Monday 15 May at 14:00

Workshop in the framework of the Fourth United Nations Global Road Safety Week in 14 May 2017

Save Lives #SlowDown

The future of road safety research

NTUA Zografou Campus, Athens Railways Amphitheatre of the Department of Transportation Planning and Engineering

Monitoring road safety risk factors and measures

SafetymCube

Apostolos Ziakopoulos
Civil - Transportation Engineer, MSc DIC, PhD Candidate - Researcher

Website: www.nrso.ntua.gr/apziak
e-mail: apziak@central.ntua.gr

Together with:
Eleonora Papadimitriou, Akis Theofilatos, Alexandra Laiou, Katerina Folla, Costas Marinos, George Yannis
The SafetyCube project

- **SafetyCube** - Safety CaUsation, Benefits and Efficiency [www.safetycube-project.eu](http://www.safetycube-project.eu)
- May 2015 - April 2018

Objective: to provide the European and Global road safety community a user friendly, web-based, interactive **Decision Support System** (DSS) to properly substantiate their road safety decisions for measures, programmes, policies and strategies to be implemented at local, regional, national, and European level.

- The **main contents** of the SafetyCube DSS concern:
  - road accident risk factors
  - road safety measures
  - best estimate of effects on casualty reduction
  - cost-benefit evaluation
  - all related analytic background
Risk Factors and Measures

Problem:
- **Evidence-based** road safety policies are becoming more widespread
- **Linking** of risks and measures is imperative:
  - Specific effects are required,
  - Current knowledge is dispersed amongst several countries and repositories,
  - Effects are not comparable and reported in dissimilar manners

Solution:
- SafetyCube meets this need by generating new knowledge about risk factors and measures to be **integrated** in the Road Safety Decision Support System (DSS)
- This knowledge is attained by gathering, assessing and **meta-analyzing** research
A Comprehensive Taxonomy

The Taxonomy endeavours to:

- **Capture all elements** of road safety studied worldwide

- **Systematic approach:**
  Road user behaviour, infrastructure and driving environment, vehicles

- **Examine parameters** on a risk factor or road safety measure basis

- **Link every risk factor with scientifically researched appropriate measure(s)** in a case-by-case approach

<table>
<thead>
<tr>
<th>Behavioural element</th>
<th>Risk factor</th>
<th>Specific risk factor</th>
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<tbody>
<tr>
<td>Speed choice</td>
<td>Speeding</td>
<td>Built-up areas</td>
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<td>Rural roads</td>
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<td>Motorways</td>
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<td>Inappropriate speed</td>
<td>Too fast weather-related</td>
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<td>Too fast traffic related</td>
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<td>Too slow</td>
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<td>Risk taking</td>
<td>Risky overtaking</td>
<td>Risky overtaking: wrongside</td>
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<td>Without adequate visibility</td>
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<td>Without warning others</td>
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<td>Into oncoming traffic</td>
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<td>Headway distance</td>
<td>Misjudgement</td>
<td>Tailgating</td>
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<table>
<thead>
<tr>
<th>Infrastructure element</th>
<th>Measure</th>
<th>Specific measure</th>
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<tr>
<td>Infrastructure management</td>
<td>Speed management</td>
<td>reduction of speed limit</td>
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<td>weather-variant speed limits</td>
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<td>woonerfs and narrowings</td>
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<td>Lighting</td>
<td>Visibility / Lighting treatments</td>
<td>installation of road lighting</td>
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<td>improvement of existing lighting</td>
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Challenges and criteria

- Several **challenges** when examining road safety studies:
  - Considerable **variations** at study design levels (e.g. cross-sectional vs. case-control studies etc.)
  - Inclusion of all relevant parameters (e.g. different road users, scenarios), topic **complexity** (e.g. land use regulations)
  - Relevant outputs to road safety, **quantifiable impacts**

- Rigorous **criteria** for study inclusion:
  - Study **year**: 1990 or newer
  - Document **type**: Journal (unless needed)
  - Existing **meta-analyses** prioritized at all times
  - Good overall **quality**, verification and transferability of results
Synopses: summarizing outcomes

Every topic is presented in a synopsis:

- Pertinent studies are grouped and assessed; a relevant analysis accompanies the studies: (Meta-analysis conducted when possible, vote-count or review-type analysis alternatively)

- Synopses include assigning a colour code: **Ranking** of risks and measures

- Synopses contain **condensed knowledge** and can be used by all road safety stakeholders for reference and planning

- **Quality control** at all stages ensures verified and accurate outcomes
Main findings

- Risk factors – stage complete:
  - More than 670 studies have been coded (behaviour: 240, infrastructure: 300, vehicle: 130)
  - As a result, more than 3,500 individual effects for road safety are accessible in the DSS
  - 65 topic synopses have been authored, containing 10 original meta-analyses
  - Risk factors have been ranked based on the synopses

- Road safety measures – stage underway:
  - More than 750 studies are planned to be coded, finalizing this step at present
  - Findings similar to the risks are expected: 70 synopses planned with several meta-analyses
Why we should all slow down

Speeding and inappropriate speed was examined as part of the risk factors:

• Synopsis concluded that speed has a **clear negative effect** on road safety (color code: red) based on 13 studies

• The **Power Model** still stands (1981 to 2013); speed reduction entails crash and injury severity reduction

• **Risk** to be involved in a crash when speeding is 12.8 times higher, speeding over a limit of 70-90 km/h induces a 2 times higher risk to be involved in a fatal crash.

• Studies on speeding often reveal **several limitations** like availability of a control group or completeness of data

• Speeding can be **addressed** by enforcement, speed cameras, rehabilitation, and awareness raising

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**The power model**

Example:

Reduction of mean speed from 60 km/h (37mph) to 55 km/h (34 mph) i.e. by 8% reduces fatal accidents by 25-35%.

Nilsson, 2004
Future Challenges

• Identification of existing **knowledge gaps** (especially in road safety measures) is a very important first step

• Complexities and **interdependencies** demand an approach both thorough and standardized

• Some aspects of road safety are **under-represented** (vulnerable road user groups, developing countries)

• The continuous updating of the SafetyCube DSS will lead to a **road safety encyclopaedia**
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