

# Sweden's Vision Zero

Scouting for Global Road Safety

May 6<sup>th</sup> 2013

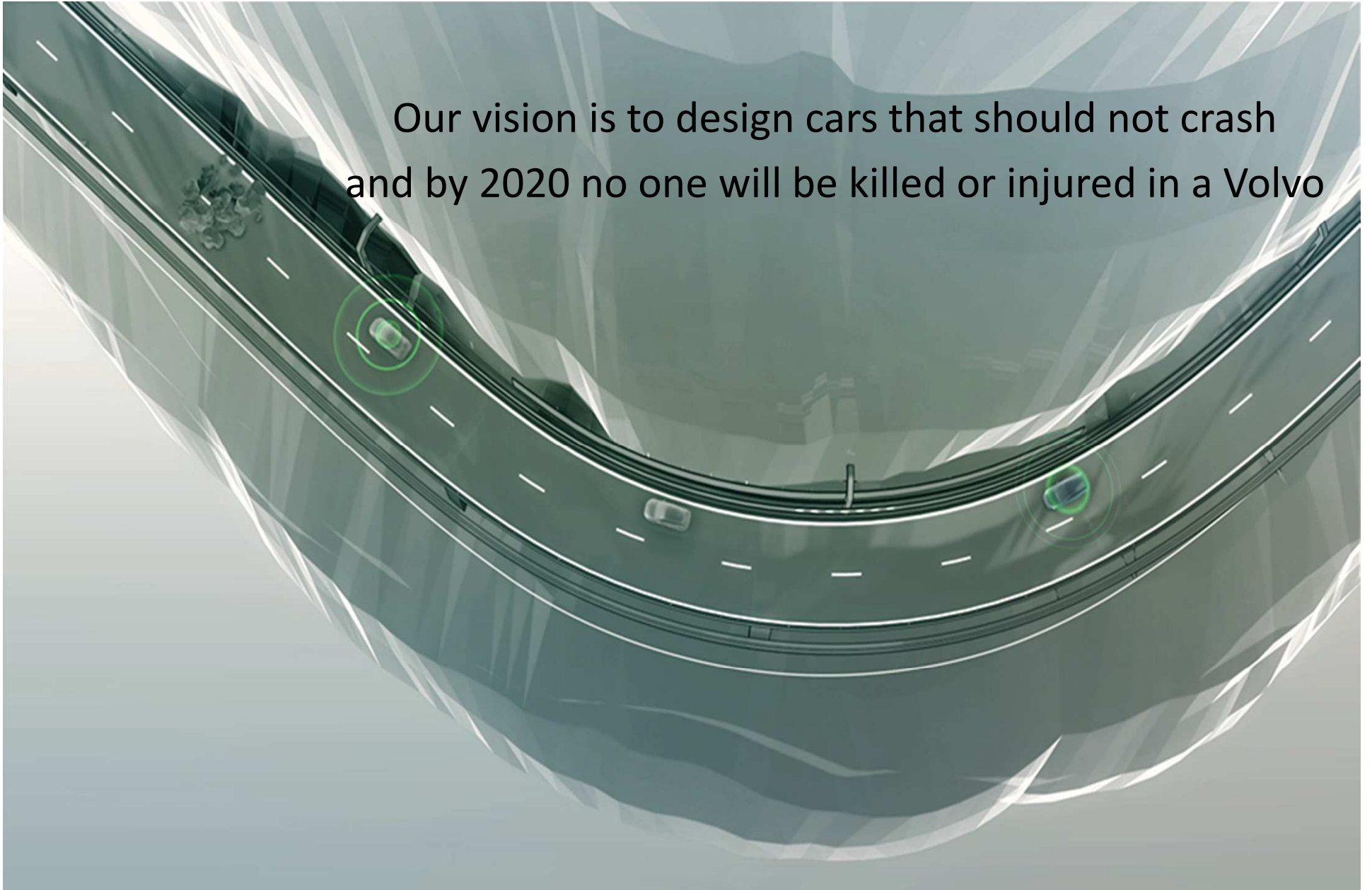
Claes Tingvall (Swedish Transport Administration)

(9) By 2050, move close to zero fatalities in road transport. In line with this goal, the EU aims at halving road casualties by 2020. Make sure that the EU is a world leader in safety and security of transport in all modes of transport.

