

SafetyCube – the European Road Safety Decision Support System



The webinar will start at 11:00 CET

www.roadsafety-dss.eu

#roadsafetydss



SafetyCube - the European Road Safety Decision Support System



Presenters: **Pete Thomas**, Loughborough University
Stijn Daniels, VIAS Institute
Eleonora Papadimitriou, NTUA
Wendy Weijermars, SWOV
George Yannis, NTUA
Susanne Kaiser, KFV



Delivering a long awaited powerful tool

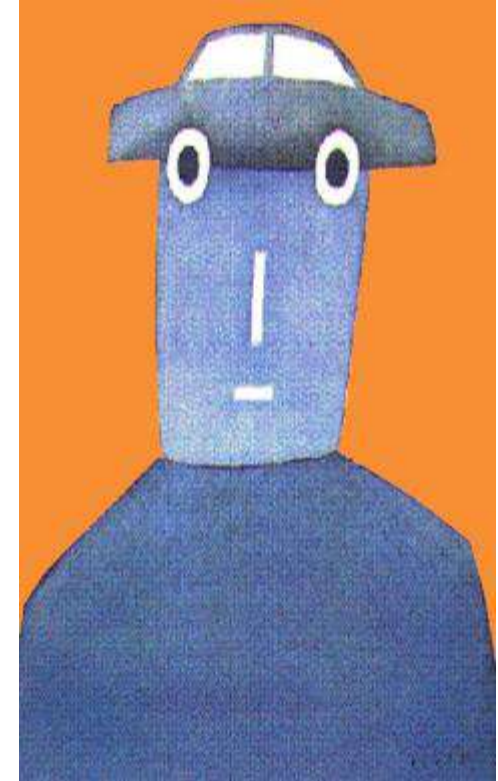


- SafetyCube DSS is the first integrated road safety support system **developed in Europe**
- SafetyCube DSS **offers for the first time** scientific evidence on:
 - risks and not only measures
 - risks and measures not only on infrastructure
 - a very large number of estimates of risks and measures effects
 - links between risks factors and measures
- SafetyCube DSS aims to be **a reference system** for road safety in Europe, constantly improved and enhanced



SafetyCube concept and vision

- Problem
 - ***Evidence based road safety policies** are becoming more usual and there is much better availability of national data and state of the art knowledge*
 - *Effective road safety policies need good information about accident risk factors and about measures*
- SafetyCube will meet this need by generating **new knowledge about accident risk factors and the effectiveness of measures** relevant to Europe, to be integrated in a European Road Safety Decision Support System (DSS)



SafetyCube DSS Objectives



*The SafetyCube DSS objective is to provide the European and Global road safety community
a user friendly, web-based, interactive Decision Support Tool
to properly substantiate their road safety decisions
for the actions, measures, programmes, policies and strategies
to be implemented at local, regional, national, European and international level.*

The main contents of the SafetyCube DSS concern:

- road accident risk factors and problems
- road safety measures
- best estimate of effectiveness
- cost-benefit evaluation
- Serious injuries
- all related analytic background



Example questions addressed

- how important is my road safety problem?
- what is the nature of that problem?
- what solutions are usually proposed for my problem?
- how efficient are the solutions proposed?
- which is the most efficient solution?
- and if I have a combination of problems ...

... then use SafetyCube DSS to have the answers



SafetyCube DSS Users



- **Public Authorities**
local, regional, national, European and international
- **Industry**
Infrastructure, Vehicle, Insurance, Technology
- **Research Institutes, Experts**
- **Non Governmental Organisations**
- **Mass Media**
- **Everyone**

The SafetyCube DSS is intended to have **a life well beyond the end of the SafetyCube** research project.



Methodology

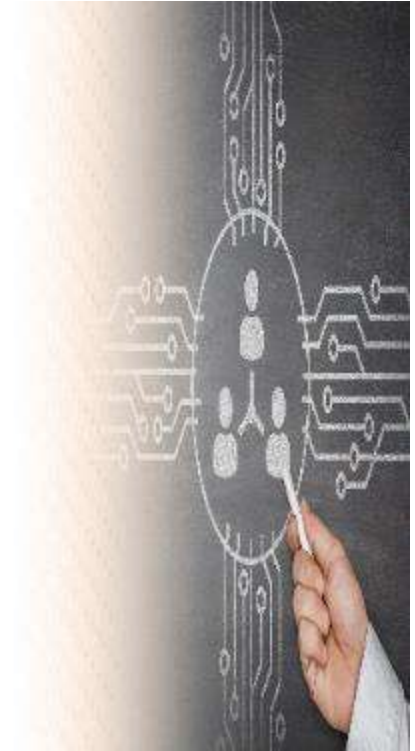
An abstract graphic on an orange background. It features a light orange hexagonal frame with rounded corners and circular nodes at its vertices. Two black gears of different sizes are interlocked in the lower-left area of the frame. The word 'Methodology' is written in white, bold, sans-serif font in the upper-left quadrant.

Stijn Daniels, VIAS Institute

SafetyCube Methodology



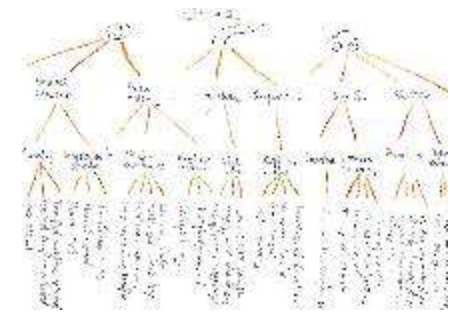
1. Consulting **stakeholders** to understand needs
 2. Creating **taxonomies** of risk factors and measures
 3. Exhaustive literature review and rigorous study selection criteria
 4. Use of a template for **coding studies**, to be introduced in the DSS back-end database
 5. Carrying out **meta-analyses** to estimate the effects of risk factors / measures.
 6. Drafting **Synopses** summarising results of risk factors / measures.
- **Systems approach**: links between infrastructure, user and vehicle risks & measures
 - Emphasis on risk factors and measures of **priority issues** (VRUs, ADAS, speed management, distraction, etc.)
 - Rigorous assessment of the **quality of the data / study methods**



