DaCoTA

Session 6
Improving our Understanding of Crashes

Friday 23rd November 2012

Julian Hill, Loughborough University

Directorate-General for Mobility and Transport
Project co-financed by the European Commission, Directorate-General for Mobility and Transport

DaCoTA

Agenda for Session 6

Improving our Understanding of Crashes

1. The Pan-European In-depth Accident Investigation Network
2. Panel Session on Future Plans to Investigate the Causes of Injuries and Accidents
   - Points of view from the panel
   - Discussion

DaCoTA

The Pan-European In-depth Accident Investigation Network

Directorate-General for Mobility and Transport

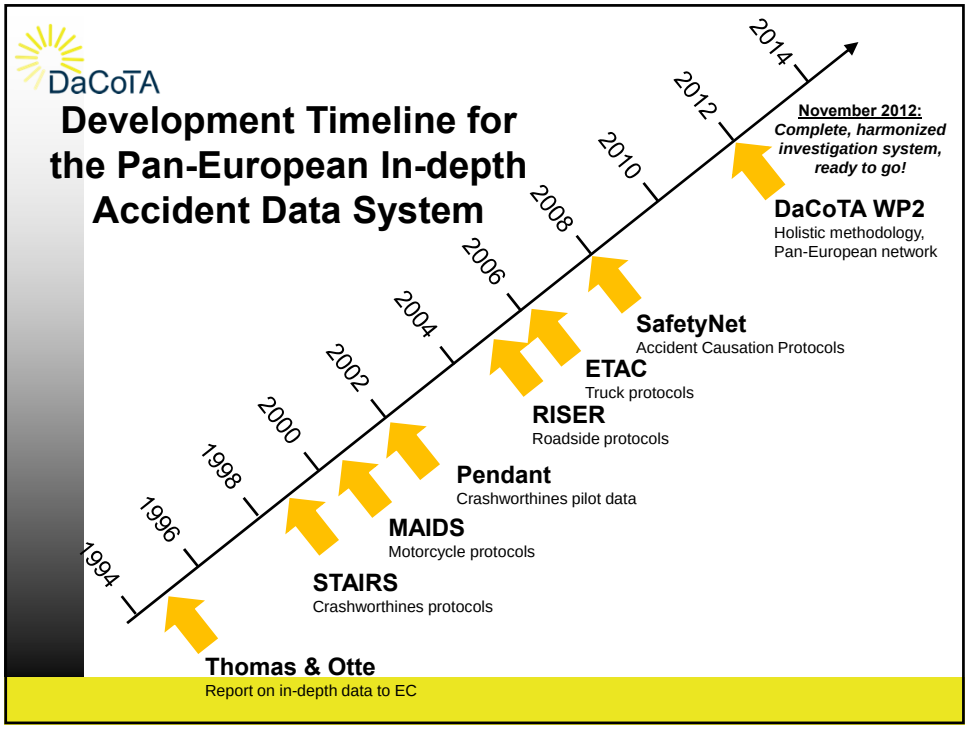
Project co-financed by the European Commission, Directorate-General for Mobility and Transport

The Aim of the DaCoTA In-depth Team

To "harmonize in-depth crash investigation protocols and at an EU level, identify and train crash investigation teams who will prepare for investigations according to these harmonized protocols“

What are In-depth Accident Investigations?

- Detailed and factual information from independent investigations
- Conducted by trained experts using a multi-disciplinary approach