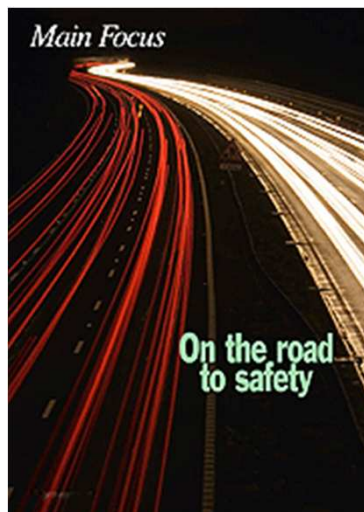
**WHITE PAPER**

**Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system**

Our vision is to design cars that should not crash  
and by 2020 no one will be killed or injured in a Volvo



# A management system standard



International  
Organization for  
Standardization

Reference number of working document: **ISO/PC 241 N 55**

Date: 14 Jan. 11

Reference number of document: **ISO/CD 3 39001**

Committee identification: **ISO/PC 241**

Secretariat: **SIS**

## Road traffic safety (RTS) management systems – Requirements with guidance for use

*Élément introductif — Élément principal — Partie n: Titre de la partie*

### Warning

This document is not an ISO International Standard. It is distributed for review and comment. It is subject to change without notice and may not be referred to as an International Standard.

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Crash injury is largely predictable and largely preventable. It is a problem amenable to rational analysis and remedy.

- Road safety policy must be based on a sound analysis and interpretation of data, rather than on anecdote.
- Since human error in complex traffic systems cannot be eliminated entirely, environmental solutions (including the design of roads and of vehicles) must help in making road traffic systems safer.
- The vulnerability of the human body should be a limiting design factor for traffic systems, i.e. for vehicle and road design, and for setting speed limits.

*From the WHO World report on road traffic injury prevention 2004 on the fundamentals*

Common driving errors and  
common pedestrian behavior  
should not lead to death and  
serious injury –the traffic system  
should help users to cope with  
increasingly demanding conditions

*From the WHO World report on road traffic  
injury prevention 2004 on the fundamentals*

9. CONSIDERS that infrastructure, vehicles and road users should be seen as a system in which human error and inappropriate behavior should always be taken into account. Infrastructure and vehicles should be designed as to prevent and limit consequences of such failures;

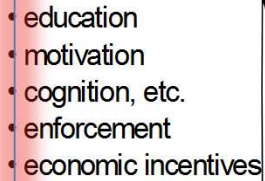
**15. ENCOURAGES a strong cooperation between the bodies responsible for the infrastructure in the Member States and the vehicle industry in order to support the deployment of promising in-vehicle safety systems that can contribute to save lives on the European road-network. New technical solutions of which the effect is proven can contribute to make it possible to deal with problems like speeding and impaired driving (such as driving under the influence of alcohol, drugs and fatigue);**



