Implementation of infrastructure measures for improving powered two-wheelers safety on Slovenian national road network

Marko Renčelj¹, Stanislav Zotlar², Tomaž Tollazzi¹, Matjaž Šraml¹
¹University of Maribor, Faculty for Civil Engineering, Smetanova 17, SI-2000 Maribor, Slovenia
²Ministry of Infrastructure and Spatial Planning, Slovenian Roads Agency, Tržaška 19a, SI-1000 Ljubljana, Slovenia

Motivation:
• Slovenia represents the highest risk for PTW riders in the European Union (in 2006)

Main causes:
• Number of registered PTWs (2002-2010) increased by value of 79.8 %
• PTW`s travelled kilometres per year (2002-2010) more than doubled!
• Age of PTW riders involved in traffic accidents: the range of 18 to 44 years, with a significant emphasis from the age group of 24 to 34
• Significant number of PTWs accidents occurred on dangerous road sections
The chart shows the number of deaths in various countries. The countries listed are:
- Norway: 30 deaths
- Switzerland: 33 deaths
- Denmark: 36 deaths
- Finland: 40 deaths
- Germany: 48 deaths
- Israel: 51 deaths
- Portugal: 59 deaths
- Austria: 64 deaths
- Sweden: 65 deaths
- Greece: 76 deaths
- Spain: 92 deaths
- Ireland: 103 deaths
- The Netherlands: 104 deaths
- France: 114 deaths
- Great Britain: 115 deaths
- Belgium: 137 deaths
- Estonia: 171 deaths
- Poland: 193 deaths
- Latvia: 275 deaths
- Hungary: 298 deaths
- Czech Republic: 314 deaths
- Slovenia: 357 deaths
Measures for improving PTWs safety – “key factors”:
• National road traffic safety program for the period 2007–2011
• Measures of the Transport inspectorate
• Measures of the Slovenian traffic safety agency
• Measures of the Slovenian Police
• **Measures of the Slovenian road agency:**
  - Installation of additional security elements for PTWs on existing guardrails
  - Installation of traffic signs which warn PTW riders on a dangerous road section
Motivation:
In Slovenia, people over 60 years represent 21.6% of population. Consequence is larger number of elderly people in traffic (inci/accidents). Older drivers are more often considered responsible for accidents.

Research approach and main causes:
Research was made in following phases:
1. questionnaire among traffic participants, aged 60 and more about “feel safe” in different types of road intersections,
2. traffic accident data analysis — from two Slovenian cities (large and middle size), including only drivers and in situ investigation on recorded accident spots with purpose to find causes.

It was founded:
• Most risky for elderly drivers are non-lighted and multilane intersections.
• Older drivers have more error accidents and this tendency increases with age. An error accident is defined as the failure of planned action to achieve a desired outcome without the intervention of some chance or unforeseeable event.
• Most recorded accidents happened in peek hours — cause: reduced ability and longer reaction time, improper assessment.
• Most recorded accidents were located in urban intersections (travel habits), mostly cause is poor sight distance or mistake while maneuvering.
• Non-negligible are accidents on highways — mostly the cause is inappropriate speed and wrong direction on entrance.
In situ findings and further research:

Problems in non-lighted intersections:
Inadequate visibility angle with regard to speed limit in main road.
Incomprehensible (or too many) traffic signs.
Connection to main road in curve.
Visibility – lighting.

Problems in multilane intersections:
High speed in main road – alder driver’s reaction time is longer
The maneuver of inclusion to the main road or turning left to minor road became dangerous.
Infrastructure, signalization and guidance of cyclists and pedestrians at intersections.

