenses for 3 months for any speeding offence. This policy resulted in a 36% reduction in provisional driver speed related fatal crashes[22].
- decisions about vehicle safety policy and regulation will be informed by the link between crashes, injuries, and the vehicles involved. Analysis of the relationship between cars and crash outcomes informs government policy and can be employed to inform the community about which cars to buy for safety (which are often surprisingly not more expensive than less safe cars).
- funding decisions should consider the costs of crashes best estimated from the linkage of crash and hospital/health and other databases.

[21] Sakashita Graham de Roos Croft & Elliot (2007).

[22] Job~~, RFS.~~ (2013),~~ *Pillar 1 Road Safety Management – Speed management.* Paper to the TRB Annual Meeting- TRB Sunday Workshop: Pivotal Role of Speed Management across the Five Road Safety Pillars, Washington DC, January 2013.~~

Attempts have been made to analyze possibility of linking police crash data with health system data for improving assessment of road safety in Poland. The respective research[23] identified obstacles and concluded that police crash data is most likely underreporting the scale of the problem. However further works will be needed to link these two important sources in order to verify the scale of road safety challenge in Poland from health sector perspective. This research may be however useful as input in development of RSIS, particularly in relation to assuring proper links between police road crashes database and health sector databases.

Best international practice is moving towards to creation of comprehensive road safety observatories to provide the rich information stream required to maximize the efficacy of road safety activities. The Motor Transport Institute has been funded by the EU to create a road safety observatory for Poland. However, it is not clear that a comprehensive observatory can be set up outside Government or that this is the most useful and efficient location to house the observatory given severe limitations that the Institute faces in accessing some data-bases held by the Government and privacy considerations, which limit possibilities for establishing data linkages.

A less obvious advantage of linking the crash data with features of the road, and features of the vehicle, as well as data on speeding, is that the analyses allowed by these linkages draw out the role of the pillars of road safety management, and thus create a stronger focus on safe systems. The collection of crash data by Police, with a keen focus on enforcing the law and thus on the behaviors of the crash participants, generates a data focus on the human element of the crash, at the significant expense of analysis of the road, the roadside, and the vehicles involved. It also generates a strong focus on the cause of the crash at the expense of the cause of the injuries. Having the capability to examine the role of vehicles, and roadsides will improve safe systems focus through allowing measurement of relevant variables, as well as evaluation of relevant interventions. This perpetuates the excessive focus on behavioral factors and causes of the crash rather than causes of the injury or death, because the behavioral factors are in the crash database, and so we can estimate how many fatalities are due to drink-driving, etc. However, there is no simple way to estimate how many serious crashes occur where there is a guard rail versus not; when the vehicle is 5 star EuroNCAP rated versus 2 star, or involving drivers with a history of speeding offences versus not. Thus road features, vehicle features, driver history, etc. cannot be readily associated with crash outcomes for research, policy or advocacy purposes. A sound connection between crash and hospital data would allow stronger assessment of crash costs overall and by type, location, speed limit, etc. allowing more precise evaluation of road safety programs and more precise selection of works for stronger benefits.

Use of private information for road safety purposes

[23] ITS Research Analiza możliwości wykorzystania informacji gromadzonych przez policję i w służbie zdrowia do oceny stanu brd w Polsce (Analysis of possibility of using information gatherd by police and health services for assessing road safety in Poland)

While there are good reasons for strongly protecting privacy, there are also strong reasons for allowing the use of PESEL numbers in order to provide a feasible means of connecting databases. For example, finding the connection between the person recorded as being involved in a crash and the person who enters hospital hours later as a patient would be made reliable by use of this personal information. Privacy can be protected by removing the PESEL number form the data records being used for road safety management and research, after the data records are connected.

For public access to the data, a few additional precautions may be required to protect privacy. Some agencies in other countries place another limit on analyses- that the cell sizes into which the data can be segregated cannot contain less than 5 examples. The reason for this is apparent in a hypothetical scenario. A person may know those involved in a particular crash (for which the location and time of the crash are known). On this basis more could be found out about the crash, such as: was the driver speeding or drink-driving according to Police. Public access to the crash database could be used to reveal this by seeking segregations of crashes for the relevant day by location and causal factors. This is prevented by not revealing data for cells which drop below 5 cases.

The process of linking databases would ideally be undertaken by the road safety NLA, so that the agency is the master of its own destiny in ensuring that this is done well and in a timely manner. However, other agencies may be engaged to do this on the basis of having the authority to use PESEL numbers now (for example, the Ministry of Interior). Data could be linked by the Ministry of Interior and handed over to the RSIS held by the NLA. Over time and with proper regulation, the Lead Agency should aim to obtain such authority for itself.

Costs of Crashes

Linkages of crash and health records will allow for better measurement of the costs of crashes, a core information source for the prioritization of road safety works, and for advocacy for road safety as well as government understanding of the need for strong road safety actions. This issue has been discussed in Poland[24] and examined recently upon request from SNRSC by the Institute of Roads and Bridges (IBDiM)[25] with some support from National Public Health Institute (*pol. Narodowy Instytut Zdrowia Publicznego*) and other partners, although only through analysis of linkages and extrapolations from the small data sets. Caution is also needed not to include medical costs from all patients presenting as victims of crashes, because some of these will have occurred on private property and should not be counted as road crashes.

8. Additional regular data collection on intermediate outcomes

[24] http://www.pbd.org.pl/wydarzenia/single/id/772

[25] http://www.krbrd.gov.pl/images/files/KOSZTY_WYPADKOW_DROGOWYCH_W_POLSCE_W_2012_R_final.pdf

The above discussion of data linkages considers existing databases (health data, vehicle registration, driver licenses, and road features). In addition, best international practice in monitoring and management of road safety calls for the development of databases which provide measurements of intermediate outcomes of key relevant to road safety for prioritization of actions, funding decisions, evaluation and refinement of actions. These include systematic measurement of:

- driving speeds;
- seat belt use;
- child restrain use;
- drink-driving prevalence;
- bicycle helmet use;
- road safety related community beliefs and attitudes;
- motorcycle helmet use (though motorcycles are less common in Poland than many countries, and so this may be a lower priority).

Some of these data were collected in Poland between 2002 and 2008, but this was stopped due to lack of funding. EuroRAP ratings of some roads have also occurred, but the extent of use of this information to set interventions is not apparent.

Processes are required to collect these data on a sufficiently regular basis as to allow monitoring of progress and early detection of problems. It is clear form small scale observations of road use in Poland that there are already significant problems with seat belt use, child restrain use, speeds, and bicycle helmet use.

SNRSC has recently re-started collecting many of the above data and this creates a good opportunity for the development of data-base of such intermediate outcomes. The World Bank can provide additional guidance on surveys, data collection methodology, and analysis if required in the course of such work.

Two points are worthy of note on these data collections:

1. Required study sample sizes should be carefully considered rather than based on exiting studies and international practice, because many countries employ much larger samples than are required for the purpose of national monitoring of these factors and provision of baseline data for evaluation of interventions. For example, collections of samples of over 20,000 seat belt use/non-use records are common but excessive for the purpose. Sample size can be calculated from the level of change in seat belt use which should be detected.
2. The regularity with which the data are collected must be fit for purpose and so should be determined by the road safety NLA based on circumstances and planned relevant interventions.

9. Resourcing and contracting process required to efficiently manage the creation and sustainability of the recommended databases

Best international practice dictates that the RSIS should be housed within the road safety NLA for Poland. As mentioned in the Road Safety Management Capacity Review Report[26], such agency can be for example build based on the Secretariat of the National Road Safety Council, but the detailed solution would have to be worked out based on international good practices and take account of specific institutional and legal environment in Poland.

It is important that the NLA for road safety (the organization which will have the greatest responsibility, accountability, and leadership role for road safety) should be responsible for creating, sustaining, and maintaining the observatory, consistent with international expert recommendations such as the Buenos Aires Declaration. Considerations included in this section are based on this principle.

It is to be expected that any agency outside government will have challenges with creating a road safety information system, for reasons to do with managing privacy of information which will limit the feasibility of data linkages, as well as broader caution with government data being handed over to a non-government or semi-government organization.

The Lead Agency will also need to manage integration of the data collections noted in the section above on regular data collections.

10. Analyses and uses of the databases

In order to capture the benefits a well developed Road Safety Information System can provide in efficiency and effectiveness of road safety delivery, the Lead Agency must have the ability to undertake comprehensive analyses, the ability to ask the most relevant questions of the data, and the ability to use the results observed in the setting of strategy, the prioritization of interventions, and the delivery of actions. International training in these skills and processes may be of value. This may be achieved through a number of possible arrangements, including:

- partnership with another country,
- training by World Bank experts
- courses available for road safety in a number of universities may be helpful, including Delft University (Netherlands), Centre for Accident Research & Road Safety - Queensland (CARRSQ) or Monash University Accident Research Centre (MUARC) (Australia), although these courses are not road safety data focused.

11. Public access to data

[26] Job et al. (2013)

The crash database is currently made available to certain government agencies and research organizations but is not available to the public or the media. Additionally, the POBR allows public access to some (de-identified) Police crash data and some limited other data via the website.

In addition to the principle of transparent government, there are strong advantages for road safety (and interestingly, if soundly managed, for Government) in moving to free access to the crash data, including for the public, the media, and research institutions. This has worked well in other jurisdictions which have such access including Sweden and the State of Victoria in Australia. For example, Victoria allows public access to the crash data for various analyses, and this has worked well. In Victoria, this move appears to have reduced accusations of Government hiding facts, has reduced claims by media that they found out certain fact through their own investigations which had the implication that Government was avoiding revealing these facts, and has calmed media claims of revenue raising in relation to speed cameras. Interestingly, the anticipated mass misuse of the data and misunderstanding of it in writing stories generally has not occurred. The advantages of the move to open crash data include:

- Increased road safety advocacy by stakeholders, with better informed suggestions and pushes for government action;
- More research from the data by academic institutions, often providing insights not otherwise likely to have been identified;
- Greater understanding and credibility for road safety data among journalists;
- Increased understanding of road safety issues by the public;
- The above changes have allowed government to do more about road safety, with less pushback from the community.

The key issue to be managed with public access to data is privacy. The publicly available databases should not contain private information, and limitations should be placed on data availability and analysis to avoid individual crash details being revealed.

Creating a road safety data "virtual watchdog" and apparent independence of the RSIS

Overall, the move to publically available crash data allows the media, advocacy groups, and the public to act as a broad „virtual watchdog" for road safety. It is difficult and expensive for government to set up an alternative version of a watchdog type institution because this involves funding an agency to perform this function as well as creating legislation which ensures the full independence of such a watchdog.

Independence is often raised as a virtue of non-government agencies holding the RSIS. However, because the data are collected and handed over by government, there is not greater independence as long as the RSIS is open to non-government stakeholders for scrutiny and analysis.

