

TECHNICAL COMMITTEE C2

28 September 2011 (pm)

SAFER ROAD OPERATIONS

INTRODUCTORY REPORT

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EXECUTIVE SUMMARY

A road system is as safe as how road users operate on them. A safe system approach warrants a holistic approach and many of them are issues that enables and complements the physical aspects of the road system. Complementing the road infrastructure safety initiatives, this report and session will discuss matters pertaining to ensuring safer road operations. The session will look into four topics covering:

- policy formulation matters
- social marketing issues
- economic evaluation matters

This session will be a platform where experience on approaches to ensure that the operations of roads are safe from many countries surveyed is shared. The session will also highlight suggestions from the technical committee on best practices and recommendations.

COMMITTEE MEMBERS WHO CONTRIBUTED TO THE REPORT

George Mavreyoni, Australia
Michael Griffith, United States of America
Randall Cable, South Africa
Ahmad Farhan Mohd Sadullah, Malaysia

1. INTRODUCTION

1.1. Safer road operations in the context of a safe system approach

The matters discussed in this report may not seem directly relevant to the scope of the World Road Association's (PIARC) usual domain, as traditionally, PIARC predominantly deals with physical and infrastructure matters. However, as road safety has been made as one of PIARC's strategic thrust, a safe system approach must be used. After all, the safety of the road infrastructure will only be regarded as safe, when the operations of the roads are safe.

Under such arguments, PIARC has decided to initiate a dedicated technical committee that investigates the safety of the operations of road, and has empowered Technical Committee C2 on "Safer Road Operations" to deliver the intended outcomes.

1.2. The terms of reference

On order to achieve the aspirations, PIARC has set out the following terms of reference for C2:

- a) Issue C.2.1: Comparison of national road safety policies and plans
Strategies: Review road safety policies and plans across a range of countries
Outputs: Report on key aspects of road safety policies and plans, while identifying case studies.

- b) Issue C.2.2: Best practices in safety campaigns by public administrations
Strategies: Identify different approaches to road safety campaigns undertaken by public administrations and review the different media that are used for promoting road safety
Outputs: Report on the different types of campaign and the targeted audiences and case studies of the different media for campaigns
- c) Issue C.2.3: Cost effectiveness of safety measures and allocation of resources
Strategies: Study and compare the cost and benefit analysis used by different road authorities for investment in road safety schemes
Outputs: Report on the comparison of methods and case studies to illustrate choice of safety options

1.3. Objectives of the report and the session

This introductory report is prepared to serve the followings:

- a) To introduce the work of the working committee towards realising the strategic goals of PIARC for this session
- b) To share the experience of selected nations or localities on the issues covered by the work of the committee
- c) To pose concluding remarks on the subject matter leading towards firm resolutions or perhaps towards further cause for investigations

2. SAFER OPERATIONS OF ROADS

2.1. The role of policy

2.1.1. Introduction

The work carried out for this issue examined the road safety performance of many nations as well as localities, reviewed reported policies and strategies in jurisdictions and attempted to establish linkages between adopted and implemented road safety policies, overarching multi – year strategies and performance outcomes.

This has proven challenging as the level of understanding available through the review of survey returns is, by its nature, limited. Road safety performance is the outcome of complex interactions of many factors in each society.

The findings are built upon survey returns from 16 PIARC member countries and 8 selected state/provincial jurisdictions which set out the road safety visions, strategies, policies and practices they have adopted to underpin their road safety performance. 15 countries and 5 states / provinces returned the policies survey - and 11 countries and 4 states / provinces returned the strategy survey.

The surveys sought information which included: road safety vision, ambition and approach, road safety management arrangements, population and driver data, policies adopted to address drink driving, drug driving, speeding, and improve seat belt and helmet use (motorcyclists and cyclists), penalties to deter non compliance with these policies, improvement of the inherent safety on a section of road through policies for infrastructure safety programs and speed limit setting guidelines, policies to achieve improved standards of vehicle safety, policies linking injury insurance premiums and crash risk by vehicle or user, and any adoption of intermediate safety performance indicators.

A road safety strategy is considered a high level plan designed to achieve a particular long-term aim. The plan would often identify the vision on which the strategy is based, as well as actions, targets, performance measures, institutional arrangements, research and

development and funding requirements to deliver desired road safety performance. On the other hand, road safety policies are considered to be courses of action proposed by an organisation. They usually flow from a strategic context and may relate to interventions or institutional management arrangements. They may respond to specific road safety issues or be the road safety component of a response to broader societal issues.

2.1.2. National Road Safety Policies

Commitment

A long term vision such as the “ultimate elimination of serious road trauma” is powerful in recalibrating the road safety challenge. Although the target of zero serious injuries is aspirational, the vision may alter the community’s view of the inevitability of road trauma and leads to demands for clear allocation of responsibilities and a framework setting out accountabilities for performance. It will drive the search for innovative interventions. Different countries have varied ways to achieve this.

