

# **Vision Zero – Designing a Safe Transport System**

Roger Johansson  
International Secretariat  
Swedish Road Administration

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# 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.

# New approach to responsibilities

- Historically main responsibility on the road user (blame the victims approach)
- Vision Zero suggests a shared responsibility

## New approach to responsibilities (cont.)

- The designers of the system are always ultimately responsible for the design, operations and 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 road-users fail to obey these rules due to a lack of knowledge, acceptance or ability, or if injuries do occur, the system designers are required to take the necessary further steps to counteract people being killed and seriously injured



## Articles

1. Everyone has the right to use roads and streets without threats to life or health
2. Everyone has the right to safe and sustainable mobility: safety and sustainability in road transport should complement each other
3. Everyone has the right to use the road transport system without unintentionally imposing any threats to life or health on others



## Articles

4. Everyone has the right to information about safety problems and the level of safety of any component, product, action or service within the road transport system
5. Everyone has the right to expect systematic and continuous improvement in safety: any stakeholder within the road transport system has the obligation to undertake corrective actions following the detection of any safety hazard that can be reduced or removed.

# Road users have the right to know about the safety of cars and roads

examples

NCAP for vehicles

([www.euroncap.com](http://www.euroncap.com))

EuroRAP for infrastructure/  
speed limit (<http://217.174.251.13/>)