12. SNRSC survey on collecting and providing access to road safety data.

As part of the data collection contributing to this report, a survey was organized by the SNRSC aimed at better understanding the current demand for road safety data and methods for accessing and managing such information. The survey involved requests to a diverse range of public institutions and NGOs with a questionnaire attached to an explanatory note. The main objective of the survey was to collect information necessary to better understand the needs of the partners, any particular problem areas to guide the process of developing the RSIS to accommodate the needs of numerous stakeholders.

196 organizations and public administration units responded to the request. Responses were sent primarily by self-governments: 95 poviat authorities (*pol: starostwa powiatowe*), 40 municipal authorities, communes or regional authorities, 27 road administrations and road traffic units (WORDs), 33 NGOs, insurance companies and 5 academic institutions and ministries.

Conclusions from the survey confirm the need for wide and as open as possible access to road safety data. Key conclusions from the survey are summarized in Table 5. They confirm that that most of stakeholders need regular, long-term (continuous) and free of charge access to reliable data and information related to road safety. They also expect that such databases will be continuously expanded and improved particularly by linking them with information about the road infrastructure and other details related to specific locations. However, behavioral data and links of crash data with vehicles or drivers were not found particularly useful to the respondents. This may mean indicate that public institutions in Poland still do not see importance and role of linking databases and doing more advanced research to improve performance of the whole road safety management system. More detailed analysis of survey results is provided in Annex 5.

Table 5. Key conclusions from survey related to collecting road safety data and making them available.

Group of conclusions	Conclusions
General response to survey and road safety data needs	- Survey reception by participating institutions has been very positive, as evidenced by diligent completion of questionnaires and frequent answers to open-ended questions - Respondents confirm that they need data on road safety status and that they do use such data. Most respondents use it several times a year, but some even several times a week.
Data acessibility	- Nearly all the institutions agree that road safety data should be publicly available for free (via Internet).
Type of data used	- Most respondents have found annual reports concerning fatalities, injuries, accidents and collisions in Poland very useful in their day-to-day work. They use such reports along with more detailed data, such as: the cause of the

	accident, specific demographic information, location, and trends by for example comparison with previous years data; they found very useful regular reports (drafted at least once a year) with detailed summary of road safety indicators (fatalities, injuries, accidents and collisions) at a national, regional (*województwo*), county (*powiat*) and municipal (*gmina*) level. Many institutions feel however that they do not need comparative reports. - Indicators applied by many institutions in their day-to-day work and particularly those that describe reduction in crashes and fatalities/injuries in relation to specific road safety measures undertaken are rated as extremely useful; speeding indicators are found occasionally useful; safety belt and child restraint use indicators broken down by e.g. type of road type, child age, location in the vehicle, etc. are evaluated as not useful by most respondents. Respondents from academia and ministries were also interested in guidelines and good practice manuals.
Need for linking with other databases	- All respondent groups believe that key priority is the link between crash data and infrastructure data as well as precise crash location on the map. Any links between crash data and detailed information concerning the victim (disability, medical treatment costs, training examination score) have been rated as low priority or totally insignificant. Likewise, vehicle data was not rated as worth using, by respondents (though this may reflect an incomplete appreciation of the importance of vehicle data and the management mechanisms available for improving vehicle safety) .
Need for improving databases	- Questions concerning the need to improve databases and data collection system triggered very diverse replies, but a definite "not needed" was very rare answer. There was a split between answers in support of the idea and those without any view.

13.Ensuring the sustainable management and use of the databases

Funding, data systems management and building ability (the latter perhaps most effectively partially outsourced) are critical to sustaining the Road Safety Information System.

In relation to the database, current practice by Police, necessitated by the limited available data storage within their system, is to discard a year of crash data as each new year of data are added. Thus, there is no long term historical record of crash data available for analysis from Police. However, the Motor Transport Institute has a record of verified crash data extending further back (to 1990) than the Police hold. The RSIS should have sufficient

storage to sustainably hold the crash data indefinitely, including loading the backlog of available historical data for long term trend and evaluation analyses.

The POBR Observatory that is being developed by the Motor Transport Institute (ITS) is not fully operational, though a number of effective and useful functions are available. The sustainability of the Motor Transport Institute Observatory beyond 20115 is uncertain because EU funding was for its development only and it is not a permanent source of funds. Due to involvement of EU funds, formally the Institute is obliged to maintain and operate the Observatory for at least 5 years. During this period it has to provide the data free of charge hence cannot generate any revenues using assets supported by EU funds. Based on estimates provided by ITS the annual cost of Observatory operations (including licenses for data processing software) reaches approximately PLN 1 million.

14. Access to, and ability to use, a sound evidence base from research and experience

Poland has a long and impressive history of world leading research in both pure and applied fields. More can be done to leverage this capacity for road safety, and a sound information system available for research will facilitate such research. The principles of evidence based decision making, public accountability, and continuous improvement in road safety dictate that public access to research and evaluation are critical elements of transparent road safety management.

In addition to the extensive data available from the lead agency in a sound RSIS, good international practice in road safety management and leadership also requires other information. There is an extensive body of research based evidence published from many countries on what works best in road safety (and what does not work). This now large body of research from numerous international journals and books resplendently shows that a common-sense approach to road safety often fails. Many actions which most of us would expect to improve road safety do not. In addition, there is a body of experience available from international road safety experts who have been genuinely involved in successful delivery of road safety. Poland should access these arenas of information rather than re-inventing the wheel. Processes such as training of Lead Agency (the SNRSC in the short-term) staff by international experts, providing access to electronic sources of journal articles, and contracting experts to undertake literature reviews on specific issues of particular relevance to ongoing policy issues will all facilitate effective use of this body of critical information.

The motivation to employ the evidence base to make decisions, and the appreciation of the value of evidence-based decisions are critical. Monitoring and evaluation of safety programs are currently quite limited at all levels of government. Progress measurement is based largely on national crash data and broad trends, and there is a lack of before-to-after data collection (and use of control jurisdictions) for monitoring and evaluation of policy. This situation will

be improved by both access to an RSIS but also by training of NLA staff in why and how to use an evidence base.

The appreciation of the need for a sound evidence base for understanding of the current situation and past trends, for producing targets for the future, and for monitoring and evaluation of interventions, is a fundamental requirement that should be given high priority in training of road safety management staff.

A. ACTION PLAN FOR MANAGEMENT OF ROAD SAFETY RELATED DATA AND INFORMATION

This section provides a high level plan of action for Poland to substantially improve the country's crash and related road safety data and information systems.

Strategic Aim of Action Plan

The strategic aim of the Action Plan is to deliver for Poland, a crash and road safety data and information system which allows sustained, effective, efficient, fully informed management, delivery, evaluation, and performance monitoring of road safety. In order to achieve this aim the data and information must be sustainably stored, accurate, comprehensive and credible; should be amenable to international benchmarking; must be readily available to multiple stakeholders; must be expertly analyzed; and must be effectively used in the advocacy for, development of, public promotion of, assessment of, and monitoring of road safety activities.

The Strategic Output of Action Plan

The strategic output of the action plan proposed below is to deliver RSIS for Poland (via gradual change over some time) with the following recommended characteristics:

- is held by the road safety NLA (SNRSC) alone or in collaboration with partners;
- data and information sourced through sound collaborative partnerships within government;
- sources of broad scientific and practical experience based information on what works and does not work in road safety, and the practical pitfalls in delivering it;
- the staff and capacity required to analyze the data;
- the staff and capacity required to use the results of the analysis in road safety planning and delivery;
- the resourcing required to sustain the above benefits and improve the delivery of road safety;
- open access to the de-identified and privacy protected) crash and other key road safety data in the RSIS, to circumvent the current practice of multiple organizations holding their own crash and other databases; thus providing one source of information on crash and other important road safety statistics, and independent scrutiny of road safety progress at national and self-government levels in Poland.

Implementation of modern and comprehensive RSIS should result in the following outcomes:

- improved road safety management sustained by the capable NLA having RSIS as a source of sound road safety evidence-basis encouraging a strong results focus;
- increased safe system thinking through proper linkages between data sets;

- transparent communications with others, and better informed media, advocacy groups, and public on road safety, creating greater acceptance and motivation for genuine road safety measures;
- better informed government on road safety, more motivated to deliver road safety through better informed advocacy and a better informed public;
- a broader evidence base for road safety management, including intermediate outcome as well as final outcomes;

Figure 2 shows a schema of RSIS proposed for Poland reflecting good international practices in establishment and operations of road safety observatories and broad processes associated with RSIS, including open access, advocacy, government funding and support. The schema proposed in Figure 2 reflects the key features and advantages listed above, and the plan of steps below aimed at delivering it in Poland.

Figure 2: Proposed model of Road Safety Information System for Poland (green arrows illustrate data and information transfer; yellow arrows illustrate potential funding lines. Source: World Bank)