Best Practice is represented by a commitment to a long term goal of zero fatalities with strong interim targets that establish the path to success. This commitment at the highest level of government, eg., Poland (and for Sweden, Norway and Western Australia – by Parliament) will influence and underpin road safety management and road safety policy in a jurisdiction and will be clearly reflected in the proposals described in a strategy and action plan to achieve the ambitious interim targets.

The Safe System approach

A Safe System approach is the key to achieving longer term ambitious road safety targets. The movement towards a safe system of road use is central to the achievement of targets set in many of the countries that have been most successful in reducing road deaths and serious injuries. Safe system thinking influences road safety management and road safety policy as well as being the foundation and guiding set of principles for any effective road safety strategy.

Best practice is a road safety approach that takes a systematic view of all road transport design elements to manage crash forces to within human tolerances – an inherently safe system which accommodates human error. It should also accept and reflect the obligation of shared responsibilities between users and ‘system providers’.

Addressing road user behavior - drink driving, drug driving, speeding, seat belt and helmet use (motorcyclists and cyclists)

Policies to achieve safer/ improved behavioural compliance (usually through effective deterrence) display considerable superficial similarity. However, implementations have differed substantially at a detailed level*.

This applies to legislative and regulatory settings, levels of enforcement, judicial support, ease of enforceability, penalty levels (monetary fines and license suspension/ disqualification sanctions including demerit points) and cultural acceptance that certain types of offence are not acceptable (ie., are outside social norms in that society)

* *SUNflower: A comparative study of the development of road safety in Sweden, the United Kingdom, and the Netherlands* Matthijs Koornstra (SWOV), David Lynam (TRL), Göran Nilsson (VTI), Piet Noordzij (SWOV), Hans-Erik Pettersson (VTI), Fred Wegman (SWOV), and Peter Wouters (SWOV), 2002

- a. Drink driving is a persistent challenge to improved road safety performance. Even in countries with good road safety records, drink driving has been cited as a contributing factor in up to 30% of fatal crashes. Most developed countries have legislated for random breath testing by Police for alcohol. Many states/ provinces in the US, Australia and Canada have well established alcohol interlock programs – for repeat offenders and in some cases for higher level first offenders as well. Best practice indicates that drink driving penalties should be comprehensive, with minimal exemptions and substantial penalty levels to achieve strong deterrence.
- b. Drug Driving. Tests for drug driving are conducted in most high income countries in instances of visible gross impairment. Random drug testing, based on saliva testing is relatively new and has been conducted in an extensive and systematic way to date in a few (but increasing number of) jurisdictions.
- c. Speeding A number of jurisdictions reported significant effort focused on detecting speeding related offences as a major initiative to prevent crashes. In general, however, limited information to determine the intensity of enforcement effort was available. Again, the high performance countries were active in achieving speed control through speed cameras. There is a most uneven approach by jurisdictions to enforcement effort, extent of covert operation and fines and other penalties for offending, indicating the considerable scope to achieve improvement if the political support for these proven measures could be galvanised. It is contended that those jurisdictions with a strong speed enforcement regime, for example with many mobile cameras deployed unpredictably, demerit point penalties linked to offence severity and other penalties that are a substantial deterrent, will have a greater level of compliance with speed limits than other jurisdictions. Best practice is an effective program of covert speed cameras, combined with other speed enforcement technology. Cameras systems should be programmed with minimal tolerance levels (ie allowed speed above the speed limit) before offences are prosecuted. Efficient penalty processing and follow up processes if unresolved are essential. High urban speed limits (above safe system levels) still persist in some PIARC jurisdictions. These limits reflect a primary focus on permitting higher levels of vehicle speeds and compromising safety, rather than making safety the constraint on permitted speeds. Best practice is to set speed limits according to safe system guidance taking into account the standard of the infrastructure, including crash risk, road user mix, and road function, density of flow, and the road and roadside environment. Low urban speed limits should be introduced where conflicts with vulnerable road users are likely. Higher highway/freeway/expressway speed limits should only apply where the highest safety design standards have been implemented.
- d. Red Light running (red light camera offences). Cameras to deter red light running are common in many countries. Best practice is the strategic deployment of red light cameras, particularly at high risk locations and consideration should be given to combining these cameras with speed measurement devices.
- e. Seat belt and helmet use. Most jurisdictions require all seats to have seatbelts and vehicle occupants to use those belts. However, there are fewer jurisdictions where all vehicle occupants are required to be belted. Most jurisdictions with enforceable seat belt wearing regulations typically report the percentage of compliance to be in the mid 90's for the front seat and 85%-90% in the rear. Requirements for motorcycle helmet

wearing vary and regulation for mandatory helmet wearing for cyclists is much less common than for motorcyclists. Best practice is requiring all vehicle occupants to wear seat belts, requiring all motorcycle riders and passengers to wear approved standard helmets, requiring all bicycle riders to wear helmets and conducting regular surveys of wearing rates. A more comprehensive survey response from nations who have motorcycles as their dominant type of vehicle would have given better understanding on the issue.

Policies for infrastructure safety improvement

The all important linkage between travel speed (usually reflecting applicable speed limits) and infrastructure characteristics, traffic conditions and abutting environment are inadequately understood or applied in many countries.

