

# Drive towards Zero Injuries and Fatalities

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Volvo Car Corporation

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# We all know the picture:

- 1.2 million deaths annually worldwide
- Disables 50 million people annually
- Exceedance of pollution levels for ambient air quality standards
- Increasingly high CO<sub>2</sub> emissions
- Congestion problems
- *Transportation is the backbone of modern society*





Vision 2020

**Our Vision is that no one will be killed or injured in a Volvo by 2020.**

Drive towards Zero Injuries and Fatalities



# Vision 2020

- Can it be done?
- How?
- What will be necessary?
- What will be the obstacles?
- What will help to make this happen?

# Vision 2020 will require ...

- Shared responsibilities of all road safety stakeholders.
- Substantially increased knowledge through research
- Co-operations industry – governments – academia
- Support by offers, e.g tax incentives, insurance premium discounts and consumer information in order to have rapid penetration of new advanced safety systems.



To Reach the Visions we need -

**Co-operation between different stakeholders:**

- Vehicle manufacturers
- Governments/ authorities
- Standardization organizations
- Interest organizations
- Researchers

# Co-operation Between Different Stakeholders:

- Shared view on the strategies forward
- Agreements on division of responsibilities
- Shared view on interfaces between car safety systems and infrastructure
- Data sharing
- Standards for interfaces and communication systems

# Division of Responsibilities

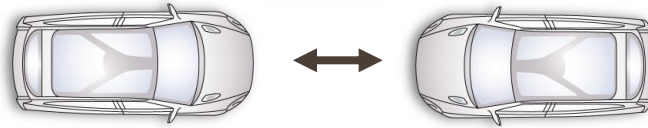
**Car manufacturers, governments and local authorities need a common view on the division of responsibilities.**





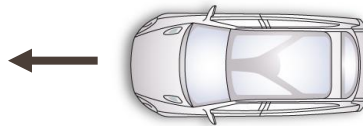
# Division of Responsibilities/ Boundary Conditions

80



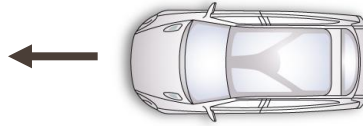
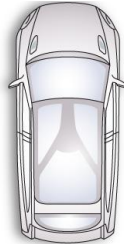
Head-on

40



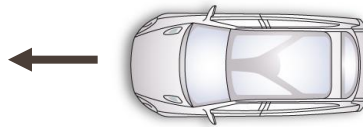
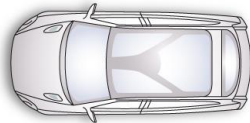
Pedestrians