Further research:
In depth research is continuing – using basic Haddon matrix, analysing the environmental factors in pre-crash phase (the impact of road design and layout elements (found on in situ investigation) and different environmental conditions) to consider various impact to traffic safety. Using statistical methods and T distribution (because of small data sample), the correlation between traffic safety and infrastructure elements will be evidenced.
The attitudes and behaviour of European pedestrians

Authors: Eleonora Papadimitriou, Athanasios Theofilatos, George Yannis (NTUA), Gerald Furian, Christian Brandstätter (KfV), Virpi Britschgi (VTT), Emil Drápela (CDV), Richard Freeman (University of London)

- Risky behaviour, attitudes, perceptions and behaviour
- Descriptive analysis: gender, age, town size, urban/rural area
- Profiles of pedestrians in terms of motivations and travelling style
- Satisfaction for pedestrian infrastructure: pavements, separation of pedestrians and cyclists, crossing points, street lights etc.
- Pedestrians show strong support for a variety of safety measures and dissatisfaction with the speed of traffic, but not the establishment of more 30 km/h zones.

<table>
<thead>
<tr>
<th></th>
<th>Average distance traveller, public transport user (45%)</th>
<th>Short distance traveller (24%)</th>
<th>Average distance traveller, frequent cycling (22%)</th>
<th>Long distance traveller (10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of walking kms</td>
<td>17 %</td>
<td>67 %</td>
<td>23 %</td>
<td>19 %</td>
</tr>
<tr>
<td>Daily travel distance</td>
<td>22 km</td>
<td>9 km</td>
<td>21 km</td>
<td>80 km</td>
</tr>
<tr>
<td>Daily walking distance</td>
<td>3 km</td>
<td>4 km</td>
<td>2 km</td>
<td>9 km</td>
</tr>
<tr>
<td>% of public transport kms</td>
<td>44 %</td>
<td>4%</td>
<td>31 %</td>
<td>46 %</td>
</tr>
<tr>
<td>% of car passenger kms</td>
<td>31 %</td>
<td>5 %</td>
<td>28 %</td>
<td>27 %</td>
</tr>
<tr>
<td>% of cycling kms</td>
<td>6 %</td>
<td>24 %</td>
<td>14 %</td>
<td>6 %</td>
</tr>
</tbody>
</table>
Network Safety Ranking – a European directive implemented in Flanders

- European directive 2008/96/EC on road infrastructure safety management
- via Empirical Bayes
- limited set of road sections with high potential
Capacity building for road safety in rapidly motorising countries: A framework and an Indonesian case study

Mark King, Doug Brownlow, Barry Watson and Darren Wishart

Pillar 1: Road safety management

**Encourage the creation of multi-sectoral partnerships and designation of lead agencies with the capacity to develop and lead the delivery of national road safety strategies, plans and targets, underpinned by the data collection and evidential research to assess countermeasure design and monitor implementation and effectiveness.**

Capacity and the UN Decade of Action


**What is ‘capacity’?**

“The ability to perform functions, solve problems, and set and achieve objectives” (Fukuda-Parr, Lopes & Malik, 2002:8)

“Capacity” applies at the individual, institutional and societal level, however typical capacity building focuses only on individuals and institutions (Fukuda et al, 2002). Further, it tends to focus mainly on training individuals (Potter & Brough, 2004), which can distort even institutional capacity building (Fanany, Fanany & Kenny, 2011).

Changing focus

Capacity development: “the process through which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time” (UNDP, 2007).

Although this is primarily a community development approach we can abstract some principles from UNDP (2007):

- People, organisations and society define their own needs
- Participative approach to development and implementation
- Cycle of implementation and evaluation leading to development progress.

Towards a new framework: “Same, same, but different”

**FROM...**

- Capacity Building
- External needs assessment
- Externally provided training
- Sustainable institutions via pool of trained

**Implications**

Local road safety needs and priorities as perceived by the community and local agencies are a basic input in the capacity development approach; however they should still be informed by accumulated experience and scientific knowledge of professionals and experts.

This suggests that partnerships are important.