Some countries use “system-wide” (sections or lengths of the road network) and others use “spot location” approaches for their infrastructure safety programs. While there is a place for both risk assessment approaches, building a safer system requires acceptance that the current system is generally not fundamentally safe and in the initial years, many of the higher risk lengths across the whole network need to be identified and treated to reduce the network wide risk over time.

The iRAP (International Road Assessment Program) model utilises a range of data about a road length to calculate the safety level of that road. This is of great benefit when crash data is unavailable or of limited coverage or quality. iRAP also produces a range of potential treatment types which are cost calibrated to the country of application. This is not only a highly useful tool for practitioners in providing treatment options but is also an invaluable source of insight and training about what elements of a road, its operation and its environment contribute to its inherent crash risk and how certain countermeasures can more effectively address that risk than others. iRAP was initially developed for application in low to middle income countries, however, enhanced RAP programs in high income countries are now picking up and seeking to apply many of the iRAP features for their risk assessment and intervention response programs.

Best practice requires highway authorities to assess network wide crash risk and concentrate on route treatments over time prioritised by potential benefit. At present, if a highway authority reports a relatively homogeneous accident rate along its single carriageways or even along its motorways, it may not invest significantly, particularly if the accident rate was near the national average. Is this appropriate? Designing ‘to the average’ will generally perpetuate the average. While it is natural to direct resources to the most deserving sites (and it is noted that this provides a good legal defence), it may be time to challenge some of the historical theories used by the road industry.

Policies to achieve improved standards of vehicle safety

The US and the EU have led the development of strong vehicle safety regulatory reform. However, EuroNCAP has been a most successful consumer focused crash test based information program, operated by the road safety agencies and automobile clubs in Europe.

Countries such as Australia utilizing the UN – ECE regulations are behind the northern hemisphere regulatory curve and the Australian States and New Zealand rely more upon fostering market demand through the ANCAP consumer vehicle crash test based

information programs - publicizing test results and other emerging vehicle safety features to improve the safety of the vehicle fleet.

Best practice is government adoption of high standards for design regulations and for registration for road use, (especially features such as Electronic Stability Control, head protecting airbags and other emerging technologies), the promotion of vehicles with high levels of occupant and vulnerable road user protection to the public utilising the NCAP test results and incorporating high standard vehicles into government fleets to promote industry change.

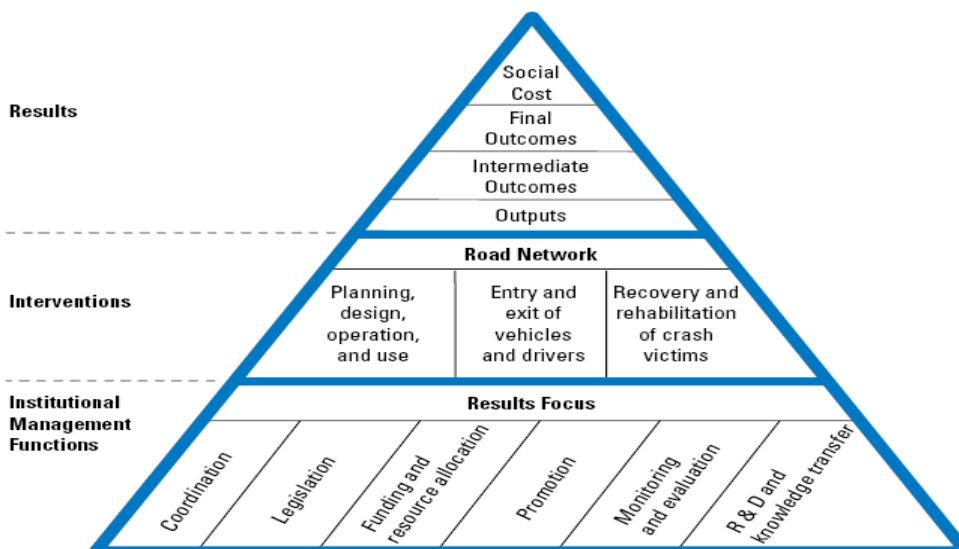
Crash data and IRTAD - Understanding crashes

IRTAD produce the International Road Traffic and Accident Database, which includes aggregated data on injury accidents, road fatalities, injuries and hospitalised road users as well as relevant exposure data such as population, car park, network length, vehicle kilometrage and seat belt wearing rates from 30 countries for every year since 1970. Moreover, key road safety indicators are compiled on a monthly basis. IRTAD is developing a set of new variables to be progressively included in IRTAD data and are extending membership and peer support to low and middle income countries.

Road Safety Management Arrangements

In reviewing the scope and effectiveness of road safety policies (and strategies) within a jurisdiction it is recommended that the road safety management system is considered in its entirety. The system is represented in the diagram Figure 1*.

Figure 1: Road safety management system



Source: Bliss and Breen, building on the frameworks of Land Transport Safety Authority, 2000; Wegman, 2001; Koornstra et al, 2002; Bliss, 2004.

