Development of an integrated road safety management system in Indonesia: Traffic police as lead agents in a Safe System approach

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Abstract

In accord with the UN Global Decade of Action 2011-2020, Indonesia is committed to reducing its traffic fatalities by 50% by the end of 2020. Traffic accidents in 2010 were officially estimated to result in an annual social cost of about 3.1% of the Indonesian Gross Domestic Product (GDP), rising to 3.7% of GDP in 2011 (i.e., ~AUD 29.8 Billion of a total GDP equivalent to AUD 805 Billion in 2011). With rapid motorisation associated with economic development, annual social costs could approach some AUD 39 Billion or 4.6% of GDP. The Indonesian National Traffic Police Corps (Korps Lalu Lintas Polri, or Korlantas) has a central role in reducing traffic fatalities. Korlantas' role is specified in Law 22 of 2009 relating to road traffic and transportation and includes responsibilities for: road policing, traffic management and traffic enforcement; accident investigation; accident reporting and analysis; driver licensing; vehicle registration; and traffic education. Law 22/2009 provides the legislative framework for road safety activities, but the direction is provided by the National General Plan for Traffic and Road Transportation Safety (Rencana Umum Nasional Keselamatan Lalu Lintas dan Angkutan Jalan, or RUNK), which was released in 2011. The RUNK identifies five pillars on which to build road safety and traffic enforcement policies and actions: road safety management; safer roads; safer vehicles; safer road users; and, post crash care. To ensure that reliable and valid accident data are available, Korlantas has – with World Bank funding – developed a web-based accident investigation system (AIS). After piloting in Central Java during 2012, the AIS is available nationwide. Access to comprehensive, reliable and accurate road accident data makes it possible to identify the specific roads, vehicles and road users which need to be targeted with road safety and traffic enforcement interventions. Not only is the IRSMS being used as an accident investigation and policing tool, the system is able to be used by road safety stakeholders. The ability to access up-to-date accident data coupled with the need for Local, Provincial and National road safety interventions, the IRSMS will aid decision makers to develop evidence based strategies to reduce casualties and improve road safety in Indonesia.

Keywords

Indonesia, Road safety, Accident information system, Road safety strategy, ISO 39001, Traffic policing, Road safety management

Introduction

Road accidents[1] are a very serious problem in Indonesia. In 2010, Police reported 31,234 road accident fatalities; equivalent to a rate of road fatalities per 100,000 people of 12.1. This is high compared to Singapore with 4.8 fatalities per 100,000 people, and Australia with 5.2 fatalities per 100,000 people. The preliminary data for 2011 indicate that 30,629 people were killed, 35,787 were seriously injured and 107,281 were slightly injured in 106,129 reported road accidents in Indonesia. Commentators consider that this is an underestimate as traffic accidents may not be reported, and data are inconsistent and difficult to verify: AusAID/ Indonesia Infrastructure Initiative (IndII), for example, has suggested that about 40,000 people died as a consequence of traffic accidents in 2010 [1], suggestive of a level of underestimation of road trauma of 20-25%. Based on the current trend, it is estimated officially that 37,500 people could die on Indonesian roads in 2020 [2](see Figure 1). However, estimates up to 65,000 traffic fatalities per year have been projected for 2020 [3]. The Indonesian Traffic Police Corps commissioned the development of an improved accident database, using a web based accident information and analysis system not only to define the number of casualties and accidents but to capture the details needed to implement and monitor the effectiveness of evidence-based safety interventions.

[1] In Indonesia, "accident" is used instead of "crash". While not consistent with the Safe System approach espoused by Western nations, the Indonesian terminology is used in this paper.

As part of Indonesia's commitment to the UN Decade of Action 2011-2020 program, an ambitious target has been set to reduce these numbers by 50% to less than 18,750 deaths by the end of 2020 [4]. A five-year program of action was established to support road safety; this program ran over 2008–2012. Priorities have been established with assistance from the World Bank, the AusAID-funded Indonesia Infrastructure Initiative (IndII), the Asian Development Bank, and other stakeholders. A particular priority is for road safety partnership actions among stakeholders to improve capacity by strengthening coordination and management of road safety. Developing capacity is a pressing issue, as the responsibility for road safety action has been, until recently, quite diffuse [5]. These priority programs include:

- Study of locations with a high occurrence of accidents ("blackspots") to better inform decisions regarding road safety engineering and traffic enforcement programs;
- Improvement in the quality of traffic accident investigations and improvement of the traffic accident data recording system;
- Improvement in traffic education from an early age and improvement of the system for issuing driver licenses;
- Trials of a number of new traffic policing actions, including speed enforcement using electronic devices such as radar and LIDAR; and enforcement of drunk driving and drug driving.