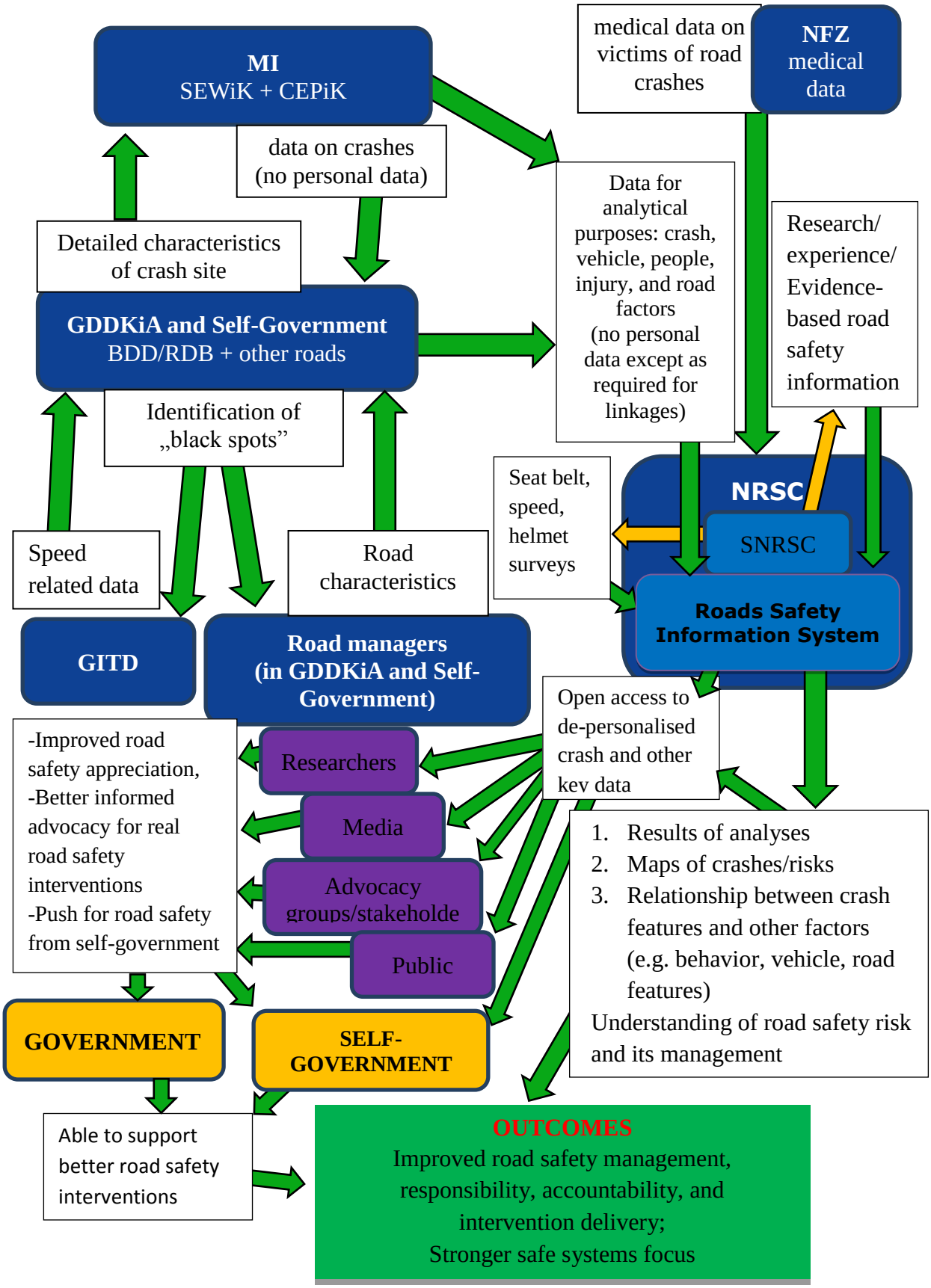


Table 6 provides a list of databases and variables which would constitute a sound Road Safety Information System (RSIS) for Poland

Table 6. Databases required in a Road Safety Information System, for best practice road safety development, monitoring and management in Poland

Databases and information
Crash database (connection to other data via PESEL, crash location records, and vehicle registration details)
Population (national, and within each self-government area) and other data on self-government administrative unit in which crash occurred (derived from crash location data or recorded at crash)
Vehicle database (connection to other data via vehicle registration)
Driver record database (connection to other data via PESEL or driver license)
Health system database on patient injuries, treatments, and rehabilitation (connection to other data via PESEL)
Road Crash Insurance database (connection to other data via PESEL; PIU have confirmed that they have PESEL numbers in their database)
National Road inventory and features database (connection to other data via location details)
Traffic database (connection to other data via location details)
Road inventory, road condition, and other databases held within self-government (connection to other data via location details)
Speeds database (connection to other data via location details)
Seatbelt and child restraint use database (by demographic details and connection to location/self-government administrative units)
Drink-driving database(by demographic details and location/self-government administrative units)
Motorcycle helmet database(by demographic details and location/self-government administrative units)
Bicycle helmet database (by demographic details and location/self-government administrative units)
Red-light running (connection to other data via location details)
Number of vehicles (connection to self-government administrative units and traffic data)

Traffic supervision, enforcement
Data on demographic details of victims of road crashes (connection to other data via PESEL)
Roads data by location in specific voivodships, poviats, municipalities and towns and by administration responsibility (national, voivodship, poviat and gmina/municipality)
Weather conditions (primarily from IMiGW, but GDDKiA has data from their operated 400 weather stations as well)
TEN-T and EU co-financed roads (linked to location and road data)
National Road Safety Program (NRSP) implementation data (targets, indicators, activities planned, executed, institutions responsible and involved, contacts to key stakeholders etc.)
Expenditures on roads safety activities (preferably linked to NRSP implementation data – projects/activities)

Source: World Bank analysis

Role of POBR Observatory - Options for Consideration

The above strategic aims and outputs represent an ideal solution recommended for Poland given ambitious road safety targets and unique opportunities for creating state of the art RSIS resulting from unique opportunities for strong linkages between crash and health records offered by PESEL number, currently occurring database improvements, and opportunities. However, due consideration must be given to recent developments in POBR Observatory in determining how to progress to this ideal situation, as described earlier in this report.

Recent developments result in an unusual situation. The POBR Observatory is not ideally located vis-a-vis international good practice and inevitably data held within the database are limited in scope by Government policy, legal and privacy concerns. Nonetheless, this is a significant development by the ITS, a Government subordinated entity[27] which operates independently and is not part of a Government. This development adds value to road safety related data in Poland, and a significant investment has been made to achieve this. Furthermore, the Institute has gained an expertise by developing POBR and the analysis of the data.

The Institute has achieved a significant development of the POBR Observatory. The database is available on-line and allows for a substantial level of analysis including a world class mapping system of crash locations. This is a valuable tool for road safety management by all levels of government and self-government in Poland. It supports also stronger road safety advocacy through allowing greater public and media access to road safety data. The EU funding for this development is a significant contribution, and the value of what has been

[27] ITS is reporting to the Ministry of Infrastructure and Development

achieved with it should be maximized for road safety in Poland. ITS have shown persistence and a passion for POBR development, which is of value to road safety.

However, the development of the system by the ITS is not sufficient to be considered a fully functioning road safety information system. The Institute is unable to create the full POBR Observatory and populate it with the planned data because of formal barriers to data access resulting from the fact that the ITS not part of the Government. Under Polish law, this creates a critical impediment for a number of government agencies which hold key but sensitive data (primarily due to the privacy issues and other data protection considerations), preventing them from providing the data to ITS.

A number of options exist for addressing the above situation:

1. Create a new RSIS within government, leaving the POBR Observatory held by the Institute as a separate database.
2. Absorb the POBR Observatory into government and expand the range of available data to include the data and create linkages which can only be handled within Government.
3. Use the POBR Observatory as the primary basis for a database for Government management of road safety but with full access provided to the NLA (SNRSC) while leaving the database in the ITS and expand the range of available data to include the data and create linkages which can only be handled within Government

The advantages and disadvantages of these options are considered below.

Option 1: This has the advantages of allowing for a full observatory within government and yet leaves a more independent observatory available for independent scrutiny, apparently adding to the "watchdog" security processes within the system. However, because the core data on crashes are supplied to the Institute by Government agencies the apparently stronger watchdog function in this model is more in perception than in reality. The same level of watchdog function can be achieved by allowing outside agencies (including Motor Transport Institute) access to the crash data managed by Government. Furthermore, Option 1 adds expense and is inefficient, allows the continued duplication of database developments, and fails to fully capture the value of the EU investment and the work of the Institute to create the database within the Institute. Thus, this alternative is not recommended.

Option 2: A central issue is whether the dataset should finally sit under the responsibility of, and within, the road safety NLA or not. A number of considerations primarily based on international good practices suggest that the data should be managed and owned by the NLA:

1. As noted in the World Bank guidelines, in managing for improved road safety results, the foremost and pivotal institutional management function is results focus[28]. IRTAD provided similar recommendations, which were additionally recently reinforced

[28] Bliss & Breen (2009)

through so called Buenos Aires Declaration[29]. Holding, refining, and managing a road safety observatory facilitates this focus within a NLA and thus across government.

2. The most common successful placement of the road safety databases or observatories has been within the government lead agency, and this placement is the recommendation of the World Bank team for Poland. Most highly successful countries and independent states have placed the crash and other road safety databases within Government and specifically within the road safety NLA (for example, Sweden, Spain, Germany, New Zealand, and every state of the Australian continent). Although in some cases the management of the data by the NLA is via different mechanisms involving some external partners these are exceptions, which usually result from unique administrative cultures, special institutional environments and the legacy of a long process of developing such observatories - circumstances which do not apply strongly to Poland[30].
3. The few exceptions to this approach which has been successful are marked by a number of noteworthy features:
    a. The agency holding the data has a depth and breadth of road safety expertise as well as analytical expertise. This must comprehensively and credibly cover proven international level expertise in analysis and research across the full range of road safety pillars: roads and roadsides, vehicles, behavior, speed, and road safety management[31]. The position that the Netherlands has acquired in the field of road safety and SWOV's role in this process are recognized throughout the world. Unfortunately Poland has no equivalent, globally recognized, institute nor capacity to be able to build it quickly given limited resources that can reasonably be expected for road safety research in the short term. Nonetheless, the ITS and the Roads & Bridges Institute do have strong national reputations and international recognition of some staff.
    b. The agency holding the road safety data is a genuine road safety organization, rather than a general transport agency. For example, SWOV is the central agency for road safety research in the Netherlands, with a very strong road safety focus, not a broader transport focus of which road safety is just one element.

[29] http://www.internationaltransportforum.org/jtrc/safety/Buenos-Aires-Declaration.html

[30] For example, in the UK the Department of Transport set up a government committee to manage the databases, and this committee (the Standing Committee on Road Accident Statistics or SCRAS) has managed the databases since 1977. Thus, while the data are also held by Transport Research Laboratory (TRL Limited), they are made freely available by Police in the UK. Another example is: SWOV, which holds the database for the Netherlands. SWOV is uniquely well placed to undertake this role (see footnote below). Finally, the Transportation Research Centre in the Czech Republic is a failing example. The research centre the Czech observatory composed of a number of the road safety databases has been discontinued due to lack of sustained financial support.

[31] For example, SWOV contains such international expertise and both SWOV and its head (until recently, Professor Fred Wegman) have been recognised internationally for road safety expertise. SWOV has about 40 researchers as well as supporting staff, working on nine defined themes, which cover the areas of the road user, vehicles, the road infrastructure, telematics, analysis of road safety, understanding the road transport process and support of decision making in this field.

c. There is a very close successful working relationship between the government road safety NLA and the organization holding the road safety data, and the organization holding the data is tightly controlled in its data functions by the NLA.
d. Any organization holding the road safety data should be expected to make it freely available for analysis and use, rather than holding the data primarily for its own use, which can lead to a situation when it becomes the important source of revenue for such an organization. This may be an incentive to such an organization to limit access to data in order to benefit from a monopoly or near monopoly on providing analysis of the data or providing access to data. This contradicts open data principles that should be followed by governments and other public sector institutions, since governments must maximize the benefits provided to the community from the tax payers money and cannot risk being 'held to ransom' by paying for maintenance of, development of, access to, or simple analysis of, crash and other data which, after all, were practically collected by governmental institutions in the first place.