Figure 1: Road safety management systems

The capacity of a jurisdiction to establish and operate institutional management functions – the lowest level in the triangle – to adequately devise and deliver interventions and to achieve overall results is critical for all countries. The above model is used to provide a framework for evaluating current practice in jurisdictions.

* OECD ITF JTRC "Towards Zero: Ambitious Road Safety Targets and the Safe System Approach", 2008

The seven key factors within road safety management institutional management activity are:

- the existence of a *results focus* within a jurisdiction (clear lead agency; the existence and active performance of a road safety decision hierarchy within government; clarity of roles, responsibilities and accountabilities for the key road safety agencies; and identification of the capacities that need to be strengthened).
- *coordination* between the agencies and also with stakeholders
- the existence of adequate *legislation*, supported by *judicial concurrence*, *effective enforcement frameworks* and *accessibility of accurate licensing and traffic offence data*
- the adequacy of *funding and resource allocation* to enable implementation of priority road safety interventions to achieve road safety performance.
- the adequacy of *advocacy and promotional activity* to build awareness and encourage the implementation of change within government and beyond. Bipartisan parliamentary road safety committees receiving regular briefings are an effective tool to build understanding and commitment.
- *Monitoring, evaluating and publishing* road safety performance and
- adequate *research and development* and *knowledge transfer* arrangements within the jurisdiction.

There are gaps in institutional road safety management activity in each jurisdiction. However, consistent limitations occur in the collection, measurement and performance monitoring of key intermediate performance measures as well as the transfer of research and development knowledge and expertise to road system designers especially those not specifically involved in specialist road safety.

2.1.3. National Road Safety Strategies

A critical component of an effective road safety strategy is to have a quantitative target. A road safety strategy should include policy objectives, a special budget, new design safety features, integrated community programmes and new technologies. The major factors for the success or failure of road safety initiatives are political will, proper organisation, and knowledge’.

Targets

Most developed countries have committed to achieving a 40% to 50% reduction in fatalities and (increasingly adopting targets for) serious injuries over the life of current and proposed 10 year strategies. While some countries adopt a modelled approach linking inputs to estimated outcomes, others use an aspirational approach. Some countries are achieving more success than others.

Delivering accountability through use of safety performance indicators ,(SPI)

The quality of *monitoring and evaluation* of road safety activity, particularly the use of intermediate data to measure change is a vital component of effective management arrangements to progress road safety strategies. Carefully selected intermediate safety outcomes or safety performance indicators are highly effective predictors of fatal and serious injury movements. The level of monitoring and evaluation of road safety programs varies substantially between countries and there are commonly many gaps.

Best practice is the use of a broad range of SPI's as in Sweden, which is clearly defined, whose information requirements are readily understood, which will be most efficient in

measuring underlying change in the level of safe operation of the road system and will drive a shift towards Safe System outcomes. Measurement of public opinion in relation to new or proposed initiatives is an important means for providing guidance about implementation readiness to the political level.

Content of an effective Strategy

The development and implementation of effective actions to give effect to an adopted strategy is a core activity. Strategic *directions* introduced by the responding jurisdictions based on the survey returns are reported, supplemented in some cases by drawing on other available national strategy and research based road safety documents.

These *directions* can be summarised under the four key elements of the safe system model:

- Safer infrastructure (Safer roads and roadsides)
- Safer speed limits
- Safer vehicles
- Safer road users [Alert and compliant road users (including legislation and enforcement)]
 - Speed limit compliance
 - Reducing impaired driving – alcohol, drugs and fatigue
 - Seat belt and helmet wearing
 - Countering distraction
 - Technology in vehicles (and on road) to address unsafe behaviours

and also the five supporting safe system elements including:

- effective controls on drivers/riders and vehicles entering the system
- public information and education programs
- improving understanding of crash risk on the network
- improving the responsiveness and effectiveness of emergency medical care for crash victims
- effective legislation and enforcement

In addition, most jurisdictions have considered it useful to provide a special focus in any strategy on vulnerable road user safety and heavy vehicle safety given the particular safety challenges applying to these users. These *directions* can be summarised under the following headings:

- Improving pedestrian safety
- Improving cyclist safety
- Improving motor cyclist safety
- Reducing heavy vehicle crash involvement

The main steps in establishing national road safety strategies include:

1. Identify stakeholders
2. Establish a road safety initiative
3. Knowledge of the current situation and trends
4. Prerequisites
5. Road safety objectives
6. Organise a road safety project
7. Implementation of the road safety strategy
8. Evaluate and update the road safety strategy

2.1.4. Correlations Between Policies and Performance

A comparison was attempted to link between policies and performance. It is interesting to note that some countries have markedly improved their performance (relative to others in % terms) during the 2000 to 2009 period compared to their relative performance in the 1970 to 2000 period.

In reviewing performance by jurisdictions, there appear to be a number of crucial elements which are present in the better performing countries. It is useful to look at institutional management issues as well as the breadth and depth of interventions in place.

