SafetyCube

Collecting and disseminating evidence on safety impacts in the EU SafetyCube project

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13th PRI World Congress - Tunis - 5 May 2017

Co-funded by the Horizon 2020
Framework Programme of the European Union

SafetyCube project

Funded by the European Commission under the Horizon 2020 research framework programme

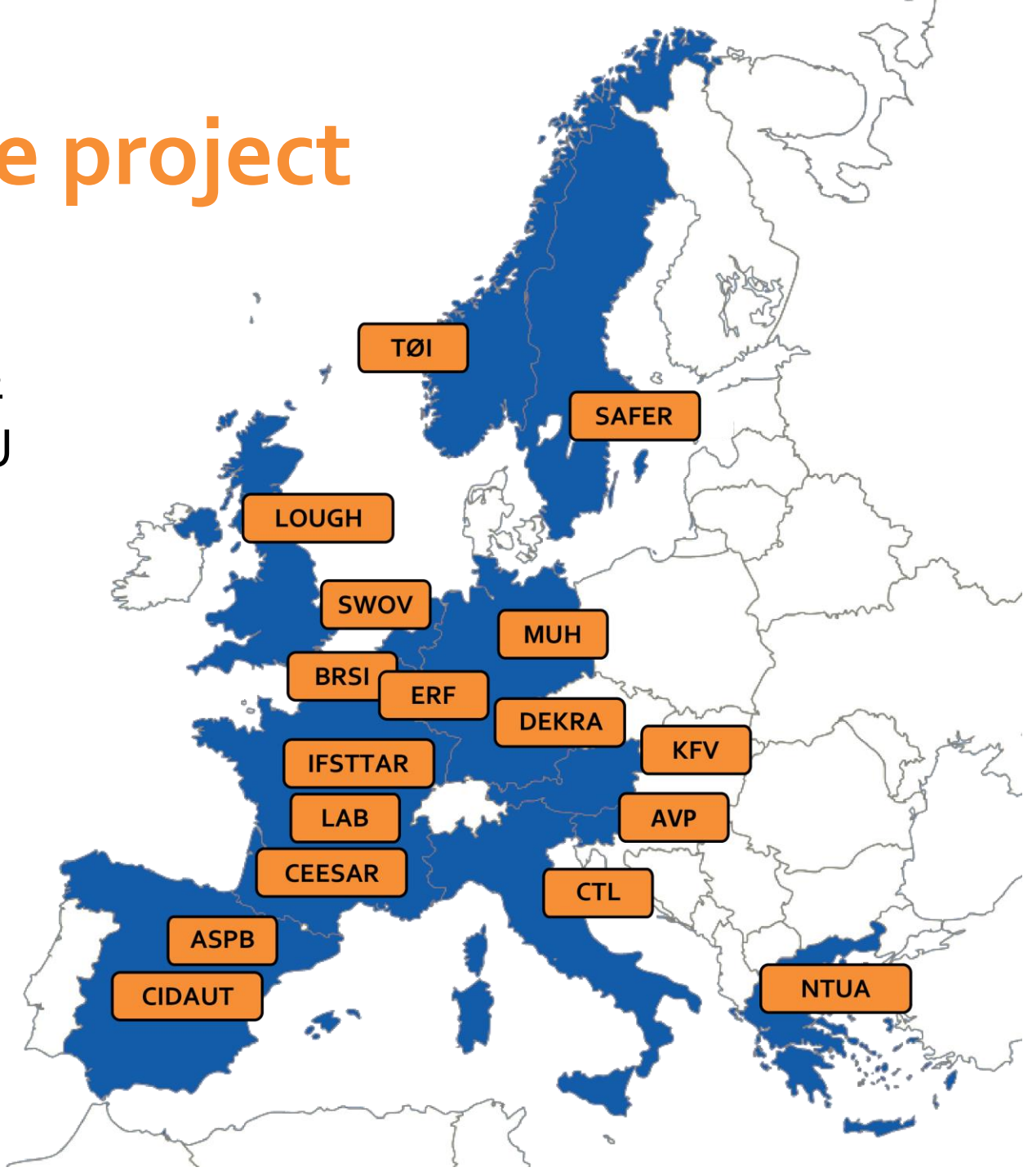
Coordinator: Loughborough University, UK