Thus, there are strong reasons for managing the road safety observatory within the NLA. Option 2 delivers that feature, yet without the disadvantages of Option 1 (inefficiency and database duplication, failure to capture the value of the EU investment). Thus, it is preferred over Option 1. Several critical considerations and risks are however brought into play by this option. These include:

a. Can the POBR Observatory be employed as the functional source of data for analysis in the interim (to satisfy also the requirement of assuring at least 5 years of non-commercial functioning following receipt of EU co-funding)?
b. What interim arrangements are necessary to allow for effective data access and analysis during the period of ITS management of the POBR Observatory gradually being transformed into governmental RSIS?
c. Will ITS provide prompt open, free and convenient access to the POBR Observatory for the period of its stewardship of the Observatory?
d. How can the existing POBR Observatory be transferred under the Government responsibility (most likely SNRSC in the short-term and ultimately to a NLA)?
e. What legal or financial arrangements (including in relation to EU funding) are needed with the ITS to achieve this transfer?
f. How can the expertise and experience of the ITS in creating and managing the POBR Observatory be best retained for the successful transition of the ongoing POBR Observatory and further development of RSIS within Government?
g. Can the Institute be funded by the Government to assist with the transfer process and with operations and maintenance of the POBR Observatory for some time after the move to the Lead Agency? It is strongly recommended in this context however that there should be an open access to the POBR data for research and analysis assured for any interested partners as part of any interim arrangement with ITS.

Option 3: This Option offers a more collaborative approach, in which the ITS would continue to maintain the POBR, and the NLA would be given complete access to the dataset of POBR in arrangements with the ITS. The NLA, being fully within Government, is also in a better position than the ITS to access the data which governmental units and other public institutions have not been able to provide to the ITS. Thus, the ITS would also contribute to create an expanded RSIS based on the POBR database.
This way forward has a number of advantages:

- It allows quick improvements of the POBR
- It maximises the use of the developments funded by the EU
- It minimises inefficiency and duplication
- It allows the NLA prompt access to a database which can be developed further with Government sensitive information
- The separation of these additional sensitive expansions (at NLA) from the centre from which public access occurs (at ITS) may be an added security for privacy and sensitive data protection.

For Option 3 to be effective a contract arrangements between the NLA/SNRSC and the ITS must be developed regulating all details of cooperation in operating and developing POBR.

If such contract can be agreed, then Option 3 should be the preferred option since it provides the best of both other options. If however for some reason suitable arrangements with ITS for full appropriate access to the POBR cannot be achieved, the other options should be considered.

Policies and Practice which should be maintained

The above findings of this review process reflect the need for significant changes in order to improve the evidence-based delivery of road safety for Poland. However, a large number of current practices and structures are sound and effective and should be maintained. These include:

- Police should continue to collect crash data at the scene of the crash, as per IRTAD's recommendation on best practice (though refinements of process are recommended below);
- Each key government road safety organization has its area of appropriate expertise, and the level of expertise is high in Poland. This expertise should continue to be accessed by tightening cooperation between:
    - SNRSC (and full NLA in the future) as the coordinating agency for establishment and essential expansion of the governmental RSIS, including all key datasets.
    - GDDKiA for road infrastructure information;
    - Police for crash data;
    - Ministry of Interior for licensing and vehicle information;
    - Health system partners for hospital and individual health records;

- Other key stakeholders as identified in the process.

A number of research institutions and universities should be informed about data availability and invited to provide sound research and analysis, so representatives of academic and research community should be also approached and involved in the process of defining their evolving needs and expectations.

Outline of Actions to Deliver the Road Safety Information System and Associated Features

Actions are grouped into areas of related activities, and could be undertaken in different orders. The groups of activities are listed below, and each is considered in turn.

1. Seeking government approval and required legislation
2. Seeking sustainable funding
3. Seeking expert assistance
4. Working with partners
5. Working with the ITS
6. Identifying key areas of change needed in databases
7. Establishing database(s) collecting behavioral data and intermediate outcome variables
8. Establishing tools supporting implementation of NRSP
9. Begin the process of developing the comprehensive governmental RSIS
10. Recruitment and professional development of SNRSC staff
11. Encouraging development of "watchdog" functions
12. Later actions

1. Seeking Government Approval and Required Legislation

Government approval will be a critical early step to achieving the strategic aim. Communications to facilitate this should include the NRSC, the Minister for Transport, other relevant Ministers, and other governmental stakeholders more broadly. It is expected that the Minister of Infrastructure and Development will undertake much of the communication on this issue. Strong government understanding and support are needed for funding, high level agreement to collaborations across government agencies, and for legal reasons. The World Bank stands ready to support MID in this process, by for example presenting findings and recommendations of this report at the high level ministerial meeting.

Current laws specify the existence of SEWIK and the NRSC Secretariat but do not address sometimes quite complex issues related to the proposed RSIS, which will thus require modifications in existing and/or completely new legislation. Obtaining strong Government support and the preparation of the required legislation are not only necessary steps, but will

signal to partners that the real work on governmental RSIS is beginning and is supported at the highest level of Government. The exact legislation required may depend in part on the Option from the three above chosen for addressing the relationship between the Government run RSIS and the POBR.

2. Seeking Sustainable Funding

In addition to seeking funding directly from the National Government, other possibilities include:

- IRTAD, with an account of the need for the RSIS to be in government;
- The EU financial assistance through European Structural and Investment Funds (ESIF) coordinated by the European Commission (EC); to this end contact with EC colleagues responsible for road safety may be useful and the World Bank offers support in facilitating such contacts and sharing its knowledge of road safety in Poland.
- Sustainable funding from the hypothecation of fines from speed cameras (or perhaps just new cameras with a much needed expansion of the program to improve safety) and/or via a dedicated road safety component included in the National Road Fund program.
- Based on the help the RSIS will provide to self-government, a small contribution could be taken from each of these self-governments to fund the RSIS, or the National Government could be asked to provide the required funding as part of its budget for support of self-government;
- International Financial Institutions (European Investment Bank, Council of Europe Development Bank or the World Bank) could be approached for financial and technical support related to the establishment of RSIS.

3. Seeking Expert Assistance

Expert input into the process of RSIS development and staffing will provide value. A twinning arrangement, in which a country with considerable relevant expertise and success is paired with a country which is developing a road safety observatory, may be of significant value. This worked very well for the development of the observatory in Argentina and Ibero-American Regional Observatory. At least three organizations could be approached for expert support:

- IRTAD, which often arranges and manages twinning and other appropriate arrangements between road safety institutions;
- The EU/European Commission, since it has noted that it will "cooperate with the Member States with a view to:
  - promoting twinnings and other modes of cooperation to increase road safety capacity of Member States;

- improving data collection and analysis as regards accidents and developing the role of the European Road Safety Observatory"[32];

- The World Bank for broad road safety technical assistance.

The EU has co-funded POBR Observatory but no collaborative arrangement with another country has been made. It is recommended that such an arrangement should be sought, ideally with a partner which has already developed modern and efficient RSIS, but preferably between SNRSC (and NLA in future) and an experienced EU partner. The World Bank team stands also ready to facilitate contacts with IRTAD and if needed some EU contacts for this purpose.

4. Working with Partners

Consultation with stakeholders in the process of development of the RSIS is an important undertaking. The aim should be to accommodate the data and information needs of stakeholders, as well as understanding issues with accessing data from partners.

The maintenance and provision to the SNRSC/NLA of the multiple databases required to populate the RSIS relies critically on partners who maintain and hold the source databases. It also depends on access and authority to employ PESEL numbers or other sensitive data (such as car registration numbers) to link the databases. In addition, in some instances, the proposed action plan calls for improved data which will require significant extra effort from some partners. Thus, maintaining good relationships with all the partner organizations and arranging their proper input in the process are critical.

The use of PESEL numbers or other sensitive data for establishing linkages between databases requires an authority. It may be best to leave the linking of databases and "depersonalizing" the linked databases to an organization currently holding that authority as an interim measure, but ideally the SNRSC would need to hold the requisite authority.

Self-Government constitutes an extremely large number of key road safety stakeholders. It may be useful to start working with a small number of self-government bodies as an initial step into this arena. These could be identified as demonstration regions, and this would allow a more gradual introduction to the issues and a more gradual increase in resource demands within the SNRSC and later in NLA.

A consultation group to consider the full development of the RSIS may be appropriate, in addition to the survey already undertaken.

5. Working with the ITS

[32] COM (2010)

The ITS was funded by the EU to develop a Road Safety Observatory for Poland. The ITS development of the POBR is an important achievement and expenditure of EU funds.

As noted in the World Bank guidelines and described above, in managing for improved road safety results, the foremost and pivotal institutional management function is results focus[33]. Based on international best practice, successful experience, the recommendations of international expert reports, and our analysis of the situation in Poland, it is recommended that the government NLA should hold the RSIS.

This can be achieved in a number of ways discussed earlier in this document.

A number of factors may facilitate efficient co-operation between ITS and SNRSC (and NLA in future):

- A commitment to provide full access to the non-sensitive data that ITS and government may hold for research by the ITS and other research institutions;
- The difficulty the Institute is experiencing in creating the POBR Observatory and filling it with the planned data, and the need for Poland to have a more comprehensive RSIS;
- A commitment to cooperation in the development and use of the POBR Observatory and gradual expansion or transformation into a comprehensive RSIS;
- Exchange of experience between key ITS staff involved in POBR and staff from other institutions dealing with the relevant databases with SNRSC (and NLA in future) to increase capacity for development of RSIS.

6. *Identifying Key Areas of Change Needed in Databases*

The above description of findings identifies many areas ripe for improvement, which will need to be considered in the development process and with partner agencies. Core areas of improvement include:

1. Improvement to the SEWIK - Police crash data recording, especially in relation to crash location and GPS recording, coding of more detail of the crash type/movements which led to the crash, follow-up for deaths within 30 days, properly reflecting the role of speed as a crash factor, and recording crash data electronically[34] at the crash scene to ensure information is not missed in completing the form. Police or MI has to lead this effort formally as most likely by law they are the only agency which can make changes to the crash data collection processes. However SNRSC and other key

[33] Bliss, A. & Breen, J (2009). *Country guidelines for the conduct of road safety capacity reviews and the specification of lead agency reforms, investment strategies and safe system projects*. World Bank Global Road Safety Facility, Washington, D.C.

[34] For example using standard software installed in the standard equipment of Road Police, which would be error proof and require to enter all crucial data, which then immediately or shortly after collecting data at crash scene transmit all the data to the central SEWIK data base; WB team was informed about some trials in electronic data collection in some Polish regions; although they were discontinued lessons learned could be useful in the context of the proposed SEWIK modifications.

stakeholders should be consulted on their needs so that modernization can preferably in one go introduce as many of them as can be reasonably expected.