Institutional management issues

In countries such as the Netherlands, Sweden, United Kingdom, Switzerland and Japan there are comprehensive institutional management arrangements in place for road safety. These arrangements constitute the “how to” for implementation challenges and while differing in each jurisdiction, provide a distinguishing sense of purpose across government for achievement.

They all follow a multi-sectoral approach across government; there is a clear vision or set of principles setting out desired long term road safety performance; there is a clearly designated lead agency; effective coordinating mechanisms are in place across government (and with non government stakeholders); there is a robust safety performance framework in place with all agencies knowing their shared and individual agency responsibilities and accountabilities and regular measurement of performance. There is regular contact between key agency chief executives who meet to discuss policy, funding and public information needs, manage implementation across sectors and monitor and review progress; and there is usually effective ministerial involvement. Good public communication activity is evident with road safety being almost a daily item of news interest.

Effective research capacity exists which interacts effectively with practitioners to build the essential support for evidence based policy adoption. It also provides a broader pool for training of road safety professionals who can move on into policy development areas within government agencies. The existence of comprehensive and reliably derived crash data systems, supplemented with driver offence data recorded against licensing records are essential requirements for professional road safety analysis of system level crash risks. These high performing countries have good practice data systems and conduct capable data analysis.

A further characteristic of these leading jurisdictions is that they have, in general, adopted a comprehensive set of actions which are challenging and are derived from a road safety strategy which has a clear vision for the longer term and is evidence based. Without such a plan, publicly adopted by governments, commitment by agencies and others will usually be limited.

They employ competent road safety practitioners, with the ability to devise strategies, to convince Ministers that the political risks are manageable, and to deliver some benefits in a short period which can then be promoted to the public to increase support for the strategy and its future implementation. There is good funding support by government for recommended interventions, which is critical for raising the standard of infrastructure safety as well as improving compliance with laws by road users.

Good performing countries measure performance and continuously strengthen their professional knowledge. It needs to be said that those countries with good performance usually have a long experience with motorisation. Most of the countries at the other end of the performance scale from the surveyed nations are experiencing the surge in motorisation that can be initially overwhelming until the society gathers the intent to build the strengths outlined above which are necessary to address this.

Larger countries benefit from regional (or provincial or state) strategies. Indeed in countries such as Australia, State road safety activity is the great majority of road safety effort. This is also the situation to varying degrees in the US, Canada and Argentina.

2.1.5. Summary

There are opportunities for all nations to improve their road safety performance. A focus on institutional management issues and the major intervention areas will expose the barriers within jurisdictions to implementation. Often it is the expense of data systems upgrades or infrastructure improvement; very often it is a capacity issue in terms of knowledge among professionals, senior bureaucrats and at the political level.

Relatively underperforming nations should highlight their level of underperformance and use this as a catalyst for improved commitment.

- They can learn from the issues set out in this (and other) reports.
- They should seek to establish contact with a high performing country and examine opportunities for information, staff exchanges and decision maker visits.

The best performing nations can continue to improve by focusing on their institutional management effectiveness, strengthening interventions to target the higher volume, higher risk crashes and doing what is necessary to make the road system safe and forgiving of error.

2.2. Effective social marketing

2.2.1. Motivation

As road user error is believed to be a factor in 95 percent of all road accidents, improving road user behaviour should always be a priority. With the ability to educate and influence the general public, road safety publicity is needed in order to:

- 1) create awareness of road accident threats and vulnerability of certain road users;
- 2) educate road users as to what constitutes safe road user behaviour;
- 3) change attitudes and beliefs to a more positive road safety approach; and
- 4) inform road users of changes in traffic regulations or operating conditions.

On the face of it, it might seem unnecessary to have to devote resources to guide people to behaviour that may obviously be in the best interests of their own health and safety; e.g., not drinking and driving, wearing of safety helmets and seat belts, not driving at excessive speed. People may not actually understand the risks, or if they do, may displace the risk by acting on the basis that “it will happen to someone else, not me.” Many people are sceptical or even superstitious about certain safety measures, such as the wearing of seat belts. In some cultures there might even be a fatalistic attitude that all accidents are “the will of God.” Breaking down these barriers and convincing the public that many accidents can, and have been prevented, can be a slow process. Road Safety Campaigns should, therefore, be seen as a sustained commitment. Road safety publicity is an indispensable part of any nation’s road safety strategy and is most successful if used in conjunction with engineering, legislation, or enforcement.

2.2.2. Approach

The primary objective of the paper is to report in Best Practices for Road Safety Campaigns specifically for (i) Different type of Campaigns and Target Audiences, and (ii) The use of Different Media Types for Road Safety Campaigns. However, these two focus areas cannot be looked at in isolation, and the literature review and international survey questionnaire investigated Road Safety Campaigns more holistically.

The paper encompasses the results of the literature review and analysis of the PIARC international survey questionnaire. The literature review revealed extensive works already carried out in this field.

The objective of the survey was to develop an understanding of “best practices” of campaigns developed by Road Administrations or Authorities worldwide in order to improve the effectiveness of road safety campaign results in the future. 18 countries completed and returned the questionnaires and therefore the results presented here cannot be regarded as representative of all the countries in the world. It does however, give an indication of how road safety campaigns are planned and implemented in a cross-section of developed and developing countries.

