The Role of New Technologies for Safety in the 21st Century

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Outline

• State of Safety
• Sustainability and Safety
• Safety Technologies
• Shared Responsibilities

1. Lower respiratory infections
2. Diarrhoeal diseases
3. Unipolar depressive disorders
4. Ischemic heart disease
5. HIV/AIDS
6. Cerebrovascular disease
7. Prematurity and low birth weight
8. Birth asphyxia and birth trauma
9. Road traffic accidents
10. Neonatal infections & other

Road Accident Fatalities are a significant cause.....

Ischemic heart disease
Perinatal conditions
Cerebrovascular disease
COPD
Lower respiratory infections
Hearing loss
Cataracts
HIV/AIDS
Unipolar depressive disorders
Road traffic accidents

And will be more important in the future

Total: 1.3 Million Fatalities in 2004

Vehicle safety technologies may need to vary by region

Sources:  
- WHO, World Report on Road Traffic Injury Prevention, 2004  
- International Road Traffic and Accident Database (IRTAD - OEC/ITF), 2008
Fuel Economy

• Fleet shift to smaller vehicles will increase compatibility challenges

• Alignment of structures per Voluntary Agreement will help increase compatibility in North America

• Structural enhancements (e.g., adaptive structures) can help reduce the impact of downsizing and weight reduction
Effect of Changing Vehicle Mix on Fatality Rates

Drivers killed / 1000 crash events*

Vehicle-to-Vehicle Accidents

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Single Vehicle

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Changing the fleet mix increases the likelihood of incompatible vehicle interactions

* All crash types included in analysis

Source: UMTRI
Vehicle Compatibility

Sources: Evans, AJPH, 2001 & Evans, SAE, 2004
Small Vehicle Safety Challenges

• Smaller vehicles, in general:
  - are lighter and have less crush space
  - have lower structural height
  - experience higher accelerations than larger vehicles in multi-vehicle accidents

• Therefore, the challenge for the safety community is to:
  - continuously improve safety by democratization of safety technologies (e.g., airbags, ESC, etc)
  - make newer technologies affordable for small vehicles
Levels of autonomous safety features for driver assistance/accident avoidance and crash protection will increase due to:

- Increasing computing power
- Faster algorithms
- Advanced sensor capabilities
- Lower sensing costs
- Advanced electrical chassis systems
Safety Technologies Outlook

Safety potential

100%


Passive safety
Active safety

- brake assist
- ACC
- ABS
- ESP
- traction control
- preactivated restraints
- compatibility
- adaptive restraints
- safety pedals
- side airbag
- side impact protection
- advanced seat belts
- head restraints
- crumple zone
- safety belts
- safety cell

Active safety

- V2V & V2I
- active accident avoidance
- active driver assist.
- active body control
- ACC
- ESP
- traction control
- ABS
- safety cell
- side airbag
- safety belts
- head restraints
- crumple zone
- compatibility
- adaptive restraints
- safety pedals
- side impact protection
- advanced seat belts
- safety cell

Passive safety

- V2V & V2I
- safety cell
- safety belts
- Adaptive restraints
- compatibility
- preactivated restraints
- active accident avoidance
- active driver assist.
- ESP
- traction control
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- safety cell
- side airbag
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Head restraints
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- safety cell
- safety belts
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- preactivated restraints
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Side impact protection
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Advanced seat belts
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Crumple zone
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Breakthroughs in safety will occur when all entities work together.
Outlook

• Vehicle safety technologies will make a significant contribution to the improvement of road safety

• Technologies must address customer needs and be adapted to specific national situations

• Shared responsibilities exist for all stakeholders