

Vision Zero

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Vision Zero

- is the image of a future in which no one will be killed or seriously injured
- is the basis for the work conducted on road safety in Sweden, ratified by Parliament
- is both an attitude to life and a strategy for designing a safe road transport system



Vision Zero

- **Loss of human life in traffic is unacceptable**
- **Roads, streets and vehicles must be much more adapted to human capacity and tolerance**
- **Responsibility for safety is shared between those who design and those who use the road transport system**



International Breakthrough

- **Introduced in Sweden in 1995**
- **It can never be ethically acceptable people to be killed or seriously injured when moving within the road transport system**
- **Responsibility is attributed to all levels of decision making, designing and acting as well as the user**



Mistakes Should not be Punished by Death

- **Road transport system must be designed from the realization that people do make mistakes and that traffic accidents can therefore not be avoided completely**
- **Vision zero can accept that accidents occur, but not that they result in serious human injury**



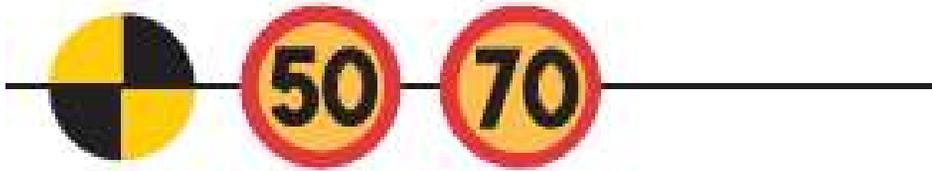
Adaptation to the Human Body

- **Human limitations are an important basis upon which to design the road transport system as well as vehicles**
- **Human biological tolerance against what the human body can stand must be taken into account**



Adaptation to the Human Body

- Limit values based on the design of modern vehicles and roads established scientifically



- A safe car protects occupants at speeds up to 65-70 km/h in a head-on collision and at speeds up to 45-50 km/h in a side impact collision, assuming of course that everyone is wearing a seat belt.



- Most people **survive** if they are hit by a car travelling at 30 km/h.



- Most people are **killed** if they are hit by a car travelling at 50 km/h.

Responsibility for Road Traffic Safety

- **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**



Responsibility for Road Traffic Safety

- **Road users are responsible for following the rules for using the road transport system set by the system designers**
 - **System designers primarily include road managers, the automotive industry, the police, politicians and legislative bodies**
 - **Responsible for road safety are others as well, namely; transport carriers, health services, the judicial system, schools and road safety organizations**