70



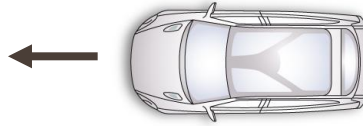
Side

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Rear-end

110



Large animals

# Division of Responsibilities/ Boundary Conditions

Example: traffic separation for avoiding head-on collisions > 80 km/h

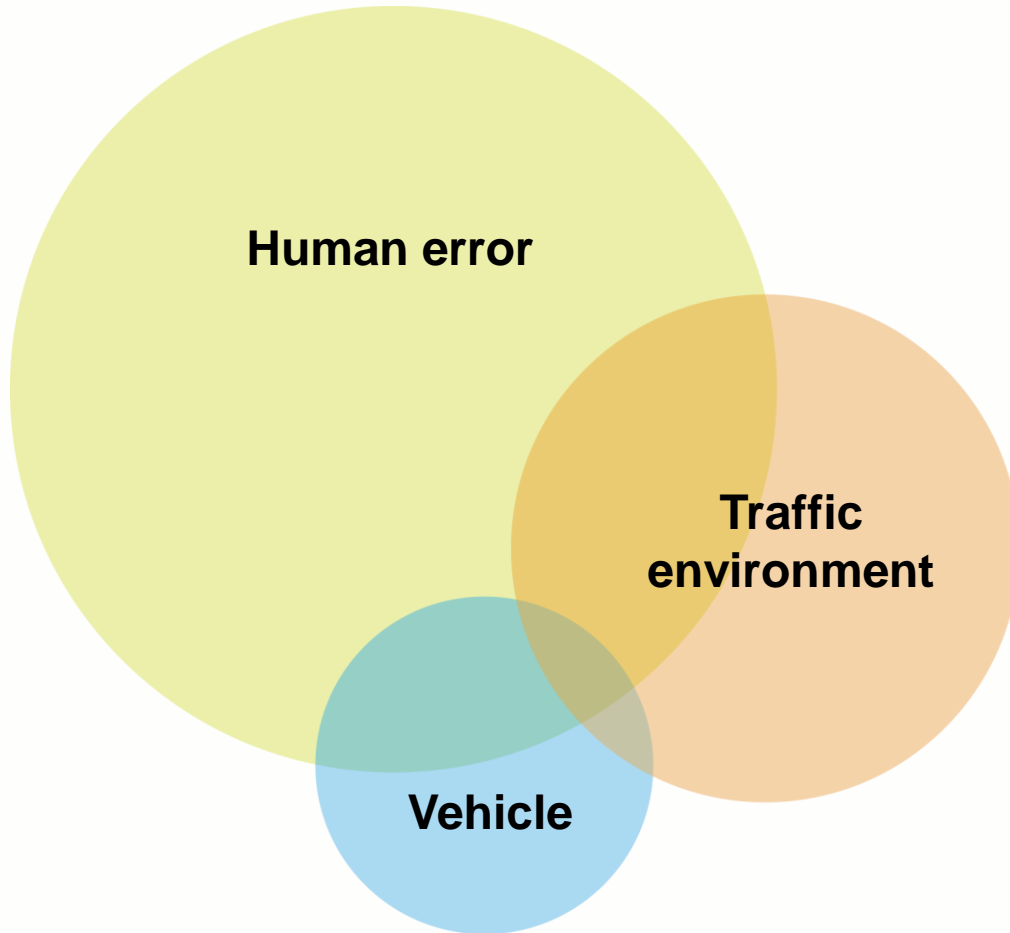


**< 80 km/h**



**+ 80 km/h**

# What Causes Accidents?



## **The four D's:**

Distraction

Drowsiness

Driving while intoxicated

Driver capabilities

Source: Virginia Transportation Institute

**“Any system which depends on human reliability is unreliable.”**




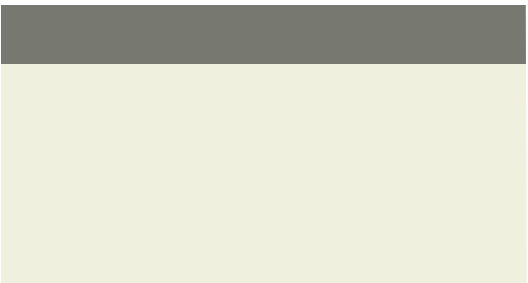

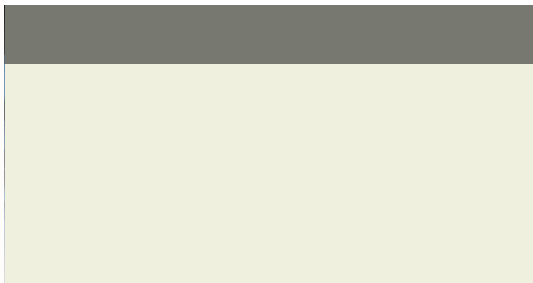
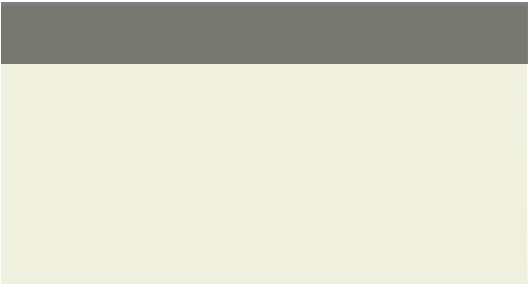
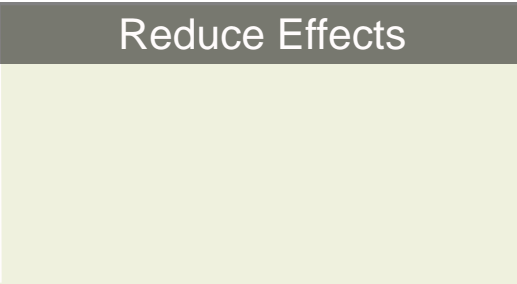