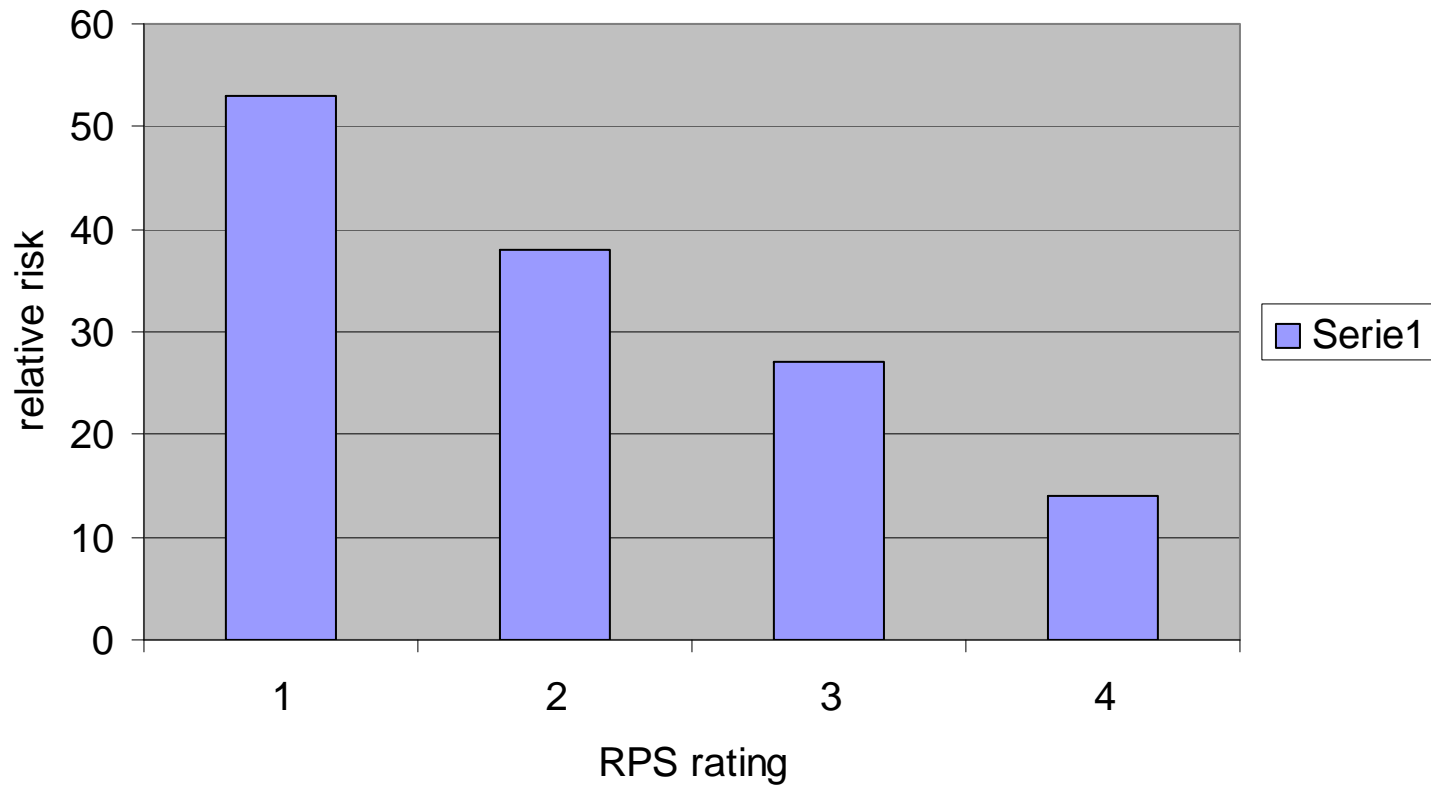


# Ncap results:

- Every “star” reduces injury risk with 12%
- The presence of a Seat Belt Reminder (SBR) increases seat belt use to more than 99% (dec07 new cars sold in Sweden have SBR in 80%)
- Electronic Stability Control (ESC) reduces crash involvement by 20 – 40% (dec07 96% of new cars in Sweden have ESC)



Relative risk of fatality and severe injury for 1 to 4  
star rated roads (RPS) in Sweden



# **ISO have decided to develop a Road Traffic Safety Management System Standard**

**(ISO; International Standardisation Organisation, 152 member countries)**

- Compatible with ISO 9001 and ISO 14001
- Based on Vision Zero philosophy; focus on injury prevention, includes roads, vehicles and regulations
- 4 year process

# **New safety legislation in Sweden for road- and street administrations end of 2008**

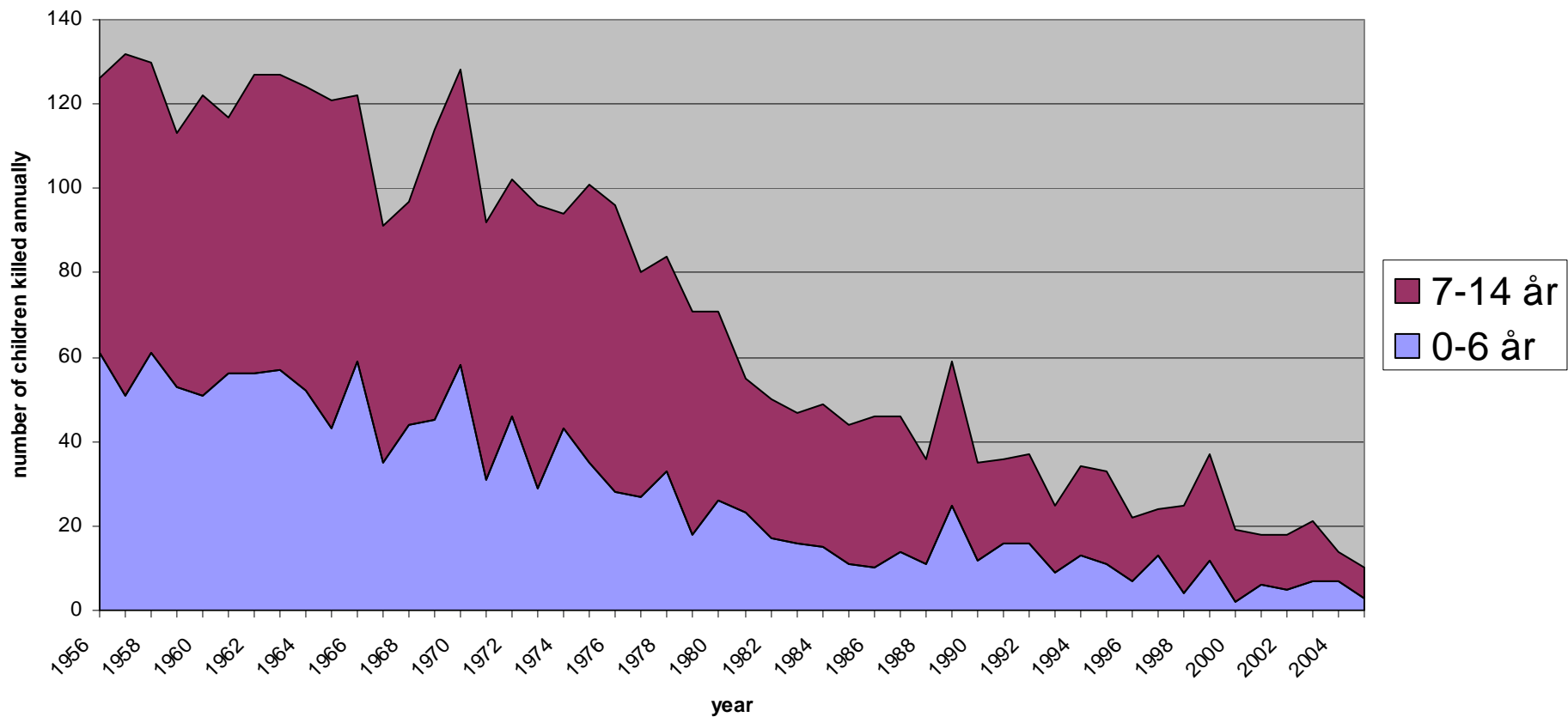
Demands that all road- and street adm. should have a plan for safety improvement of infrastructure