Year	Prediction			DoA Target
	Population	Vehicles	Fatalities	
2010	237,000,000	50,000,000	32,192	32,192
2011	237,521,400	52,500,000	32,687	32,514
2012	238,043,947	55,125,000	33,189	32,189
2013	238,567,644	57,881,250	33,698	30,509
2014	239,092,493	60,775,313	34,216	28,828
2015	239,618,496	63,814,078	34,742	27,148
2016	240,145,657	67,004,782	35,275	25,468
2017	240,673,977	70,355,021	35,817	23,787
2018	241,203,460	73,872,772	36,367	22,107
2019	241,734,108	77,566,411	36,926	20,427
2020	**242,265,923**	**81,444,731**	**37,493**	**18,747**
2025	244,942,599	103,946,409	40,462	12,866
2030	247,648,849	132,664,885	43,667	10,513
2035	250,384,999	169,317,747	47,125	8,700

Figure 1: (TOP) Predicted traffic fatalities in Indonesia 2010-2035 and the targeted reduction under the Decade of Action (DoA); (BOTTOM). Targeted reduction in fatalities in Indonesia under to the Decade of Action of Road Safety (from [2])

These programs are most likely to succeed if they use measurable objectives, if all stakeholders are committed and play an active role in implementation, and if they are regularly reviewed to evaluate program success and apply any necessary changes in anticipation of new trends. A forecast impact of these activities on fatality reductions from traffic accidents is shown in the lower part of Figure 1; Year 2010 is used as the base year for the projections [2].

Improvement in the quality of accident data is urgent, as these data form the basis of safety program planning by all stakeholders and serve as performance indicators to assess road transport safety. The success of the UN Decade of Action 2011-2020 programme in Indonesia depends on accurate evaluations of various interventions and these in turn depend on whether accident data are recorded and reported accurately and systematically. Put simply, there is a need to establish an evidence base – statistical data, or practical facts – and to act to place that evidence (those facts) before decision makers, road users, and the general community.

The accident data for Indonesia are provided by the IRSMS Accident Information System (and related databases on driver licensing, vehicle registration, hospital attendance and insurance claims). The Accident Information System is one part of the Integrated Road Safety Management System (IRSMS) being implemented in Indonesia. The IRSMS, as will be outlined in later sections, reflects a holistic approach to reducing road trauma and improving road safety, involving legislation, strategy development, use of valid and reliable accident data as the basis for decision making, an integrated approach (bringing together otherwise disparate functions such as road management, traffic enforcement, road safety education, driver licensing), and seeking to deliver local solutions to address local problems. It is intended that IRSMS will serve as the basis for an integration of the management of road safety in Indonesia across all relevant government agencies (at local, provincial and national levels) and with the private sector and community organisations.

The IRSMS Accident Information System is central to understanding the road safety situation in Indonesia, as it specifies who was involved; what happened immediately prior to, during and after the accident; where the accident occurred; when the accident happened; and describes how the accident took place; and, through police investigations and witness accounts, can establish why the accident occurred.

Of course, there needs to be a belief that change can happen. The moral compass for traffic accident reduction and improvement to road safety in Indonesia is provided by the Safe System approach, as expressed through the strategic plan (RUNK 2011-2035) [5] and action plans developed to address and guide road safety and traffic policing efforts.

The Indonesian National Traffic Police Corps

The Indonesian National Traffic Police Corps (INTPC), Korps Lalu Lintas Polri (or Korlantas) is an independent policing agency under the Indonesian National Police. The INTPC recognises that there is an increase in road trauma across Indonesia, and thus there is an imperative for action to implement more effective traffic policing actions to address road safety risk areas. Institutional capability reviews of INTPC have indicated that the organisation is disciplined and led by experienced senior officers [3]. While there is a good training capability at the Police Academy in Semarang and at the Traffic Education Centre near Jakarta, operational traffic policing capability needs to be improved to detect, contain and reduce illegal road behaviours and to change inappropriate or risky behaviours. In order to do so, further institutional development is required to improve the professional and operational capabilities within INTPC. This is already underway, with budgetary responsibilities being shifted from central to provincial (Polda) levels. It is proposed that a safety directorate be established within Korlantas, tasked with the operation of the IRSMS which includes the accident reporting system, traffic accident statistical analysis and reporting (with more than 3,000 possible analyses available), as well as with stakeholder liaison, audit and quality control functions, training in accident data collection, and a traffic technology development function [3].

