Traffic Safety in Sweden

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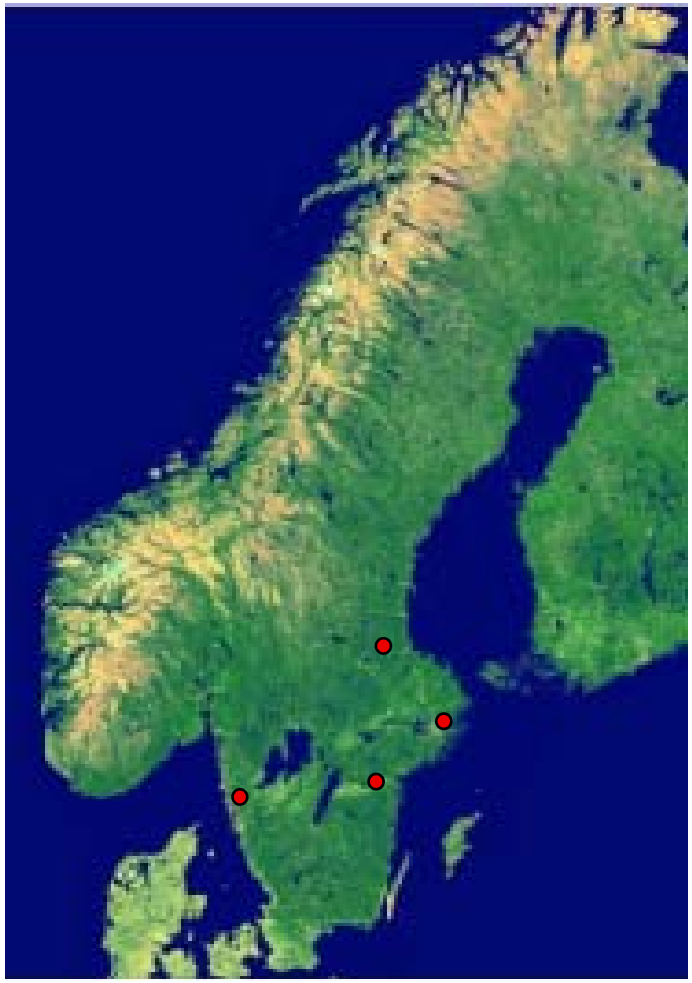
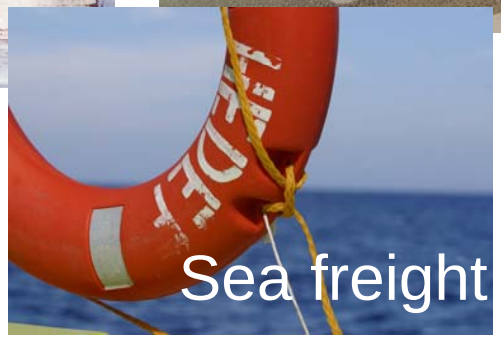


Swedish National Road and Transport Research Institute

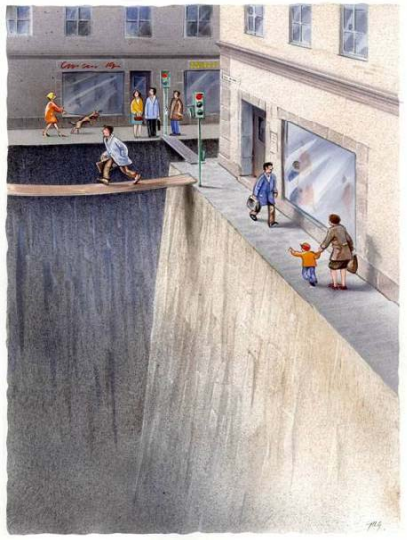
- Independent research institute
- 4 offices in Sweden
- 180 employees

Research Areas

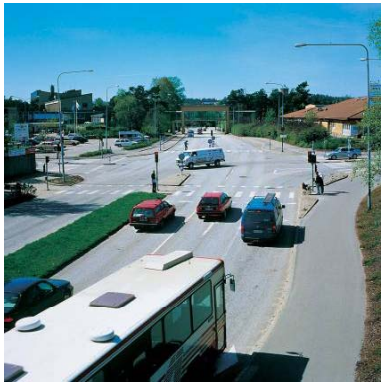


Content

- Traffic safety
- Vision Zero
- Some examples



The road transport system: an open and complex system



How is the system controlled?

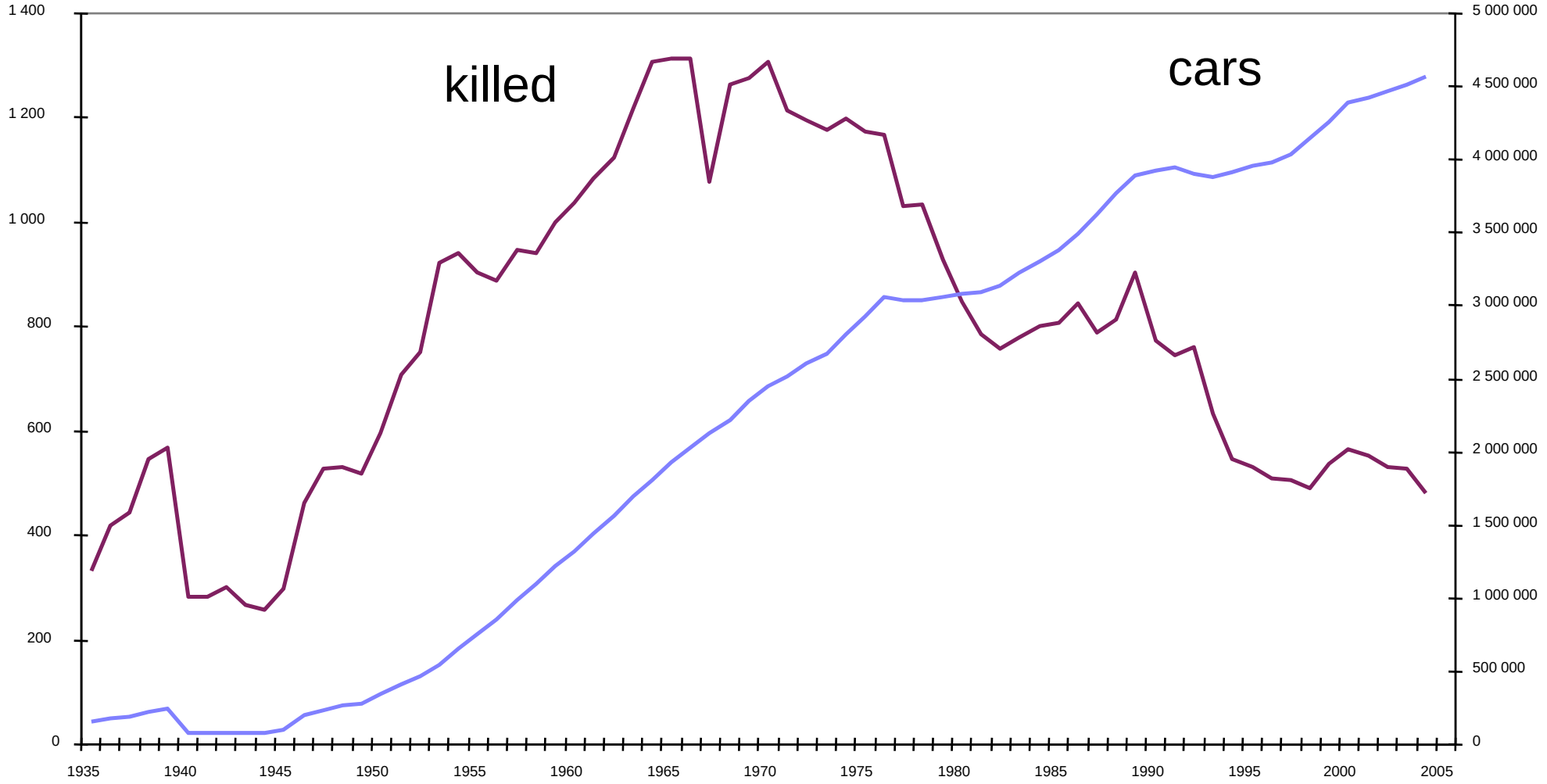
- Rules and regulations mainly controlling the users