Audition of these plans by a dedicated administration

# Vision Zero safety results and future targets

- 15 years ago 6 killed/100.000 inhabitants/year
- 2006: 4.7 killed/100.000 inhabitants/year
- Future plans and strategies leading to less than 1 killed/100.000 inhabitants/year

## Children killed in traffic in Sweden 1956-2005



# Swedish Policy for Traffic Safety for Children

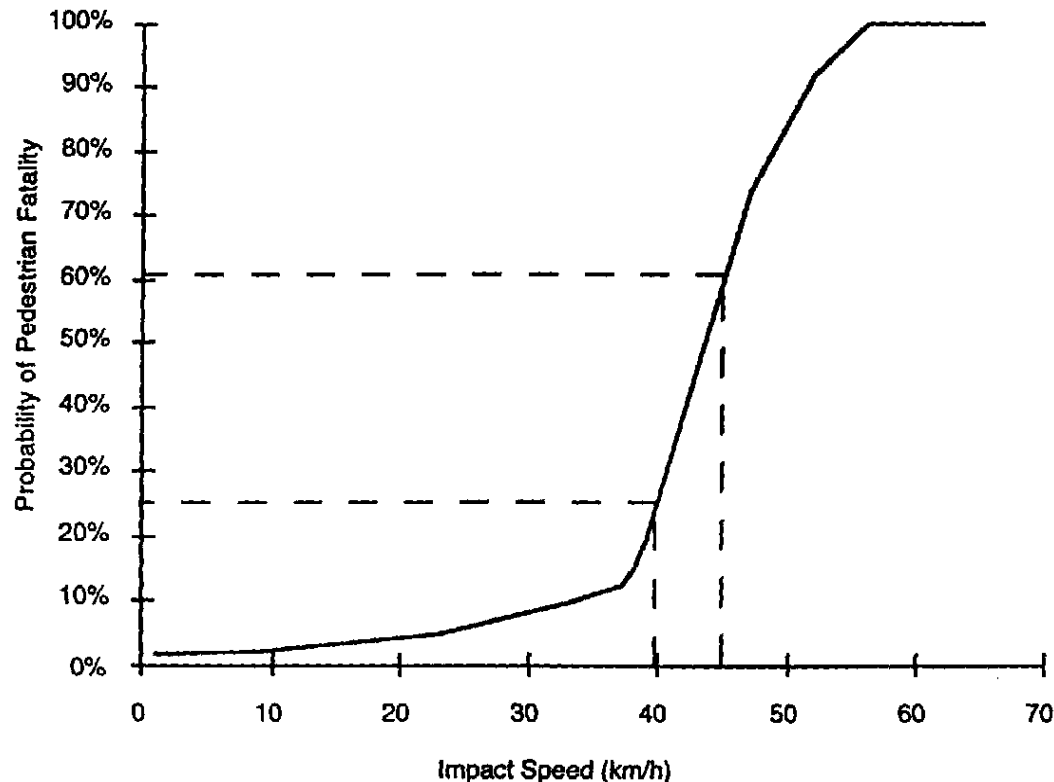
- The safety of children is not a question for the child – it is a question for parents and society
  - Education for parents, school staff, traffic engineers etc
  - Measures focussed on safe environment (bicycle lanes etc), bicycle helmets, child seats in cars, safe school busses (belts, alcohol interlock)
- Result of this strategy is a fatality rate of
  - Less than 1 killed/100.000 children/year (0-14)