DaCoTA

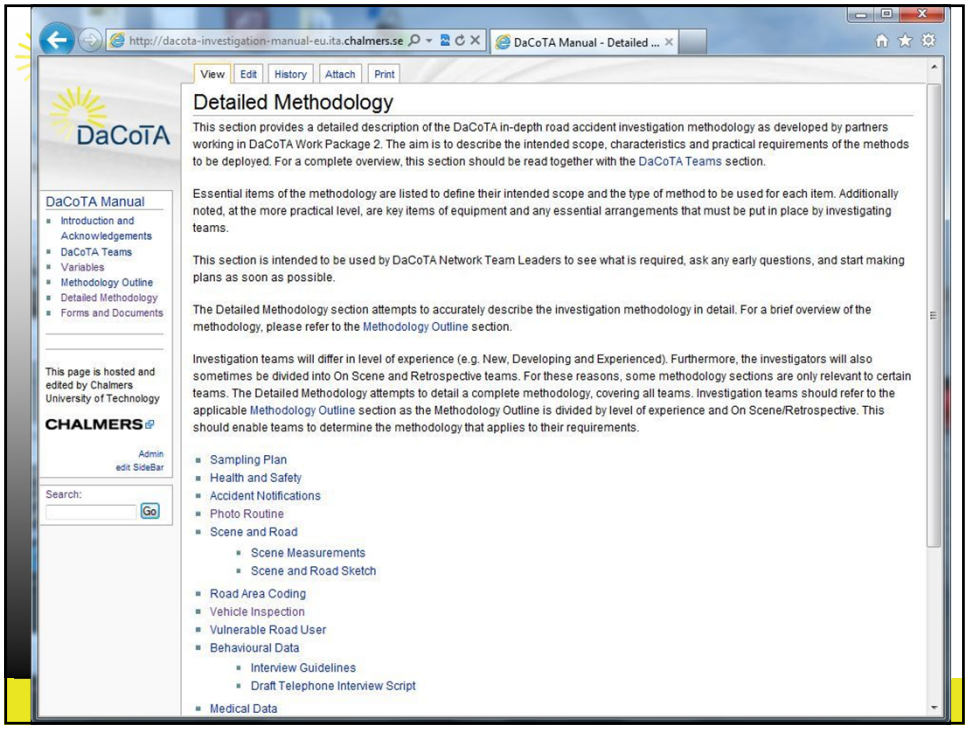
Our Presentation Today

1. Introduction
2. What are in-depth investigations and why?
3. Development of the investigation network
4. The pilot study
5. The DaCoTA Crash Investigation System
6. Conclusions