What is the effect?

- More than 1,2 million fatalities (UN/WHO)
- Around 40 000 fatalities in EU

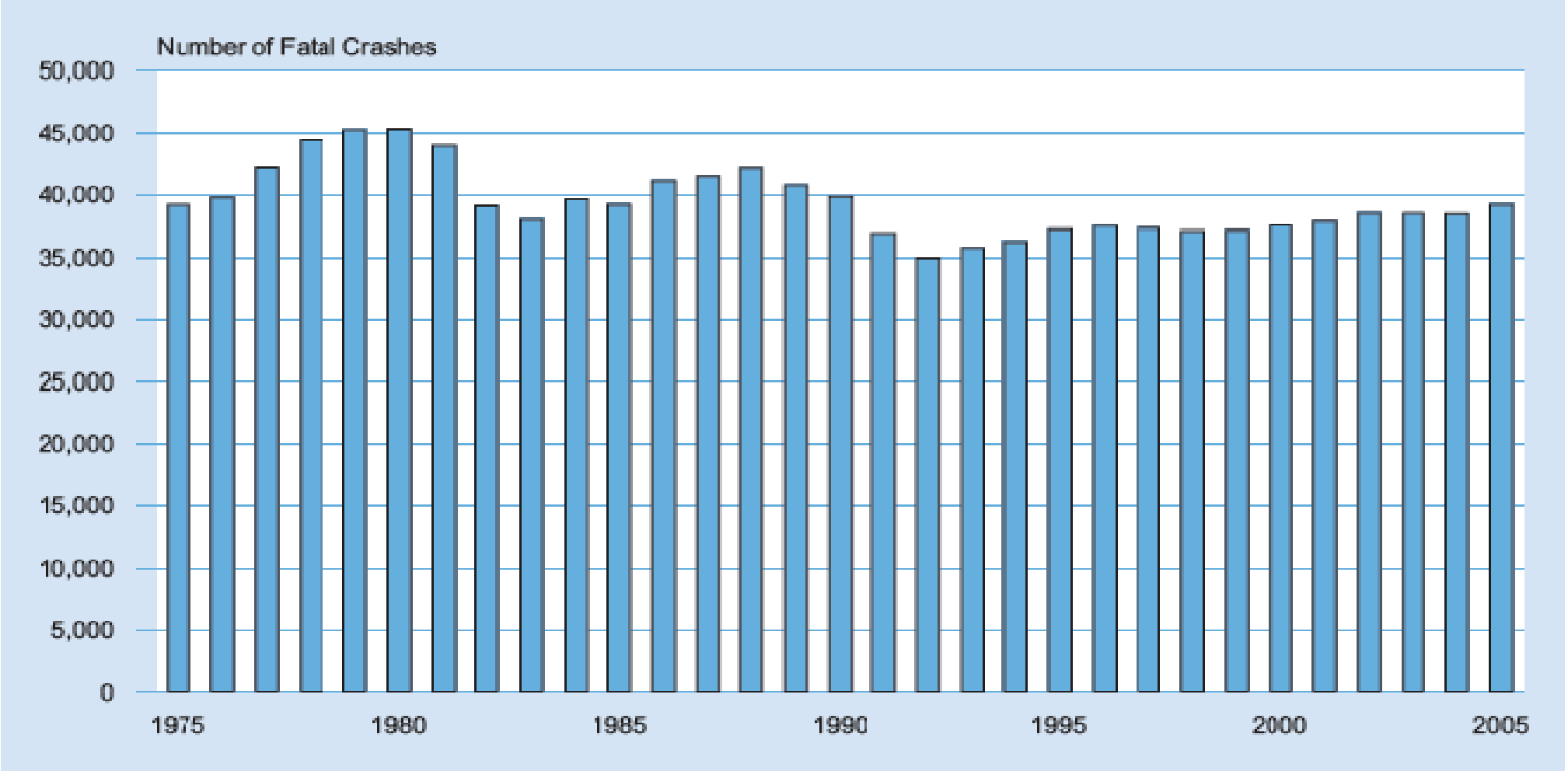
Development of fatalities in Sweden

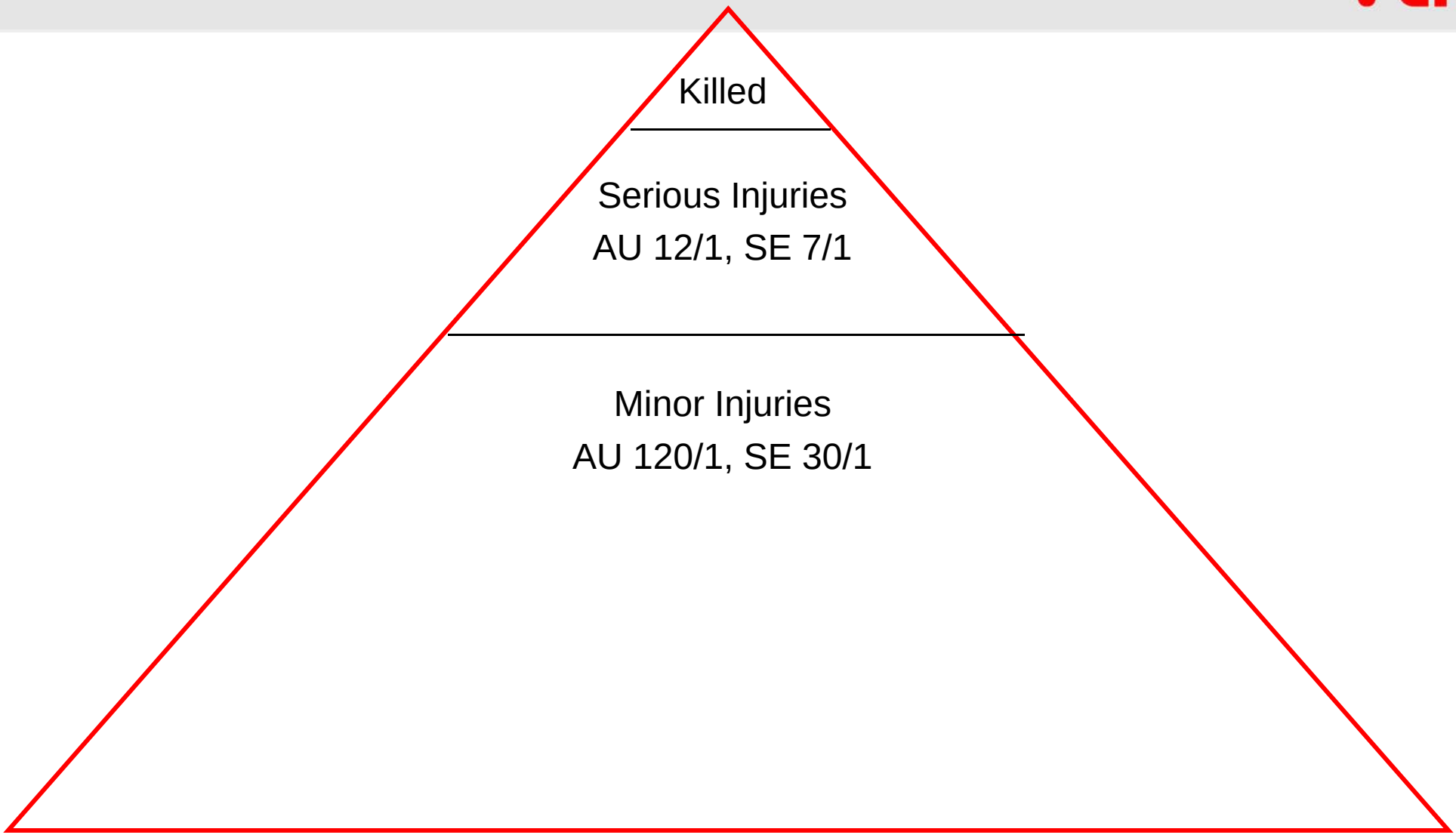
(440 in 2005) 4,9/100 000 inhabitants



Fatalities on USA Roads (1975-2005)

Fatal Crashes, 1975-2005





Source: Road Crash Costs in Australia 1999, Report 102, Bureau of Transport Economics (Insurance data) and Road Traffic Injuries in Sweden 1999, Statistiska Centralbyrån (police reports)

The current road transport system

- Major mismatch between components of the system
- Trade-off between health and benefits allowed
- Unclear responsibilities
- Unclear safety philosophy
- Weak driving forces for change

VISION ZERO : A SAFE TRAFFIC CONCEPT

History

- On October 9, 1997 the Road Traffic Safety Bill founded on "Vision Zero" was passed by a large majority in the Swedish Parliament. This represents an entirely new way of thinking with respect to road traffic safety.