SafetyCube Taxonomy

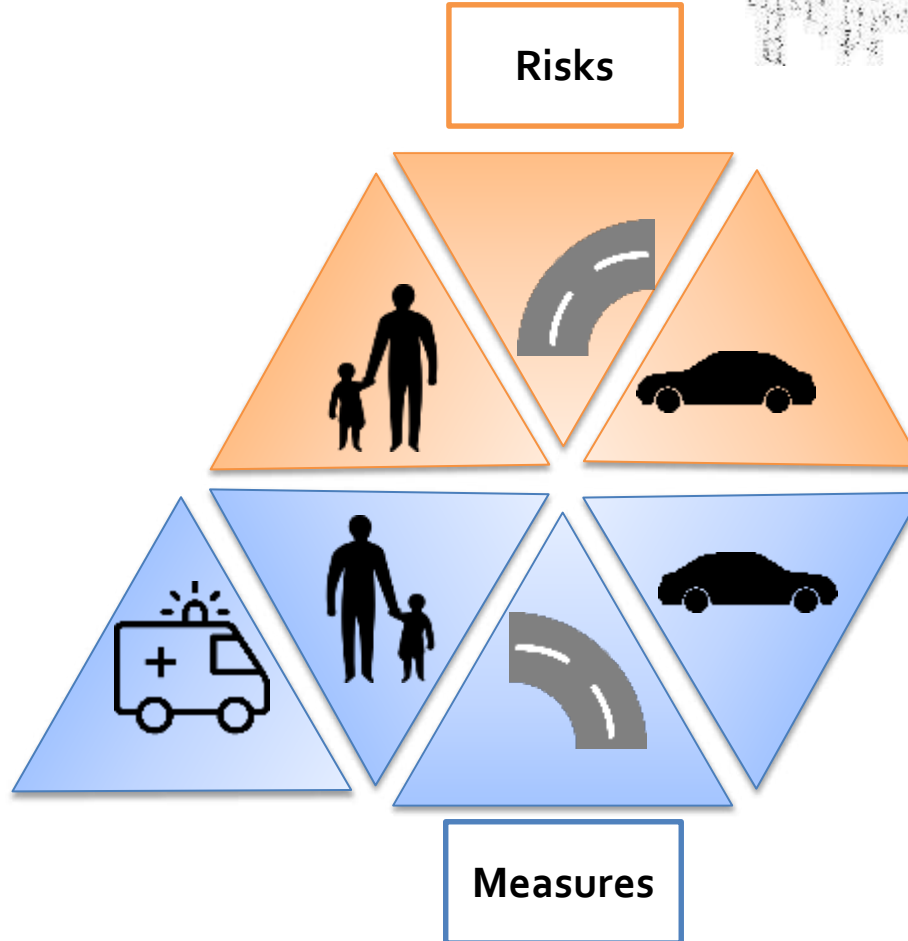


Taxonomy

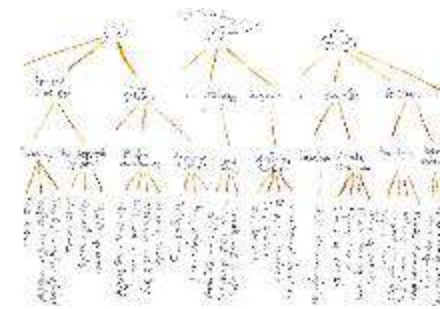


Risks

- Risks & Measures
- main AREAS
 - Behaviour
 - Infrastructure
 - Vehicle
 - (Trauma care)
- Hierarchical



Taxonomy - DSS



- Backbone of DSS
 - Finding risks & measures
 - Linking risks to measures
- Additional entry points:
 - *Road user groups*
 - *Accident categories*



