Session 7
Measuring, Assessing & Improving Vehicle Safety

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Evaluation, a public health point of view (Thierry Hermitte)
Perspectives & future challenges (Thierry Hermitte)
Evaluation based on drivers’ needs analysis (Pierre Socrat-Elslande)
Perspectives & future challenges

Thierry Hermitte
Outline

01 The road safety context

02 Assessing & Improving vehicle safety
   Technology
   Assessment methods
   Support / Tools / Data

03 Conclusion
Outline

01 The road safety context

02 Assessing & Improving vehicle safety
   Technology
   Assessment methods (evidence)
   Support / Tools (Data)

03 Conclusion
The road safety context

Evolving in space and time:

We’ve reached the best level of safety ever

The problems are different according to regions (Industrialized countries and emerging countries)

Evolvement of mobility (electric/hybrid vehicles, priority to soft modes, etc.)

Vehicles safer and safer for everybody

New regulations, improvement and development of Consumerist tests (EuroNCap, LatinNCap, JNCap, etc.)

Bigger and bigger awareness by citizens, governments, etc. => safety demand increases

...
The road safety context

Contribution of several actions from several actors & interactions

Stakeholders’ requirements

Unpredictable changes

Technology

Regulations

Users’ behavior

Market

…
Outline

01  The road safety context

02  Assessing & Improving vehicle safety
    Technology
    Assessment methods (evidence)
    Support / Tools (Data)

03  Conclusion
Assessing & Improving vehicle safety

A public Health issue:

- Be able to assure travels for all road users in full safety
- Be able to help the driver to manage critical situation
- Be able to counter the drivers’ failures

Other values exist …

From automotive point of view:

- To help prioritizing the « best » solution(s)
- To find the best compromise safety benefit/cost
- For the brand identity
- For positioning the brand to others
- To have a lead in a competitive market
- To find the real value for the client
- …
- To contribute in saving lives
Assessing & Improving vehicle safety

Technology

Assessment methods

Supports / Tools / Data
The main issues:
Is the technology address the right problems?
Is the technology correctly solve the problem?
How much does it cost?
What is the value for the client?

What are the limits?
- limit due to the technical possibilities
- humans have failures, the technology too
  (absence of detection, wrong detection, untimely switch-on, etc.)
- cost: we are able to make a high technological vehicle but unsaleable
Challenges:

- Make ADAS more accurate
- Communication V2X
- Automation
Car structure enhancement reduces fatality rate by 60%.

Frontal airbags suppress 90% of serious head injuries and 60% of serious injuries to the neck.

Load limiters reduce serious thorax injuries by 80%.

Double pretension reduces serious abdomen injuries by 75%.

11% of injury crashes if all cars are equipped with Brake Assist.
-15% of injury crashes if all vehicles are equipped with ESP.

Evaluation methods

Assessing & Improving vehicle safety
Assessing & Improving vehicle safety

Evaluation methods

The BOX

- Limit: Global performance
  - Integrate in the assessment others aspects (driver behavior, driver adaptation, environment conditions, changes in traffic, etc.)

White box

- Technical specifications are needed
  - Benchmark (test different systems offering the same safety function)
  - Optimization (define the best compromise)
  - Help to the development (define requirements)

Black box

- System is a black box.
  - Only input and output are known.
  - (ex a posteriori evaluation)
Assessing & Improving vehicle safety
Evaluation methods

Challenges:

- Improve methodology (evaluation of safety package, side effects, etc.)
- Take into account human behavior in assessment (reaction, adaptation, acceptation, use, etc.)
- Set up new criteria (other values than injuries reduction)
- Develop meta-analysis
In-depth Accident databases:
- several attempts at European level but none perpetuated (PENDANT, EACS, MAIDS, ETAC, DACOTA)
- Need long time to collect enough information to be correctly used
- very expensive

Vehicle safety equipment database
Does not exist, car makers have only information on their own fleet
Big issue related to a posteriori evaluation

Exposure data:
Classical exposure data exist (km driven, fleet, etc)
Assessing & Improving vehicle safety
Support / Tools / Data

Challenges:

- Knowledge has to be shared and continuously improve
- A European Information system allowing to have information on
  - accidents (aggregated and disaggregated data)
  - Vehicle safety equipment
  - risk exposure data
  - Human driving behavior
  - Use (social acceptance, technical acceptance, real use on the road, etc.)
  ...

European commission, members states authority, automotive industry, road maker have to work together in order to reach the 2020 target, in particular for:

Common European Information system:
- in-depth road accidents
- vehicle safety equipment
- exposure data (naturalistic driving, FOT, etc.)

To continue improving evaluation tools & methodologies:
- new criteria (other values than injury reduction)
- human behavior in the loop
- develop meta-analysis
... Anticipate what will be tomorrow
Thank you!