Law 22 of 2009 on Road Traffic and Transportation

The legislative framework for road safety in Indonesia is primarily provided by Law 22 of 2009, relating to Road Traffic and Transportation. That is, the primary responsibility for road safety rests with the INTPC rather than with Indonesian transport or public works agencies, although these other agencies retain road safety structures. Under Law 22/2009, the INTPC is charged with the responsibility for road traffic and transport safety. Generally, Law 22/2009 (Article 4, 5 and 12) aims to develop and organise a secure, safe, orderly and smooth land transportation system through:

- The movement of vehicles, people and/or goods on roads;
- The use of traffic and road transportation infrastructure and facilities; and
- Activities related to registration and identification of motor vehicles and drivers, traffic education, traffic management, engineering, and the enforcement of traffic and road transportation laws.

More specifically, the INTPC is charged with:

- Testing applicants and controlling licences for driving motor vehicles;
- Motor vehicle registration and identification;
- Collection, monitoring, processing and presentation of traffic and road transportation data;
- Traffic regulation, surveillance, escorting and patrolling;
- Law enforcement including actions against violations and handling of traffic accidents;
- Traffic education;
- Implementation of traffic management and engineering; and
- Implementation of traffic operational management.

A number of additional laws apply to particular issues, (e.g., provisions of Law 27/2009 on narcotics, relating to taking samples of blood, urine, etc., are relevant to addressing drug driving).

Accident data – information about the circumstances of an accident – are the basis for all targeted road safety interventions. For example, access to comprehensive, reliable and accurate road accident data makes it possible to identify specific roads, vehicles and road users which need to be targeted with road safety interventions. Road safety data can also be disseminated to relevant stakeholders and can aid decision making about the overall direction and strategy for road safety in Indonesia. While road users are required to report accidents, such reports can be made to local INTPC officers up to 40 days afterwards. As well, Law 22/2009 allows accidents to be "resolved at scene", that is, to be negotiated between the affected parties. This means that an unknown number of accidents may be unreported, as they are settled between the parties and may not be recorded within the accident information system.

The National General Plan for Traffic and Road Transportation Safety (RUNK)

The National General Plan for Traffic and Road Transportation Safety (Rencana Umum Nasional Keselamatan (RUNK) Jalan 2011-2035) [4] was released on 11 May 2011 and reflects the goals outlined for the UN Decade of Action for Road Safety. Indonesia organised national events to launch the RUNK and used the opportunity to advocate for increased attention on the road safety issue. The RUNK estimates that traffic accidents result in an annual social cost estimated to be at least 3.7% of the Indonesian Gross Domestic Product (total GDP is approximately Rp. 831 Trillion, or AUD 805 Billion).

The RUNK has identified five pillars on which to build road safety and traffic enforcement policies, based directly upon the Global Decade of Action for road safety 2011-2020:

- Pillar 1 relates to Road Safety Management. There are number of activities envisaged and undertaken under this Pillar, including:
  - Establishment of a Forum on Road Safety at executive government level - enacted in Law 22/2009;
  - New Government Regulations to regulate road security and road safety;
  - Inclusion of the Provincial and Regency/City Governments – all levels of government are to take an active role in road safety;
  - Targeting the business sector and civil society to take more responsibility for remedial measures to improve road safety, and to promote road safety information; and
  - Bringing leaders in Indonesian society, such as imams and other religious leaders, into the campaign on road safety.
- Pillar 2 concerns Safer Roads. Specific program actions have been identified, including projects to provide:
  - Safer Roadways;
  - Safer Road Planning and Construction (including road furniture); and
  - Safer Road Environment.
- Pillar 3 concerns Safer Vehicles. There are a number of activities envisaged under this Pillar, but an important aspect for vehicle occupant safety is:
  - Legislative reform is needed to make the use of rear seat belts mandatory. The mandatory wearing of seat belts in the front seats of vehicles only has been applied in Indonesia since 1993 (with Law 14/1992, as later revised by Law 22/2009).
- Pillar 4 concerns Safer Road Users. There are a number of activities envisaged and undertaken under this Pillar, including
  - Indonesia Road Safety Week, initially at a limited number of provincial levels in 2010-11, but to be extended to all provinces and to regencies and cities over 2012–2020;
  - Increasing Government Agency participation;
  - Increasing public participation; and
  - Increasing corporate participation.