Goal

- The long term goal is that no-one shall be killed or seriously injured within the Swedish road transport system.

Vision Zero forms a basis

1. Vision for many stakeholders
2. Ethical platform (right to survive)
3. Shared responsibility
4. Safety philosophy (failing human)
5. Driving forces for change

Shared vision

Car/
Industry

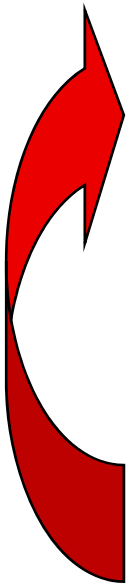
Road/
Govern-
mental
Agencies

Road User/
Society

Shared responsibility

- Historically main responsibility on the road user
- In Vision Zero the responsibility is shared between road users and system designers

System designers are responsible for the design, operation and the use of the road transport system and are thereby responsible for the level of safety within the entire system.



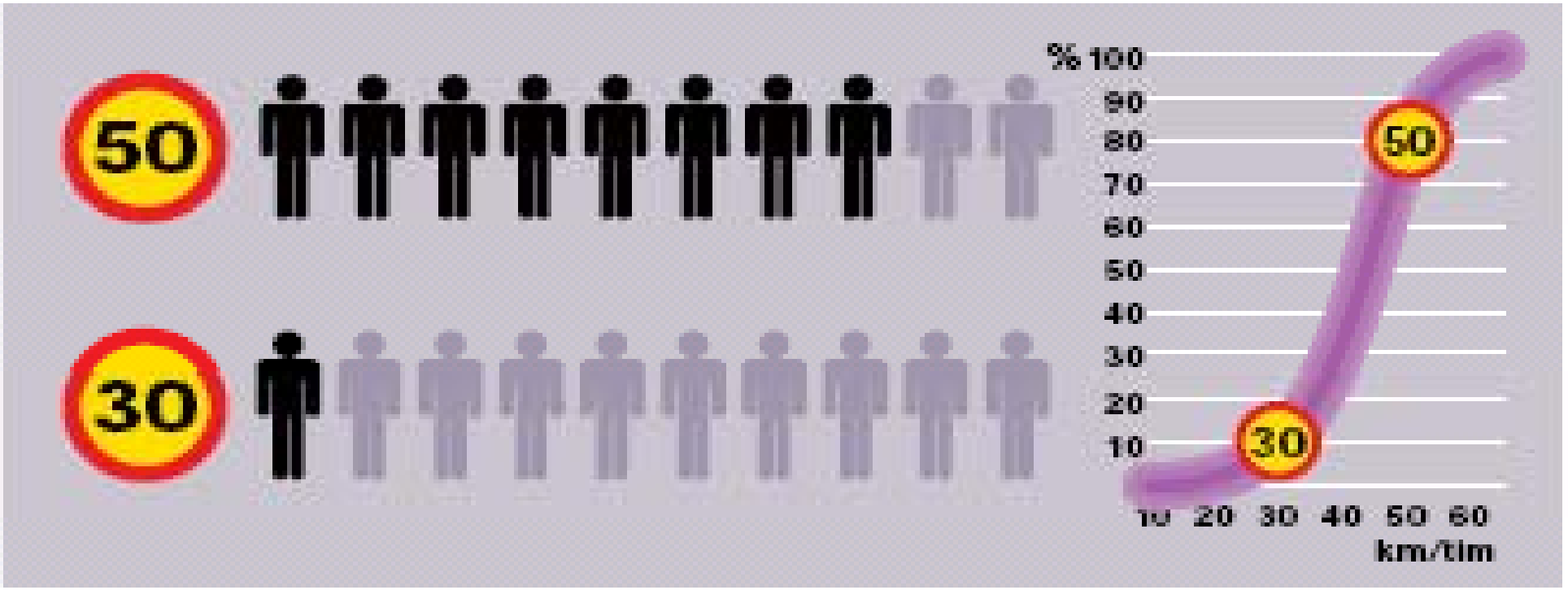
Road users are responsible for following the rules for using the road transport system set by the system designers.