# In essence two imperatives in one basic task

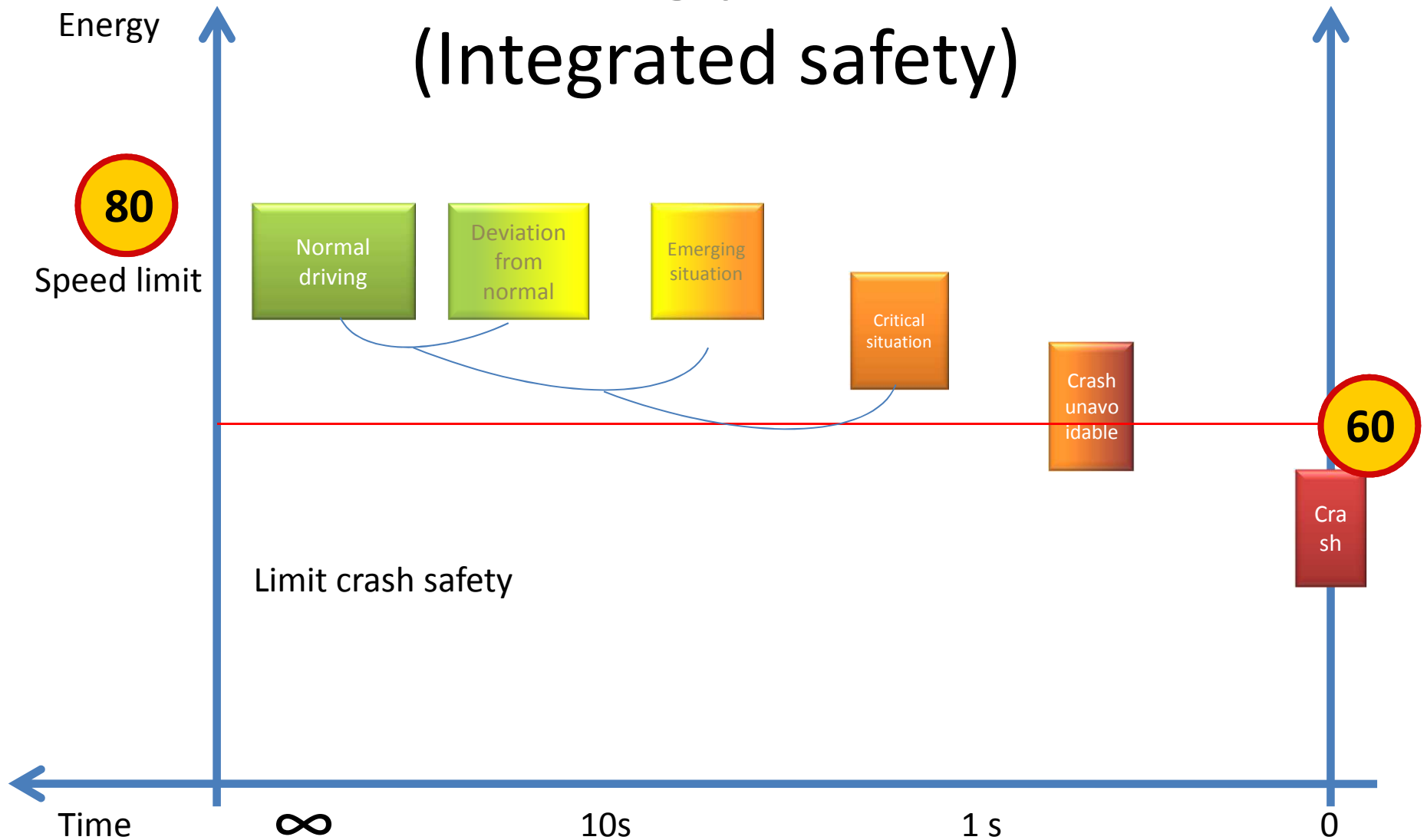
Build a chain of barriers that can  
accommodate the errors not to  
exceed human tolerance

what we  
might hit:



<ul style="list-style-type: none"> <li>• access to road transport system</li> </ul>	<ul style="list-style-type: none"> <li>• comfort</li> <li>• economy</li> <li>• social conformity</li> </ul>	<ul style="list-style-type: none"> <li>• warning system</li> <li>• supporting system</li> </ul>	<ul style="list-style-type: none"> <li>• intervention in driving</li> </ul>	<ul style="list-style-type: none"> <li>• immediate correction</li> </ul>	<ul style="list-style-type: none"> <li>• preparation for crash</li> </ul>	crash protection
Vehicle	promote normal driving	(ISA, SBR, alcohol interlock)	(AICC, LDW)	(ESC, LDA, AICC2)	(pre-safe, emergency braking)	(seat belts, airbag, whiplash protection, pedestrian protection)
Infrastructure	promote normal driving	(speed warning, tactile warning, humps)	tactile edge lines	high friction surface		barrier design, roundabouts
Others	promote normal driving	<ul style="list-style-type: none"> <li>• enforcement</li> <li>• insurance</li> <li>• contracts</li> </ul>				<ul style="list-style-type: none"> <li>• emergency service</li> </ul>