It appears that most of the safety campaigns are in their infancy, but are planned to be long-term efforts. Most countries are developing their approaches and strategies based on crash data and traffic offense data and not on theoretical behavioural models.

While data detailing the approaches to each campaign is available in the surveys, information about the results is scarce. Apparently, the campaigns are seeing some success with the specified target audiences; however, the lack of comprehensive evaluation data limits the ability to identify which approaches are the most successful.

2.2.3. Findings

Use of Behavioural Change Models

Only a few countries used a Theoretical Behavioural Model (TBM) when developing their road safety campaigns. Each country was asked if their traffic safety campaigns or objectives were based on a TBM and if there was a link between their target audience and a TBM. Most reported a TBM was not used in the development of their campaigns.

Campaign Themes, Goals, Budgets, Objectives

Most campaign themes or slogans communicate safe driving. While they vary greatly from country to country, they focus on three general areas: promoting safe driving, reducing deaths and injury and reducing traffic offenses.

Overall, campaign goals focus on reducing traffic accidents and deaths. Other goals of the campaigns include encouraging safe driving habits, reducing traffic offenses and reducing auto crime. Behaviour modification is the key to the success of road safety campaigns. Most road safety campaigns are looking to do more than just increase awareness, increase knowledge or change attitudes; they include a combination of these objectives. Specific goals are in place to raise awareness and change attitudes, which leads to a change in behaviour.

Road safety campaigns have become a major commitment for many countries. Half of all countries spent €1,000,000 (EUR) or more per year on their safety campaign while 28 percent spent more than €2,500,000 and two countries (11 percent) spent more than €5,000,000. The road safety campaigns in the countries that responded are fairly new. Half of the road safety campaigns have been running for two years or less. Just over one-fourth of the countries indicated that their campaigns have been ongoing for more than five years. In fact, one country's road safety campaign (Korea) has been in place for more than 30 years, starting in the 1970's.

Even though many of the campaigns are fairly new, a large number of the countries said they plan on their campaigns being part of a long-term strategy and will continue well into the future. Few countries' road safety efforts were international in scope. The vast majority of the safety campaigns had a national or regional/local focus.

Supporting Activities

Almost every campaign was supported by specific activities in addition to the media component of the campaign. All countries but one (Switzerland) stated they had one or more activities supporting their safety campaign. The top examples were changes or increased law enforcement, legislation and educational activities.

Problem Definition and Target Audiences

Except for two, the countries stated that they used either road crash or traffic law offense data to identify or define the road safety problem their campaign should address.

The respondents indicated that road safety campaigns were aimed at specific target audiences. When developing the various campaigns, target audiences were key to the process. Most countries felt there was a link between a specific target audience and the campaign problem identified. The research shows the target audiences were identified by age, type of driver (car, motorcycle, professional), by behaviour (speeders, pedestrians, car thieves) or by language spoken.

Media Types used

Content of the primary message was most often described to be rational. The primary message was also described to be educational, persuasive, emotional or humorous.

Media plans were developed based on target audience descriptions and geographic considerations. Most media plans were developed with more than one media type in order to reach specific targets within certain geographic areas. While media plans were developed more often than not, few pre-tested the plans prior to introducing them to the public.

Campaigns went beyond traditional mass media (TV & radio). Online media was the second most used media to deliver the campaign messages. Other communication tools incorporated outdoor billboards, newspaper, cinema advertising and fliers to communicate the safety message.

Campaign Evaluation

In order to decide on the most appropriate method(s) of evaluation, it is necessary to first know the objectives of the campaign. In most cases the overall objective will be to reduce crashes or casualties. It is necessary to use appropriate means of evaluating publicity campaigns. If crash prevention/reduction is to be used as a measure, then the time interval must be great enough to pick up any effects. While use of crash or casualty statistics may be appropriate, especially in the case of long term (five or ten year) campaigns, in the shorter term it is not appropriate to use crash data alone. The use of crash rates as a measure can be awkward for all kinds of reasons such as under-reporting, time scale, influence of other factors. Instead there are other measures that can be used. Wherever possible multiple measures should be used. These may include the following:

1. popular liking for a message;
2. popular opinion of message effectiveness;
3. expert opinion of message effectiveness;
4. the numbers and types of road users reached;
5. recall of the message used;
6. change in traffic knowledge;
7. change in attitudes;
8. change in behaviour as reported by the individual;
9. change in observed behaviour;
10. change in violation rates; and
11. change in crash rates.

Most of the respondents conducted evaluations of the outcome of their campaigns. Far less evaluated the process or economic impact the campaigns had. When evaluating the target audiences, the top three metrics included awareness levels, followed by changes in behaviour, then reductions in injuries/deaths.

2.2.4. Summary

In general, the aims of road safety communication and awareness campaigns are intended to change the road users' behaviour, attitude or knowledge through mass media campaigns in order to increase road safety. It is, however, important to bear in mind that communication and awareness initiatives cannot succeed as a measure on its own, but should function as support to other elements of an integrated programme.