DaCoTA

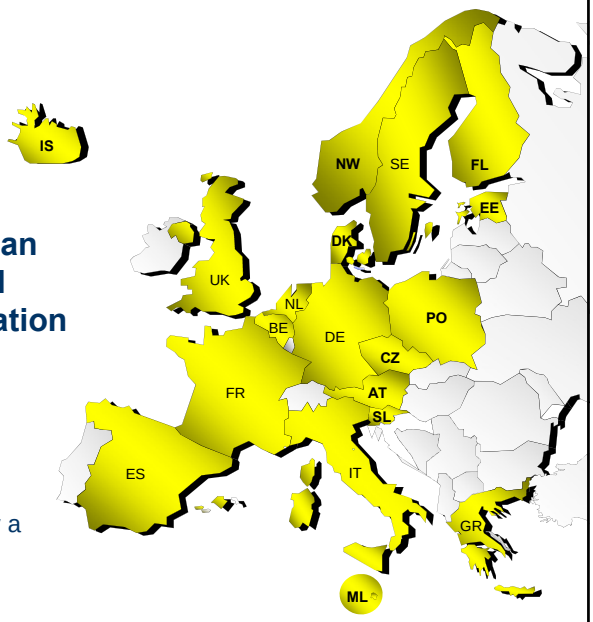
Helen Fagerlind

SAFER
Vehicle and Traffic Safety Centre
Chalmers University of Technology



DaCoTA

The Pan-European In-Depth Road Accident Investigation Network

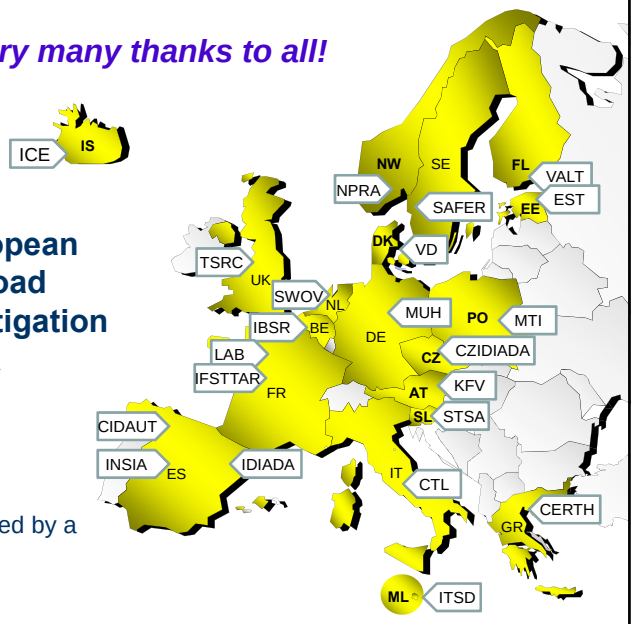


Countries represented by a DaCoTA Network investigation team
March 2012

DaCoTA

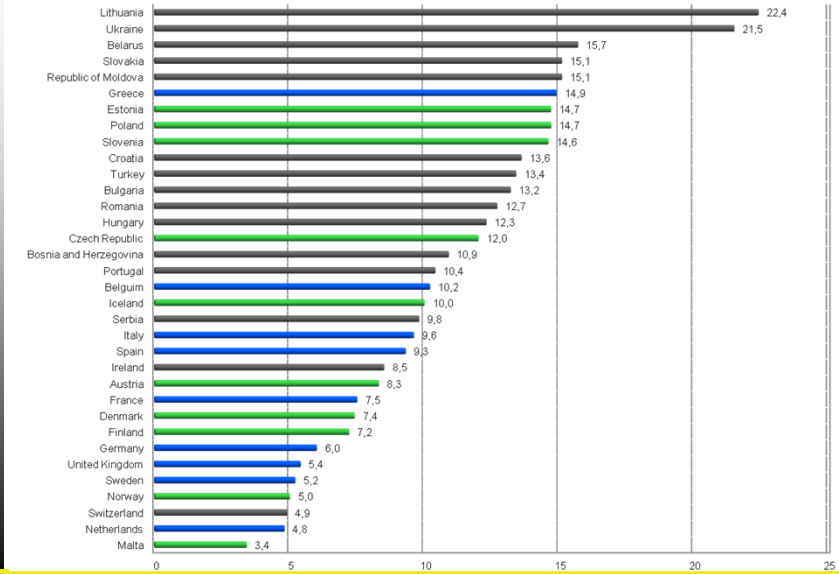
Very many thanks to all!

The Pan-European In-Depth Road Accident Investigation Network



22 Centres represented by a DaCoTA Network investigation team
2012

Fatality rates per 100 000 population



European status report on road safety"(2009) World Heath Organization

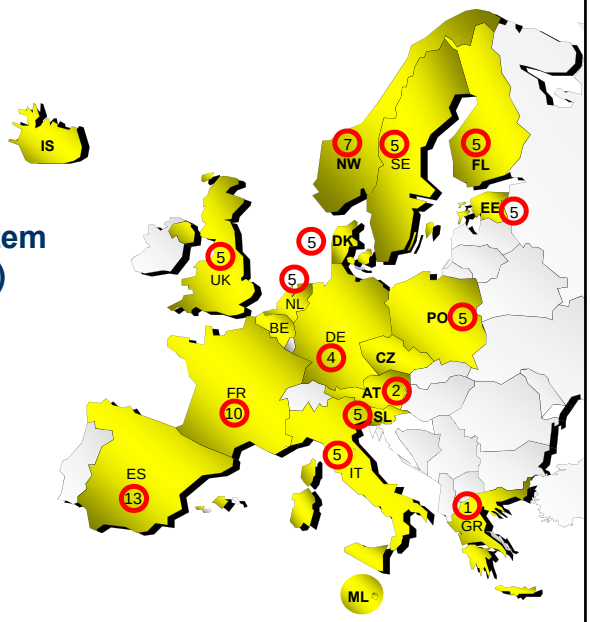
Team Training in March 2012

Team Training in March 2012

Team Training in March 2012

DaCoTA

Cases in the system to date (n = 82)



20 November 2012

DaCoTA

Pilot Study Conclusions

- Network functions well
  - Training, support and mentoring
  - > 80 cases investigated to date
- Methodology effective
- DaCoTA crash investigation system works well

Some Recommendations after the Pilot Study

- Detailed team training must be on-going
- A core data-set would be more manageable for some teams
- Some teams to further develop capability to capture:
  - Long term injury consequences
  - Human behavioural data
- Many teams would like the network to continue

Gabriele Giustiniani

CTL "Sapienza" University of Rome

The DaCoTA Crash Investigation System

In order to support the Pan European in-depth network the DaCoTA crash investigation system has been developed:

- The database web application;
- The On-line Manual.

This tool has been developed starting from the INTACT system developed by SAFER in Sweden for Swedish in-depth investigation activities.