SafetyCube Repository



-

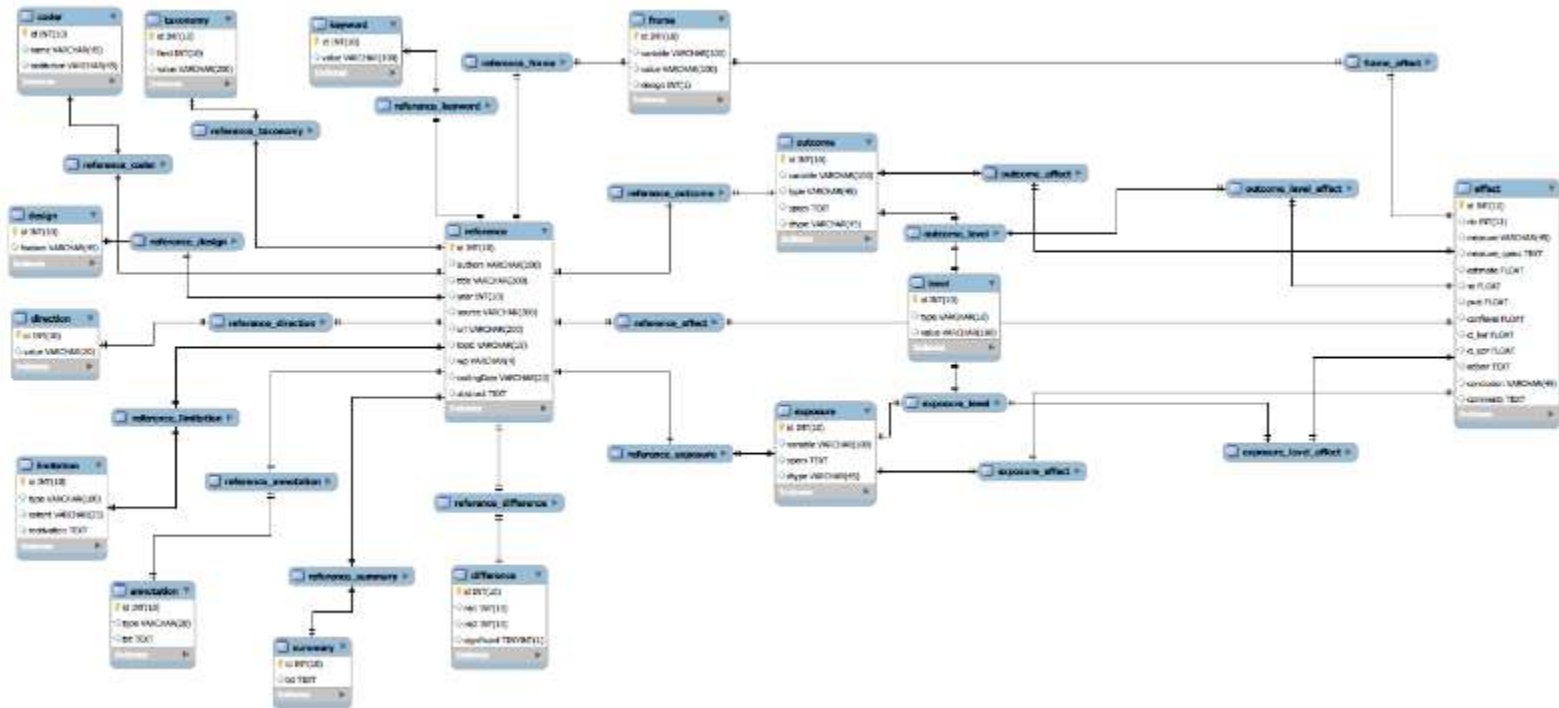


Repository Coding template



Core info

Coder	Name	Focant Nathalie				
	Institution	BRSI				
	Date (dd/mm/yyyy)	20/05/2016				
Reference	Authors	Nathalie Focant, Martensen Heike				
	Title	Are there more accidents in the rain? Exploratory analysis of the influence of weather conditions on the number of road accidents in E				
	Year	2014				
	Source	BRSI report				
Topic	Risk factor or Countermeasure?	Risk factor				
	<input type="checkbox"/> VP	VP5				
	<input type="checkbox"/> Header 5 - Infrastructure element	Road environment				
	<input type="checkbox"/> Header 6 - Risk factor	Adverse weather				
	<input type="checkbox"/> Header 7 - Specific risk factor	rain	snow / ice / low temperature	wind		
	<input type="checkbox"/>					
Abstract	Keywords	Its purpose is to determine how "weather" conditions do or do not influence the daily occurrence of "injury" and "fatal" accidents" in E mean comparison				
Sampling frame	<input type="checkbox"/> Countries	Belgium				
	<input type="checkbox"/> Administrative Level	National				
	<input checked="" type="checkbox"/> Road user profile - Modes	Pedestrian	Cyclist	Car	LGV	HGV
	<input type="checkbox"/> Road user profile - Type	All				
	<input type="checkbox"/> Road user profile - Subgroup	All				
	<input type="checkbox"/> Road user profile - Age	All				
	<input type="checkbox"/> Road user profile - Gender	All				
	<input type="checkbox"/> Road network profile - Area	All				
	<input type="checkbox"/> Road network profile - Segments	All				
	<input type="checkbox"/> Accident severities	Injury	Fatal			
<input type="checkbox"/> Injury severities	All					
Design	Features	Observational				
	Direction	* Exposure -> Outcome				
	EXPOSURE DEFINITION	Rain	Snow	High winds	Cold	
	OUTCOME DEFINITION	Injury accidents	Fatal accidents			
	Total number of effects	+	56			
	Comments	Mean comparison				
Limitations / Potential sources of bias	Extent	Motivation				
	Experiments / Pre-trial group differences	Maybe a problem	Days with rain might differ from days without on characteristics other than the weather.			



SafetyCube Synopses



Synopsis

- Key conclusion
 - Overview
 - Scientific summary
 - Supporting background
-
- For risk-factors and counter-measures



Effect of traffic volume on road safety: ● RED (RISKY) - [Icon]

Most of the reviewed studies find higher traffic volumes to be associated with a net increase in crashes. However, the crash increase is less than proportional to traffic volume increases, indicating a lower risk for each road user. The effect of traffic volume on crash occurrence appears to differ between crash types. The studies reviewed concern motorways.



Congestion as a risk factor: ● YELLOW (PROBABLY RISKY) - [Icon]

Some studies find congestion to be associated with adverse road safety outcomes, but this finding is not consistent across studies and conditions investigated. The effects might differ based on the crash types and/or congestion indicators considered. All reviewed studies concern motorways.



Absence of access control: ● RED (RISKY) - [Icon]

Absence of access control seems to have negative effects on road safety. More access points on road segments is mostly negatively associated with road safety, and a greater distance between an intersection and the nearest driveway (corner clearance) has positive effects on road safety.



Occurrence of Secondary crashes: ● YELLOW (PROBABLY RISKY) - [Icon]

The presence of a crash or an incident can contribute to the occurrence of additional (secondary) incidents or crashes. The prevalence of secondary crashes, and the factors contributing to their occurrence is unclear, as this varies between studies. The available literature concerns motorways in the United States.



Risks associated with the distribution of traffic flow over arms at junctions: ● GREY (UNCLEAR RESULTS) - [Icon]

There was an adequate number of studies investigating the risk factor 'distribution of traffic flow over arms at junctions', but it was rarely the main variable of interest included in the crash models. Furthermore, the risk factor was not expressed in a consistent way across the studies, resulting in an unclear picture of its overall effect.

Synopsis: colour code



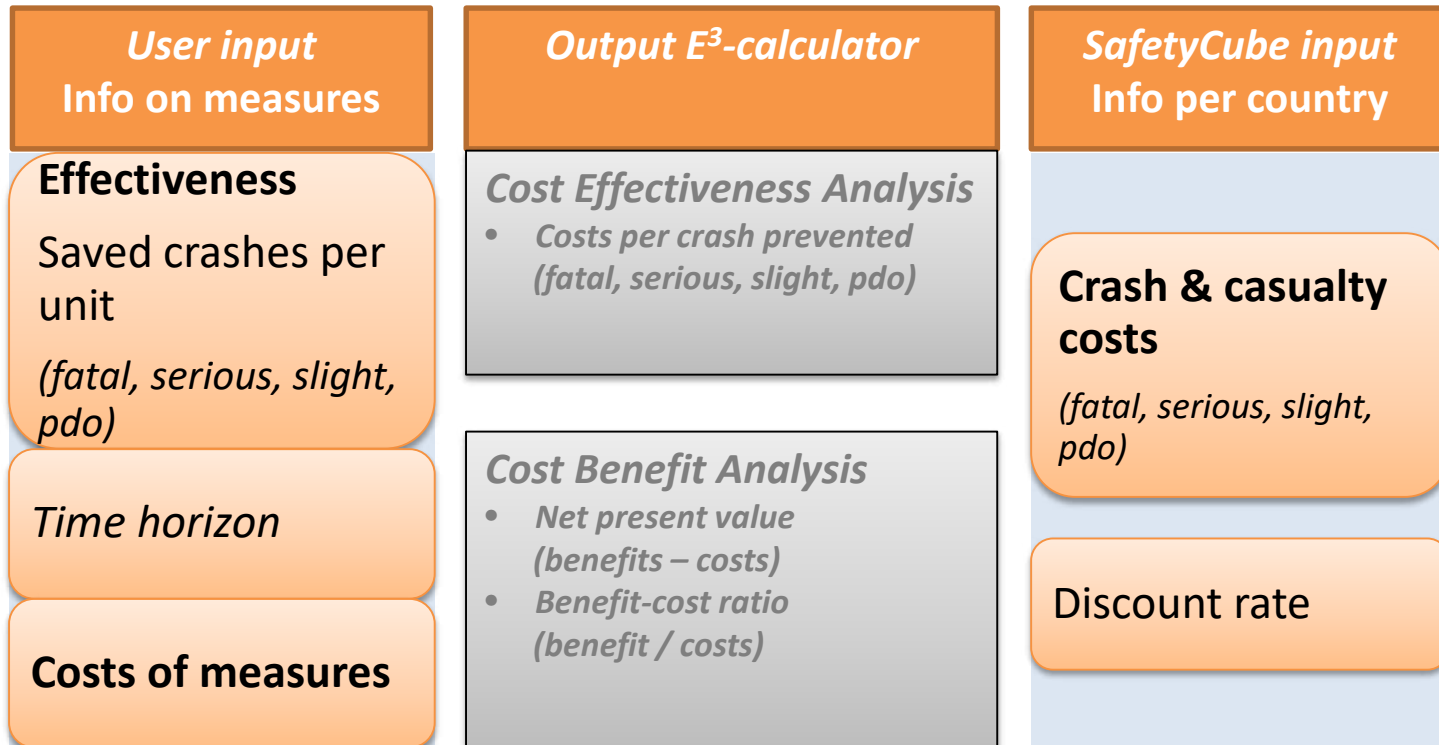
Risk factor		Countermeasure	
Red	Results consistently show an increased risk when exposed to the risk factor concerned.	Green	Results consistently show that the countermeasure reduces road safety risk.
Yellow	There is some indication that exposure to the risk factor increases risk, but results are not consistent.	Light green	There is some indication that the countermeasure reduces road safety risk, but results are not consistent.
Grey	No conclusion possible because of few studies with inconsistent results, or few studies with weak indicators, or an equal amount of studies with no (or opposite) effect.	Grey	No conclusion possible because of few studies with inconsistent results, or few studies with weak indicators, or an equal amount of studies with no (or opposite) effect.
Green	Results consistently show that exposure to the presumed risk factor does not increase risk.	Red	Results consistently show that this measure does NOT reduce road safety risk and may even increase it.