# Vision Zero 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

# Probab. of pedestrian fatality as a function of impact speed

Figure 2: Probability of Pedestrian Fatality by Impact Speed.  
Derived from the Interdisciplinary Working Group for Accident Mechanics (1986) and Walz, Hoeffliger and Fehrmann (1983)

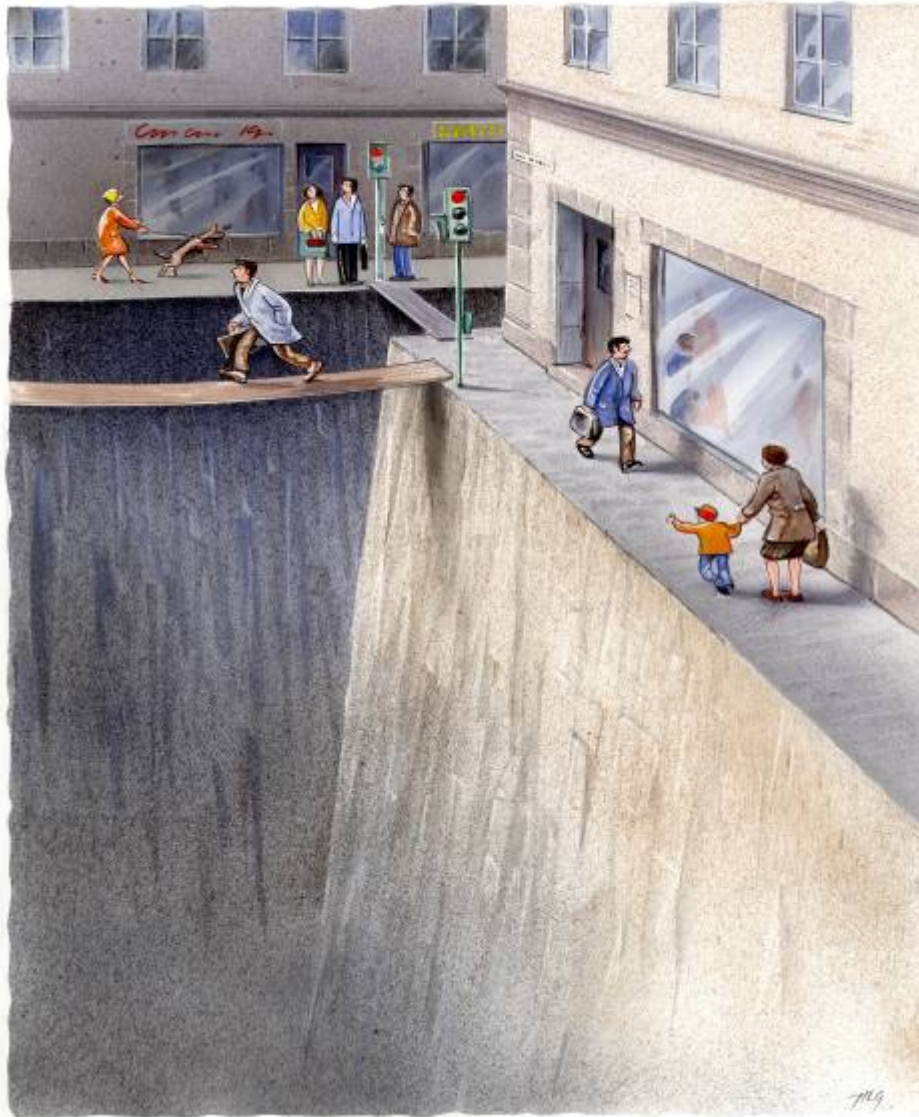




# Kinetic energy

- But – people are blind to kinetic energy!
- That's why you can't put all responsibility on the road user