2. Health systems data can be improved as identified by WHO, and collaboration with Police in providing information on crash victims also requires improvement.
3. While most hospitals participate in the provision of data on crash victims, some do not. All should be participating, and this may be achieved through collaborative discussions or financial consequences. Discussions to establish the reasons for non-participation are a sound first step. For example hospitals could be penalized for failing to provide Police with appropriate information on crash victims. Perhaps exchange of such information could be done periodically and semi-automatically by exchanging some data between the relevant Police and health data bases. An alternative could be to try to verify data on crash victims using individual personal health records collected by the recently established Ministry of Health IT Center, obviously assuring proper protection of privacy.
4. Creating a process which allows for self-government to access crash data related to their jurisdiction or administrative area, including historical records for analysis.
5. All government agencies, non-government stakeholders, the media and the public should be able to access the crash database (de-personalized and sanitized by removing all sensitive data and if needed grouping data to avoid the risk of compromising privacy) for analysis over the web.
6. Critical database linkages need to be created, including between crash data and health data on injuries, crash costs, road features and crash outcomes. These linkages should ideally include all Poland's roads, not just national level roads (managed by GDDKiA) or only selected self-government roads[35].
7. The condition and features of vehicles in crashes are also not captured in current crash data, and may be achievable via sound links.
8. Sustainable long term data storage is required without the need to discard old data as new data come in to allow for analyzing long-term trends in road safety.
9. GDDKiA and self-government road features databases should include details of road geometry and other key characteristics (road signs, barriers, etc.) not just road surface Road feature data systems are not consistent nor across self-governments, or with the database held by GDDKiA[36]. Standardization is of high value to road safety and road management more broadly so using road safety as an argument some improvements may be introduced in this area as well. For example it would be useful to develop as part of the RSIS project a set of detailed standardized guidelines on the road features database parameters important for road safety considerations, along with some standards for exchanging such data between self-governments and RSIS so they can be used as data linkages. A problem of victim injury classification[37] (as minor or

[35] This feature can be developed gradually and begin with a number of pilot activities involving several different level self-governments, who may be interested and eager to cooperate.

[36] GDDKiA promoted their system as a standard for some years after passing road assets to newly created self-governments in 1999 as part of the administrative reform.

[37] The Polish definition of a serious (heavy) injury does not match the international standard. EC is currently trying to coordinate work on EU-wide definition. However such standardization may take

serious injury) may occur on the Police and hospital side. Since hospitals in Poland receive refunds depending on medical services provided, they may "stretch" the severity of injures and treatment in order to receive extra payment. Audit processes are needed to manage this risk.

Collaborations and data connections currently rely too heavily on personal relationships rather than systematic arrangements and agreements. Thus, there are multiple examples of collaborations which stopped because of changes of personnel. Therefore all data exchange agreements for the RSIS should be regulated legally as may be required in the Polish legal system and when possible and needed formalized in writing to ensure continued cooperation even when personnel change.

7. Establish database(s) collecting behavioral data and intermediate outcome variables

Currently no institution in Poland is systematically collecting and storing data on safe (or unsafe) road user behaviors and related intermediate road safety indicators on seatbelt use, helmets use, child restraints etc. International good practice demonstrates that such data are instrumental in managing road safety and influencing safer user behavior, thus improving road safety.

Good quality database(s) containing such information and supporting NLA in its campaigns and education efforts will be of paramount importance. It will be also convenient since such database(s) can be created from scratch by the government, i.e. SNRSC and later transferred to NLA, since the existing POBR Observatory did not plan to collect such data.

The SNRSC has already developed some surveys methodology, collected some sample data related to several kinds of road user behaviors and collected a large amount of countrywide baseline data related to key road user behaviors in 2014. SNRSC plans also to undertake another round of surveys in 2015 to begin capturing the change in behaviors in relation to speeding, using seatbelts and child restraints systems and wearing helmets. Regular surveys related to behavior should be undertaken by SNRSC (and future NLA) based on statistical experience and good practice[38].

In addition to such regular surveys it strongly recommended that SNRSC begins the development of database(s) providing detailed results and data resulting from these surveys

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some time as EU countries have different views on this topic, usually because they have some legacy issues arising from their current practices in this respect; resolving the issue of common definition of a serious injury is an important but fortunately not immediate issue.

[38] In many countries sample sizes for such surveys are often much larger than necessary resulting in unnecessary additional cost to NLA; While it is good practice to outsource the routine regular collection of behavioral data (and other intermediate outcome variables), a sound way forward would be to seek specialized expert suggestions on estimation of the sample sizes that may be sufficient before tendering for the surveying work is undertaken; similarly optimal time periods between data collections should also be determined.

as promptly as possible as it would be a perfect opportunity for the SNRSC team to initiate work on an important element of future RSIS and to start learning how to deal with the development of a modern RSIS. Such an important component of the whole RSIS Project can be most likely supported under the twinning arrangement with experienced NLA for road safety or can become a project for EU or other external co-financing.

It is also strongly recommend that all results of such surveys should be provided to the SNRSC in the form of the standardized databases, which can then be made available via Internet, and not just descriptive reports summarizing the surveys. Descriptive reports of findings are of limited value compared with the raw data, which could be made available for analysis within the SNRSC and for any external research institutions for example as part of their scientific work.

8. Establishing tools supporting implementation of NRSP

Since SNRSC is in the process of implementation of National Road Safety Program adopted in mid-2013 using bi-annual Action Plans and is continuously monitoring the implementation of specific activities by different stakeholders it would be useful to establish as quickly as possible dedicated database tool and processes, which can facilitate in this monitoring.

This will assist in planning specific activities, monitoring their costs and benefits, tracking progress and reporting any interim or final results of different activities. Timely initiation of work on these developments is recommended.

Additional advantage of such database would be that in case of using EU or any external support for implementation of NRSP it can be used for managing and reporting progress and results of different co-financed activities to the respective donors. In case of EU funds such tool may be developed in close coordination with general databases used by the Government for monitoring use of ESIF made available to Poland, hence it can automate or at least improve efficiency of monitoring and reporting the use of EU funds for road safety activities in Poland.

Given that there is an obvious link of such database with implementation of EU funds (since some activities are to be supported from EU funds) SNRSC may try to obtain funding for development of such tool from the remaining EU funds 2007-13 or apply for new funds available in the period 2014-2020

9. Begin the Process of Developing the Governmental RSIS

An appropriate person in SNRSC (and future NLA) should as soon as possible be assigned responsibility for the development of a comprehensive RSIS and a team should be built as quickly as possible to advance the development of such a system. These should include:

i. Starting work on improving the data collected by Police, with direct and immediate input from the SNRSC and other key stakeholders.
ii. SNRSC (and future NLA) should begin work on establishing: (i) its own road user behavior data base using the baseline data collected already on seatbelt use, helmet use, speeding, drunk driving, etc. and (ii) database supporting the implementation of NRSP.
iii. Discussions with EC and IRTAD on possibility of collaborative arrangements involving SNRSC (and NLA in future) and an experienced European road safety NLA.

These actions will require improved SNRSC capacity and resources, but possibly EU funds can be used in the short-term for such purpose. Participation of key governmental stakeholders in the process should be assured, particularly at the needs identification stage, to maximize positive impact of any changes on quality of data and future research.

10. Recruiting and Professional Development of SNRSC Staff

The SNRSC will need to increase staff numbers specialized in road safety data systems, source some specialized training, and buy in expertise from external institutions (such as for example universities, research institutes, international institutions or commercial consultants) to increase its knowledge and capacity in this arena. Secondments or transfers of professional staff from other governmental agencies or institutes may save money and provide opportunity for a quick capacity improvement.

The skill sets required for set up, and maintenance and use of databases differ. Thus, resourcing needs for set up should not be permanent. Contract work and/or temporary staffing or use of specialized staff and other resources of other Ministries (such as for example Ministry of Interior) or government agencies (such as GDDKiA) for set up or development of databases if possible may be preferred in the short-term over significant increase in permanent SNRSC staffing. Additional flexibility offered by such temporary arrangements may also be valuable to manage peaks and troughs of work as contracts are managed for periodic data collection, data entry and analysis. Alternatively the same staff may manage multiple databases rotating around the collections needed for each dataset, with periodic data collection times set to allow for a steady flow of work.

11. Encouraging development of "Watchdog" functions

A full specialized "watchdog" organization is not recommended because of the costs involved and the complexities of creating and funding a fully independent entity with autonomy to potentially criticize road safety practices of government or other public partners. In addition, such an organization already exists in the Polish system. It is the Supreme Audit Office (NIK –Naczelna Izba Kontroli), which recently performed a series of detailed audits of several different aspects of road safety management in Poland. However, a number of

processes can be entrenched in the management of road safety data and its uses which create the function of watchdog by various stakeholders being motivated and provided with the information to monitor other stakeholders. This, in effect, allows for multiple watchdogs. Examples include:

- The SNRSC (or NLA in future) can act as a watchdog on the road safety performance of some governmental institutions (particularly if NLA would be located for example directly under Prime Minister's responsibility) but certainly self-government partners. In relation to self-governments it can publish for example a scoreboard of self-governments road safety performance for public scrutiny. In addition, this should increase public demand for improved road safety from the poorer performing self-governments;
- Organizations able to access the observatory should include research institutions, and their independent scrutiny should be encouraged as an added layer of independent commentary;
- Some comments received during interviews in the context of this project suggest that crash data are of significant concern and may not always be entered properly and legitimately by Police or hospitals. Linkage of crash and hospital data will also allow detection of such practices and likely under-reporting, which sometimes takes place even in developed countries. Such linkages will additionally reveal failures in data collection systems, and should be adopted for the purpose of improving the data collection practices and accuracy of databases;
- A process of checking completeness and verification of accuracy of data entry within Police is also called for to improve accuracy of collected data and avoid the need for costly data verification at correction at later stages of data integration and processing in RSIS;
- Public and media access to data will act as a "watchdog" on road safety activities generally;
- Periodic auditing processes should be applied to the issues of hospitals stretching injury reporting and Police recording crashes inappropriately or incompletely. Poland's Supreme Audit Office (NIK) which has already some experience in road safety related audits could be perhaps periodically undertaking some audits focused on data collection and management process.
- Finally, it should be noted that because government collects the crash and other data and provides them to the holder of the RSIS, having the RSIS held by an "independent" institute does not avoid the risks under-reporting and inaccuracy. On the contrary, an organization outside government has less opportunity to detect these problems.

12. ***Later Actions***

Road safety monitoring, understanding, and benchmarking will be facilitated by the development of an agreed definition of serious injury, perhaps based on MAIS3+.

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Annex 1. Recommendations on data and information systems and use from the Road Safety Management Capacity Review of Poland[39]

Recommendation: Establish a multi-sectoral data working group to oversee the development of data systems.

Recommendation: A multi-sectoral, multi-disciplinary research strategy should be developed to guide research to maximise its relevance to policies and strategic decisions. In considering what research is necessary, greater appreciation of the broad similarities of road safety problems from country to country may be helpful. Work is already proceeding on this recommendation.

Recommendation: Actions for road safety are often not evaluated, and thus failures can be perpetuated, and successes may go unnoticed or not be effectively defended from attack because the evaluation has not been done. Evaluations should be an integral part of road safety projects and programs, and should be planned from the initiation of the project, including ensuring that any data required are considered and collected before the program begins as well as after its implementation.