# Driving process (Integrated safety)



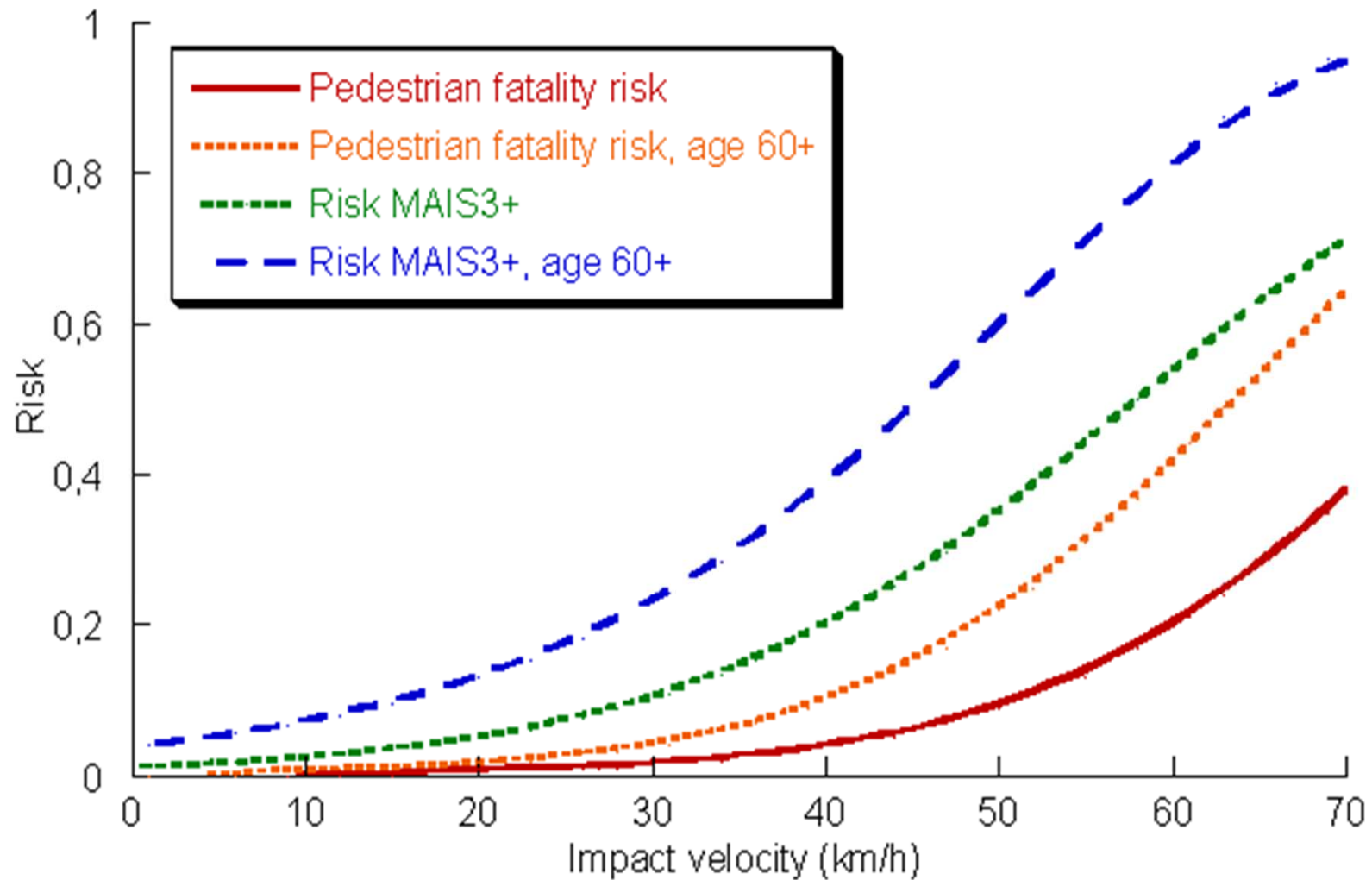
# Safety as a function of rules, road design, driver behaviour, car design and advanced technology