- Finally, Pillar 5 relates to Post Crash Care. When accidents occur, and it is recognised that in the operation of the road transport system accidents will occur as road users are fallible and make mistakes, then the response and timing of the actions of police, emergency services, healthcare and insurers is important.

To date, most activities have dealt with Pillar 2, relating to Safer Roads [1, 6], but capacity development actions to address all Pillars have been undertaken under IRSMS [3] and under the Indonesian Transport Safety Assistance Program (ITSAP) by AusAID [7,8].

Safe System and the road transport system

The UN Decade of Action for Road Safety and the Indonesian Road Safety Master Plan are based on the belief that improvements in road safety and reductions in road trauma are possible, and that the greatest road safety gains into the future will be achieved through adopting a Safe System approach. The primary aim of the Safe System approach is to prevent accidents from happening, and, in the event of a crash, to ensure that the impact forces released are within the boundaries of human tolerance and that no fatalities or serious injuries resulting in life-long disability will occur [9, 10]. Currently, what a road user understands about the sensibility and appropriateness of a road rule and what they accept as being sufficiently "safe" for travel, are not what is desired by the general community. That is, drivers don't necessarily know or fully understand why a particular traffic law is in place ("what it's for"), and drivers can often have a misplaced faith or expectation that the road on which they are driving, their vehicle, and other drivers are all sufficient to provide a "safe" place, seemingly independent of the manner in which they themselves are driving. In the immediate to medium term, a focus on the management of occupant protection devices (motorcycle helmets, seat belts), vehicles, the road infrastructure, and driving speeds will likely best minimise the probability of death or serious injury as a consequence of a road accident. Appropriate and well-designed behavioural countermeasures are desirable, but reliable mechanisms for ensuring that road users are always alert and attentive, and are compliant with traffic laws, are not well understood or well implemented at present [11].

In the widest view [12], it is accepted that the desires of the population in any jurisdiction, in road transport terms, can be expressed as:

- Wanting to be mobile, that is, to be able to travel;
- Wanting to have access to transport options (road, public transport);
- Wanting to be safe;
- Wanting to have a sustainable environment; and
- Wanting to have a "pleasant" environment in which to live (amenability).

The IRSMS project is built on these general concepts.

The concept of an Integrated Road Safety Management System

The Indonesian IRSMS has been independently developed as a practical system to address road trauma and improve road safety [13]. For this system, the following elements were considered to be necessary to underpin effective management, target setting, the development of countermeasures and interventions and evaluation of actions taken, as shown in Table 1:

- Enactment of a legislative framework to regulate the road transport system;
- Access to valid and reliable data (the practical facts) concerning road trauma and behaviour; and
- A belief that change can happen.

ISO 39001 – Road traffic safety management system

The IRSMS in Indonesia predates the new international standard: ISO 39001:2012 "Road traffic safety (RTS) management systems – Requirements with guidance for use". The ISO 39001 standard was developed to support the United Nations' Decade of Action for Road Safety 2011-2020 and published in late 2012 and sets out the minimum requirements for a Road Safety Management System [14, 15, 16]. Despite being developed earlier than the ISO 39001 standard, IRSMS incorporates all of the necessary elements for a road traffic safety management system, and is, in fact, an exemplar for the implementation of the standard.

The ISO 39001 standard is intended to be a practical tool for governments, vehicle fleet operators and all organisations worldwide who want to reduce death and serious injury associated with road accidents. The standard is intended to be a tool that can be used to support strategies and actions to address risk in the road transport system, including the setting of ambitious road casualty reduction targets, the documentation of performance relative to those targets and the sharing of experiences. It was developed from ISO standards such as ISO 9001 for quality management, including the plan-do-check-act cycle, and a requirement for continual improvement by all public or private sector organizations involved in regulating, designing or operating road transport. It will also help by providing a framework for contracts and communication between regulators, vehicle manufacturers and their suppliers.

Table 1: Elements considered necessary for an Integrated Road Safety Management System (from [3])

A framework	The legislative framework for an Integrated Road Safety Management System in Indonesia is provided by Law 22 of 2009, relating to Road Traffic and Transportation, and related laws. Law 22/2009 establishes INTPC as the lead institution for road safety.
The practical facts	The data on traffic accidents are provided by an Accident Information System that specifies who is involved; what happened immediately prior to, during and after the accident; where did the accident occur; when did the accident happen; how did the accident take place; and, why did the accident happen.
A belief that change can happen	The moral compass for traffic accident reduction and improvement to road safety is provided by the Safe System approach, as expressed through the strategic plan (RUNK 2011-2035) and action plans developed to address and guide road safety and traffic policing efforts.

