

SafetyCube



InDev

IN-DEPTH UNDERSTANDING OF ACCIDENT CAUSATION FOR VULNERABLE ROAD USERS

Accident Cost Calculation in Europe A Joint Survey of InDev and SafetyCube

Susanne Schönebeck

Federal Highway Research Institute (BAST)

IRTAD meeting, 13/10/2016, Rome



HORIZON2020

Smart, green and integrated transport

- Work programme 2014/15
 - Call “Mobility for Growth”
 - MG3.4-2014: Traffic safety analysis and integrated approach towards the safety of vulnerable road users

Scope:

- *Update existing knowledge of accident causation in Europe for all road users*
- *Improve the road safety of vulnerable road users*
- *Assess the societal benefits of road safety measures*

InDeV

- Main objective: Gain insight into accident causation, especially focussing on VRU (vulnerable road users)
- Identification of significance of VRU crashes for road safety
 - i.a. Better monetary valuation of crashes *with VRU*

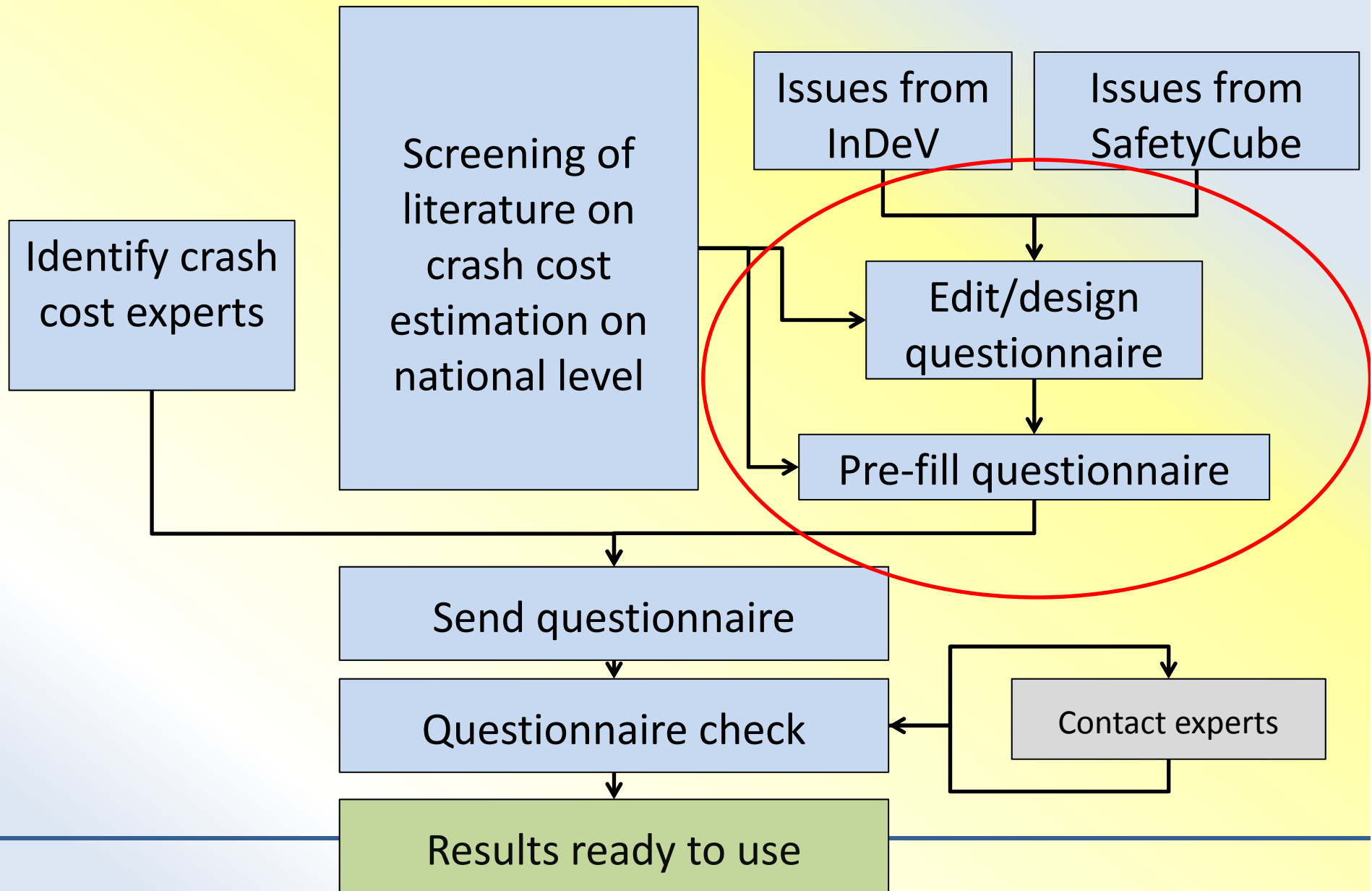
⇒ Development of options for adjustment of crash costs to the issues of VRU