If the users fail to comply with these rules due to a lack of knowledge, acceptance or ability, the system designers are required to take the necessary further steps to counteract people being killed or injured.

Safety philosophy

- Inspiration from other areas (i.e. occupational health and safety)
- People make errors, mistakes and misjudgements
- There are biomechanical tolerance limits
- The chain of events can be cut at many places
- Focus on injuries not crashes

Percentage pedestrian killed at impact velocities



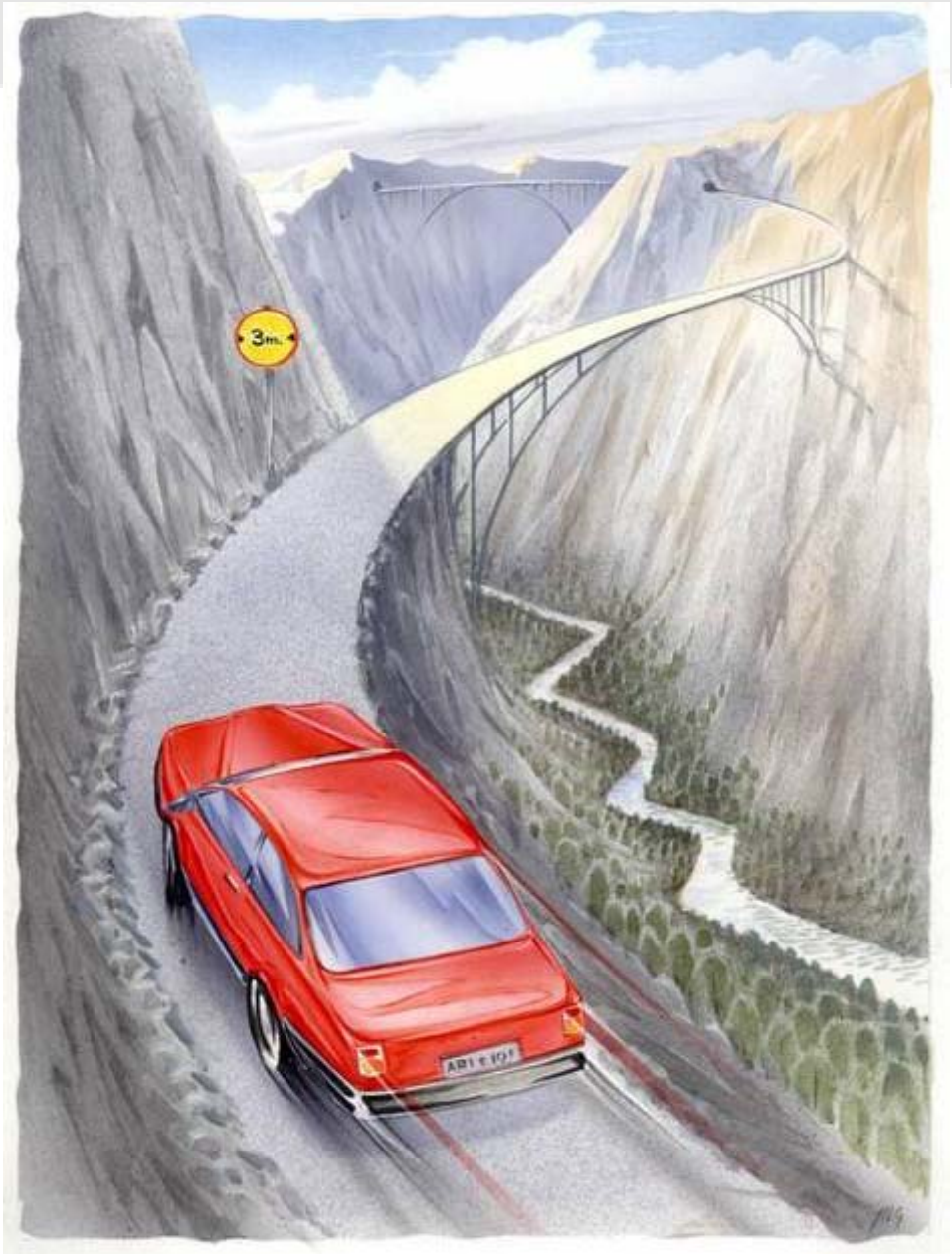
Threats, Velocity and Height

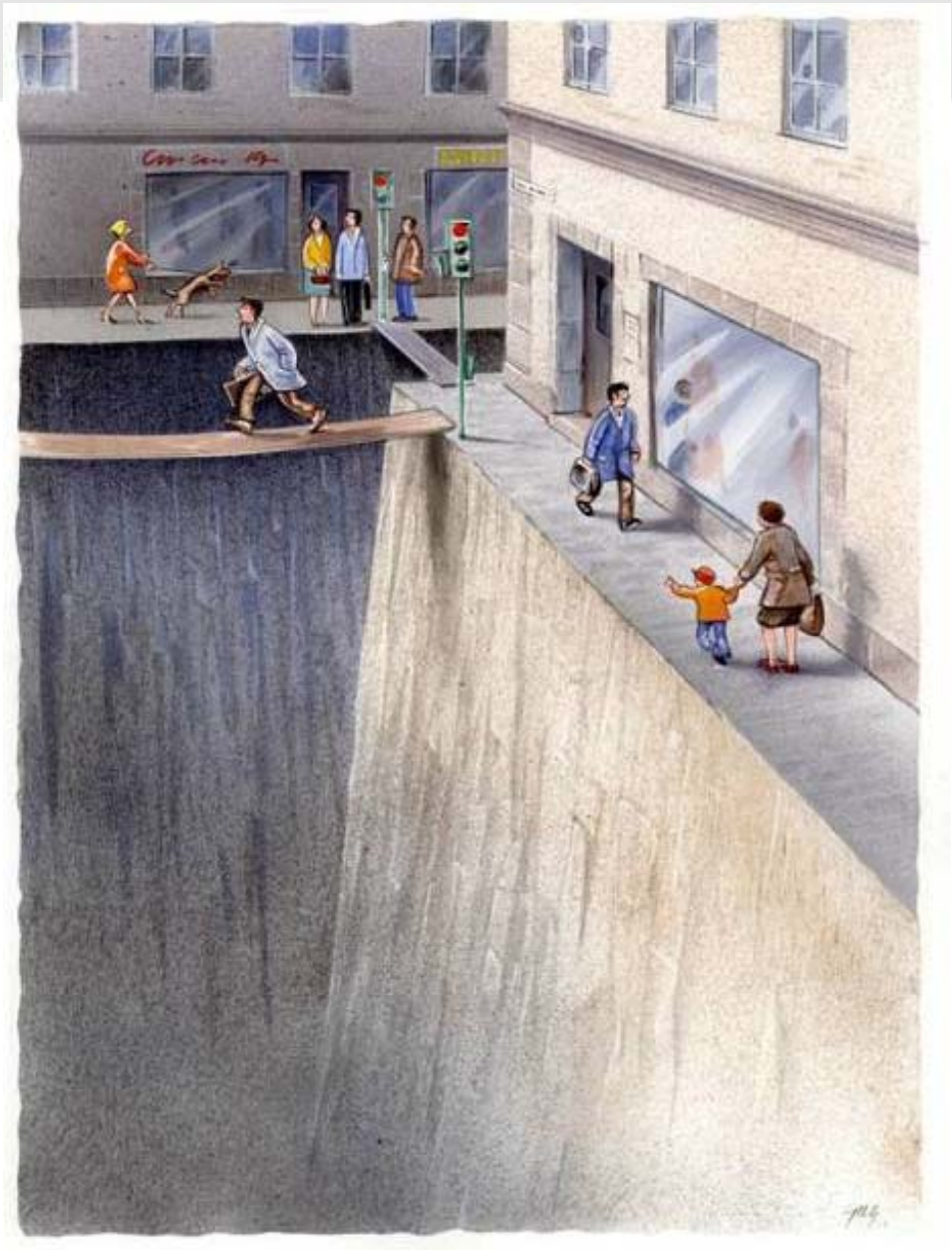
We show a lack of ability to feel the risks in the traffic systems.