Gilb's Second Law of Unreliability



'When setting the targets for the drive towards zero injuries and fatalities, no condition for further restriction of the access to the the transportation sector will be acceptable'



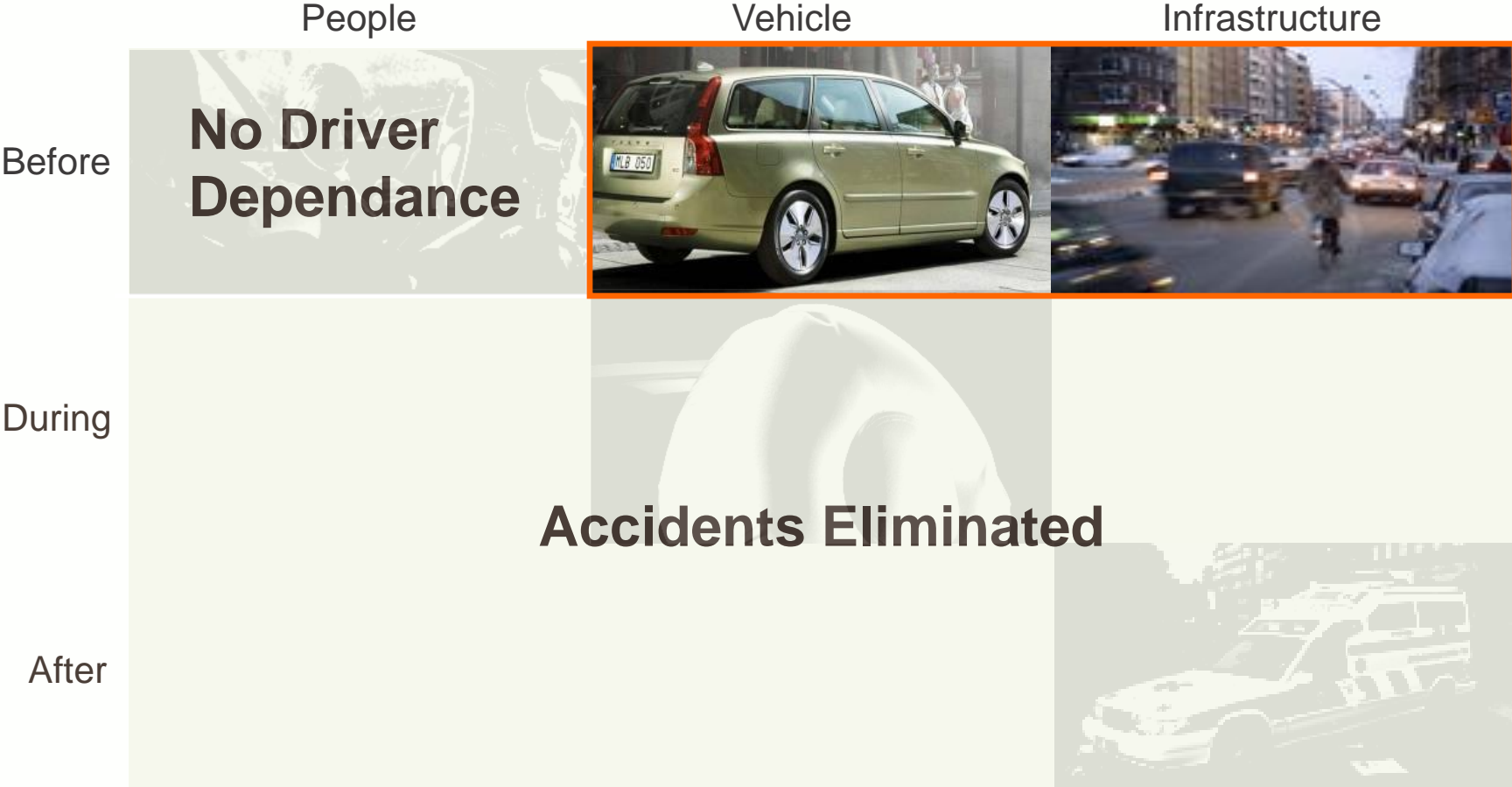
# The Haddon Matrix

|        | People   | Vehicle  | Infrastructure   |
|--------|--|--|--|
| Before |   | <b>Avoiding Accidents</b><br>    |   |
| During |   | <b>Protect from Injuries</b><br> |   |
| After  |  | <b>Reduce Effects</b><br>       |  |