Mass media campaigns can achieve the following:

- increase awareness of a problem or a behaviour;
- raise the level of information about a topic or issue;
- help form beliefs, especially where they are not firmly held;
- make a topic more salient and sensitise the audience to other forms of communication;
- stimulate interpersonal influences via conversations with others (e.g. Police, teachers, or parents);
- generate information seeking by individuals; and
- reinforce existing beliefs and behaviours. ⁽¹⁾

One of the problems in using publicity measures is that people, on the whole, are resistant to change, especially when there is no apparent personal gain for them to do so. This attitude creates the challenge to convince road users to change attitudes and habits when there is no real desire to do so.

It is well known and researched fact that road user behaviour plays a major role in the current status of crash rates experienced by many countries. The ability to effectively change poor road user behaviour which have been proven to adversely impact road safety, to that which is regarded as more conducive to a safer environment for all road users, is therefore much desired. An effective methodology to provide a sustained positive change in road user behaviour is therefore seen as an investment with very high road safety return.

2.3. Economic evaluation

2.3.1. Motivation

Funding adequacy is critical to road safety progress. Lack of knowledge and innovative approaches to governments inhibit achievement. The OECD/ITF Towards Zero Report (2008) stated that *“Cost benefit analyses from various member countries show that carefully targeted road safety activity can be a viable investment opportunity, providing a competitive return for the insurance industry as well as government especially when the aggregate costs to the two sectors are considered and not solely the costs to government. Opportunities to attract funding by offering commercially acceptable rates of return for investors need to be vigorously pursued. A step change in resources invested in road safety management and in safer transport systems is required to realise the achievement of ambitious road safety targets in most of the world.”*

Without adequate funding any road safety strategy across the disciplines has no chance of achieving success. This is a particular challenge for low and middle income countries. It is critical, for example, that politicians resist the temptation to announce ambitious targets unless there is an appropriate allocation of funding to deliver the interventions needed for achievement.

2.3.2. Approach

The group created two primary products to conduct its work. They include: 1) State of the Practice report “Cost- Effectiveness Analysis (CEA), Cost-Benefit Analysis (CBA), and Resource Allocation,” and 2) a survey that was sent to member countries to learn about economic analysis methods used by different road authorities for investment safety schemes.

2.3.3. State of the Practice “Cost-Effectiveness Analysis (CEA), Cost-Benefit Analysis (CBA), and Resource Allocation” Report

The state of the practice report provides a comprehensive overview of cost-effectiveness analysis and cost-benefit analysis techniques. It covers material from international reputable references on the topic.

The report covers several aspects of economic assessment for highway safety purposes including:

- 1) Project appraisal and the importance of efficiency assessment tools
- 2) theoretical principles of cost-effectiveness analysis and cost-benefit analysis techniques,
- 3) overview of cost-effectiveness analysis tools,
- 4) advantages and disadvantages of cost-effectiveness analysis,
- 5) overview of cost-benefit analysis tools,
- 6) advantages and disadvantages of cost-benefit analysis,
- 7) evaluation of accident costs,
- 8) data required for the assessment of road safety measures,
- 9) results obtained in studies on the assessment of road safety measures,
- 10) barriers to use of efficiency assessment tools, and
- 11) resource allocation practices.

2.3.4. Survey Work

A survey was undertaken to gather information from various countries in support of our effort comparing economic analysis methods used by differed road authorities for investment safety schemes.

Twenty-one countries responded to the survey .The countries that responded include: 1) Argentina, 2) Australia, 3) Belgium, 4) Canada (responses from provincial agency and the federal transport agency, 5) Cuba, 6) Denmark, 7) France, 8) Germany, 9) Hungary, 10) India, 11) Iran, 12) Japan, 13) Korea, 14) Lithuania, 15) Mexico, 16) Netherlands, 17) Portugal, 18) Slovenia, 19) South Africa, 20) Sweden, and 21) United States (State of Washington).

Summaries of the results are as follows:

Almost all of the respondents were familiar with CBA or CEA for road safety action appraisal. Furthermore, all but one felt the need for their country to use such analysis. All countries identified “black spots” or dangerous sites on their road network. Other techniques for identifying sites in need of safety improvement varied. These include: hospital and emergency response information, grey spot site analysis, collision prediction models, and public pressure, among others.

Five of the respondents did not indicate any use of CBA or CEA tools for prioritizing programs and projects. One indicated very limited use. Three used both CBA and CEA for programs and projects. Most others who used the tools used either CBA or CEA; but the tools were used for both programs and for projects. Two used CBA only - one only for programs; one only for projects.

Almost all respondents cited “Technical/Methodological Barriers” as major reasons why CEA or CBA are not always performed for road safety measures. A majority of respondents also identified “Fundamental Barriers (resulting from theoretical basis of assessment tools)” and “Institutional Barriers” as major reasons. “Implementation Barriers” were cited by a third of the respondents.