SafetyCube

- Main objective: Development of a Decision Support System (DSS) for road safety
- Methodologies to perform sound assessment of road safety measures
 - i.a. better monetary valuation of crashes

⇒ Development of best practice, guidelines for estimation of crash costs in general

Workflow for Joint InDeV-SafetyCube Survey

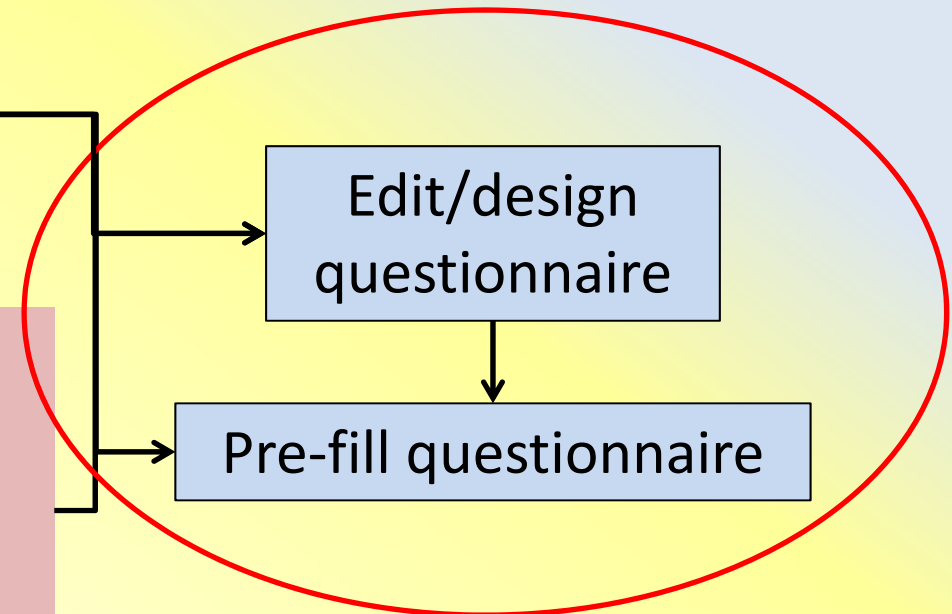


How?

- Components
- Methodologies
- Databases

Results?

- Basic information
- Overall cost rates
- Subdivided cost rates
- Total costs/numbers of crashes



Accident costs

| Medical costs | Production loss | Human costs | Property damage costs | Administrative costs | Other costs |
|---------------|-----------------|-------------|-----------------------|----------------------|-------------|
|---------------|-----------------|-------------|-----------------------|----------------------|-------------|

- | | | | | | |
|--|---|--|---|---|--|
| <ul style="list-style-type: none"> • First aid and transportation • Emergency department • In-patient hospital treatment • Out-patient hospital treatment • Non-hospital treatment • Aids and Appliances | <ul style="list-style-type: none"> • Loss of future market production • Friction costs • Loss of non-market production | <ul style="list-style-type: none"> • Victims • Relatives and friends | <ul style="list-style-type: none"> • Vehicle damage • infrastructure • Freight carried by lorries • Personal property | <ul style="list-style-type: none"> • Police and fire department • Administration of insurances • Legal costs | <ul style="list-style-type: none"> • Funeral costs • Vehicle unavailability • Congestion costs • Visiting people in hospital • Costs of house adaption and moving |
|--|---|--|---|---|--|

Which method(s)?

Which database(s)?

Item included in which unit(s)...?