We can understand that a frontal collision in high velocities is a sever event but we do not experience it as a threat.

Humans has a natural respect towards heights. If the kinetic energy is represented into potential energy the experience changes.

Kinetic energy	Potential energy
30 km/h	3.5 m
60 km/h	14 m
90 km/h	32 m


3m



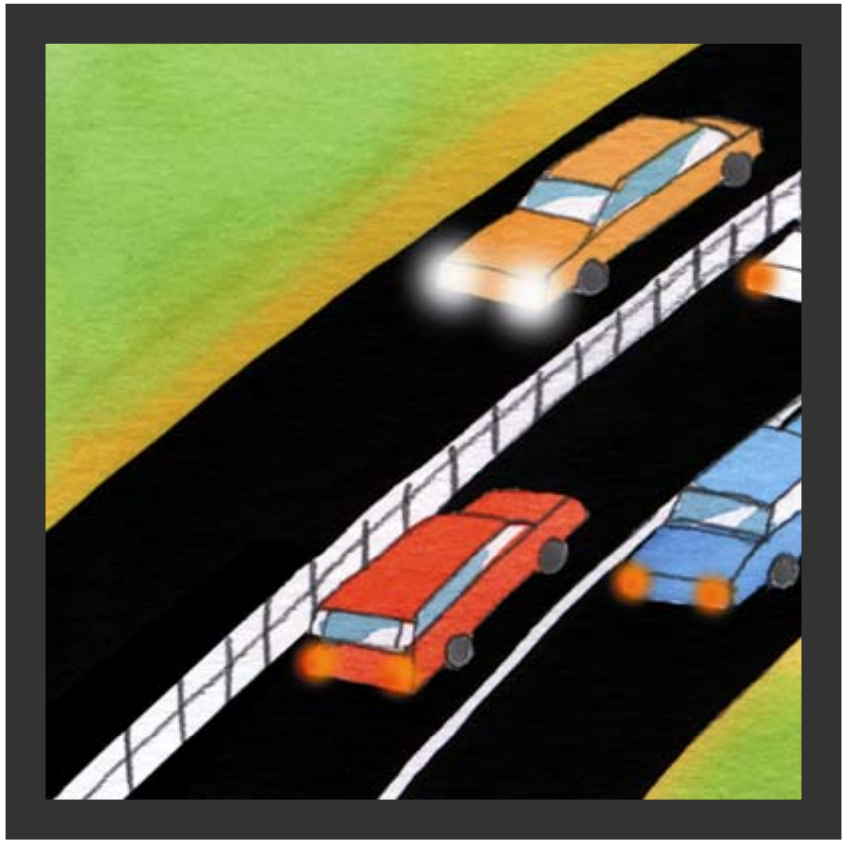
So what has happened?

Some examples!

ROUNDABOUTS

Intersection with problems
Focus on crashes results in signals
Focus on injuries results in roundabouts