Recommendation: For behavior change programs, there is a dearth of intermediate outcome data for assessment of the extent of problems and evaluation of road safety programs to address them. A systematic annual comparable data collection process is needed to determine levels of speeding in each level of speed zone, drinking and driving, seat belt usage, child restraint usage, bicycle and motorcycle helmet usage, and the proportion of the vehicle fleet which is 4 or 5 star EuroNCAP rated.

Recommendation: There are fourteen state research institutes across various areas, in addition to a number of technical universities which conduct research. A review of activities, value, overlaps, and adjustment of partnerships which create collaborations that remove competition, will be helpful to road safety, and may also be helpful to other areas of endeavor related to research. Development of road safety research expertise in centers of excellence should be encouraged.

Recommendation: Publicly accessible annual multi-disciplinary national road safety conferences should: review the road safety performance of the last year; allow analyses of performance to be presented from independent experts, researchers and auditors; and allow dissemination on successes and failures. Strong media presence should be encouraged to improve public understanding and government accountability.

From Annex 9 of report:

[39] Available at

Recommendation: As an early priority establish a program for replicable nation-wide data collection on intermediate outcome variables: seat belt use, child restraint use, bicycle and motorcycle helmet use, and speeds.

Recommendation: As a medium term action, increase research and analysis capacity within the lead agency, and move the crash database to the lead agency.

Recommendation: As a medium term action, review the national estimates of economic costs of road crashes with a view to moving to willingness to pay estimates including social costs.

From Annex 5 of report:

The Capacity Review has identified a need for:
• Reduced duplication of crash databases.
• Better coordination of data sources and databases.
• Improvement of access to crash data at all levels of administration.
• Improvement of data to include accurate information on location and on contributory factors to causation of crashes and of injuries and deaths.
• Inclusion in crash databases of road infrastructure factors i.e. road features such as barriers, pedestrian facilities; and vehicle factors such as age, make and model etc.
• Access to drivers and vehicle information and linking such date to crash data.
• Access to penalty points statistics and linking it to drivers, their age, sex, place of residence, etc.
• Better information on injury severity and access to health services and costs databases.
• Improving structure and access to data on costs of accidents (direct and indirect).

Recommended steps in crash database management are:
a. Police should continue to be responsible for the collection of crash data.
b. The Lead Agency should manage the database, taking account of the requirement to protect sensitive personal data.
c. The database could be enhanced through a review process which should be focused on ensuring that road safety activities can be evaluated more precisely by use of the database, and that road safety trends can be examined to a deep and detailed level in the search for understanding of the problems and likely solutions. The review should consider what revisions are necessary to ensure the database is serving a primary research and evaluation function (as well as a primary legal function regarding responsibility for crashes, as used by Police). This will include a focus on what additional information should be collected, which would help us to understand the problem in terms of what caused the injury or death, not just what error caused the crash, and what could have been done at that location to avert the injury or death (not just avert the crash).
d. Crash data need improved location coding (GPS, with effective training in usage) in order to allow better selection of works for road safety based on sound crash location information.
e. The crash database, and related road safety databases should be made fully accessible (within limits of privacy considerations) to the many stakeholders, and duplication of efforts in maintaining databases should be avoided.
f. Current practice by Police is that as each new year of crash data are collected one year of older data are dropped from the system. Thus, although a database back to 1990 is held by the Road Traffic Institute, long term trends and comprehensive research evaluations of programs

are limited. This practice should be discontinued in favor of maintaining a long term crash database.

Annex 1a. Terms of Reference for Road Safety Data System Review and Action Plan

Road Safety Information Systems Development project Terms of Reference Diagnosis, quality assurance, and strategic guide for crash data and other data collection and analysis

Background

Upon request from the Polish Secretariat of National Road Safety Council (SNRSC) and the Ministry of Transport, the World Bank declared support in preparation of a long-term Program/Strategy (the Program) and a two-year Action Plan and by undertaking a national level Road Safety Capacity Review (RSCR). As part of this broader review process, the World Bank is able to provide assistance to facilitate improvement to international best practice in a number of specific areas of road safety. One key area identified as open to such improvement with Bank help, is the development of best practice in data collection, analysis, and policy development driven by the results of these information collection processes.

Objective

The aim of the input supported by the Bank for this element of work is to facilitate and advise on:
1. Good quality collection of crash data (e.g., additional variables to be collected);
2. Broader quality access to, and analysis of, crash data;
3. Good quality collection of other data of critical relevance to road safety policy, programs and projects (e.g., vehicle speeds in various speed zones; seat belt wearing rates);
4. Good quality access and analysis of other data of critical relevance to road safety policy, programs and projects including development of relevant indicators for monitoring;
5. Sound development of policy, programs and projects based on the results of these data analyses;
6. Sustainable capability for Poland to maintain these processes with limited further input from the Bank.

Methods

The project will include extensive consultation with the key stakeholders: collectors, holders, analyzers, and users of road safety information. Based on understanding of best practice availability and use of data and evidence internationally, safe system principles (which highlight the need for certain data for policy development), as well as a deeper understanding of what information and data are collected, held, analyzed, and employed by whom and for whom in Poland, we propose to provide recommendations on:
1. Crash data collection variables.
2. Proposed list of additional regular data collections and analyses required to guide policy and programs, and to monitor, evaluate and refine policy and programs once implemented.

3. Proposed agencies which should have access to these data, as well as analytical capabilities and responsibilities.

Deliverables

Deliverables are:
1. Draft report on crash and other data collection, analysis and use to aid road safety efforts in Poland, drawing on best international practice, making recommendations to improve and expand these processes and uses in Poland.
2. Final revised report.
3. Mentoring and training in the use of data and evidence for road safety leadership, persuasion, policy development, and program deployment.

Annex 2: Information collected in the Police Crash Database

Road Accident Form

ROAD ACCIDENT FORM

POLICE UNIT [01] ..... VV HQ [02] .....
POWIAT [03] ..... COMMUNE [04] ..... TOWN/VILLAGE [05] .....
STREET, NUMBER [06] ..... ROAD NR [07] ..... km ..... hm .....
INTERS. WITH STREET/ROAD NR [08] ..... DIST FROM INTERS. [09] ..... DIRECTION [10] .....
DATE OF INCIDENT [11] ...../...../..... HOUR [12] ...../..... GPS [13] X ..... Y ..... PUBL. RD [14] [.....] CLOSED ZONE [15] [.....]

I. PLACE OF INCIDENT

AREA	BUILT OVER	16	
	NOT BUILT OVER	17	
ROAD GEOMETRY	STRAIGHT SECTION	18	
	CURVE	19	
	DROP	20	
	HILL	21	
	TOP OF THE HILL	22	
INTERSECTION	EQUAL	23	
	WITH RD W/PRIORITY	24	
	ROUNDABOUT	25	

II. SITE OF INCIDENT CHARACTERISTICS

CARRIAGEWAY		26	
MEDIAN BETWEEN CARRIAGEWAYS		27	
SHOULDER		28	
EMBANKMENT, DITCH		29	
SIDEWALK, PEDESTRIAN WALKWAY		30	
BICYCLE PATH		31	
PEDESTRIAN CROSSING		32	
PUBLIC TRANSPORT STOP		33	
TRAM CROSSING OR TRACKS		34	
RAILWAY CROSSING	GUARDED	35	
	UNGUARDED	36	
BRIDGE, OVERPASS, TUNNEL ETC.		37	
MEDIAN ON DUAL-CARRIAGEWAY RD		38	
PARKING LOT, SQUARE		39	
PREMISES OR FIELD ENTRY/EXIT WAY		40	
ROADWORKS, TEMP. MARKING		41	

III. INFORMATION ABOUT THE ROAD

TYPE OF ROAD	HIGHWAY	42	
	EXPRESSWAY	43	
	DUAL CARR, 1 WAY	44	
	ONE-WAY	45	
	SINGLE CARR, 2-DIR	46	
PAVEMENT	HARD	47	
	DIRT	48	
CONDITION OF PAVEMENT	DRY	49	
	WET	50	
	PUDDLES, FLOODING	51	
	ICE OR SNOW	52	
	DIRTY	53	
	RUTS, BUMPS	54	
	POTHOLES, BUMPS	55	
TRAFFIC LIGHTS	YES, WORKING	56	
	YES, BUT NOT WORKING	57	
	NO	58	
HORIZONTAL MARKING	YES	59	
	NO	60	

IV. LIGHTING

DAYLIGHT		61	
TWILIGHT, DAWN		62	
NIGHT	ROAD LIT	63	
	ROAD UNLIT	64	

V. WEATHER CONDITIONS

GOOD WEATHER CONDITIONS		65	
CLOUDY		66	
BLINDING SUN		67	
STRONG WIND		68	
PRECIPIT.	RAIN	69	
	SNOW, HAIL	70	
FOG, SMOKE		71	

VI. TYPE OF INCIDENT

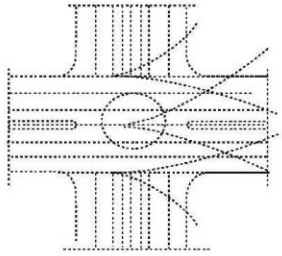
COLLISION OF MOVING VEHICLES	HEAD-ON	72	
	SIDE	73	
	REAR	74	
DRIVING INTO	PEDESTRIAN	75	
	IMMOBILE VEHICLE	76	
	TREE	77	
	POLE, SIGN	78	
	RAILWAY BARRIER	79	
	POTHOLE, BUMP	80	
	ANIMAL	81	
	PROTECTIVE BARRIER	82	
VEHICLE OVERTURNED		83	
ACCIDENT WITH PASSENGER		84	
OTHER		85	

INTERSECTION OR km hm — DIRECTION — SITE OF INCIDENT — DISTANCE TO INTERSECTION — DISTANCE TO INTERSECTION — INTERSECTION OR km hm — DIRECTION

SYMBOLS
- MOVING VEHICLE
- IMMOBILE VEHICLE
- VEHICLE IN REVERSE DRIVE
- VEHICLE INDIRECTLY PARTICIPATING
- OVERTURNED VEHICLE
- PEDESTRIAN
- PEDESTRIAN CROSSING
- OBSTACLE

VEHICLE COLLISION
- HEAD-ON
- REAR
- SIDE
- DRIVEN INTO A:
  - PEDESTRIAN
  - IMMOBILIZED VEHICLE
  - OBSTACLE

INCIDENT SITE DIAGRAM



NOTE:

VII. DAMAGES OTHER THAN VEHICLES

BUILDING		86	
ELECTRICITY OR TELEPHONE POLE		87	
ROAD EQUIPMENT (TRAFFIC LIGHT, SIGN, BARRIER, RAILWAY SWING BEAM GATE)		88	
OVERPASS, GATEWAY		89	
FENCE, OTHER		90	