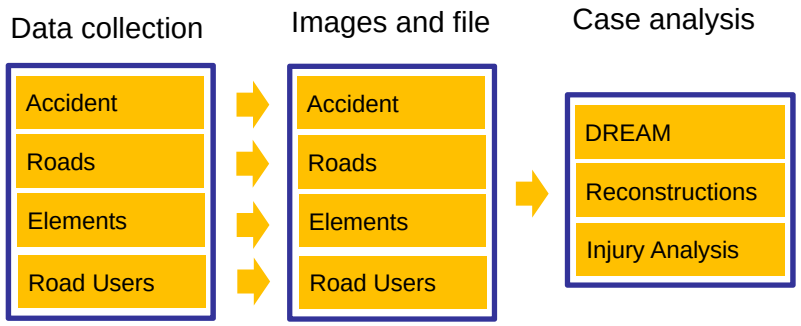
1) The Database Web Application

The Database Web Application

The database web application is a platform developed to:

- Store in harmonized way in-depth accident data;
- Analyze and filter the accidents collected;
- Secure exchange of the data collected and the analysis results among the partners involved.

Database Web Application Structure and Numbers

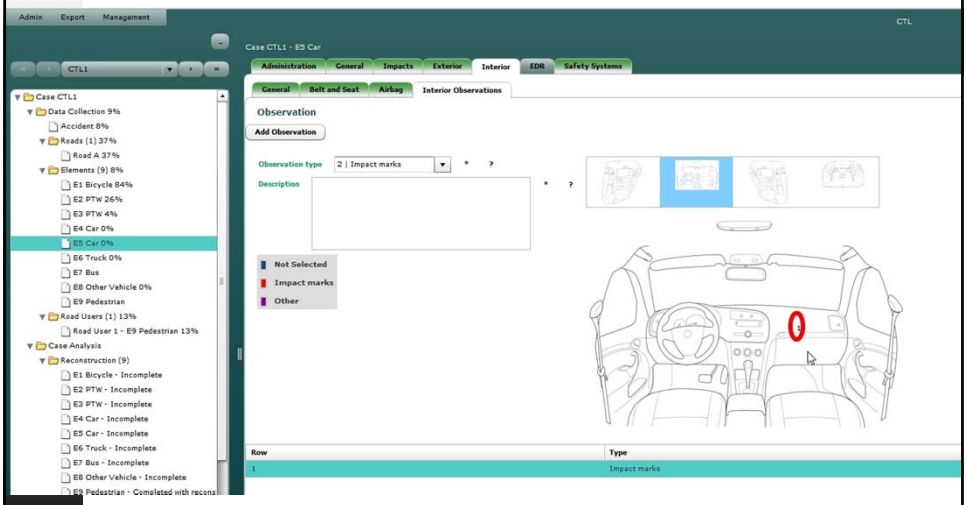


1,500 variables are available per accident.

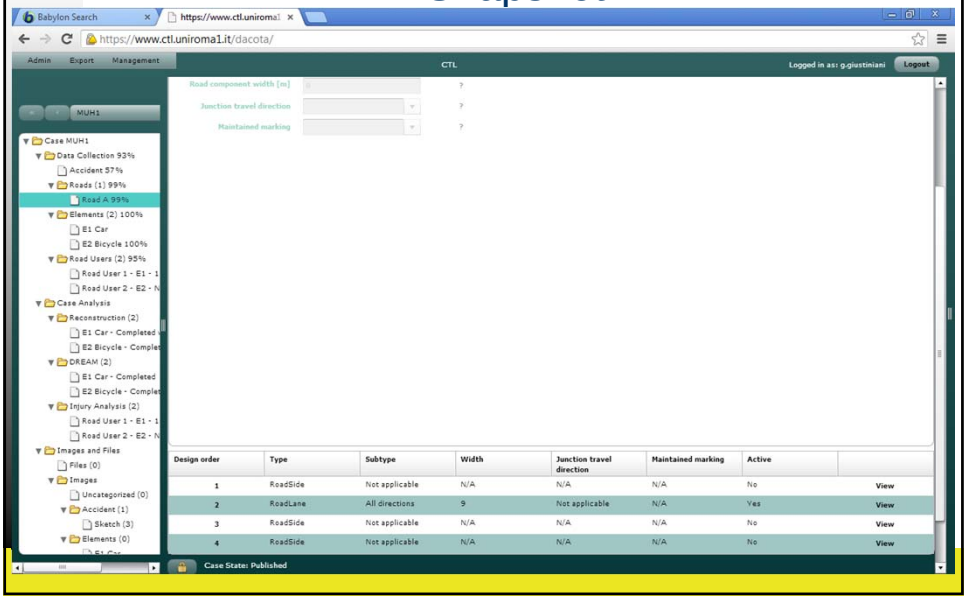
Database Web Application
Main Characteristics

- Accessible over the internet;
- All frameworks and tools are open source;
- Server cross-platform architecture: windows, linux, unix;
- Client interface is any web browser that supports Adobe Flash and runs on any OS.