More drivers give way to pedestrians at lower speeds

Social interaction is better at low speeds

Injury risk and severity is strongly related to speed at impact

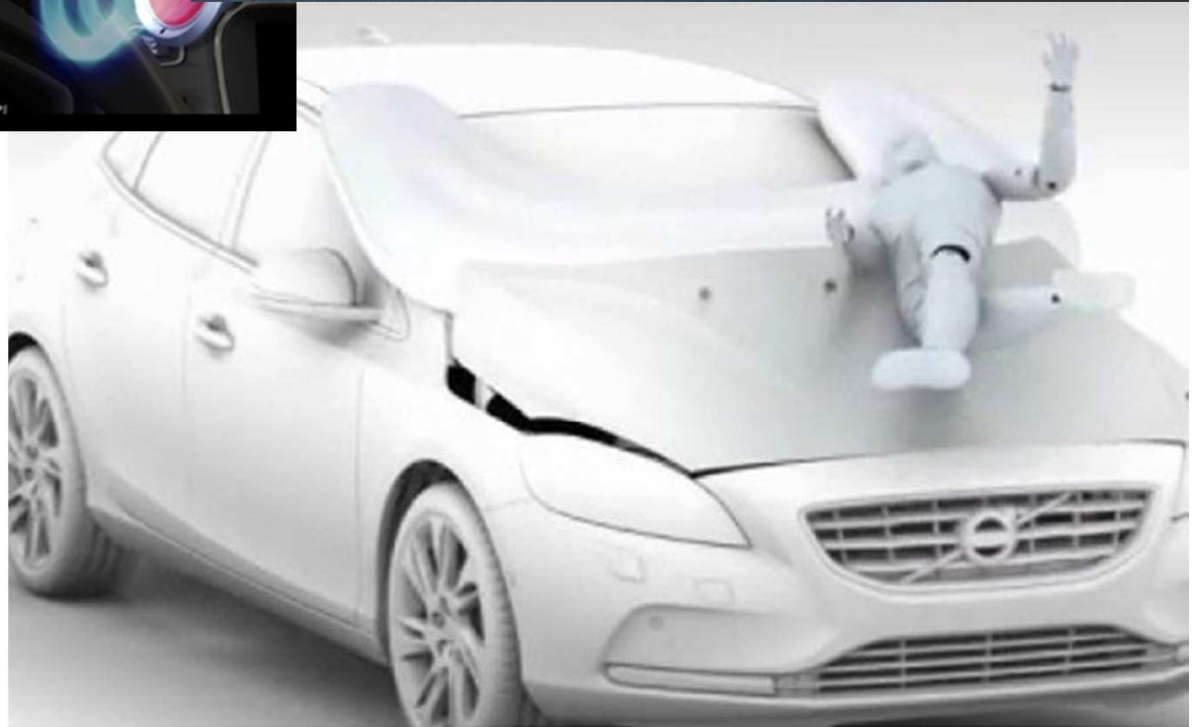
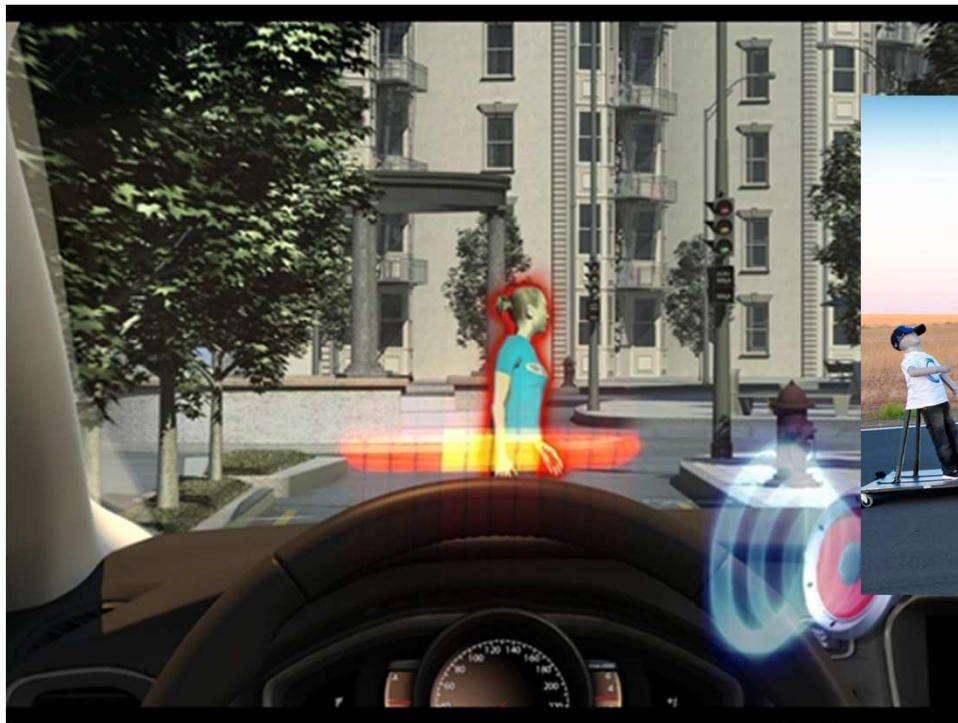
**The risk of injury MAIS 3+, and fatality, related to impact velocity, for different age groups. From Stigson and Kullgren 2010.**