CENTRE GUARD RAILS



On existing 13m wide roads
0 km 1997, 1760 km 2007

SAFE ROADSIDE AREAS

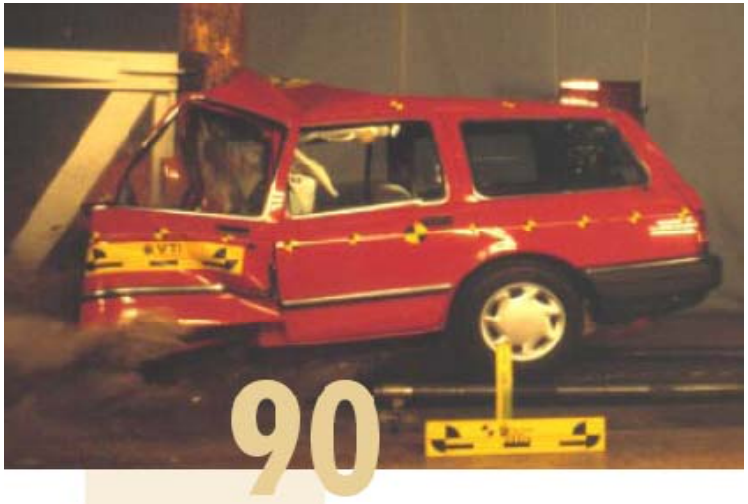
Design for people leaving the road

RIGHT SPEED

Vehicles, roads and speeds must match

Speed limit, road design and car design goes hand in hand

- Crash test 90km/h into tree



- Crash test 90km/h into guard rail

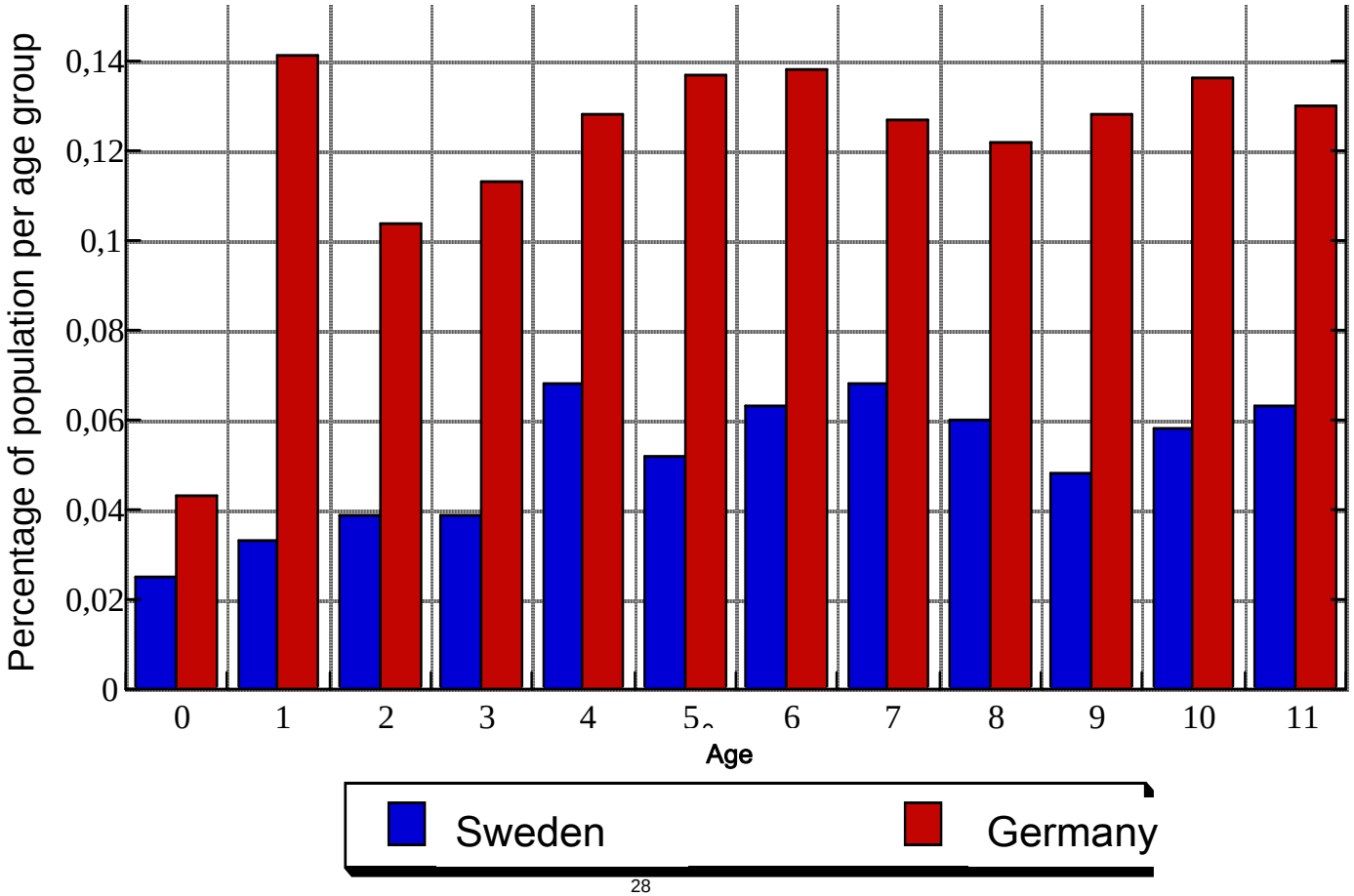
COLLISION FOR SAFETY (Euro NCAP)

Get everyone up to best practice by telling the public about safety differences
Seat belt usage (driver): 88.3 % 1997, 96 % in 2007
Bicycle helmet usage: 16.1 % 1997, 27 % in 2007

Rearward facing child seat

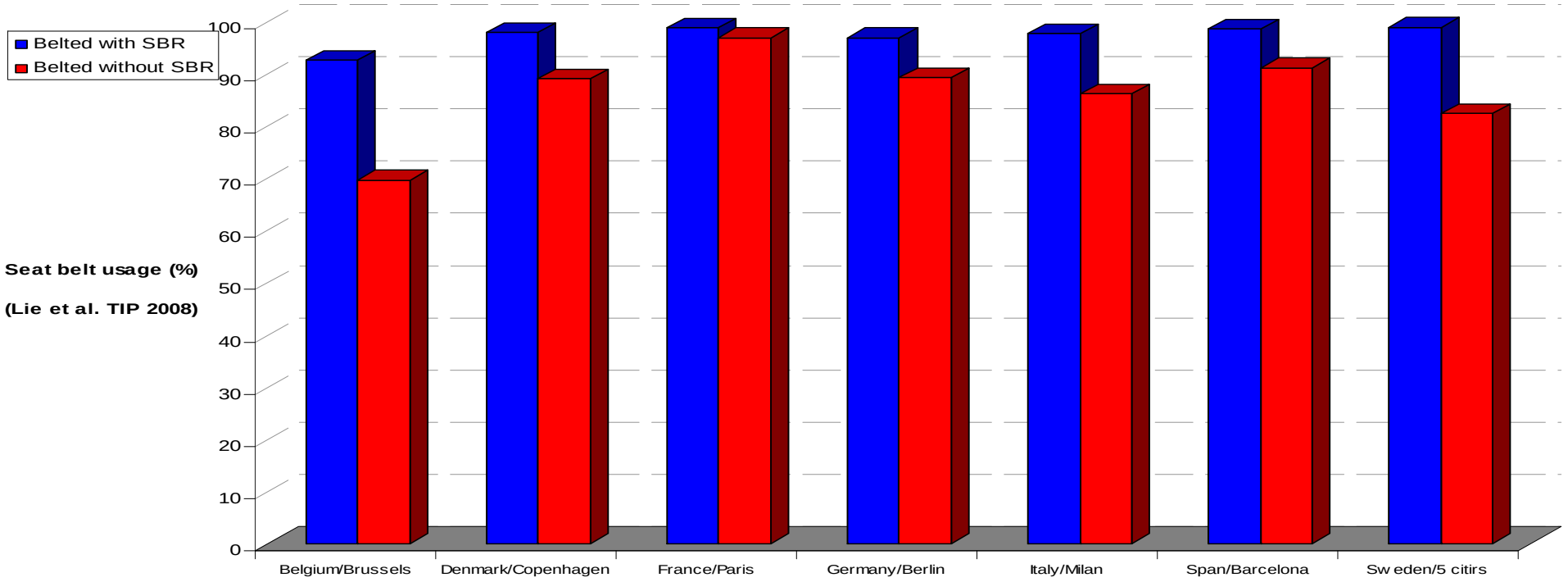
From 4 months to 4-5 years

The number of injured children in Sweden and Germany



Penetration of new technologies

- Electronic Stability Control (ESC) from 15 % to 90 % in 36 months (now 94%)
- Emergency Brake Assist (EBA) from 0 to almost 100% in 48 months
- Intelligent Seat Belt Reminders (SBR) from 0 to 80% in 48 months