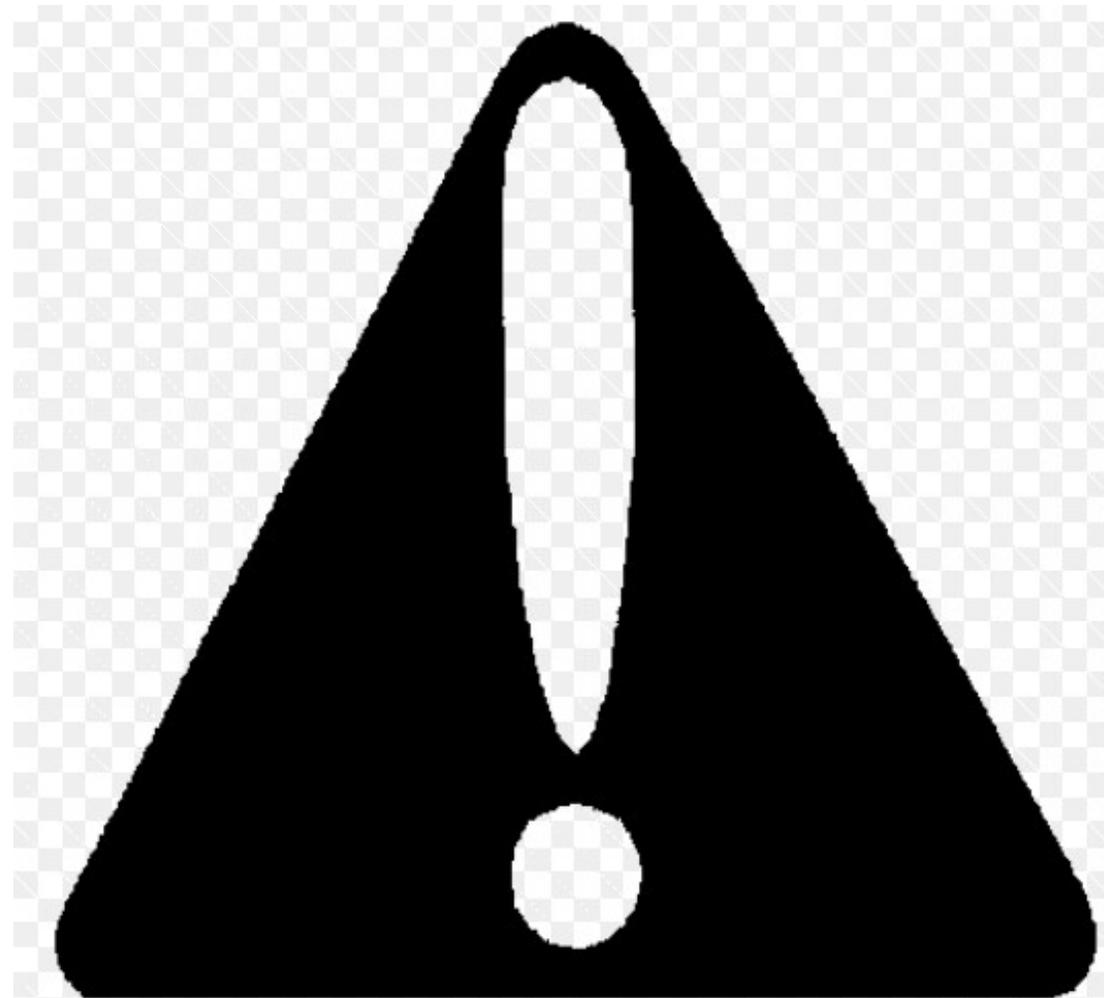
Responsibility for Road Traffic Safety

- **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**



Design Principles in Vision Zero

- **Prevent serious injuries**
- **Manage kinetic energy in crashes and collisions**
 - **kinetic energy kills and injures the road user, not the accident**
 - **an error tolerance can be built into the traffic system**
 - **Integrate compatible traffic elements and separate incompatible ones**



Kinetic Energy Management

- **Vulnerable road users should not be exposed to motorized vehicles at speeds exceeding 30 km/h**
- **If the above cannot be satisfied, separate or reduce the vehicle speed to 30 km/h**



Kinetic Energy Management

- **Car occupants should not be exposed to other motorized vehicles at speeds exceeding 50 km/h in 90° crossings**
- **If the above cannot be satisfied, separate, or reduce the angle, or reduce the speed to 50 km/h**



Kinetic Energy Management

- **Car occupants should not be exposed to oncoming traffic at speeds exceeding 70 km/h, or 50 km/h if oncoming vehicles are of considerably different weight**
- **If the above cannot be satisfied then separate, homogenize weights or reduce speeds to 70 (50) km/h**



Kinetic Energy Management

- **Car occupants should not be exposed to the road side at speeds exceeding 70 km/h, or 50 km/h if the road side contains trees or other narrow objects**
- **If the above cannot be satisfied separate or reduce speed to 70 (50) km/h**



Design Clarifications

- **A separation is always a physical separation (typically a barrier) and never a temporal one (e.g. traffic lights)**
- **Spatial separations could be tunnels, bridges or other crossings at different levels, crash barriers or barriers for pedestrians or different roads for different traffic elements**



Design Clarifications

- In areas with many vulnerable road users, the maximum speed is 30 km/h
 - Main characteristics: narrow lanes, speed bumps and vulnerable road users crossing the streets even in between crossings



Design Clarifications

- For driving speeds of 50 km/h lanes are still narrow, pedestrians and bicyclists do not cross between crossings due to mid-street pedestrian fences and speeds are reduced to 30 km/h where vulnerable road users cross