Start: May 2015

Finish: April 2018

SafetyCube project

17 partners from 12 countries within EU



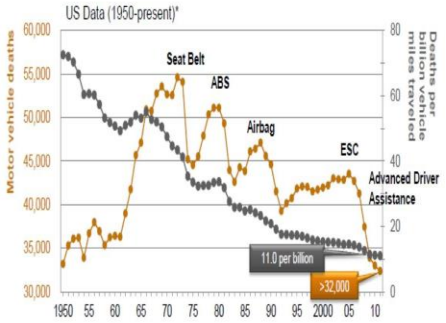
Why this project?

- Growing need for evidence based (road safety) policies
- Increasing availability of data worldwide
- Scientific knowledge has advanced

=> need for integration and dissemination of knowledge

Questions addressed in SafetyCube

1. What do we know about risk factors and problem areas *(e.g. speed, distraction, impairments, truck design,…)?*
2. What do we know about effects of measures? *(e.g. speed – enforcement, campaigns, changes in road design, vehicle technology)*
3. What are safety benefits and costs and how to estimate them?
4. How to make decisions when there is a lot of conflicting evidence?



Problems to overcome

- Much of the evidence on risks and measures is in the research literature – how can it be brought together?
- Are measures transferable from one country to another?
- How can information be made accessible to stakeholders?