**TO...**

- Capacity Development
- Self-determined needs
- Local internal development (training as an institution)
- Sustainable cycle of community involvement in functional

**Principles underpinning the course**

- Building co-operative relationships
- Using data to inform decision-making
- Applying a multi-disciplinary approach
- Understanding the network and its operations
- Planning for a safe system

**Course description**

Two workshops per location delivered in Indonesia:

- Pre-visit to agencies (central and provincial) to identify needs
- Participants from 3-4 agencies (Transport, Police, Public Works, plus Health from 2012) West Java 2009/10, Bali 2011, Sulawesi 2012
- Lectures and interactive sessions, plus field visits
- Simultaneous translation, material printed in Bahasa Indonesia, Ministry of Transport granted free licence for Indonesian material
- Guest lectures by Indonesian academics, advocates and officials
- Action plans developed by cross-agency teams defined by location – followed up in 2nd workshop

**Evaluation by participants**

- Knowledge objective is universally met
- Greater appreciation of the benefits of cross-agency collaboration and willingness to pursue it
- Valued the input of Indonesian guest speakers and the opportunity to have up-to-date information

**Indonesia case study: “Protecting people on our roads”**

**Discussion**

Addressing capacity development objectives in the role of an external expert provider is not fully consistent with the ideal approach to capacity development; however it is considered that there is an important part to be played by outside experts in helping to shape the agenda. That being said, there are complexities to the Indonesian context that are not easily understood by Westerners in the short term, so that learning becomes a two-way process.

The long term objective of sustainability implies that workshops like these will increasingly be conducted by Indonesians. Finding a way to transition to this outcome will present challenges.

**Acknowledgements**

Shinta Hapari, David Ramsay (RI), Liz Robinson, ITSAP staff (Australian Government), DGLT staff (Indonesia)

**References**


CARRS-Q is a joint venture initiative of the Motor Accident Insurance Commission and Queensland University of Technology.

www.carrsq.qut.edu.au
Is there any pattern for road safety evolution?
Long-term trends in selected countries
Attila Borsos, Csaba Koren

**Objective:** to model the long-term evolution of fatality rate

**Model:** $D/P = a \cdot N/P \cdot e^{-b \cdot N/P}$ (fatalities, population, vehicles)

**Results:** Country-level analysis (several countries, one year)
  Time-dependent analysis (one country, time series)
  Latecomers’ safety benefits

**Conclusions:**
  Differences are disappearing
  Countries tolerate lower fatality rate over time
  Latecomers can improve their road safety quicker
Analyzing interactions between pedestrians and motor vehicles at two-phase signalized intersections - an explorative study combining traffic behaviour and traffic conflict observations in a cross-national context

Joram Langbroek, Tim De Ceunynck, Stijn Daniels, Åse Svensson, Aliaksei Laureshyn, Tom Brijs, Geert Wets

- Focus on lower levels of safety continuum
- Conflict observations and behavioural observations
- 3 signalized intersections in Sweden and Belgium

- Studying interactions between pedestrians and motorized road users at signalized intersections
- Exploring links between traffic behaviour and traffic conflict involvement

- Looking behaviour pedestrian significantly better when pedestrian violates the red light
- Pedestrians not looking before crossing – higher traffic conflict involvement
Driver Education System using Pseudo Driving Picture for Improvement on Elderly Drivers’ Risk Perception Ability

Background

- The number of traffic accidents caused by the elderly drivers is increasing in Japan.
- Cognitive characteristic of elderly driver is different among individuals.

Purpose

To propose a new education to compensate for the cognitive characteristics

Strategic point of Education

- Education based on own driving
  ⇒ Driving recorder (DR)
- Education to show own driving objectively
  ⇒ Computer graphics (CG)

Education flow
Driver Education System using Pseudo Driving Picture for Improvement on Elderly Drivers’ Risk Perception Ability

See you!!
Towards a semantic-driven spatial monitoring framework for Road Safety
Tirry D. & Steenberghen T.

Semantic augmentation of road safety concepts and indicators
Active to the Kindergarten

Elke Sumper

Previous study:

- Half of the car rides are no longer than five minutes
- Children themselves prefer active transport modes

Follow Up project:

- Implementation of mobility measures to motivate parents to use sustainable ways of transport
- Before and after evaluation
- Tool Kit
"Children`s risks on their way to school using GIS method

T. Rõivas, E. Sepp ,L.Altin
Faculty of Science and Technology, University of Tartu, Estonia