“Data needs or gaps” was the most common barrier to using economic assessment tools. Another common barrier was the difficulty to forecast the effectiveness of safety measures. Respondents also indicated that barriers include: difficult to understand; political parties could not influence policymaking; state budget policy/scarcity of resources; safety programs are always long term programs so their result will be in effect in the future; governments need special knowledge to conduct CBA and CEA; dominance of intuitive approach to road safety intervention; ethical problems to assess value of life and to compare this with other values.

Speed control was the most common measure listed as the “best five road measures for achieving safety gains in order of cost effectiveness.” Pedestrian protections/measures were also common among respondents.

Other measures identified include:

- alcohol control;
- infrastructure changes - roundabouts; intersection reconfiguration; safety barriers; improving sight conditions; rumble strips; channelization; pavement maintenance; median barrier; walkways and cycle tracks; separation of traffic flows;
- signing and marking including variable message signs
- traffic signal modification/higher visibility; red light camera
- laws/regulations (safety belt, helmets, alcohol);
- access management;
- road safety audits;
- congestion mitigation;
- stricter driving licensing systems;
- vehicle improvements

Separate and sufficient facilities (including crossing facilities) was the most common measure listed for “best five road safety measures for vulnerable road users”. Increased helmet use was also a common response. Other measures identified include:

- delineation improvements (including recessed stop lines)
- barriers - to prohibit illegal crossing; for motorcycles; for access control
- wider curb lanes; wide medians
- improving sight conditions
- reduction of speed limits
- pedestrian signals (including countdown signals)
- pedestrian priority at intersections
- enhanced night visibility (including public lighting)
- reflector tabs on bicycles
- graduated licensing
- car design for VRU protection

Other findings. The most common approach to estimating the cost of a fatality or casualty was “Human Capital Approach or Gross Output” or “Willingness-to-Pay”. Few respondents used a “Life Insurance Approach”. The most common definition of a serious injury is one requiring a hospital stay of 24 hours or longer. Most respondents do not take secondary effects into account in the appraisal of safety measures because of the difficulty in assessing the value of secondary effects or because safety measures are considered in a program focused primarily or exclusively on safety outcomes. Almost all respondents indicated that politicians put the most weight for allocation of resources on the number of fatalities saved. Number of injuries saved was cited by only a third of respondents. One respondent noted that “every case is a single case with special pre-conditions and it is not so easy to calculate single effects on basis of global assessments

3. CONCLUSIONS

This report has illustrated three elements to support a quest for safer road operations. In support of a safe system approach, the experience from several countries on policy formulation, social marketing activities and economic evaluation was shared. In addition, several recommendations, as well as cautionary remarks were given.

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DRAFT CONCLUSIONS

- 1.THE STRATEGY AND POLICY FOR ROAD SAFETY IN ANY COUNTRY OR JURISDICTIONS ARE CRITICAL TO ACHIEVE THE REDUCTION IN LOSS ASSOCIATED WITH ROAD CRASHES
- 2.NATIONS AND JURISDICTIONS MUST PLACE TARGETS TO ACHIEVE, BOTH FOR LONG TERM AS WELL AS INCREMENTAL
- 3.THE SAFE SYSTEM APPROACH THROUGH A ROAD SAFETY MANAGEMENT SYSTEM IS CRITICAL TO ENSURE A HOLISTIC APPROACH TOWARDS ACHIEVING THE ROAD SAFETY STRATEGIES
- 4.LEARNING FROM PERFORMING NATIONS AND JURISDICTIONS WILL BE USEFUL TO POORER PERFORMING NATIONS. HOWEVER, EACH JURISDICTION MUST EXERCISE AN EVIDENCE BASED APPROACH AND MUST BE ABLE TO ADAPT THEM TO LOCAL NEEDS.
- 5.NATIONS AND JURISDICTIONS FROM LOW AND MIDDLE INCOME COUNTRIES WILL FACE GREATER CHALLENGES TO ENSURE THAT THEY CAN OVERCOME CONSTRAINTS (ESPECIALLY CAPACITY AND FUNDING) TO ENABLE THEM TO DELIVER THE REQUIRED STRATEGIES.
- 6.SOCIAL MARKETING WORK MUST BE AIMED AT CHANGING USER BEHAVIOUR AND THEREFORE REQUIRES SUSTAINED EFFORT
- 7.DESPITE THE IMPORTANCE OF BEHAVIOUR CHANGE, THE EFFECTIVENESS OF SOCIAL MARKETING VARIES FROM PLACE TO PLACE
- 8.AS FUNDING CAN BE SCARCE FOR ROAD SAFETY PROGRAMMES, A PROPER ECONOMIC EVALUATION TO ENSURE BEST RETURNS IS NEEDED
- 9.CAPABILITY OF NATIONS MAY AFFECT THE EXECUTION OF PROPER ECONOMIC EVALUATION
- 10.EXPERIENCES SHARED IN THIS REPORT ARE PREDOMINANTLY FROM MORE ESTABLISHED COUNTRIES. THE SITUATION IN LOW AND MIDDLE INCOME COUNTRIES MAY REQUIRE MODIFIED APPROACH TO SUIT LOCAL NEEDS AND LOCAL CONSTRAINTS.