SafetyCube primary objective

Road Safety
Decision **S**upport **S**ystem

Risks

Measures

Policy-makers & stakeholders

- ❑ strategies
- ❑ measures
- ❑ cost-effective approaches

Reduce casualties
- All road users
- All severities

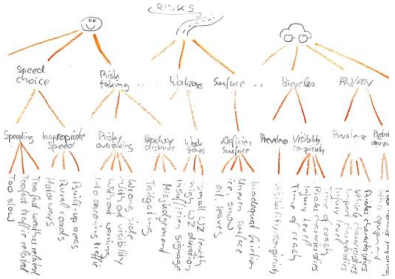
SafetyCube DSS

Road Safety
Decision **S**upport **S**ystem

→ **Risks**

→ **Measures**

Taxonomy

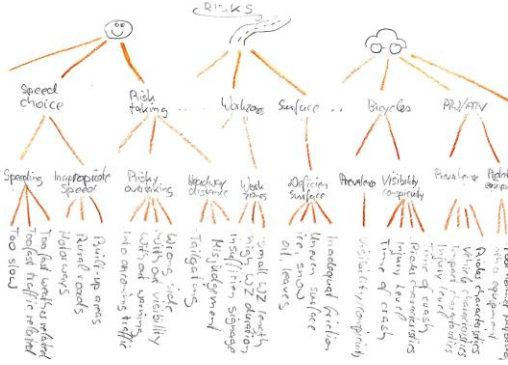


Repository

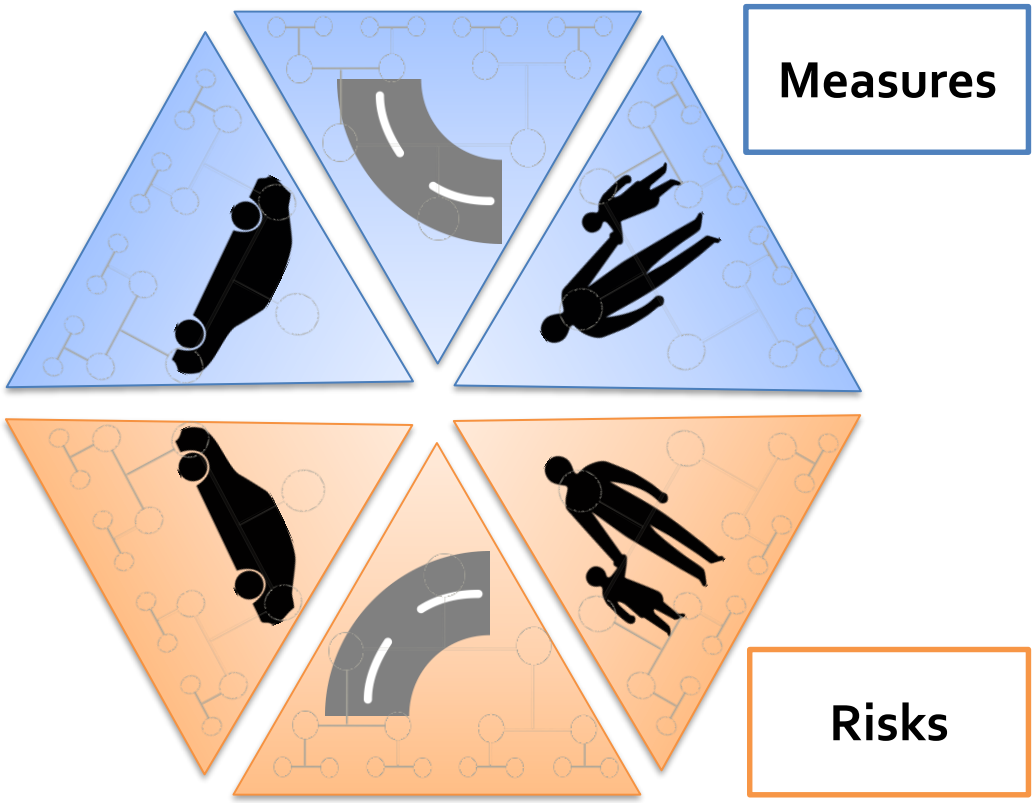
Synopsis

Prioritisation

Taxonomy



- Hierarchical
- 3 main AREAS
  - *Behaviour*
  - *Infrastructure*
  - *Vehicle*
- Risks & Measures



Repository

- Literature search
- Evaluation of studies
- Coding template
- Database

Repository

Research terms and hits

Database: Scopus **Date:** 13 January 2017

Limitations/ Exclusions:

- Search field: TITLE-ABS-KEY
- Published: All years
- Document Type: ALL

	search no.	search terms / operators / combined queries	hits
V2I	#1	TITLE-ABS-KEY ("V2I" OR "vehicle to infrastructure") AND TITLE-ABS-KEY ("conflict" OR "safety" OR "crash" OR "accident" OR "collision" OR "fatal*" OR "casualt*")	667
	#2	TITLE-ABS-KEY ("V2I" OR "vehicle to infrastructure") AND TITLE-ABS-KEY ("conflict" OR "safety" OR "crash" OR "accident" OR "collision" OR "fatal*" OR "casualt*") AND TITLE-ABS-KEY ("effect" OR "impact" OR "assess*" OR "evaluation" OR "consequence")	189

	A	L	M	N	O	P	Q
1	☐ Differences between effects	Effect 1	Effect 2	Effect 3	Effect 4	Effect 5	Effect 6
3	OUTCOME DEFINITION	Driving speeds	Acceleration noise	lane-changing frequencies	following gaps	Eye tracking	Heart Rate
4							
5	Real-time on-board warnings - Test group	Exposed	Exposed	Exposed	Exposed	Exposed	Exposed
6	Real-time on-board warnings - Reference group	Non-exposed	Non-exposed	Non-exposed	Non-exposed	Non-exposed	Non-exposed
7							
8	Measure of effect/association	Absolute difference	Function	Absolute difference	Function	Function	Absolute difference
9	Specifications	in km/u					
10							
11	Estimate	-1.6200		NA		NA	NA
12	Standard error of estimate	NA		NA		NA	NA
13	Statistic [name(parameters)=x]	t-test		sign test	Kolmogorov-Smirnov test	Kolmogorov-Smirnov test	NA
14	p-value	NA			0.0600	NA	NA
15	Sample size (x or n1=x1; n2=x2)	35	35	35	35	35	NA
16	Confidence level	0.9500					
17	Lower limit						
18	Upper limit						
19							
20	Adjustment variables/Covariates	Gender					
21							
22	Conclusion	Significant effect on driving (	No effect	No effect	Nearly-significant effect	significant effect on looking	Effect
23							
24	Comments				Drivers with the system ON keep longer following gaps from the vehicle in front of them.	Effect on looking behaviour, unsure whether this means difference in distracton	Calming influence of the on-board unit