| Methods (official figure) | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|----------------|---|--|--|--|---|---|---|-------------------|------------------|----------------------|-------------------------|--------------------------------|-------------------------------|-----------------------------------|---|--------------------------|--------------------------------|--------------------------------|--------------------------|--------------------------|--------------------------|
| 1 2 | A | B | C | D | E | F | G | Cost item is included in... | | | | | | | | P | Q | | | | | |
| | | | | | | | | fatalities | seriously injured | slightly injured | property damage only | crashes with fatalities | crashes with seriously injured | crashes with slightly injured | crashes with property damage only | | | other group, see Cost per unit | other group, see Cost per unit | | | |
| 3 | Cost component | incl. in crash costs | Cost item | Method if 'other' or several options: specify in 'further comments' For descriptions see blue tab below. | Database if 'other' or several options: specify in 'further comments' | incl. in cost item | Cost element | | | | | | | | | | | | | | | |
| 4 | Medical costs | <input type="checkbox"/> | First aid and transportation | [dropdown] | [dropdown] | <input type="checkbox"/> First aid <input type="checkbox"/> ambulance <input type="checkbox"/> helicopter <input type="checkbox"/> other | <div style="border: 1px solid black; padding: 5px;"> Method Restitution costs Human capital Willingness to pay other </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> Data base Police (official) Hospitals Insurances Other country's value EU value National surveys other </div> | <input type="checkbox"/> | | | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| 5 | | | Emergency department | [dropdown] | [dropdown] | | | | | | | | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | | |
| 6 | | | In-patient hospital treatment (overnight stay) | [dropdown] | [dropdown] | | | | | | | | <input type="checkbox"/> | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | |
| 7 | | | Out-patient treatment (no overnight stay) | [dropdown] | [dropdown] | | | | | | | | | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | |
| 8 | | | Non-hospital treatment | [dropdown] | [dropdown] | <input type="checkbox"/> rehabilitation centres <input type="checkbox"/> general practitioners <input type="checkbox"/> physiotherapy <input type="checkbox"/> home care <input type="checkbox"/> other | | | | | | | | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | |
| 9 | | | Aids and appliances | [dropdown] | [dropdown] | | | | | | | | | | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| 10 | | | other items: | | | | | | | | | | | | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| 11 | | further comments (other method, database, other value from which country etc.): | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | |
| 13 | | | <input type="checkbox"/> | Loss of future market production | [dropdown] | [dropdown] | | <input type="checkbox"/> gross production loss (incl. consumption loss) <input type="checkbox"/> net production loss | | | | | | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | |

| | A | B | C | D | E | F | G |
|----|---|--|-----------------|-------------|--------------------------------------|----------------------|-------------|
| 1 | <u>Costs per component</u> | | | | | | |
| 2 | | | | | | | |
| 3 | More detailed information | | | | | | |
| 4 | Do you have more detailed information on the crash costs per cost component and per casualty ? If so, please fill those in here. If you only have data on total costs, please choose the right tick box. | | | | | | |
| 5 | Is the information below given in costs per casualty or in total costs? | <input checked="" type="checkbox"/> Costs per casualty (preferred) | | | <input type="checkbox"/> Total costs | | |
| 6 | | | | | | | |
| 7 | Currency in which the official information is provided (EUR/Pound/etc.): | | | | | | |
| 8 | | | | | | | |
| 9 | <u>Official figure</u> | Medical costs | Production loss | Human costs | Property damage | Administrative costs | Other costs |
| 10 | fatalities | | | | | | |
| 11 | serious injuries | | | | | | |
| 12 | slight injuries | | | | | | |
| 13 | fatal crashes | | | | | | |
| 14 | serious injury crashes | | | | | | |
| 15 | slight injury crashes | | | | | | |
| 16 | property damage only (PDO) crashes | | | | | | |
| 17 | | | | | | | |
| 18 | [other groups] (your definition from tab 'Costs per unit') | | | | | | |
| 19 | [other groups] (your definition from tab 'Costs per unit') | | | | | | |

Status

- Questionnaires pre-filled on the basis of literature for 26 of 32 countries (28 EU + Iceland, Norway, Serbia, Switzerland)
- Experts identified for all 32 countries, questionnaires sent to all
- Answers received from 26 national experts on crash costs

| Quality of information received | No. of countries |
|---------------------------------|------------------|
| Very good | 11 |
| Good | 5 |
| Limited | 5 |
| Very limited | 2 |
| Extremely limited | 3 |

Selection of Preliminary Results



General

- Main driver of crash costs: Human costs and production loss

Human Costs

- Included in all cost calculation regimes
 - *Usually only human costs for victims but 7 countries include relatives and friends*
 - *Mainly used methodology Willingness-to-pay*