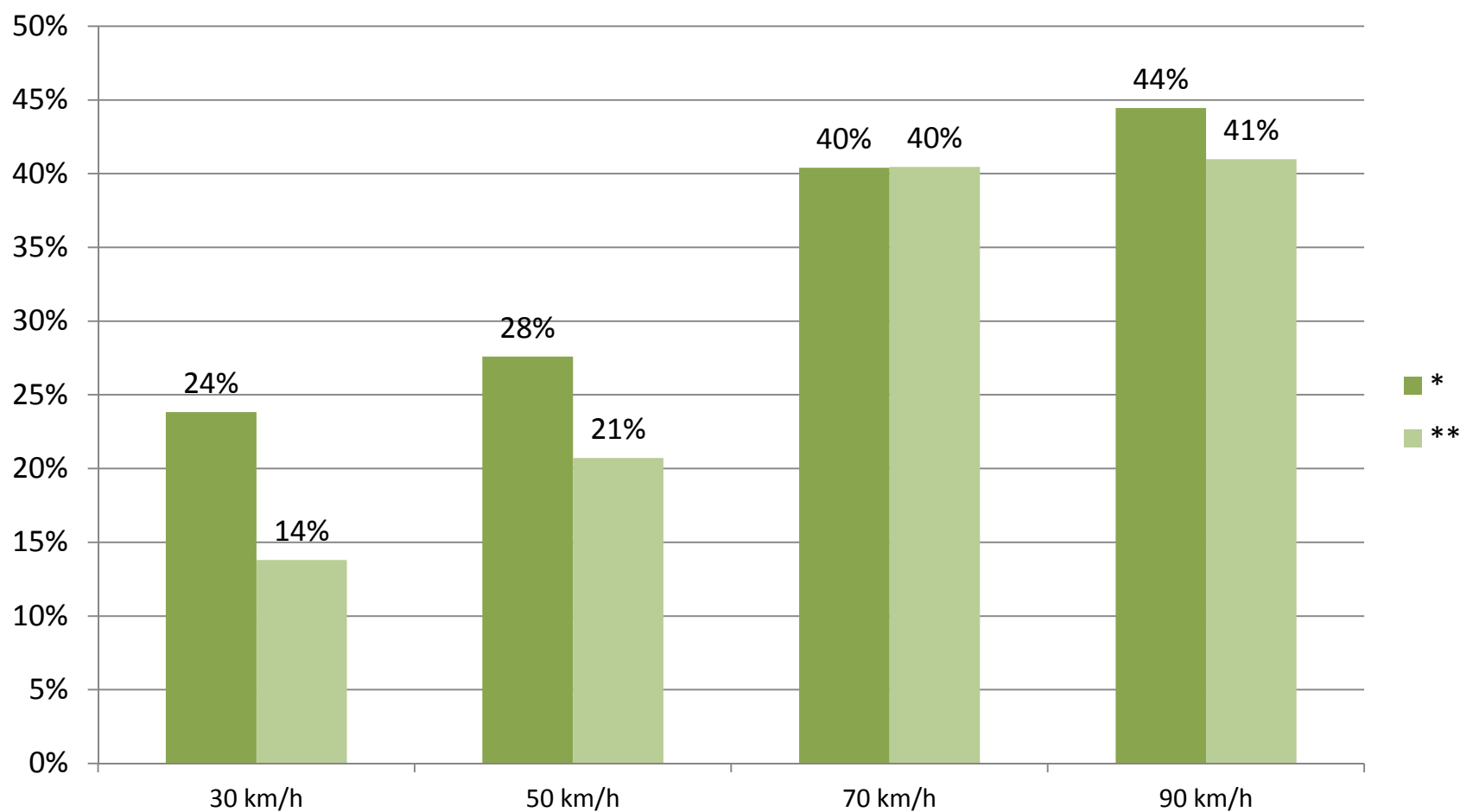


Volvo



## Comparison of mrsc in one and two star cars in different speed limits

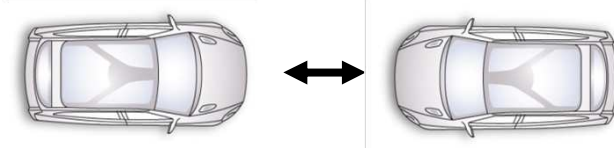
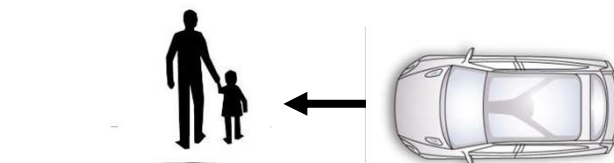
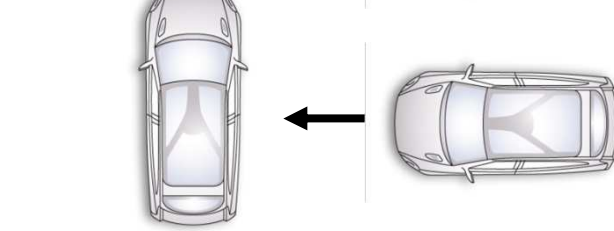

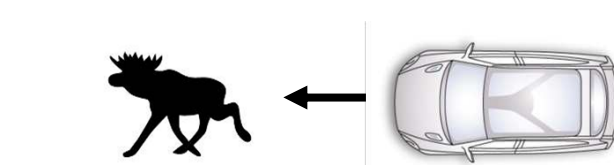
MRSC 5 %+, n=542



# Shared responsibility

Passive

Active

<b>80</b>		Head-on	<b>60</b> + <b>20</b>
<b>40</b>		Pedestrians	<b>10</b> + <b>30</b>
<b>70</b>		Side	<b>55</b> + <b>15</b>
$\Delta$ <b>40</b>		Rear-end	$\Delta$ <b>20</b> + $\Delta$ <b>20</b>
<b>110</b>		Large animals	<b>80</b> + <b>30</b>



# SUMMARY

- It is more probably more important to define and regulate the pre-conditions of the system than to divide the responsibilities post impact
- It is more important to define what is normal driving on a minimum requirement level than to regulate in every situation what the driver must do
- In an ideal world, regulations support integrated safety and make it work.

# SUMMARY

- Error and violation must be handled separately throughout the whole process of regulation
- Norms and rules must also be treated as two separate issues – only in the perfect world they match

# The Challenging questions

- Imagine a pedestrian crossing where no one is killed or seriously injured – what would it look like?
- Who should be responsible for safe walking, and how do you divide the responsibility?
- What should be regulated?

Thank you for the attention