Background to the IRSMS project for a national road safety management system

The Strategic Roads Infrastructure Project (SRIP) is supported by a loan from the World Bank (IBRD Loan 4834–IND) and has been implemented by the Directorate General of Highways within the Ministry of Public Works since late 2007. Following Law 22/2009, INTPC took over the responsibility for developing IRSMS. Project implementation is expected to be completed by mid-2013. The technical assistance to IRSMS is being undertaken by Consia Consultants.

The SRIP Project included a Road Sector Institutional Development component consisting of:

- IRSMS-1, to develop an integrated Road Safety strategy and long-term plan, including an institutional framework; via the Directorate General of Land transport (DGLT), later cancelled, and
- IRSMS-2, to develop a pilot integrated road accident database/analysis system, and establishing self-sustaining personnel development procedures for the INTPC.

Within INTPC, the IRSMS Project has delivered the following key achievements:

- Development of a web-based accident information and analysis system with a simple user interface for reporting and retrieving accident information;
- A new Accident Record Form has been developed, and Tablets using open source Android operating systems are being procured to improve both data quality and input times;
- An AIS User Manual for data entry and basic reporting has been published;
- From 1 September 2012, accident data collection, coding, entry and processing in the IRSMS server has been extended to the whole of Indonesia, in total, 445 Polres (police districts) of 31 Poldas (provincial offices);
- Daily accident reports are available to the Police Operations Department;
- Presentations on the Accident Information System (AIS) and training on the use of the new system and Accident Record Form has been provided to more than 430 police officers from the 31 Poldas, as well as to stakeholders and to police officers undertaking executive training for senior positions; further training for 500 personnel is planned in the first half of 2013;
- Two workshops on stakeholders' data system requirements have been held;
- Training courses in road safety interventions have been developed, incorporating:
    - Development of a Road Safety Data Collection Manual;
    - Development of a Data Analysis and Applications Manual;
    - Procurement of equipment for INTPC use in speed enforcement, drink drive enforcement, drug driving enforcement and overweight vehicle enforcement;
    - Development of Standard Operating Procedures (SOPs) for traffic enforcement by INTPC;

- Development of local road safety implementation plans for INTPC Polda (provincial offices) and Polres (police districts) to conduct targeted operations based on the evidence from the IRSMS accident information system and local stakeholder consultation;
- A series of media campaigns is being made for release in early 2013, including television commercials, newspaper advertisements, billboards and internet media. The campaigns will focus on the key priority means of reducing casualties based on the evidence from the IRSMS accident information system and follow and support the themes of police traffic enforcement;

- An IRSMS public website (www.korlantas-irsms.info) has been established, with web pages in both Indonesian and English languages that explain the system and provide additional background information.

Continued institutional development, training and capacity development in the present project will be closely linked to the development of the IRSMS, both under the SRIP Project to mid-2013 and beyond. In particular, much attention will be devoted to address the technical and institutional causes for the underreporting of road accidents.

A basic need for data: The IRSMS Accident Information System

IRSMS is designed to provide valid, reliable and verified data for road accidents in Indonesia [2, 3, 13]. Information about the circumstances of an accident is the basis for all targeted road safety interventions [16]. For example, access to comprehensive, reliable and accurate road accident data makes it possible to identify specific roads, vehicles and road users which need to be targeted with road safety interventions.

Through Law 22/2009, the INTPC is charged with the responsibility for accident data collection and investigation. A user manual was developed to explain the methods and procedures that the INTPC needs to use to collect and analyse these accident data. The user manual provides basic and practical guidance for police and other stakeholders when entering accident data and utilising the information that is contained within the database system. At present, there are published versions of the user manual in both Indonesian and English. The AIS User Manual Version 1.2 describes the accident input process reporting a road accident under the IRSMS Accident Investigation System [17]. Further development for system users will address issues of data verification (validation), general data analysis and reporting, usability issues, and administration of the Accident Investigation System.

As well, an expansion has been approved that allows for a broadening of the scope of the project in two pilot provinces to include electronic data collection for accident reporting, system design automation and digital transmission using tablet computers on site to gain automatic GPS location of the accident and to document the scene and gather relevant photographs and witness statements (if available).