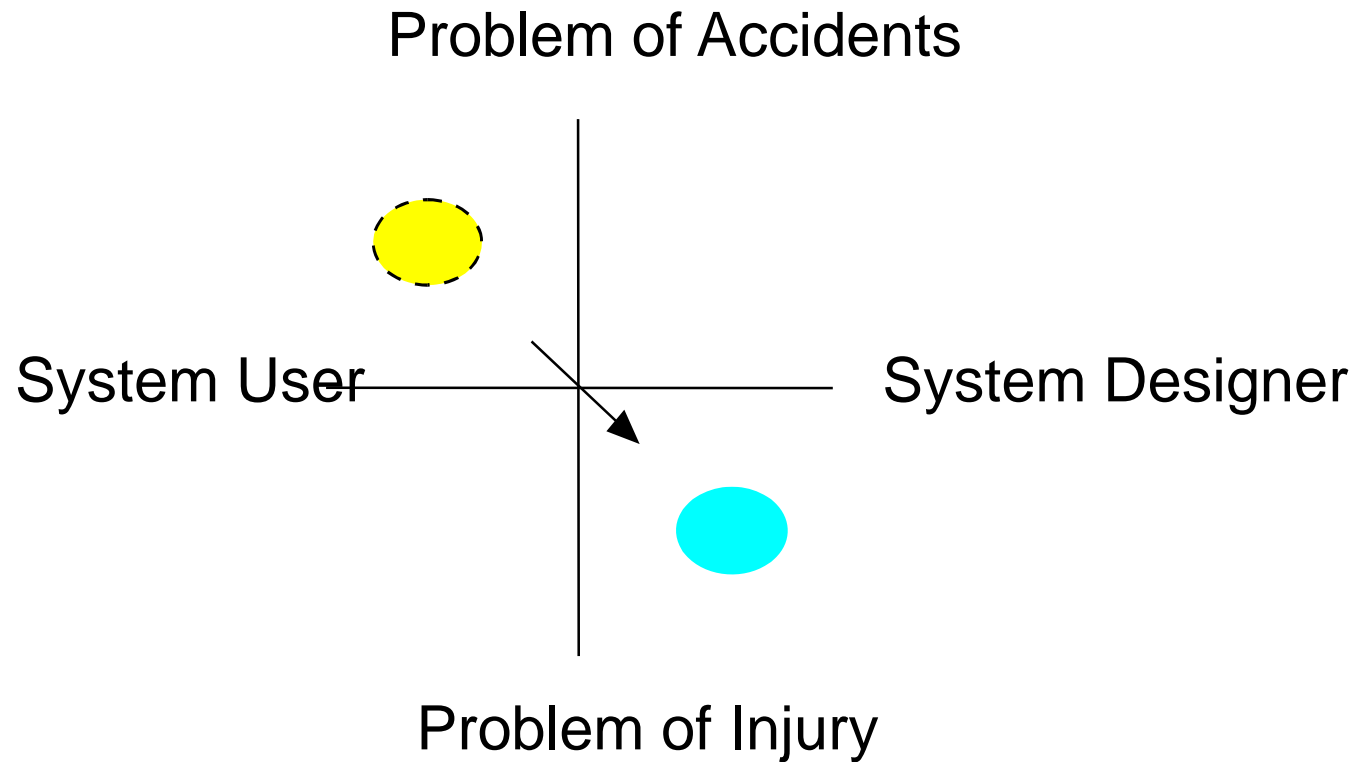












# Traditional safety philosophy for road design

- A safe road is said to be wide and straight
- These design characteristics is said to give drivers room for evasive manoeuvres and thereby avoiding accidents
- But - the traditional road design philosophy do not lead to less fatalities/km/year!