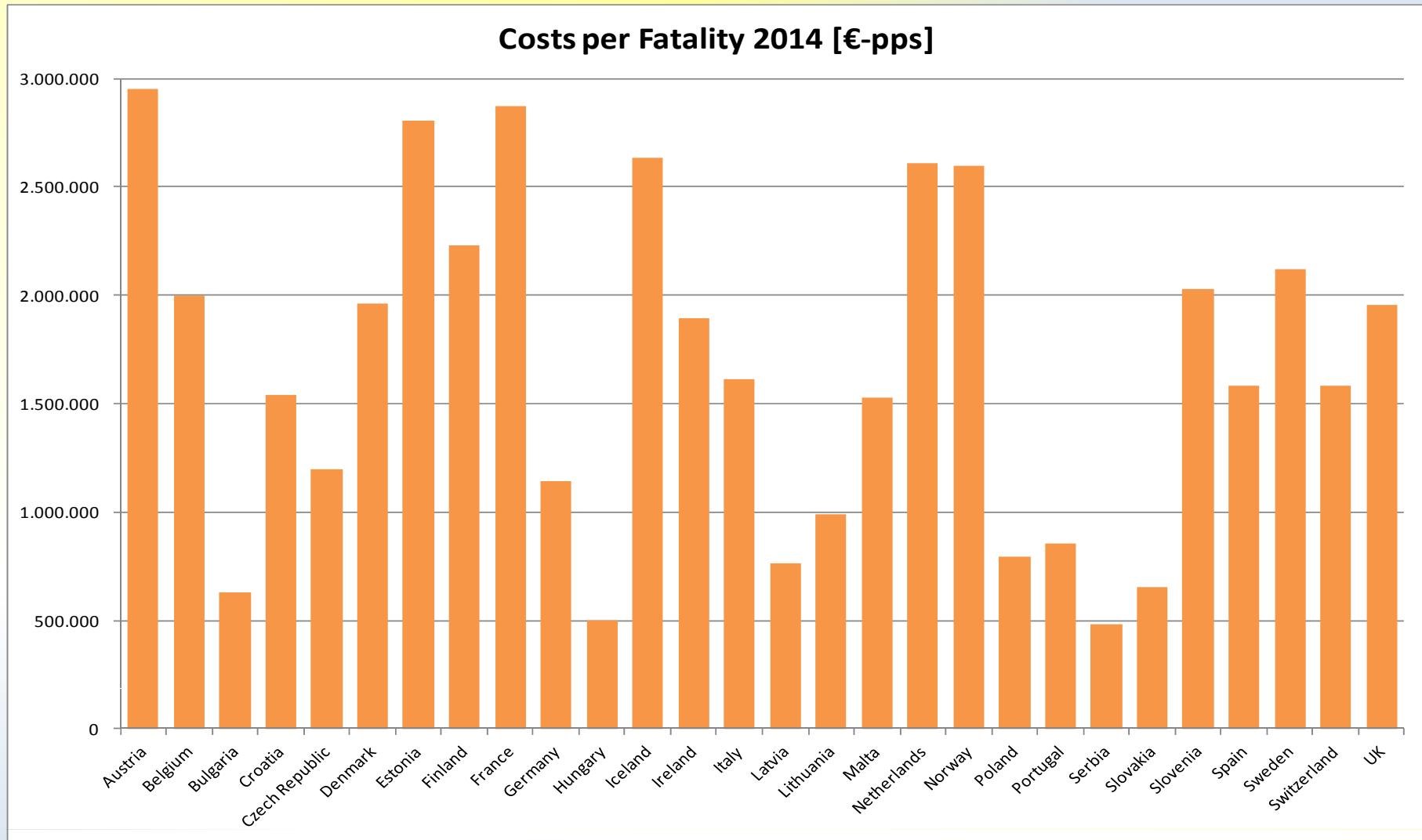
Production Loss

- *Included in all cost calculation regimes*
 - *Loss of future production always included, standard method human capital approach*
 - *Inclusion of friction costs and loss of non-market production rare (5)*

Some Peculiarities

- Strict use of HEATCO values for the VSL + 10% for all other costs in:
Belgium, Croatia, Malta

Selection of Preliminary Results



Selection of Preliminary Results



| Country | Total | Human costs | Share in total costs per fatality |
|----------------|-----------|-------------|-----------------------------------|
| Austria | 2.953.008 | 1.581.274 | 54% |
| Belgium | 1.999.166 | 1.817.335 | 91% |
| Croatia | 1.538.796 | 1.398.905 | 91% |
| Czech Republic | 1.196.997 | 6.110 | 1% |
| Denmark | 1.958.866 | 1.778.199 | 91% |
| Finland | 2.233.483 | 2.103.554 | 94% |
| Germany | 1.142.377 | 33.691 | 3% |
| Greece | n.a. | 1.562.017 | |
| Iceland | 2.634.686 | 1.855.854 | 70% |
| Italy | 1.612.908 | 602.414 | 37% |
| Malta | 1.528.857 | 1.389.870 | 91% |
| Netherlands | 2.610.566 | 1.990.371 | 76% |
| Norway | 2.864.297 | 2.475.629 | 86% |
| Slovenia | 2.031.405 | 1.587.192 | 78% |
| Spain | 1.580.296 | 1.452.128 | 92% |
| Sweden | 2.118.644 | 1.968.358 | 93% |
| Switzerland | 1.584.420 | 1.424.713 | 90% |
| UK | 2.022.329 | 1.336.343 | 66% |



SafetyCube



Thank you for your attention!

Visit the project websites at:

www.indev-project.eu

www.safetycube-project.eu

■ Susanne Schoenebeck

Section Accident Analysis, Safety Concepts, Road Safety Economics

Federal Highway Research Institute (BAST)

Bruederstraße 53, D-51427 Bergisch Gladbach

Phone +49 2204 43-461, Fax +49 2204 43-147

www.bast.de