Results Literature Search

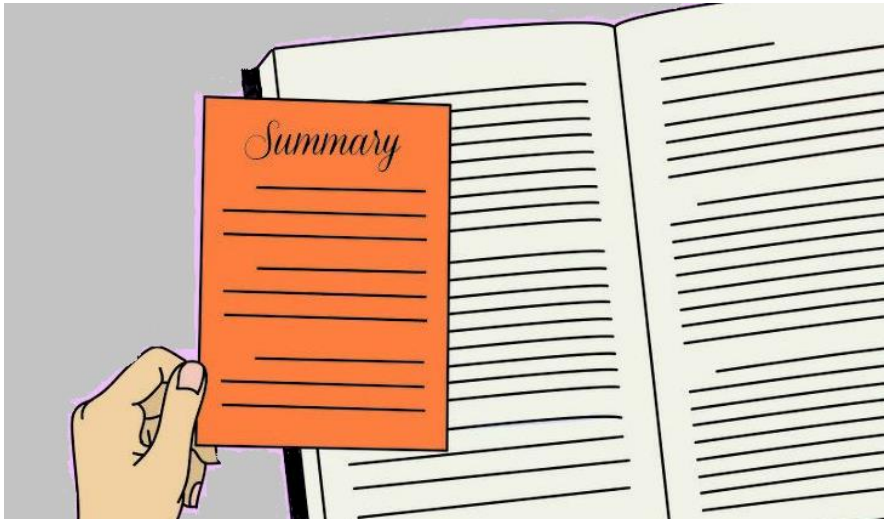
Database	Hits
Scopus	189
ScienceDirect	514
TRID	124
Total number of studies to screen title	827

Screening

Total number of studies to screen title (in order to evaluate the relevance to the topic)	827
Number of articles remaining after screening of the title = Total number of studies to screen abstract	67 (many articles on signal transmission characteristics and performance, information exchange protocols, papers in which V2I is only mentioned in the discussion section…)
Remaining studies after abstract screening	- 12 selected - 56 excluded (duplicates, solely development-oriented, outside search field, etc.)
Total number studies to screen full-text :	12

Synopsis

- Key conclusion
- Overview
- Scientific summary
- Supporting background



Synopsis – example 'Rain'

1 Summary

Nathalie Focant, Heike Martensen (August 2016)

Colour Code Yellow

Rain has been consistently shown to be a risk factor in the sense that the accident rate (the number of crashes per vehicle or km-driven) is higher in the rain than in comparable situations without rain. This has however, mainly been tested with motorvehicles, and it is not clear whether it is true for other road users as well.

1.1 ABSTRACT

Rain has been consistently shown to be a risk factor (in Europe) in the sense that the **injury crash rate** (the number of crashes per vehicle or km-driven) is higher in the rain than in comparable situations without rain. This has however, mainly been tested with motor vehicles, and it is not clear whether it is true for other road users as well. The effect on fatal or severe crashes is less reliable and crashes in rainy conditions have been found to be less severe (except in Scandinavian countries).
The **net-effect on crash occurrence** can differ substantially from the risk effect of rain, because adverse weather conditions also affect the mobility, in particular for vulnerable road users who are more exposed to the weather. Consequently the net effect of crash occurrence yields much more mixed results with decreases in crash numbers observed more often for vulnerable road users and in

Prioritisation

- Crash costs
- Measure costs
- Economic efficiency assessment

Prioritisation - example

Measure	Fatalities prevented	Net present value	Benefit-cost ratio	Choice
Intelligent speed adaptation on all cars	34	7441	1.51	1
3.5 times more speed enforcement	21	855	3.28	4
4 times more random breath testing	16	716	4.62	5
Seat belt reminders in all cars (now 58 %)	10	3952	7.93	2
Front impact protection on heavy vehicles	7	1560	2.52	3