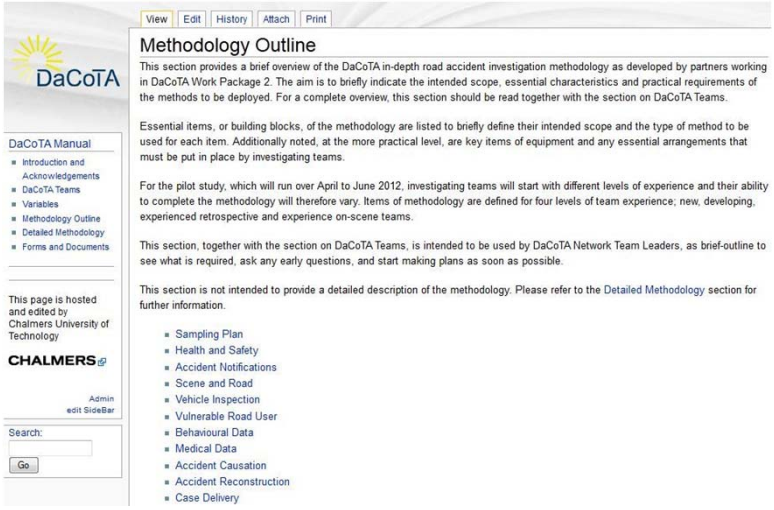
The Database Web Application
A Snapshot



The Database Web Application
A Snapshot



2) The On-line Manual



The DaCoTA On-line Manual Introduction

- The aims of the DaCoTA On-line Manual are:
  - to provide a location for the DaCoTA in-depth road accident investigation methodology.
  - to inform on scope, characteristics and practical requirements of the methodology.
- Contains detailed information on all variables (and fields) in the DaCoTA system.
- Each input field in the DaCoTA system is linked to the On-line Manual

Structure of the DaCoTA On-line Manual

The manual contents are divided into 6 parts:

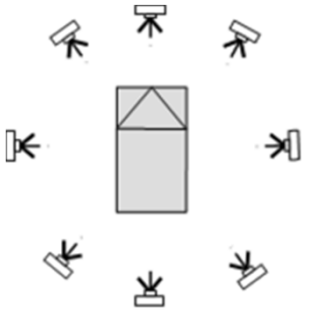
- Introduction and Acknowledgments
- DaCoTA teams
- Methodology outline
- Variables
- Detailed methodology
- Forms and documents

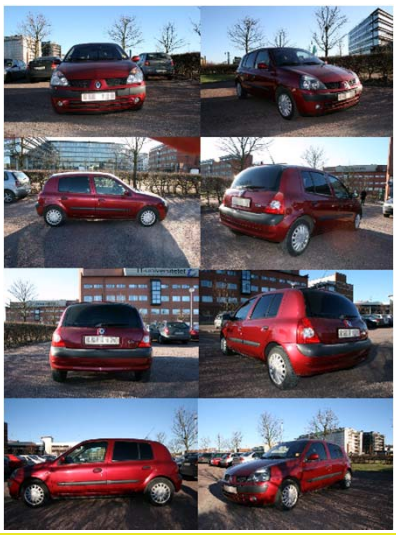
Example: Photo Routine

2.1 Car

2.1.1 Exterior photos car

Take eight photos around the car from the angles shown in the photo below. Also try to take a photo on the car from above to see deformations of the roof, if any.





The DaCoTA Crash Investigation System Summary

- These tools will be made freely available to help expand the use of harmonized in-depth investigations methods
- On-line Manual can be found at: http://dacota-investigation-manual.eu/
- They set up a common reference standards at European and International level

DaCoTA

The Vision beyond 2012 (beyond DaCoTA)

- A comprehensive, pan-European network
- A large scale, on-going accident investigation programme

DaCoTA

What do we need for on-going pan-European investigations?