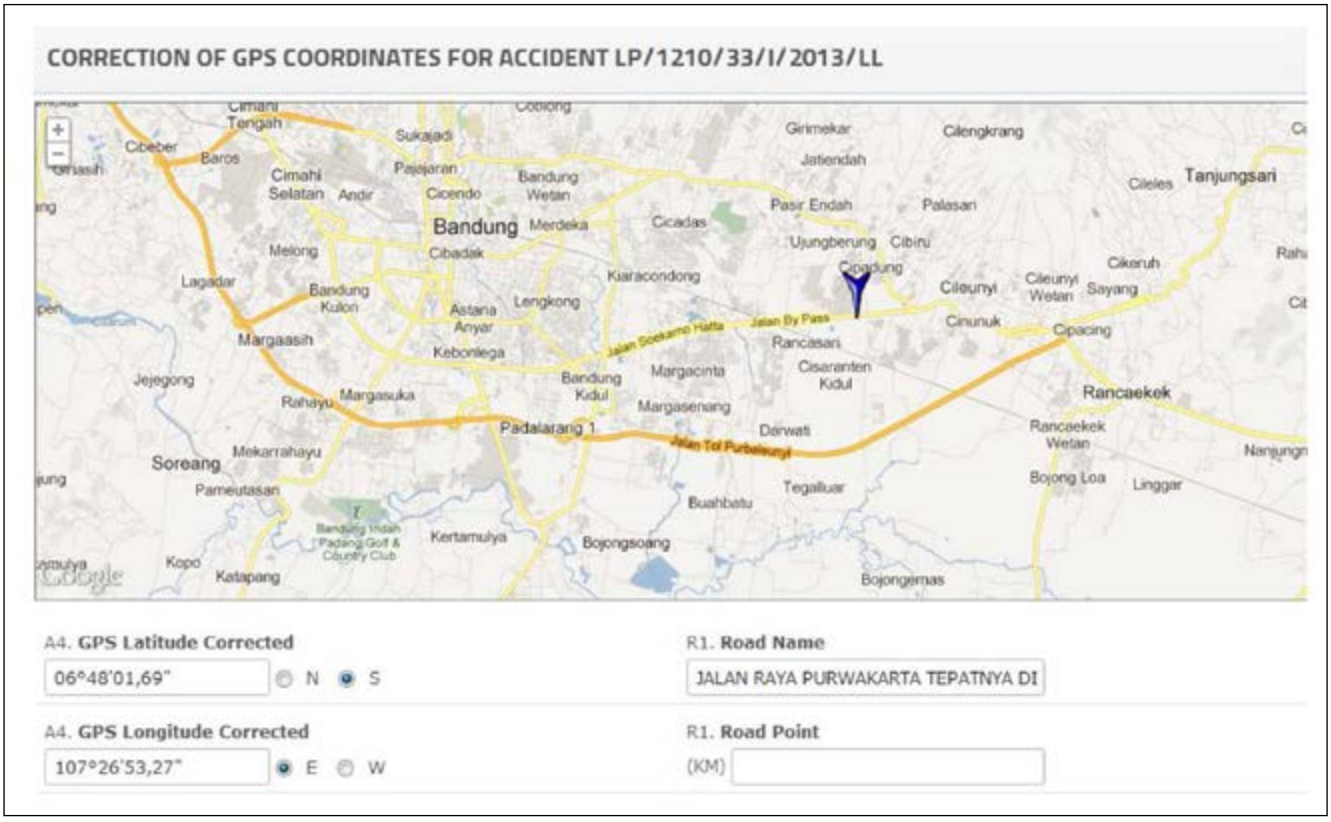
IRSMS Accident Information System functionality

At present, data are collected by police filling in a notebook entry or the paper accident report form at the accident site. The information about the accident is then later entered onto the database at the police station. The location of the accident is registered as geographical coordinates, but this has occasionally been problematic as Indonesia straddles the Equator, and North/South latitude co-ordinates can be confused.

A user-friendly interface guides the registration of data from paper forms. The location of the accident can easily be corrected by simply dragging the accident indicator (see Figure 2) on a map. The name of the road is automatically registered once the accident location is selected and confirmed. Eventually, the data collection will be made by means of a tablet computer at the accident site, which will enable use of GPS for automatic registration of the location of the accident in geographical coordinates. Use of a tablet also enables data control to be effected at the accident site, minimising coding errors associated with multiple entry of data, as well as automatic transmission of data to the national database. Furthermore, photographic evidence and recordings of witness statements can be collected with the tablet and attached to the accident record. Images are stored as an integral part of accident information and can therefore be accessed at accident level, while witness statements are available to authorised users to support later criminal prosecutions. Additional documents can also be attached to the accident record. Output from the system is designed to serve for prosecution, investigation, planning and accident analysis purposes (for example, the system produces the main report that is necessary for court proceedings).