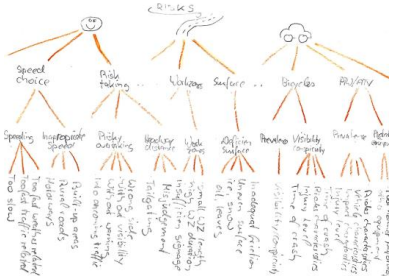
SafetyCube DSS

Road Safety
Decision **S**upport **S**ystem

→ **Risks**

→ **Measures**

Taxonomy



Repository

Synopsis

Prioritisation

Progress to date

- Collected information on **risks, countermeasures** related to **human behaviour, road infrastructure and vehicles**
- Already analysed approx. **600 studies** and many more in progress
- Updated more than 20 existing **meta-analysis**, 65 more in progress
- The design of the DSS is finalized.
- DSS prototype open for "friendly user review" in June 2017.
- Public launch of DSS in September 2017

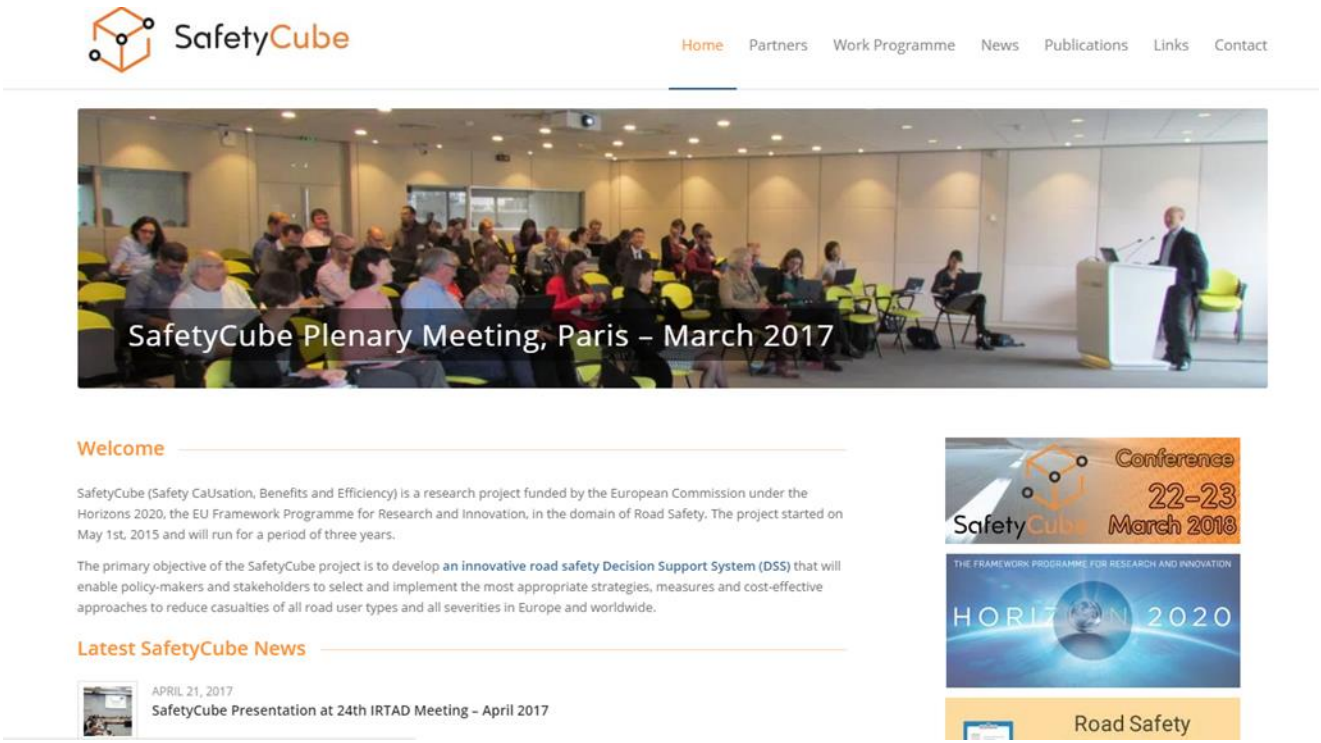
It’s not only about knowledge…

La ceinture qui vous sauvera d'une amende, mais pas d'un accident

HuffPost Tunisie

Publication: 27/04/2017 11h10 CEST | Mis à jour: 27/04/2017 11h26 CEST

Contact



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www.SafetyCube-project.eu

Save the date

Final SafetyCube Conference

22-23 March 2018, Vienna