VIII. PARTICIAPTING VEHICLES

			1	2	3
BICYCLE		91			
MOPED		92			
MOTORCYCLE		93			
PASSENGER VEHICLE		94			
TRUCK	W/O TRAILER	95			
	WITH TRAILER	96			
BUS	PUBLIC TRANSPORT	97			
	OTHER	98			
CIĄGNIK ROLNICZY		99			
TRAM/TROLEY BUS		100			
SLOW VEHICLE		101			
TRAIN		102			
OTHER		103			
UNIDENTIFIED VEHICLE		104			
VEHICLE TRANSPORTING HAZARDOUS MATERIALS		105			
PRIVILEGED VEHICLE		106			
CONDITION OF VEHICLE: FAULTS, DAMAGES	SYSTEM: BRAKES	107			
	SYSTEM: STEERING	108			
	TIRES	109			
	LIGHTS: POSITION	110			
	LIGHTS: PASS LIGHTS/DAY L.	111			
	LIGHTS: STOP	112			
	LIGHTS: BLINKERS	113			
	DIRTY OR OBSTRUCTED WINDOWS	114			
	INCORR. LOADING OR MARKING OF VEH.	115			

IX. REASONS (CIRCUMSTANCES OF THE ACCIDENT)

		1	2	3
INAPPROPRIATE SPEED	116			
REFUSING RIGHT OF WAY	117			
REFUSING RIGHT OF WAY TO A PEDESTRIAN	118			

BEHAVIOR OF DRIVER: INCORRECT	OVERTAKING	119			
	SKIRTING ROUND AN OBSTACLE	120			
	PASSING BY	121			
	DRIVING THROUGH PEDESTRIAN CROSSING	122			
	DRIVING THROUGH BICYCLE CROSSING	123			
	TURN	124			
	CHANGING LANES	125			
	U-TURN	126			
	STOPPING, PARKING	127			
	REVERSING	128			
DRIVING ON THE WRONG SIDE OF THE ROAD		129			
DRIVING ON A RED LIGHT		130			
IGNORING TRAFFIC SIGHNS AND OTHER SIGNALS		131			
FAILURE TO MAINT. SAFE DISTANCE BETW. VEH.		132			
SUDDEN BRAKING		133			
DRIVING WITHOUT REQUIRED LIGHTS		134			
FATIGUE, SLEEP		135			
BEH. OF PEDEST.: STANDING OR LYING ON THE ROAD			136		
WALKING ON WRONG SIDE OF THE ROAD			137		
WALKING ON RED LIGHT			138		
RECKLESS: IN FRONT OF A MOVING VEHICLE			139		
ENTERING THE ROAD: FROM BEHIND VEH. OR OBST.			140		
STOPPING, BACKTRACKING			141		
CROSSING THE ROAD IN A PROHIBITED PLACE			142		
OTHER: FIRE IN THE VEHICLE			143		
UNPROVOKED TECHN. PROB. WITH VEHICLE			144		
CONDITION OF THE CARRIAGEWAY			145		
TRAFFIC ORGANIZATION			146		
ROADWORKS SECURITY			147		
OPERATION OF TRAFFIC LIGHTS			148		
INCORRECT OPERATION OF RAILWAY BARRIER			149		
OBSTACLES OR ANIMALS ON THE ROAD			150		
DRIVER SUDDENLY FAINTED			151		
BLINDED BY ANOTHER VEHICLE OR BY THE SUN			152		
CAUSED BY PASSENGER			153		
UNIDENTIFIED			154		
OTHER			155		

[156] SPEED LIMIT ON INCIDENT SITE .....

X. PARTICIPANTS OF ROAD INCIDENT

PESEL NUMBER (for foreigners - date of birth and citizenship information) Date of birth / number / citizenship	SEX: MAN	SEX: WOMAN	DISABLED	INFLUENCE: ALCOHOL	INFLUENCE: OTHER SUBSTANCE	DRIVING WITHOUT: SAFETY BELTS	DRIVING WITHOUT: HELMET	DRIVING WITHOUT: BABY CHAIR	KILLED: ON SITE	KILLED: 30 DAYS	INJURED: SEVERE	INJURED: LIGHT

DRIVER 1

SURNAME .....

NAME ..... FATHER'S NAME .....

VEHICLE MAKE ..... REG. NUMBER .....

INSURANCE/POLICY NUMBER .....

TRAILER REGISTRATION NUMBER .....

DRIVER 2

SURNAME .....

NAME ..... FATHER'S NAME .....

VEHICLE MAKE ..... REG. NUMBER .....

INSURANCE/POLICY NUMBER .....

TRAILER REGISTRATION NUMBER .....

DRIVER 3

SURNAME .....

NAME ..... FATHER'S NAME .....

VEHICLE MAKE ..... REG. NUMBER .....

INSURANCE/POLICY NUMBER .....

TRAILER REGISTRATION NUMBER .....

PEDESTRIAN, PASSENGER AND VEHICLE NUMBER

SURNAME .....

NAME ..... FATHER'S NAME ..... P ..... T .....

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XI. ADDITIONAL INFORMATION ABOUT THE DRIVER

			1	2	3
DRIVERS LICENSE FOR THE VEHICLE	YES	157			
	NO	158			
	NOT REQUIRED	159			
YEARS OF DRIVING EXPERIENCE		160			
RUNNER FROM INCIDENT SITE		161			
FOREIGNER		162			

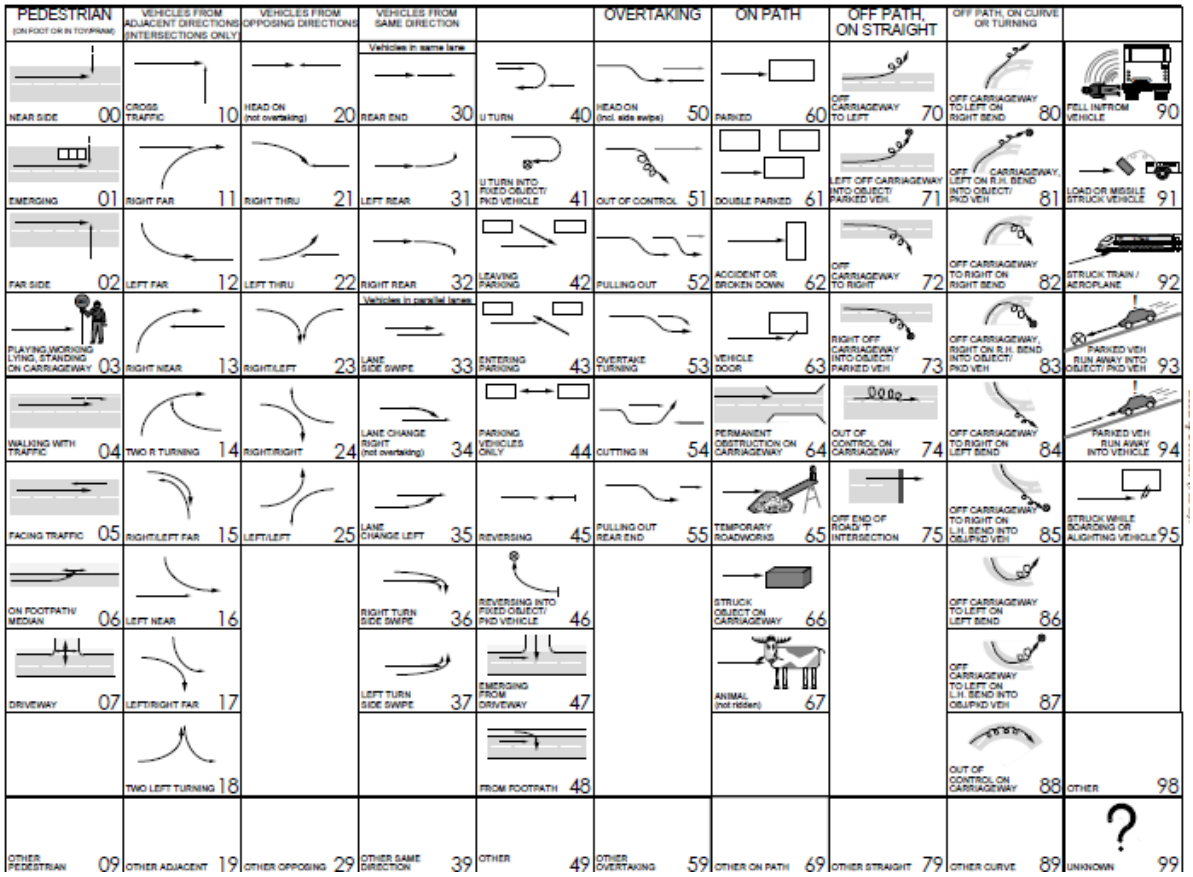
XII. RESOLUTION

		1	2	3
INVESTIGATION	163			
PENALTY RECOMMENDATION	164			
TICKET	165			
WARNING	166			
OTHER INSTITUTION	167			

[168] .....

Rank, name and surname, ID of the police officer handling the incident. Relevant Police unit.

Annex 3: crash type coding (or Road User Movement- RUM) codes for the states of New South Wales and Victoria, in Australia



Annex 4: Road Safety Data Systems – International Examples

List of Case Studies

Case 1: STRADA – Swedish Traffic Accident Data Acquisition
Case 2: Spanish Road Safety Observatory (ONSV)
Case 3: Czech Road Safety Observatory (www.czrso.cz)
Case 4: Ibero-American Road Safety Observatory (OISEVI)

Case 1: STRADA – Swedish Traffic Accident Data Acquisition[40]

In October 1996 the Swedish Road Administration was commissioned by the Swedish government to initiate a new information system covering injuries and crashes in the entire road traffic system: STRADA. The governmental commission was accomplished in co-operation with the Swedish Police, the Swedish National Board of Health and Welfare, the Swedish Institute for Transport and Communications Analysis, Statistics Sweden and the Swedish Association of Local Authorities and Regions. Since 2009 the Swedish Transport Agency has been the authority responsible for STRADA.

The key problem was that different authorities gather the same information (on road crashes) for different purposes: police, road administration (state, municipal), rescue services, medical care, and insurance companies (Poland has a similar problem). To solve this problem and act more effectively STRADA was created. STRADA is a national information system collecting data on injuries and crashes in the entire road transport system.

Information from the police and hospitals

STRADA is based on information reported from two sources. As a mandatory assignment for all police districts since 2003, the Swedish Police report to STRADA on a national scale. STRADA also receives information from an increasing number of hospitals. The incorporation of hospital data makes this method clearly different from earlier methods of registration of injuries and crashes in the road transport system. 90 % of the emergency hospitals report traffic crashes and injuries to STRADA (n=60, of total 67).