SafetyCube Tools for Prioritisation



Prioritisation

Economic Efficiency Evaluation (E³)

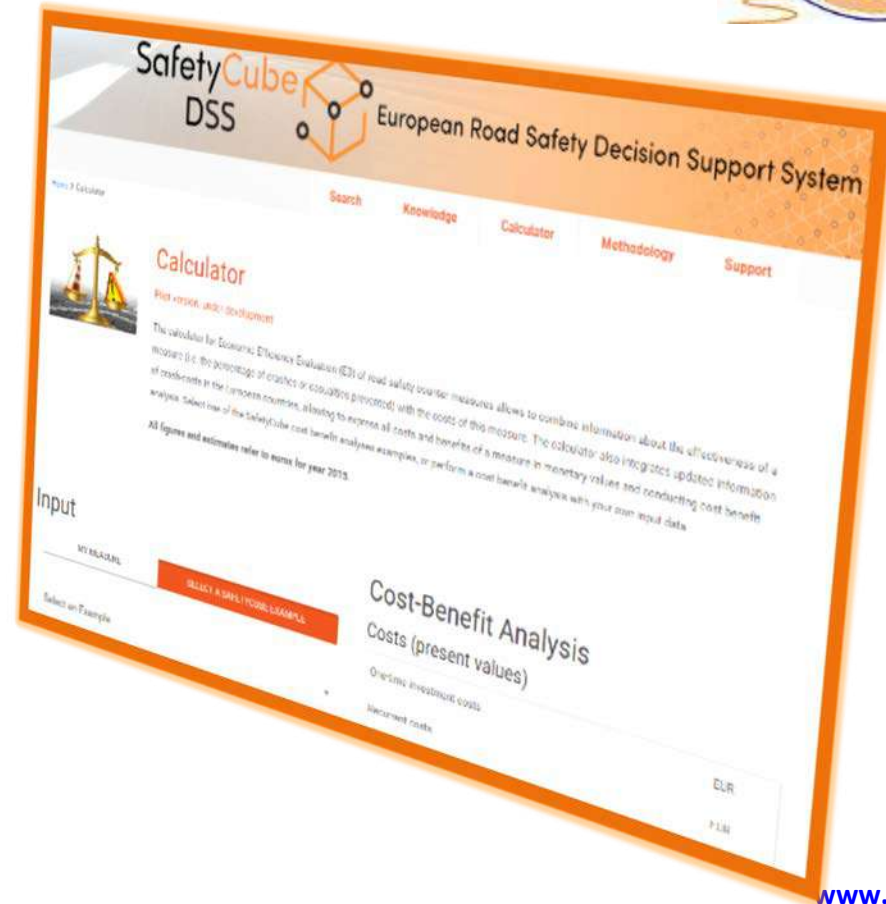


E3-calculator

Economic efficiency evaluation



- SafetyCube examples
- User adapts SafetyCube example for own purposes
- Users' analysis starts from scratch.



E3-calculator

Crash costs



- Based on SafetyCube crash-cost collection
 - *Countries' own reported values*
 - *Common methodology estimates per country*
 - *EU standardized cost*

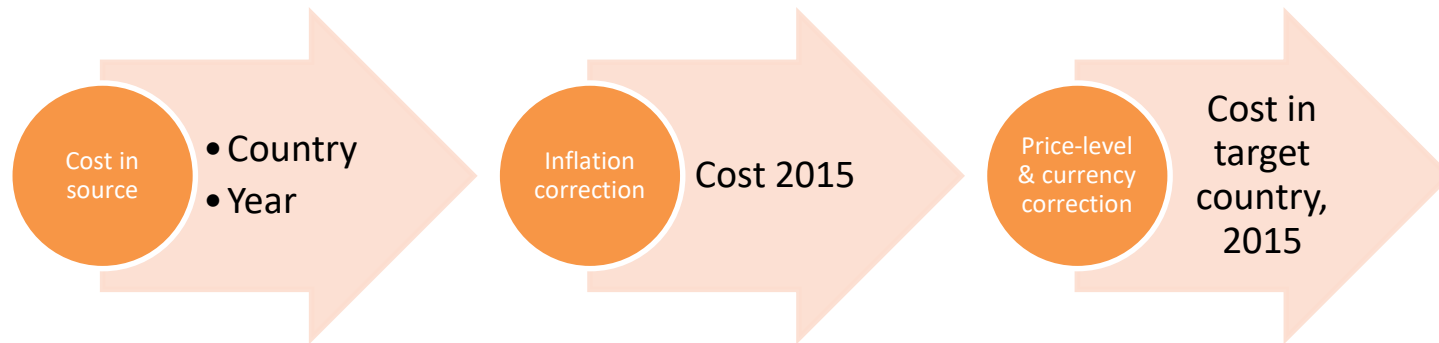


E3-calculator

Costs of counter-measures



- Costs for counter-measures can be adjusted from one country to another, by means of *value transfer*.