- Common methodology
- Investigating team network
- Key operational requirements
- Business model
- Up-to-date research objectives

What do we need for on-going pan-European investigations?

- √ Common methodology
- √ Investigating team network
- √ Key operational requirements
- Business model
- (√) Up-to-date research objectives

In Conclusion

- Current position:
  - A common method, manual and database web application built and validated (available on-line)

    http://dacota-investigation-manual.eu/
  - An early functioning network of in-depth teams across Europe
- Future objectives:
  - To sustain the new data collection system and network beyond 2012
  - To build an on-going, systematic research activity
  - To best support stakeholder needs for pan-European in-depth knowledge about the causes of accidents, injuries and potential solutions

DaCoTA

Panel Session

Future Plans to Investigate the Causes of Injuries and Accidents

Directorate-General for Mobility and Transport
Project co-financed by the European Commission, Directorate-General for Mobility and Transport

DaCoTA

Your Panel

Julian Hill (Moderator)
DaCoTA Partner
Loughborough University

Helen Fagerlind
DaCoTA Partner
Chalmers University

Gabriele Giustiniani
DaCoTA Partner
University of Rome

Daryl Lloyd
Department for Transport, UK

Joerg Bakker
Daimler

Konstandinos Diamandouros
European Road Federation

Daryl Lloyd

UK Department for Transport

The Government Point of View

Joerg Bakker

Daimler

A car manufacturer's point of view

In-Depth Accident Data and Product Development

European Conference on Road Safety Data and Knowledge-based Policy-making
2012-11-23, Athens

Daimler AG, Jörg Bakker

Mercedes-Benz

Brief History of In-Depth Accident Data at Mercedes

- Since 1968: Mercedes internal accident database DBCars
  - Current Mercedes car models
  - Southern Germany
- Since 1999: GIDAS (German In-Depth Accident Study)
  - Representative with respect to German national statistic
  - Two spots: Hanover, Dresden
- Since 2011: iGLAD project
  - Goal is the harmonization of in-depth data from different countries, building a common database
  - European countries, USA, India, OECD national data
  - Based on already available data, no new data is generated, close co-operation with DaCoTA

There is a need for continuously collected data with a broadened focus (e.g. more international, more aspects covered like pre-crash phase) for Mercedes accident research activities.

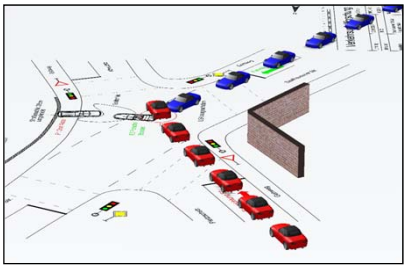
iGLAD - Pilot Study Conducted with Eight Countries

USA, India, Germany, Sweden, France, Spain, Austria, Poland provided five cases each, recoded to iGLAD common data scheme.

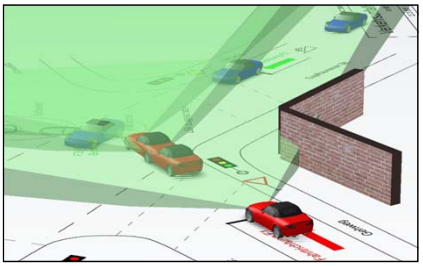
Accident Data Usage in Product Development

- Development of safety systems
  - Monitor and improve existing systems
  - Identify most relevant accident scenarios and design appropriate systems
  - Design realistic scenarios for driving simulator
  - Sensor and actuator demands / specification
- Benefit assessment of safety systems
  - Virtual testing of safety systems with real world accident scenarios (simulation)
  - Communication (e.g. ESC introduction in model year 2000)
  - Ratings (e.g. EuroNCAP Advanced Dossier)
- Testing of safety systems
  - Design of crash tests (e.g. new propulsion technology)
  - Test procedures for active safety systems

Pre-Crash Simulation of Accidents



vs.