Two sources of information provide a better picture of the crash

STRADA was created in close collaboration with all parties concerned. By bringing together data from two sources – the police and the hospitals – STRADA provides more detailed

[40] Details from: Tomas Fredlund, Traffic safety analyst, Road Traffic Department, Swedish Transport Agency http://www.transportstyrelsen.se/en/road/STRADA/

information, thus increasing knowledge and understanding of road traffic injuries and crashes. When hospital data are included there is also a decrease in the number of unrecorded cases, because the police have limited knowledge about some road traffic crashes (mainly involving unprotected road users: pedestrians, cyclists and moped drivers). In addition, the hospitals' reporting of diagnoses broadens the knowledge of the injuries and their degree of seriousness. 18 counties report to STRADA on a complete or partial basis. The remaining three counties are yet to join.

Data from STRADA

By accessing STRADA's web-based system for extraction of data or by requesting information from the Swedish Transport Agency, municipalities, researchers etc. can make use of the information in STRADA.

Official statistics from police reports

Since 2003 the official statistics of road traffic injuries are based on data extracted from STRADA. Since a number of hospitals do not yet report to STRADA (registration in STRADA is voluntary and economically compensated by the Swedish Transport Agency), the existing official statistics are based exclusively on crashes reported by the police. The information derived from the hospitals is shown in a supplement containing medical statistics.

Table 1: Information gathered in STRADA

Police reports	Hospital reports
Police on crash-site fill in the form. **Several police-personnel in each county are trained to handle the registration of information into STRADA.** **Basic information: who, where, when, how, type and conditions of the road, speed limit, light etc., vehicles, drivers and injured.** **Drawing of crash-site.**	The report on each patient is based on informed consent. The patient fills in the form by him/herself. One or several persons from the medical staff in each hospital is trained to handle the registration of information into STRADA. The information collected from the patient is complemented with injury diagnosis. Injuries are coded by the Abbreviated Injury Scale (version 2005). Basic information who, where, when, how, type and conditions of the road, etc. The patient was (driver/passenger, bicycle, motor vehicle etc.) Participants in the crash (bicycle, motor vehicle, single crash etc.)

Limitations of the Swedish system include the incomplete participation of all counties in data supply, the self-reported by patients for hospital data, and handling crashes being recorded which occurred on private property rather than a road (and are thus not road crashes).

Case 2: Spanish Road Safety Observatory (ONSV)[41]

Main assumptions

In 2004, within the structures of Spanish Directorate-General for Traffic (DGT), the National Road Safety Observatory (Observatorio Nacional de Seguridad Vial - ONSV) was established. Although it remained in operation only for 8 years, this example is very close to a model solution for a system supporting roads safety management (including implementation of a national roads safety program) on the national level. In 2012, ONSV (for political and economic reasons) was disbanded, and its functions were divided into two areas: road transport planning and statistics. During the eight-year of its life Spain succeeded in significantly reducing the number of road crash fatalities - down from over 5,000 a year to over 2,000.

At the time of ONSV creation, risks to life and health in traffic were high in Spain. The objective of ONSV was to support DGT in solving this problem. ONSV documented road safety problems and set out priorities. It helped to establish international benchmarking. It assisted analysis of how the problems had been solved in other countries, and those in charge of the sub-departments of the DGT implemented solutions.

ONSV structure

The ONSV had three different areas of operation. The first was that of sources of information. The DGT received crash reports from the police, but had to improve on that information by incorporating data from health or forensic sources. The other important pillar comprised indicators - for example, on seat belt use. ONSV analyzed European standards in relation to the essential factors for reducing the number of crashes such as speed, seatbelts, helmets, alcohol and drugs, and applied them. ONSV also compiled information related to the activity: what investment was being made in infrastructure or how many fines were being imposed, for example.

The second part related to planning included data planned to be achieved to be able to verify how far the real results from the planned ones were. It allowed presentation and regular comparisons of real parameters achieved (real data) with planning assumptions thus closing the feedback loop and helping in identifying any necessary corrective actions.

[41] ONSV currently operates in the structures of DGT: www.dgt.es/es/. Information is based on an interview with Anna Ferrer, ex-Director of the Directorate-General for Traffic's National Road Safety Observatory http://www.mapfre.com/mapfrere/docs/html/revistas/trebol/n62/en/entrevista2.html

The third key aspect was involvement of the main players in order to identify which actions are appropriate. ONSV staff managed coordination and consultation between ministries, civil society, and others.

Involved bodies

Practically, all the Ministries, Regional Governments and City Councils were invited (with great emphasis on those with influence on infrastructure). The Ministry of Development manages a small part of the road network in Spain, only 15%; the rest is the responsibility of other Administrations. For road safety, this fragmentation adds complexity, as it does in Poland. Besides the Ministry of Development, the Ministry of Health took part because of its involvement with crash victims with regards to rescue, recovery and drivers' physical and psychological fitness. The Education authorities were also involved in relation to teaching in schools. The Ministry of Labor took part because of its involvement with crashes at work and on the way to and from work. The Ministry of Transport was involved as far as driving professionals were concerned, as was the Ministry of Justice, which has a special prosecutor's office for road safety offences. This was a substantial development representing a change in State administration.

Conclusions

The Spanish experience shows that communication with stakeholders and dissemination of knowledge collected in the observatory are critical. In the minimum scenario, this may be a website with a knowledge database and contacts list, but in the ideal model assumes an observatory is part of the lead agency for road safety. For Spain, the National Road Safety Observatory (ONSV) was the lead agency. Spain's experience also points to the need to ensure sustainable funding and support for a road safety observatory.

Case 3: Czech Road Safety Observatory[42](www.czrso.cz)

Main assumptions

Another example of a roads safety observatory, different from the Spanish one, is the Czech example, developed within the framework of SENZOR project, entitled: "Building of the Czech Road Safety Observatory" (CZRSO). The project was funded by Czech Ministry of Transport within a research program for years 2005 to 2009. The Czech Road Safety Observatory has been developed together with European Road Safety Observatory (ERSO) with support of Czech Ministry of Transport and European Commission, which ensures the comparability of Czech data on European level . The project was coordinated by CDV - Centrum Dopravního Výzkumu, v.v.i. (Transport Research Centre).

[42] Based on J. Ambros (2008), Building the Czech Road Safety Observatory, 21st ICTCT Proceedings, Latvia

The main purpose of SENZOR project was to improve road safety in the Czech Republic by supporting effective decision making processes regarding safety countermeasures on all government levels – national, regional and local – with the help of the information and data obtained from the Czech Road Safety Observatory (CZRSO). CZRSO consists of information part and data part.

The establishing of CZRSO was one of the measures, which has been agreed by EU countries' ministers of transport together with the states from EEA and EFTA: support the establishing of the European Road Safety Observatory as an internal body of European Commission. At their meeting in autumn 2003, the ministers expressed their interest: "...to conduct analyses based on comparable data and to disseminate the results of these analyses to research institutes, local bodies and public with respect to the private protection laws".

CZRSO structure

The Czech Road Safety Observatory consists of two related, but independent parts: information part and data part.

Information part. There are several databases in the Czech Republic, which are related to the road safety. Besides the basic crash database of the Czech Police, there are lists of sections with higher risk of crash (prepared by the road authorities) and databases operated by Ministry of Transport and Ministry of Health. However, the use of these databases for road safety work and analyses is limited. The non-existence of a central uniform database of data and knowledge, which could be accessible for all relevant bodies, is seen as a large problem.

Such a joint database is necessary groundwork for implementation of the most effective road safety measures. It can also serve as a data source for further evaluations of measure's objective effectiveness.

For CZRSO, the Dutch information database Road Safety Information System was taken as an example. The Dutch RSIS was created by SWOV (Dutch National Road Safety Research Institute) and for many years it has served as a knowledge base for decision makers in road safety at all administration levels. The Dutch RSIS database system features proved effective and it became a model for ERSO. By the end of 2007, CZRSO was launched for the first test users. During this test phase, CZRSO databases were tested and debugged so that it worked the best for all potential future users. All the data were continuously updated with articles, charts, tables, data from actual measurements and observations.

Data part. Information sources are mainly Czech Police and Czech Road and Motorway Directorate – the latter data give information on road network and Safety Performance Indicators (SPIs) or intermediate outcomes, which were gathered within the SENZOR project. SPIs were as follows: speed, seat belt use and daytime running lights (DRL) use. The

data part was grounded on an extensive database of measurement which combined data obtained in SENZOR but also in other CDV's projects and activities. All the data contained were geographically linked together by GPS coordinates. As a result, all the data outputs could be visualized in the map application VectorMap.

In CZRSO, selected SPIs were monitored:

- Speed
- Use of restraint systems (seat belts and child restraint systems)
- Use of daytime running lights (DRL)
- Safety distances between vehicles in motion
- Mobile phone use

Current situation of CZRSO

CZRSO still operates within CDV structures. Unfortunately, after the completion of SENZOR project, major part of its most critical functionalities, including SPI monitoring in scope of speed measurement, use of seatbelts, etc. were discontinued due to lack of stable sources of financing. The Czech example confirms the need for sustainable funding or road safety data systems.

Case 4: Ibero-American Road Safety Observatory[43] (www.oisevi.org/a/index.php/sobre-oisevi/concepto)

Statistics indicate that differences in the level of safety of high-income countries and the rest of the world are constantly increasing. Therefore, initiatives are being undertaken at the global level aiming to reduce this difference. One of them is a Memorandum of Understanding signed between ITF/OECD Joint Transport Research Centre and the World Bank Global Road Safety Facility to formalize co-operation with the International Road Traffic Safety Data and Analysis Group (IRTAD). The agreement formalizes arrangements for making experts in ITF countries available to work with low and middle-income countries to develop effective data collection and analysis systems.

In April 2010 World Bank approved a four-year loan for the institutional strengthening of the Argentinian road safety lead agency ANSV (http://www.seguridadvial.gov.ar), including a component to support the national road safety Observatory (http://observatoriovial.seguridadvial.gov.ar). Afterwards:

- GRSF approved grant financing for Argentina IRTAD country exchange
- In April 2010 DGT (Spain) and ANSV (Argentina) sign a twinning arrangement to improve data collection and analysis' and help ANSV (Argentina) become an IRTAD member
- Exchange has led to the creation of new data collections systems to be organized by the National Observatory; statistical indicators manual; national survey terms of

[43] Based on M. Shotten (2012): *International Benchmarking on Road Safety,* TRB Conference, Washington D.C.

reference development; and other issues, including the move towards developing a regional road safety observatory.

- The successful twinning program between Spain and Argentina, financed by the World Bank GRSF, encouraged the desire of a broader cooperation regarding road safety in countries from Latin America and the Caribbean region.
- Following the 9th and 10th Ibero-American Encounters of Heads of Road Safety and Traffic Agencies, held in May 2010 in Montevideo (Uruguay) and in May 2011 in Mexico City, 18 countries agreed to create the Ibero-American Road Safety Observatory (IRSO), OISEVI in Spanish.
- Ibero-American Road Safety Observatory (IRSO) is meant to be a space of knowledge supporting and cooperation on road safety actions between Ibero-American countries. The IRSO's main objective is to share relevant information about road safety indicators and best practices concerning policy-making, planning and other topics related to road safety.