Design Clarifications

- **For all roads and streets with speeds higher than 50 km/h**
 - **drivers should expect barriers both to the right and to the left of their car**
 - **vulnerable road users are never mixed with cars**



Safer Road Environments

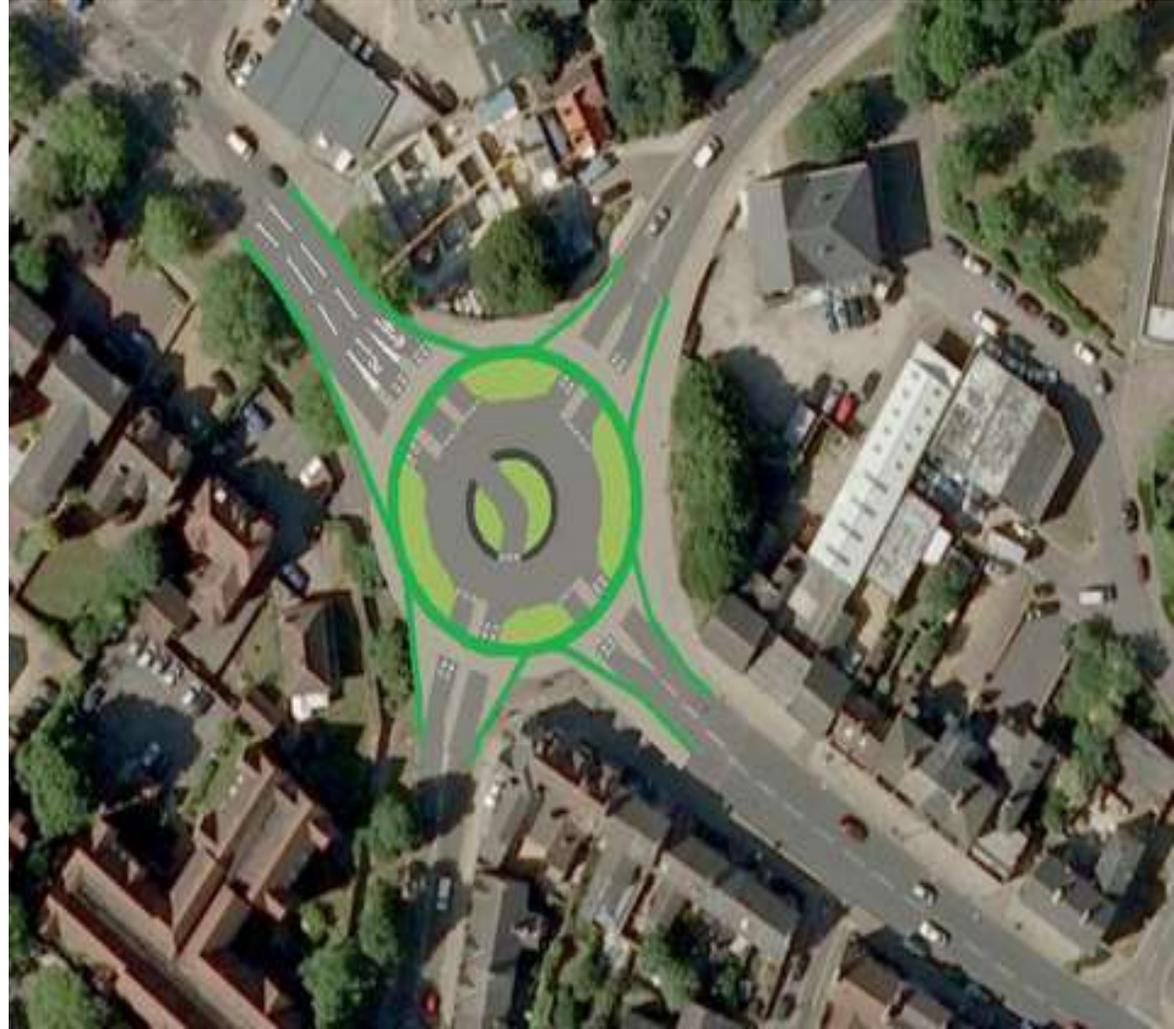
- Investments have been made to reduce the risk of serious human injury
- Municipal authorities have taken a major responsibility to improve safety from the basis of Vision Zero