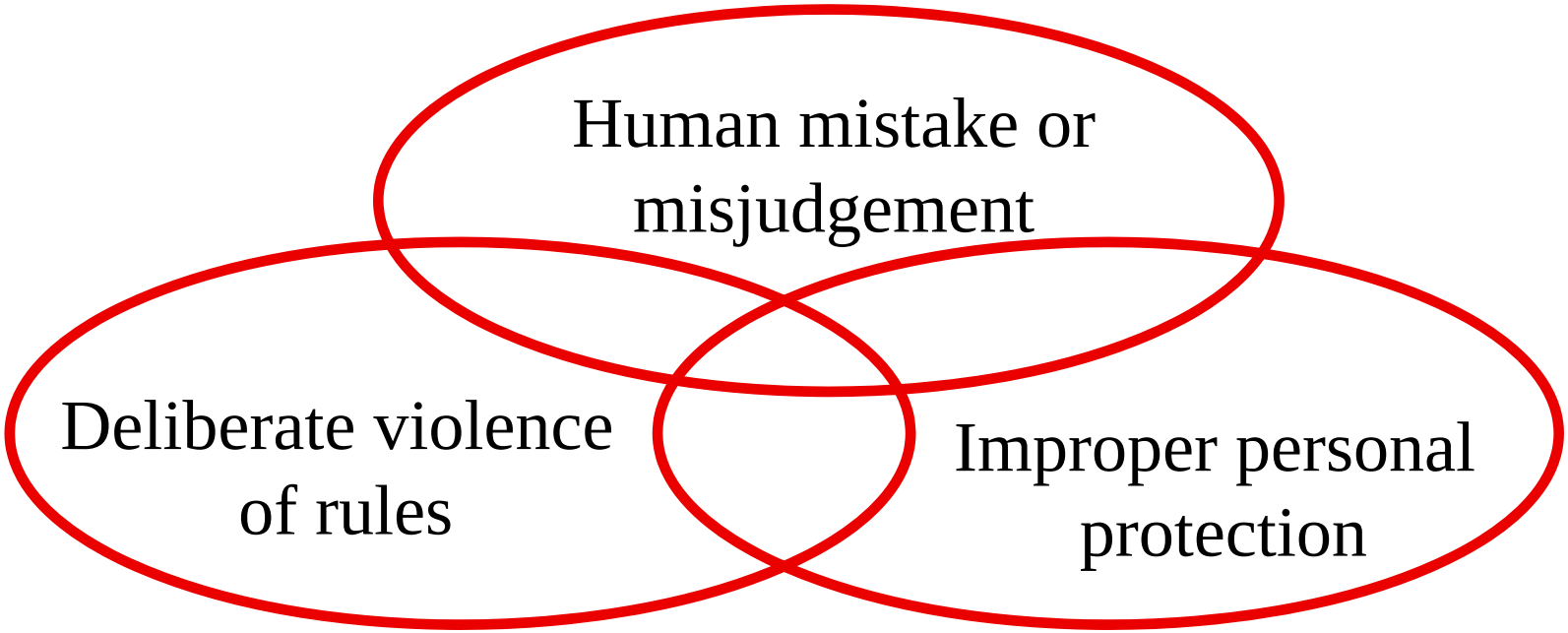
TRAVEL POLICY IN COMPANIES

Everyone company has a responsibility to assure safety

Occupational health and safety

Every company having personnel out in the road transport system is responsible for the safety of the employees

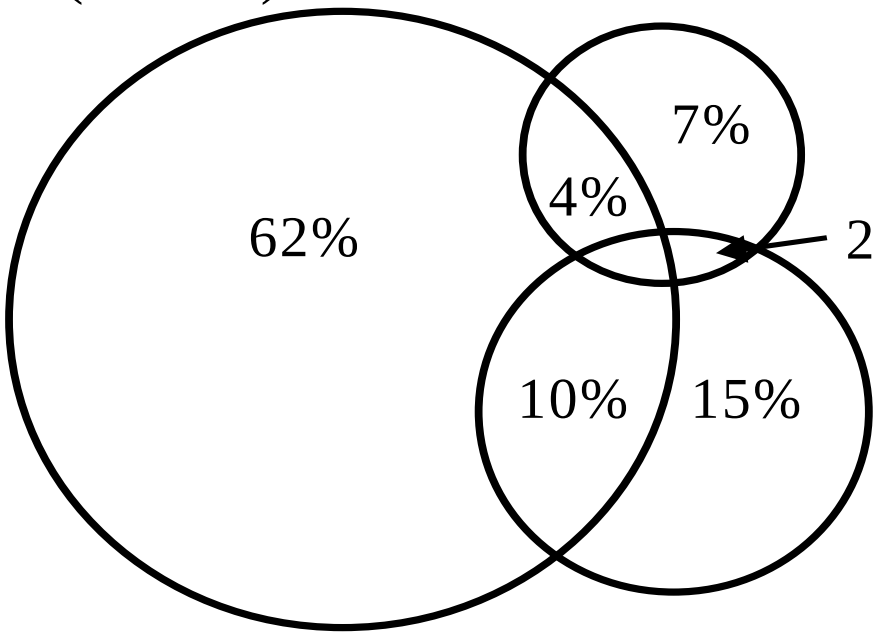
FOLLOW UP


Human mistake or misjudgement
Deliberate violence of rules
Improper personal protection