# Traditional safety philosophy (cont.)

When crashes occur in these environments the level of violence exceeds human tolerance

- thus - resulting in fatalities

# Vision Zero philosophy

- People make errors, mistakes and misjudgements
- Personal injuries is the problem - not accidents
- Human tolerance for biomechanical forces is the starting-point for design













Reduction in  
Motorcycle  
fatalities -83%

Typical view of Exclusive Motorcycle Lane

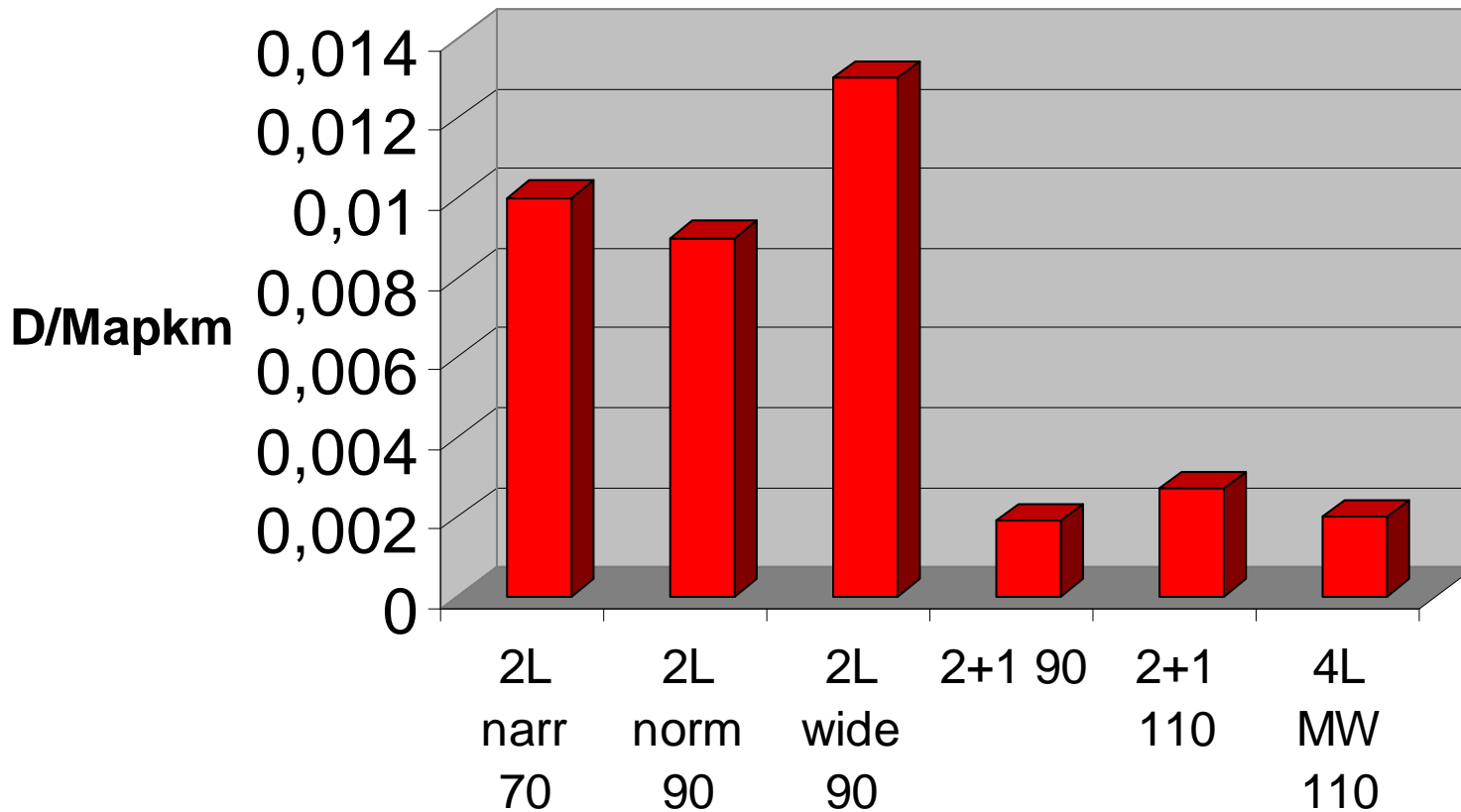


# 2+1 roads

- First built in 1998
- Now 1700 km
- Up to 90% reduction in fatalities
- Production cost 200-300 US\$/m
- Popular among road users



## Fatality rate







# Summary

- The key element is to increase system designer responsibility
- Make actors aware of differences in safety performance of components and systems
- Many different methods for doing this, depends on
  - Type of organisation (Private, Public etc)
  - Culture and traditions

# Thank you for listening!

- [roger.johansson@vv.se](mailto:roger.johansson@vv.se)
- [www.vv.se](http://www.vv.se)