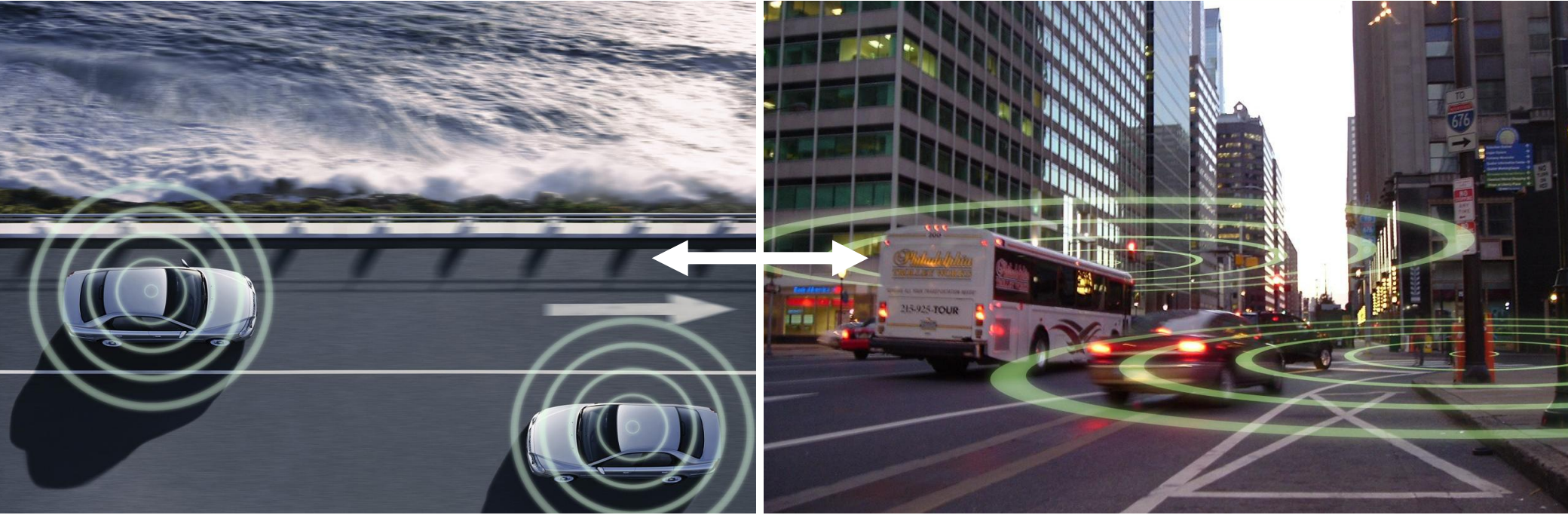
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# The Haddon Matrix in the Future



# To Reach the Visions We depend upon -



Vehicle to vehicle and vehicle to infrastructure communication





# Important First Steps towards Zero Injuries and Fatalities:

Actions for:

## **Speed management**

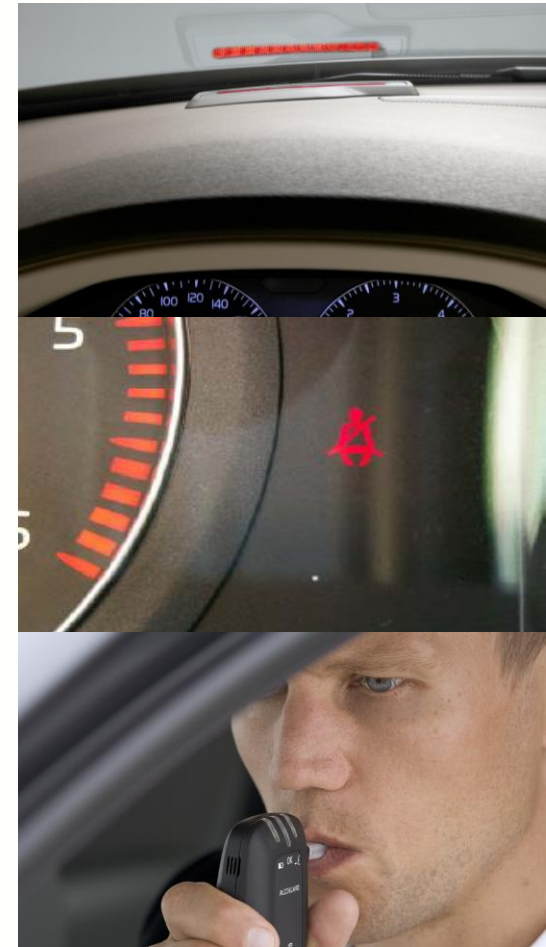
- Intelligent speed adaptation
- Support systems for assisting drivers