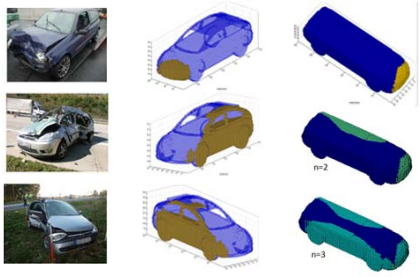
original accident

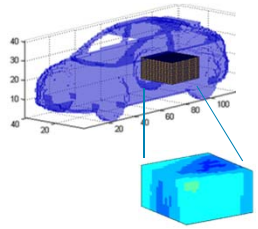
avoided by using EBS

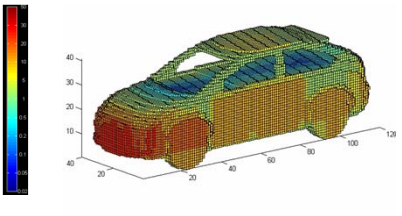
Step 1 → Benefit of the system using a single accident

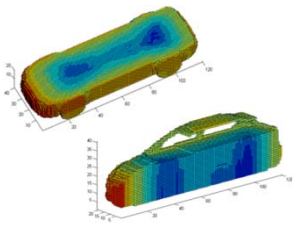
Step 2 → Benefit of the system using the whole GIDAS database (all available accidents)

Deformation Patterns and Components









DaCoTA

Konstandinos Diamandouros

European Road Federation

A view from the road sector

European Union Road Federation

Improving our understanding of Crashes

Konstandinos Diamandouros
Head of Office

The European Union Road Federation (ERF):

- Brussels based non-profit organisation
- Defends the road infrastructure sector
- More than 50 members from 15 European countries

ERF Programmes:

- Road Safety
- Sustainability
- Intelligent Roads and Financing

The need for in-depth statistics
The RISER project

- Road Infrastructure for SafEr Roads
- Co-financed by European Commission (FP5)
- Duration: 2003 – 2006
- 10 partners including ERF and VSRC

The need for in-depth statistics
The RISER project

- **Objective:** to develop set of best practices that will improve the state of road side safety in Europe
- Research could not have been carried out the availability of in-depth statistics

The need for in-depth statistics
The RISER project

Table 1. Number of cases from each contributor to RISER Statistical Database

Country	Participant	Number of accidents
Austria	TUG	17 000
Finland	HUT	5 000
France	CETE	52 000
Spain	CIDAUT	68 000
Sweden	Chalmers	11 000
The Netherlands	TNO	87 000
The United Kingdom	VSRC	24 000
Total number of accidents		**264 000**

The need for in-depth statistics
The RISER project

Criteria for data

- Only single vehicle accidents
- No pedestrians
- Years 1999 – 2002
- Fatal, Serious and Non-injury accidents
- Minor roads excluded
- Urban Roads excluded

The need for in-depth statistics
The RISER project

Data Variables

- 14 variables related to accident, vehicle and road environment
- 6 variables related to the road user

The need for in-depth statistics
The RISER project

Crash Data

- Date
- Time
- Road Type
- Carriageway Type
- Road Condition
- Weather
- Speed Limit
- Light
- No Of Vehicle Occupants
- Accident Type
- Road Alignment
- Hit Object
- Vehicle Type
- Deformation Location

Casualty Data

- Person Class
- Age
- Gender
- Alcohol
- Injury Severity
- Seatbelt Usage

The need for better statistics Challenges ahead

- DACOTA has definitely improved the data available to policymakers
- Yet, there is a need for **both** more harmonisation of data and more in depth data

White Roads Project What it tells about stats?

- **Objective:** to identify sections of the TEN-T in EU 27 where no fatal accident have occured over 5 year period
- Relatively straightforward task?

White Roads Project Questionnaire

- **Graphic Table 1**

Number	Road	Location	Date	Type of road	Killed	Serious injuries	Type vehicle involved (heavy, car, motorcyclist, cyclist, pedestrian, etc)	Existing infrastructure and equipment placed in the spot where the accident occurred (lighting, barriers, vertical signs, road markings, state of surface, etc)
1	*N-340*	*Km 17.4*	*3/7/2008 11:10 am*	*Single carriageway*	*1*	*3*	*Light vehicle Motorcycle*	*Safety barrier Road marking*

White Roads Project Questionnaire

- **Almost 85,000 km and 250,000 accident analysed**

White Roads Project Problems

- Most of the countries ***do not have an official list*** of Trans European Road Network
- Some countries ***do not provide accident data*** for analysis (although all privacy concerns are respected). This is the situation of Germany