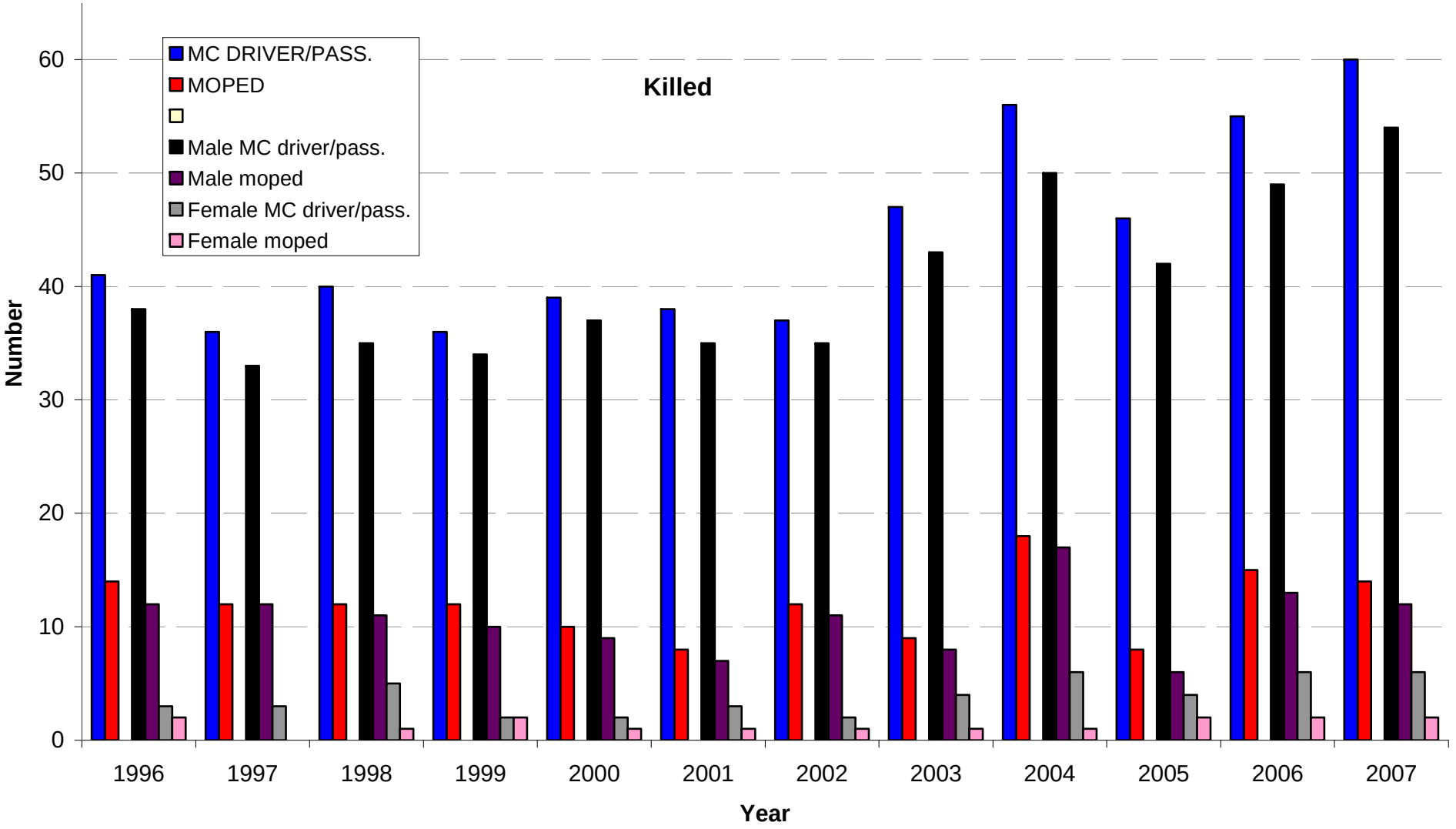
Classification of fatal crashes Sweden 1998/1999

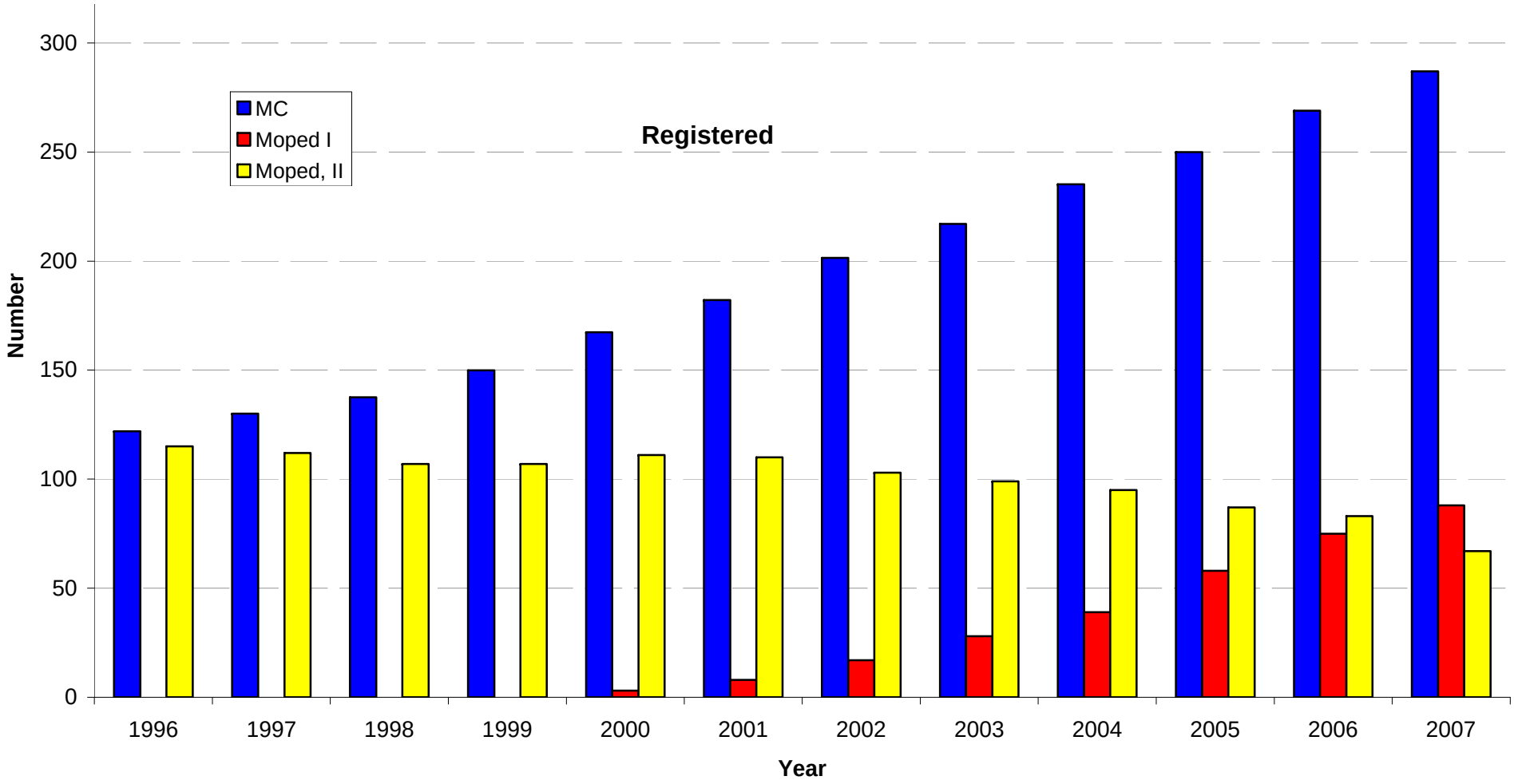
Mistake leading to fatal crash forces related to road design and speed limit (n=637)

Severe deliberate violence of rules leading to fatal crash forces (n=111)



Lack of personal safety equipment has resulted in fatal crash forces (n=218)


Killed
MC DRIVER/PASS.
MOPED
Male MC driver/pass.
Male moped
Female MC driver/pass.
Female moped
Number
0
10
20
30
40
50
60
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Year


Registered
MC
Moped I
Moped, II
Number
300
250
200
150
100
50
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Year

Thank you for your attention

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