SafetyCube E3 examples

Sensitivity analysis



- Low / high measure effect
 - *Lower CI*
 - *Upper CI*
- Low / high measure costs
 - - 50%
 - + 100%
- Combined scenarios
 - *Worst case*
 - *Ideal case*

Table 1: Input values and BCR for the 'best estimate' scenario

Scenario	Input values	BCR
Best estimate	Crash reduction: 14% Implementation cost: €3,284,143 /100,000 tests Annual cost: €0.00 Affected <u>nr.</u> of casualties per year: Crashes: 304	7.3

Table 2: Sensitivity analyses

Scenario	Input values	BCR
Low measure effect	Crash reduction: 11%	5.7
High measure effect	Crash reduction: 18%	9.4
Low measure cost (-50%)	Implementation cost: €1,642,072 /100,000 tests Annual cost: €0.00	14.6
High measure cost (+100%)	Implementation cost: €6,568,287 /100,000 tests Annual cost: €0.00	3.7

Table 3: CBA for worst case and ideal case scenarios

Combined Scenario	Input values	BCR
Worst case	Crash reduction: 11% PDO only crashes reduction: 13% Implementation cost: €6,568,287 /100,000 tests Annual cost: €0.00	2.9
Ideal case	Crash reduction: 18% Implementation cost: €1,642,072 /100,000 tests Annual cost: €0.00	18.8

Linking between risks and measures



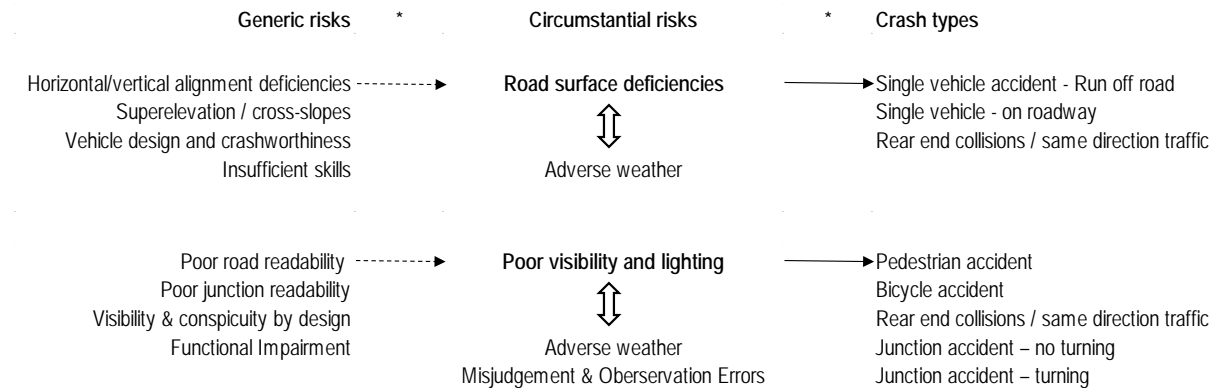
Linking between risks and measures

- — ○
 - A **theoretical framework** for linking risk factors and measures
 - *based on a crash chain model*
 - *applied through existing expert knowledge*
 - Links are **integrated in the DSS** to explore and identify a range of solutions with potential of addressing road safety problems
 - The DSS contents (individual studies, synopses and meta-analyses) “validate” or “conditionalize” the links, assist to **understand the conditions of measures effectiveness** and flag the sources of uncertainty.

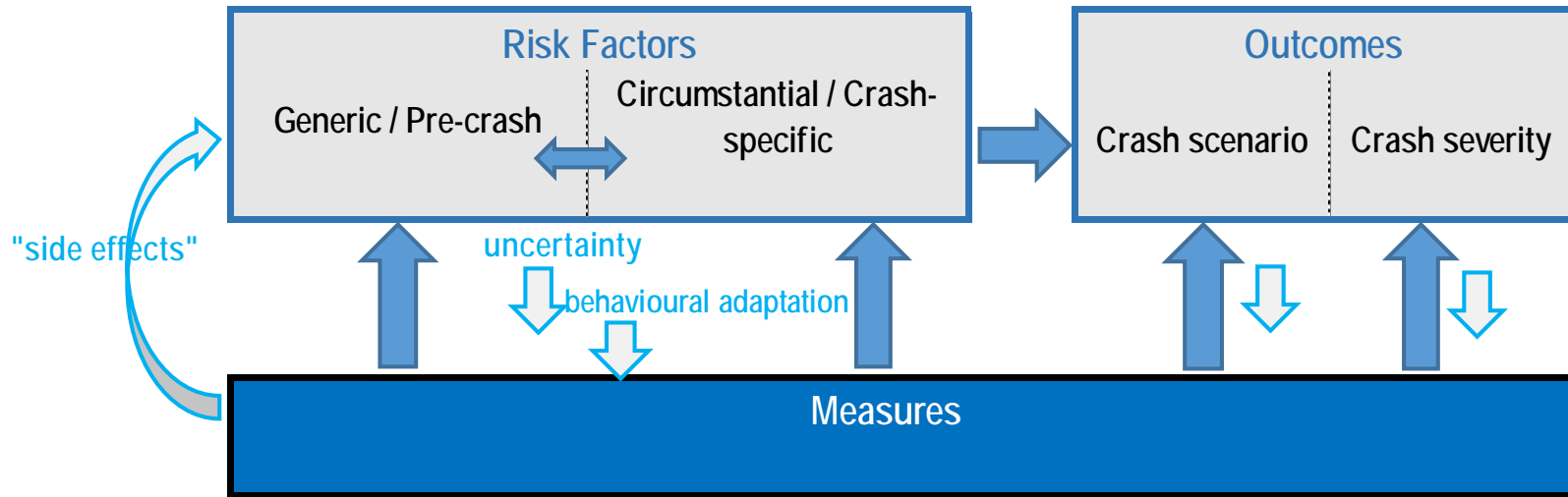


Chains of risk factors and outcomes

- Each crash type is caused by a (combination of) circumstantial risk(s), which are due to or strengthened by pre-existing generic risks.
- The combination of risk factors then may result to specific crash types and related crash consequences.



Proposed SafetyCube model



DSS links from risks to related measures

• Measures for “Fatigue - not enough sleep”

The following measures are related to the risk factor you selected. Select a measure from the table below to see the available SafetyCube results.

Behavior	Infrastructure	Vehicle	Post Impact Care
Fitness to drive, medical referrals	Installation of median	Electronic Stability Control (ESC)	Not Applicable
Came signs on fatigue	Increase median width	Lane Departure Warning (LDW), Lane Keeping Assist (LKA) & Lane Centering System	
	change median type	Drowsiness and Distraction Recognition	
	Implementation of rumble strips at centerline		
	shoulder implementation (shoulder type)		
	Increase shoulder width		
	change shoulder type		
	safety barriers installation		
	change type of safety barriers		
	create clear-zone / remove obstacles		
	Increase width of clear-zone		
	Implementation of edgeline rumble strips		

Countries

☐ GREECE

SafetyCube Synopses



Effectiveness of Road Safety Campaigns: ● LIGHT GREEN (PROBABLY EFFECTIVE) - ⓘ

There is some indication that campaigns are beneficial for road safety on various levels. Meta-analyses show an association with accident reduction, increased safe behaviours and risk awareness. However, for other outcome variables such as drink-driving or safety relevant attitudes, no such effect was found. Furthermore, meta-analysed studies vary strongly, mainly regarding the design of the evaluated campaigns.