Safer Road Environments

- **Roundabouts**

- **Common solution at intersections, particularly in populated areas**
- **Traffic calming effect**
- **If capacity is the problem, traffic lights are added**
- **The consequences of a collision are less severe than in a normal intersection**



Safer Road Environments

- **30km/h posted speed in built-up areas**
 - Implemented on a relatively large scale
 - Limit if pedestrians and cyclists are to survive a collision



Safer Road Environments

- **Speed limits**
 - road network review in order to ensure that they reflect the safety standard of the road.
 - unusual to find a road with 110 km/h speed without a median barrier



Safer Road Environments

- **Vehicle run-off road impact**
 - Major investments have been made to minimize the damage ensuing from cars veering off the road
 - Guard rails have been erected, and potentially dangerous objects such as trees and boulders have been cleared away from roadside areas



Safer Vehicles

- **Swedish road safety experts from Swedish Road Administration (SRA) were key- contributors in setting up at the European New Car Assessment Programme (EuroNCAP)**
- **Consumers have access to information concerning the safety standard of different cars**



Safer Vehicles

- **Private passenger cars have become much safer, which considerably reduces the risk of being killed or seriously injured in new car models**
 - **It will still take some time before the improvements will have full effect in vehicle fleet**



Seat Belt Reminders

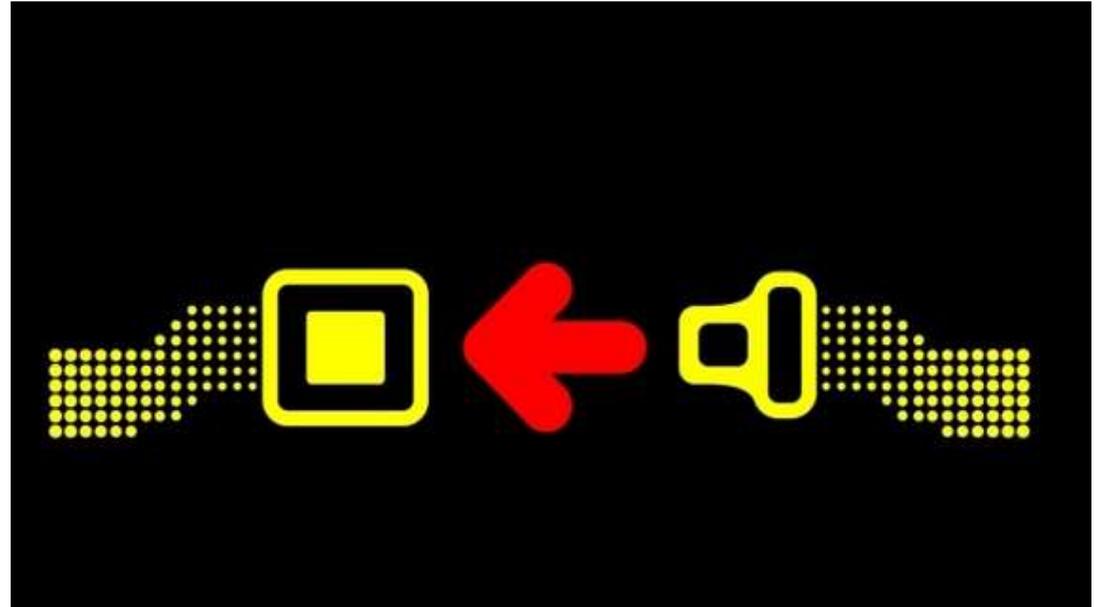
- Drivers in Sweden used to have a 92% seat-belt wearing rate
- EuroNCaP established a protocol for seat-belt reminders some years ago having the effect that 70% of new cars sold in Sweden 2005 had seat-belt reminders