When analysing accident information, the easiest procedure is to use the map facility where accident concentrations can be found by zooming in on specific locations (see Figure 3). At any time the user can click on an accident and get a summary description of data and time, location, vehicles involved and injuries. An accident diagram and pictures of the accident are also displayed. A number of standard reports such as daily, weekly and monthly reports, and standard tables are also at the disposal of the user. On top of this the system, can generate a cross-tabulation of any given pair of variables in the system. Some cross-tabulations that are common to statistical reporting of accidents are provided as programmed options within the system.

Figure 2: Screen for correcting the location of the accident



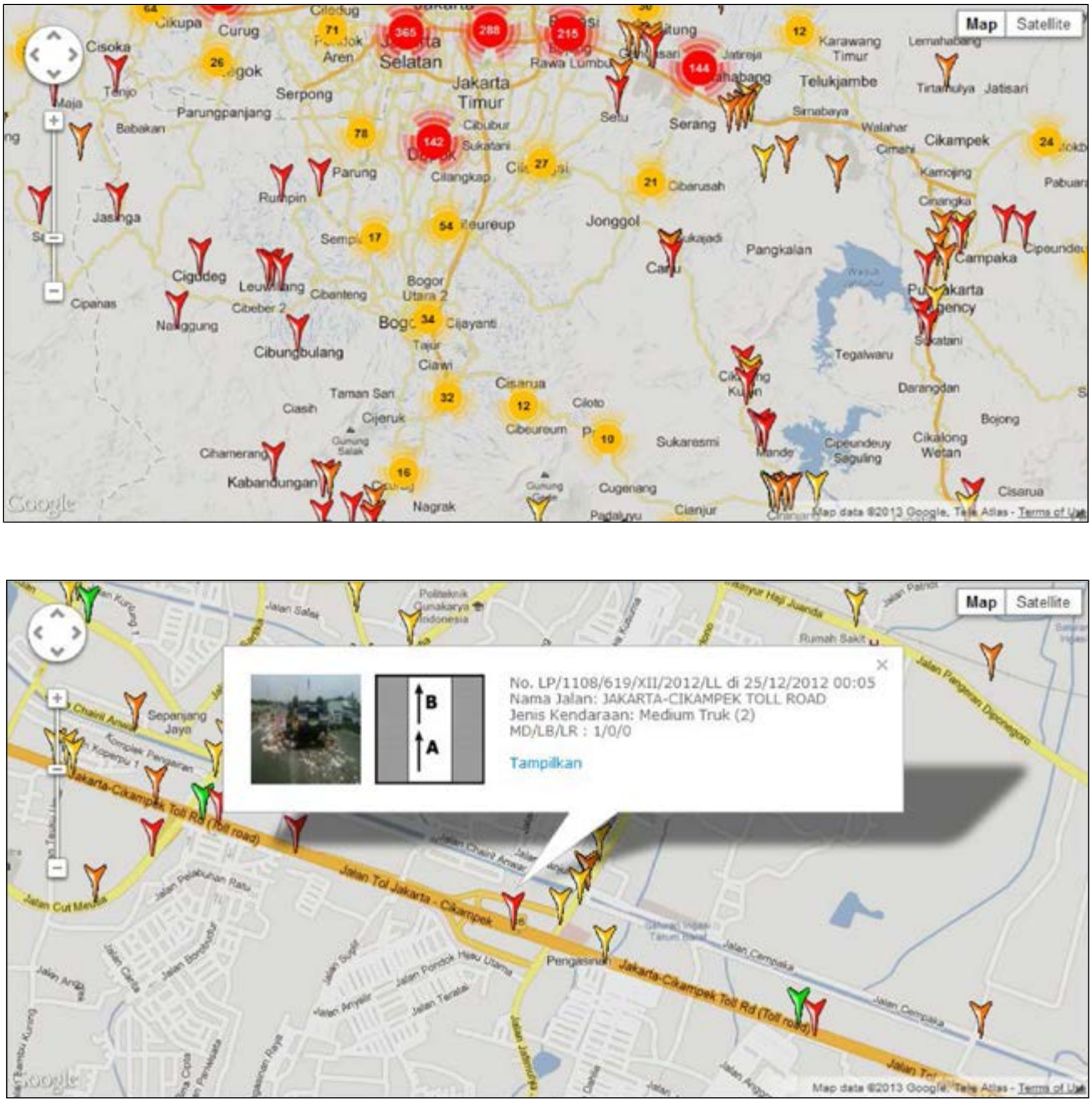


Figure 3: Zooming in on a map and selecting a specific accident

Some final comments

Overall, IRSMS should improve the capacity of Indonesian agencies – and, in particular, the INTPC – to undertake actions to reduce road trauma and enhance road safety outcomes, thus further contributing to improvement of road safety in support of the Indonesian Road Safety Master Plan (RUNK) [4] and based on the UN Decade of Action for Road Safety.