ID	Title	Source	Year	Design	Countries
49	Do Road Safety Communication Campaigns Work? How to Assess the Impact of a National Fatigue Campaign on Driving Behavior	TRANSPORTATION RESEARCH RECORD: JOURNAL OF THE TRANSPORTATION RESEARCH BOARD, NO. 2364, TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES, WASHINGTON, D.C., 2013, PP. 62-70.	2013	BEFORE-AFTER	GREECE

DSS links from measures to related risks

- Risks addressed by “Emergency Braking Assistance Systems”

The following risk factors are related to the measure you selected. Select a risk factor from the table below to see the available SafetyCube results.

Behavior	Infrastructure	Vehicle
Headway distance	secondary crashes	Risk to be injured in rear impact
Insufficient skills and operating errors		
Observation errors		
Elderly (65+)		

Road User Group

- ☐ ALL
- ☐ CAR
- ☐ LGV

Road Type

- ☐ ALL
- ☐ RURAL ROAD
- ☐ SUBURBAN ROAD
- ☐ URBAN ROAD

Countries

- ☐ FINLAND
- ☐ UNITED KINGDOM
- ☐ UNITED STATES

SafetyCube Synopses



Risk taking - Close Following Behaviour: ● YELLOW (PROBABLY RISKY) - [?]

Although following too closely is seen as one of the main reasons for rear end crashes, studies that evaluate the risk of this behaviour in connection to accidents are rare. However, if headway distances are so short that it is no longer possible to stop in time in the case of an emergency stop, it can be presumed as risky. Quite a proportion of drivers engage in such a behaviour. Results of one study indicate a higher crash risk for short headways.

ID	Title	Source	Year	Design	Countries
765	Driver crash risk factors and prevalence evaluation using naturalistic driving data	PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA PHAS, PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES	2016	CASE-CONTROL	UNITED STATES
772	Close-following drivers on two-lane highways	ACCID. ANAL. AND PREV., VOL 29, NO. 6, PP. 723-729	1997	QUASI-EXPERIMENTAL	FINLAND
840	Car following decisions under three visibility	ACCIDENT ANALYSIS AND PREVENTION, 39(1), 105-116	2007	EXPERIMENTAL	UNITED STATES

Serious injuries



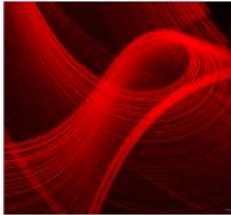
Serious injuries



- Serious road injuries are increasingly being adopted as an additional road safety performance indicator
- EU definition (2013): non-fatal road traffic casualty with an injury severity level of **MAIS₃+**
- All EU member states are asked to provide data from 2014 on, by:
 1. *Applying correction factors to police data*
 2. *Using hospital data*
 3. *Using linked police and hospital data*

Serious injuries in SafetyCube

- Estimation of the number of MAIS₃+ casualties
- Consequences of serious road injuries
- Costs related to serious road injuries
- Risk factors associated with serious road injuries



Practical guidelines for the registration and monitoring of serious traffic injuries

Deliverable 7.1



Physical and psychological consequences of serious road traffic injuries

Deliverable 7.2



Costs related to serious road injuries

Deliverable 7.3




Identification of Key Risk Factors Related to Serious Road Injuries and Their Health Impacts

Deliverable 7.4



Serious injuries in the DSS






European Road Safety Decision Support System

[Search](#) [Knowledge](#) [Calculator](#) [Methodology](#) [Support](#)

[Home](#) > [Knowledge](#)



Knowledge

The knowledge synthesized during the SafetyCube project is listed here, regarding the effects of risks and measures, the causes and impacts of serious injuries, and the most common accident scenarios. Select the related box to view and download the SafetyCube knowledge documents.

[ROAD SAFETY SYNOPSES](#) [SERIOUS INJURIES](#) [ACCIDENT SCENARIOS](#)

Estimating the number of serious road injuries

Serious road traffic injuries have recently been adopted as an additional road safety indicator. The EU High Level Group on Road Safety defined serious traffic injuries as road casualties with an injury level of MAIS3+. Within SafetyCube, practical guidelines have been developed to help countries in determining the number of MAIS3+ road casualties. A summary of these guidelines can be found [here](#).

Impacts and costs of serious road injuries

Presenting the DSS



SafetyCube DSS Design Principles



- A **Modern** web-based tool
- Highly **Ergonomic** interface
- **Simple** structure
- Powerful **Search** Engines
- Fully **Documented** information
- Easily **Updated**

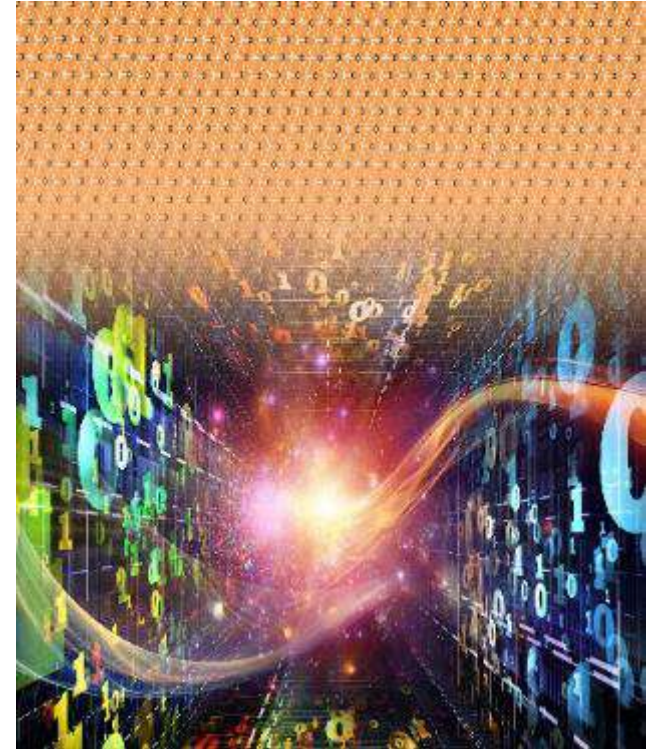


SafetyCube DSS Knowledge Wealth



SafetyCube DSS will eventually include
by April 2018:

- more than **1,250 studies**,
- with more than **7,500 estimates** of risks/measures effects on:
 - behaviour,
 - infrastructure,
 - vehicle, and
 - post impact care
- **211 Synopses**
- **36 cost-benefit analyses**