White Roads Project Problems

- Some countries ***do not have information about type of vehicle involved*** in accidents, which introduces difficulties in the analysis for road safety purposes. In Belgium, difference between regions
- Countries like United Kingdom, Finland, Ireland, Sweden and Czech Republic refer the accidents in ***coordinates "x-y", which do not correspond to the road network*** (classified in name of road and kilometre). This circumstance makes the analysis more complicated and the necessity to locate accidents using a special software

White Roads Project Problems

- Some countries ***provide accident data in road sections of 1 km long*** without specifying the exact point where the accident happened. Thus, this introduces a different analysis for these countries (Italy and Denmark)

- ***Information related to traffic flow or vehicles involved in the accident*** is not available in many countries

White Roads Project Problems

- The ***lack of clear information, statistics and correlation between accidents and road sections*** is extremely negative for road safety analysis from the infrastructure point of view. Not only for the WhiteRoads Project, but also for black spot management works or other research studies

White Roads Project Problems

- We had initially foreseen 6 months
- In the end, 18 months!

Other Stats challenges

- More specific information related to roadside equipments (barriers, markings etc)
- How to use data collected through ITS for safety for evidence-based policymaking?

FOTsis Project

- a large-scale field testing of the road infrastructure management systems needed for the operation of seven close-to-market cooperative I2V, V2I & I2I technologies
- in order to assess in detail both 1) their effectiveness and 2) their potential for a full-scale deployment in European roads.

FOTsis Project Services

S1: Emergency Management
S2: Safety Incident Management
S3: Intelligent Congestion Control
S4: Dynamic Route Planning
S5: Special Vehicle Tracking
S6: Advanced Enforcement
S7: Infrastructure Safety Assessment

FOTsis Project Evaluation

- After the completion of the FOT's, an evaluation will carried out to assess impact on safety and mobility.

Issue linked to data from ITS

- Privacy
- Minimum standards for classification

Thank you for your attention

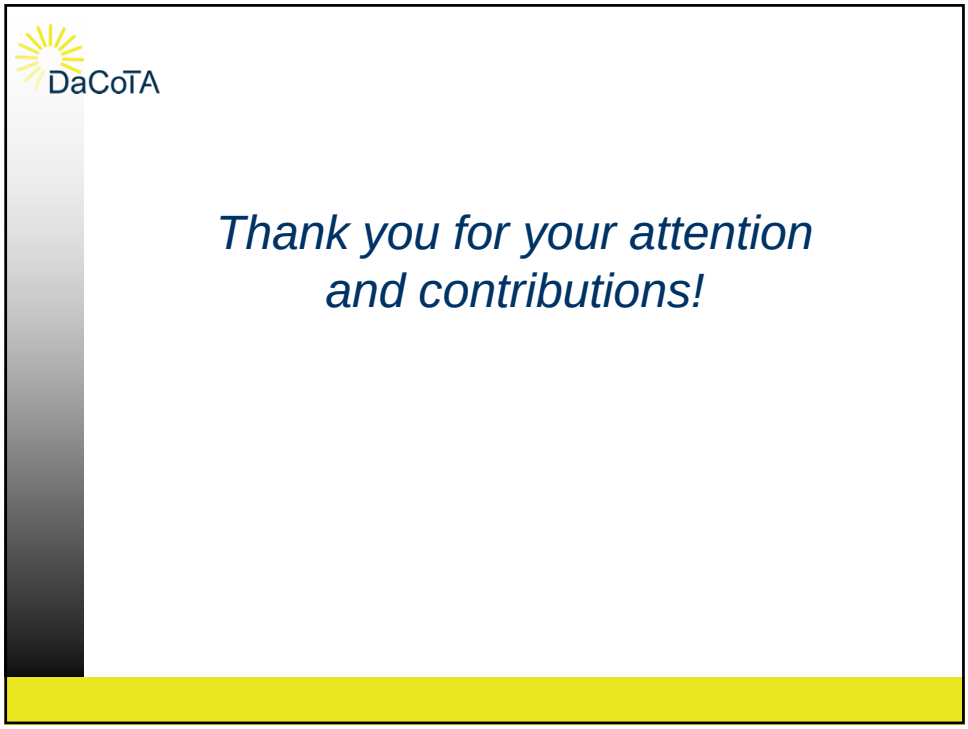
www.erf.be
www.whiteroads.eu
www.fotsis.com

k.diamandouros@erf.be

DaCoTA

Panel Session Discussion

Future Plans to Investigate the Causes of Injuries and Accidents


DaCoTA
Thank you for your attention
and contributions!