## **Increased belt usage**

- Belt reminders

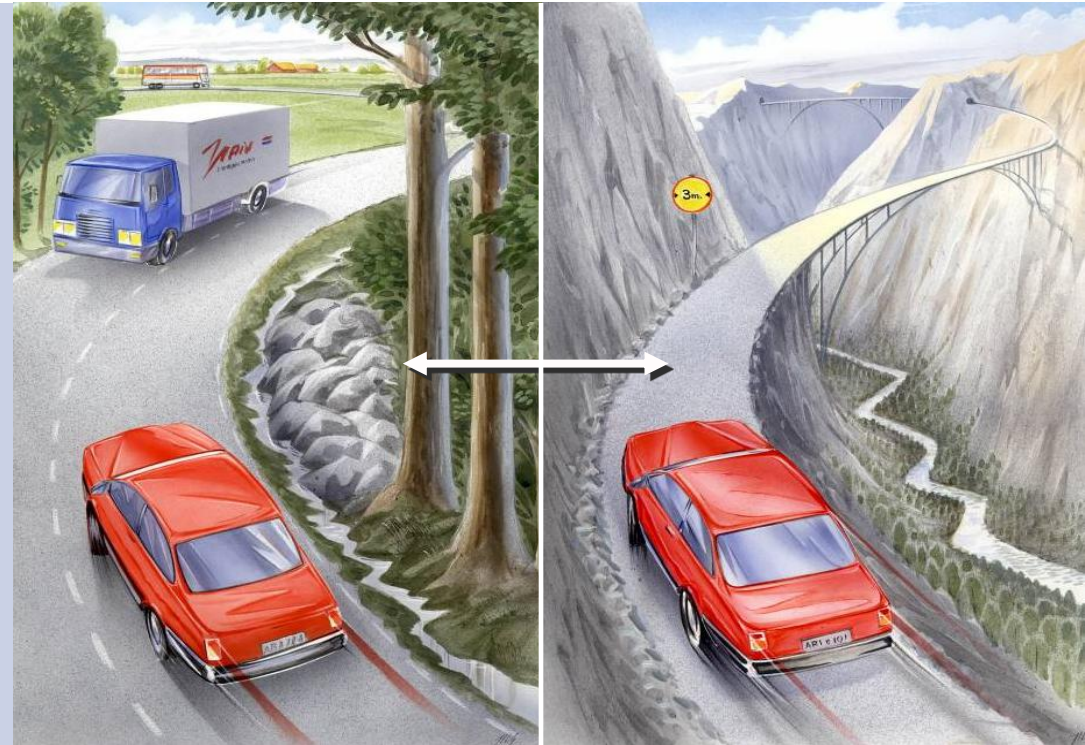
## **Preventing Driving While Intoxicated**

- Alcohol interlocks



# Speed Management

- Kinetic energy (speed) is the problem!  
People are blind to kinetic energy!
- Humans have not been programmed to understand risk with speed.



# Speed Management

## Requirements for speed limitation of vehicles

### Advantages:

- Reduced weights
- Reduced rating of tires
- Reduced engine performance

### Technologies exist

- Youth/ Restricted key 'Cinderella key'
- Programmable speed
- Intelligent Speed Adaptation ISA
- Speed Sign Recognition systems



# Increased Seat Belt use

In August 2009, 50 year anniversary  
of factory installed 3-p belt

Continues to be the single most efficient  
safety device

Substantially improved over the years:

- Pre-tensioners
- Load limiters
- Improved comfort and convenience

Belt reminders efficient to convince  
occupants of buckling up



# Preventing Driving While Intoxicated

- Alcohol related fatalities represent one third to 40% of all road traffic fatalities.
- Technologies are being developed for restricting DWI
- Goal: Systems that are:
  - Totally transparent
  - Reliable
  - With long calibration intervals
  - Inexpensive
  - Comfortable