SafetyCube DSS Menu

- **Search**
Risk Factors & Measures
- **Knowledge**
211 Synopses, Serious Injuries, Accident Scenarios
- **Calculator**
Economic Efficiency Evaluation
- **Methodology**
System documentation
- **Support**
Contact, help, feedback



SafetyCube DSS Search Pages

DSS Search through five entry points:

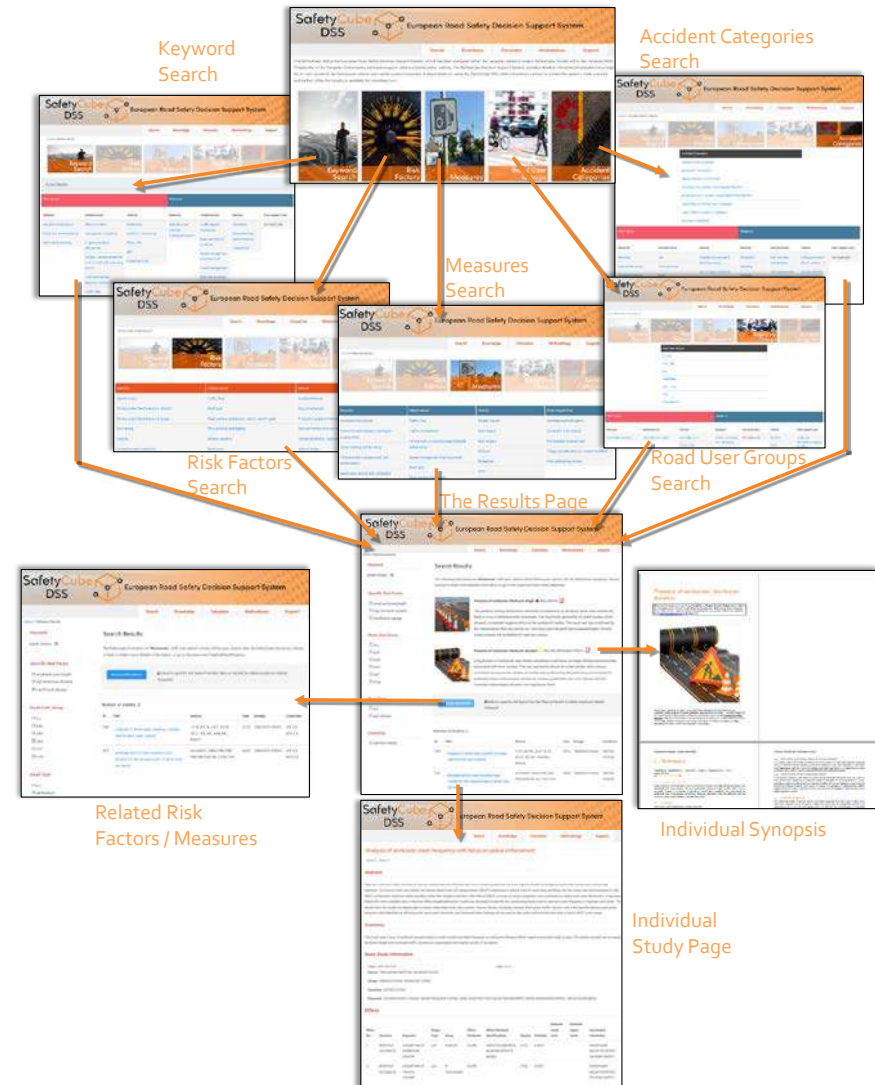
- **Keyword search**
(all database keywords)
- **Risk factor search**
(taxonomy)
- **Measures search**
(taxonomy)
- **Road User Groups**
(database keywords related to each group)
- **Accident Categories**
(under development)

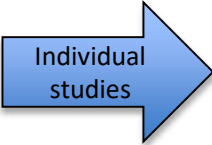
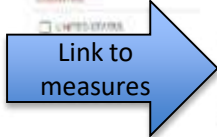
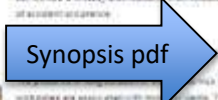
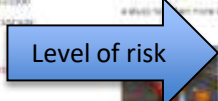
The screenshot displays the SafetyCube DSS interface. At the top, the header reads "SafetyCube DSS" and "European Road Safety Decision Support System". Below the header is a navigation bar with links: Search, Knowledge, Calculator, Methodology, and Support. The main content area features a sidebar on the left with a list of categories: CHILD PEDESTRIANS, PEDESTRIANS, PEDESTRIAN CROSSING, PEDELEC, MOPEDS, PEDESTRIAN CRASHES, PEDESTRIAN DETECTION, and PEDESTRIAN SIGNAL. A blue bracket groups the first four categories under the "PEDESTRIANS" heading. To the right of the sidebar are five large, orange-tinted buttons: Keyword Search, Risk Factors, Measures, Road User Groups, and Accident Categories. Below these buttons, a table is displayed with the following structure:

Risk Factors			Measures			
Behavior	Infrastructure	Vehicle	Behavior	Infrastructure	Vehicle	Prior Impact Data
Functional Impairment	Adverse weather	LDV	Education and training programs	Traffic signals treatment	Not Applicable	Not Applicable
Traffic Rule Violations	Poor junction readability	Passenger Cars	Front markings at junctions	Speed management & enforcement		
	Single junction bifurcations	Pedestrian	Speed management	Traffic signs treatment		
	Median / barrier performance (risk of crash with oncoming traffic)	PTW / ATV	Rail road crossings			
	Traffic flow					

The Search Structure

- **Search**
(5 entry points)
- **Results pages**
(Introduction, Colour codes, Synopses, Coded studies)
- Individual **Studies** pages
(Disaggregate level, detailed effects listed, some studies not in synopses)
- **Links** between Risk Factors
Information about which risks
can be remedied by which types
of measures





SafetyCube Synopses



211 Syntheses on risk factors / measures

Summary (2 pages)

- Effect of risk factor / measure and ranking (colour code)
- Risk / safety effect mechanisms
- Risk / safety effects size, transferability of effects

Scientific overview (4-5 pages)

- Comparative analysis of available studies
- Analysis results:
Meta-analysis/Vote-count analysis/Qualitative analysis

Supporting document (3-10 pages)

- Literature search strategy and study selection criteria
- Detailed analyses



SafetyCube Related Risks / Measures

- Linking based on a **dedicated model** categorizing risks
- Every Risk Factor (88) is **linked** to one or more Road Safety Measure(s) (175)
- Every Road Safety Measure (175) is **linked** to one or more Risk Factor(s) (88)
- A total of **762 links** between risk factors and measures

SafetyCube DSS European Road Safety Decision Support System

Search Knowledge Calculator Methodology Support

Related Studies for 'poor visibility - darkness'

The following measures are related to the risk factor you selected. Select a measure from the table below to see the available SafetyCube links.