IRSMS allows additional stakeholders (journalists, and the general public) to be able to identify specific data and to highlight where actions could be made, rather than providing accident data only to "approved" stakeholders from various government agencies, planners and road system designers. With IRSMS it is possible to give all stakeholders access to the web-based front end of an accident information and analysis system, as part of an integrated road management system as envisaged by ISO 39001. Using IRSMS, general accident data can be accessed by all stakeholders and still meet all legal privacy

requirements. The confidentiality of individual names and personnel data is restricted to the needs of a particular registered user who can be allowed various levels of access (e.g., for the normal evidentiary data needs of police prosecution). The current data system used in Indonesia is simple enough to be accessed by any registered user anywhere globally, and more than 3,000 different summary report formats can be generated, as well as allowing for the investigation of the mechanics of individual accidents.

Data applications using IRSMS are already being developed, for example:

- AusAID/Indonesia Infrastructure Initiative (IndII) have requested an independent analysis of hazardous locations – black spots and black lengths – using IRSMS data to review more than 20 black spot road locations in Jateng, Central Java, that are proposed for priority funding for improvements to the road or reconstruction of the road. To support such analyses, an IRSMS Data Analysis and Applications Manual is being developed.
- IRSMS allows situations where there are accident clusters to be identified. These may be common crash types at particular locations or at particular times of the day, and may involve particular types of vehicles, or travel for particular purposes. The draft IRSMS Data Analysis and Applications Manual discusses the OLA approach used in Sweden [18] to present objective data to stakeholders, get the stakeholders to make a list of solutions that can address the problem, and agree to the actions that are to be performed and plan or schedule those actions.
- IRSMS allows the review of sections or the full length of roads to identify poorly performing roads. This can involve not only examination of accident records, but additional data about road use, enforcement data, road safety audit reports, to allow for the development of an integrated response, such as targeted enforcement, a review of road signage, road alignments, etc.
- Finally, IRSMS can support new tactics to target the inappropriate and illegal behaviours that contribute to an increased risk of road trauma. IRSMS is being used to assist in the development of new traffic policing tactics for INTPC. Working together with AusAID, a priority program will be a demonstration of speed enforcement as an effective tool in speed management and reducing road trauma. A pilot program is being undertaken on a selected toll road east of Jakarta which has a history of high road trauma. Different interception techniques will be applied, using proposed new Standard Operating Procedures (SOPs). New speed enforcement equipment (radar, LIDAR, time X distance measurement) will be trialled and evaluated for wider use across Indonesia.

The design of the continued development of IRSMS will strengthen the institutional environment under which road safety and traffic policing actions are planned, undertaken and evaluated. If policies or decisions are based on limited or unreliable data, this can result in adverse results from program implementation and an unnecessary waste of resources. Road safety data, collected every day, can fulfil this purpose if they are properly recorded and compiled in a reliable system that can subsequently be used for data processing and analysis. The results can also be disseminated to relevant stakeholders and, when used effectively, can aid decision making on overall direction and strategy for road safety in Indonesia.

An analogy is that of "moving on an escalator of progress". The "escalator" moves from a situation where doing any form of road safety activity seems limited and likely ineffective, to a vantage point from which activities can be initiated and expanded, where researchers can investigate real events, where journalists can access real data to report on what has worked and what has not worked, and where politicians in turn are able to be better informed and be more realistic in their major economic and safety decisions concerning funding allocations and infrastructure planning.

To summarise, one way of thinking about what is being done in Indonesia is a series of small iterative changes that introduce web-based access to a safety database that can not only be used by the hosts (the INTPC) but, once officially launched in April 2013, can expand rapidly to be used by all stakeholders in Indonesia. The aim of IRSMS, together with the RUNK and with planned legislative changes under Law 22/2009, is to provide the practical facts that can be used to accelerate institutional change and underpin decisions about capacity development needs. This should not only start to stabilise the rapidly increasing casualty rate associated with road accidents but to accelerate the reduction so that a 50% reduction by 2020 becomes a planned reality rather than a remote possibility.

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