Seat Belt Reminders

- **Results**

- **The drivers of these cars have a seat-belt wearing rate of 99%**
- **The issue of seat-belt wearing will gradually be solved at a very low cost**



Alcohol Ignition Interlock

- **All over the world alcohol and traffic is a big problem, even if improvements can be made with strict legislation and enforcement**
- **By demonstrating a demand for safe transport, a demand for “proven sober” transports has risen**



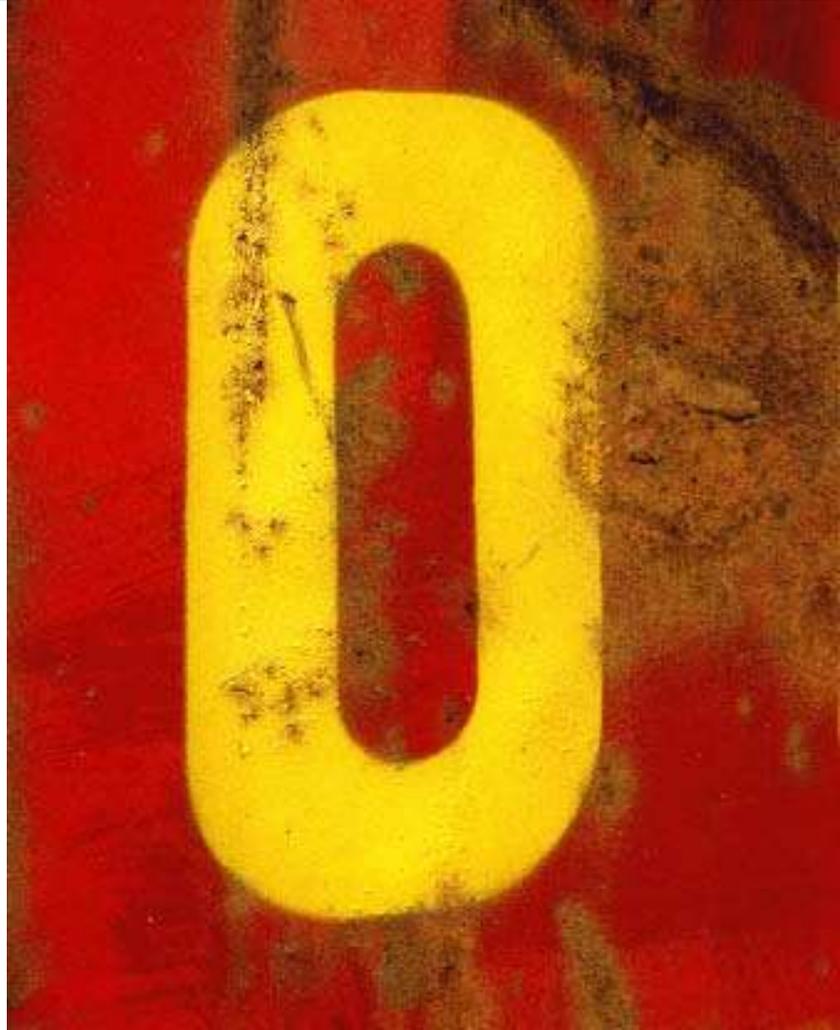
Road Safety Cameras

- **Speed surveillance using road safety cameras has been found to be an effective way to prevent speeding violations and to reduce the number of accidents that result in serious injury**
- **Attitude studies have revealed that most drivers welcome their support in traffic**



Road Safety – A Working Environment Issue

- **Many serious road accidents occur in connection with work or when travelling to and from work**
- **Swedish Work Environment Authority and the SRA have taken the initiative to work in closer cooperation to reduce the number of work-related traffic injuries**



Closer Cooperation on Road Safety

- The holistic perspective on safety in the road transport system that characterizes Vision Zero has resulted in closer cooperation between system designers and other players
- This cooperation is both formal and informal



Management by objectives

- **Vision Zero is a long-term goal. Management that focuses on the fulfilment of concrete milestones (specific objectives) in the short term is the method used in Sweden for achieving final objectives.**
- **Annual follow-ups are conducted and the milestones are successively updated.**



THANK YOU!

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