Risk Factor	Measure	Value	Publication Year
poor visibility - darkness	installation of road lighting	Advanced road lighting (adaptive, dynamic, advanced control, ...)	2015-2016
poor visibility - darkness	improvement of existing lighting	High beams	2015-2016
poor visibility - darkness	improvement of existing lighting	Variable Roadway Lighting - Emerging Solutions in Urban Environments (VRL)	2015-2016

Guidance

- ☐ OVERVIEW
- ☐ GUIDELINES
- ☐ UNITED NATIONS
- ☐ UNITED STATES

SafetyCube Synopses




Installation of lighting & improvements to existing lighting: ☒ YES ☐ NO ☐ UNKNOWN

the same majority of studies show that the installation of road lighting and improvements to existing road lighting have favourable effects on the number of occurring crashes

ID	Title	Source	Year	Design	Guidelines
206	Guidelines for Roadway Lighting Design and Lighting Performance for Roadway Safety	TRANSPORTATION RESEARCH BOARD JOURNAL OF THE TRANSPORTATION RESEARCH BOARD, NO. 543, PP. 9-15	2015	CRASH-REDUCTION	UNITED STATES
208	road lighting effects on Nighttime Pedestrian and Nighttime Driver Injury in Montreal, Quebec, Canada	TRANSPORTATION RESEARCH BOARD JOURNAL OF THE TRANSPORTATION RESEARCH BOARD, NO. 543, PP. 16-24	2016	CRASH-REDUCTION	CANADA

Study design info:

- ## Study results:

- 

SafetyCube DSS

European Road Safety Decision Support System

[Records](#)
[Knowledge](#)
[Database](#)
[Bibliography](#)
[Support](#)

Modeling work zone crash frequency by quantifying measurement errors in work zone length

Varg, Lutzjohann, Ulfarsson, Eldir Mogilica

Abstract

Work zones are necessary traffic control zones that pose serious safety problems, increasing safety while implementing necessary changes on highways. An important challenge is to capture and quantify these problems. In this study, the factors in work zone safety analysis were identified through the assumption of the quasi-homogeneity model. This assumption is an exploratory variable that is made in order to include estimation of some parameters. Among them, work zone length is a major concern. This length, however, may change with respect to a data collection program, generally without being properly documented. This paper proposes a novel modeling of work zone length that studies the change in the measured work zone length, together with the observed negative binomial distribution. The proposed approach was compared with the traditional Negative Binomial distribution of work zone length. The results show that the proposed approach is the most effective in determining the probability of the effect of work zone length on the crash frequency.

[View Full Text \(PDF\)](#)

Summary

Finally, the proposed work zone crash frequency model is applied to data sets of work zone length. A logistic regression model is applied. Work zone length, work zone number of lanes affected, and work zone width are used to analyze the safety effects and some other significant variables of locations.

Basic Study Information

Title: WORK ZONE CRASH FREQUENCY MODELING BY QUANTIFYING MEASUREMENT ERRORS IN WORK ZONE LENGTH

Author: VARG LUTZJOHANN, ULFARSSON ELDIR MOGILICA

Index: TRANSPORTATION ENGINEERING JOURNALS

Country: UNITED STATES

Keywords: FULL-SCALE ACCIDENT FREQUENCY CRASH RELATIONSHIP; WORK ZONE LENGTH; LOGISTIC REGRESSION ANALYSIS; WORK ZONE

Year: 2015

Effects

Effect No.	Outcome	Exposure	Group Type	Group	Effect Estimator	Effect Confidence Interval	Sample Size	Estimate Lower Limit	Estimate Upper Limit	Conclusion Comments
1	WZLENGTH PROBABILITY WZLENGTH WZLENGTH	WZLENGTH	yes	MILES	GLSBC	FULL-SCALE ACCIDENT FREQUENCY RELATIONSHIP	6,647	0.726	0.936	NEGATIVE CORRELATION BETWEEN WZLENGTH AND CRASH FREQUENCY
2	WZLENGTH PROBABILITY	WZLENGTH	yes	WZLENGTH	GLSBC	WZLENGTH RELATIONSHIP	6,647	0.726	0.936	NEGATIVE CORRELATION BETWEEN WZLENGTH AND CRASH FREQUENCY

SafetyCube DSS Calculator

- Combines information about the **effectiveness of a measure** (i.e. the percentage of crashes or casualties prevented) with the **costs** of this measure
- Integrates updated information of **crash costs in the European countries**
- Allows to express all costs and benefits of a measure in monetary values and conduct **cost benefit analysis**

Main Functions

- Perform cost-benefit analysis with **own input data**.
- Select one of the **SafetyCube examples** of cost benefit analyses
 - Measures with high effectiveness
 - For which reliable cost information could be found

The screenshot displays the 'SafetyCube DSS' European Road Safety Decision Support System interface. The 'Calculator' section is active, showing a 'Cost-Benefit Analysis' for 'Infrastructure safety management - Speed management & enforcement - 30 zones - implementation'. The 'Input' section includes fields for 'Measure' (Infrastructure safety management - Speed management & enforcement - 30 zones - implementation), 'Country' (UK), 'Module' (Speed management & enforcement - 30 zones - implementation), 'Number of zones' (30), and 'Costs' (Cost-benefit analysis). The 'Costs (present values)' table shows: 'One-way implementation costs' (1,200,000 EUR), 'Implementation costs' (1,200,000 EUR), 'Total costs including side-effects' (1,200,000 EUR), 'Benefits' (3,000,000 EUR), and 'Total costs including side-effects' (1,200,000 EUR). The 'Benefits' section shows: 'Presented benefits' (3,000,000 EUR), 'Socio-economic return excluding side-effects' (Net present value: 1,800,000 EUR, Cost-benefit ratio: 1.5), and 'Socio-economic return including side-effects' (Net present value: 1,200,000 EUR, Cost-benefit ratio: 1.0).

... hands-on examples for querying the DSS



Eleonora Papadimitriou, NTUA
Susanne Kaiser, KfV



The next steps ...

Prof. Pete Thomas, Loughborough University

SafetyCube Next Steps



The **future operation** of the SafetyCube DSS concerns:

1. the uninterrupted operation of the current SafetyCube DSS
2. updates of the risk factors, measures and cost-benefit analyses (recent studies but also older ones)
3. addition of studies in more languages
4. translation of the contents in other languages
5. possibility to receive, check and incorporate studies submitted by external experts and organizations and the respective quality control
6. incorporation of additional data and knowledge sections
7. A partnership of public and private organisations is being assembled to enable the DSS to continue



SafetyCube - the European Road Safety Decision Support System



A recording of this webinar and all deliverables of the project will be available at

www.Safetycube-project.eu

You are welcome to use the DSS at

www.roadsafety-dss.eu

