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**TRAFIKVERKET**  
**SWEDISH TRANSPORT ADMINISTRATION**

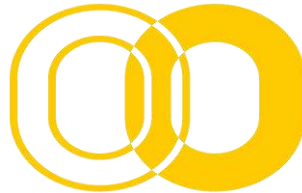




# Vision Zero - a Swedish contribution to the global community

In October 1997, Vision Zero was passed by a large majority in the Swedish parliament.

The Vision is an expression of the ethical imperative that It can never be ethically acceptable that people are killed or seriously injured when moving within the transport system





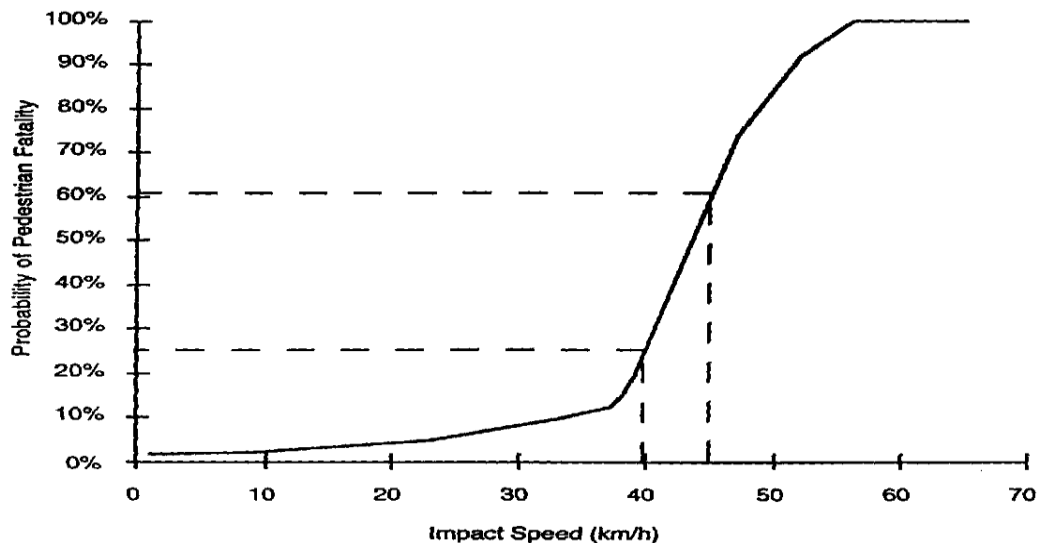
# Vision Zero a policy innovation

	Traditional	Vision Zero
What is the problem?	Accidents /Crashes	Fatalities and serious injuries
What causes the problem?	Human errors	Humans make mistakes Humans are fragile
Responsibility?	Individual road users	System designers
Peoples demand for road safety?	People don't want safety	People want safety
What is the appropriate goal?	Optimum number of fatalities and serious injuries	Eliminate fatalities and serious injuries



## Probability of Pedestrian Fatality by Impact Speed

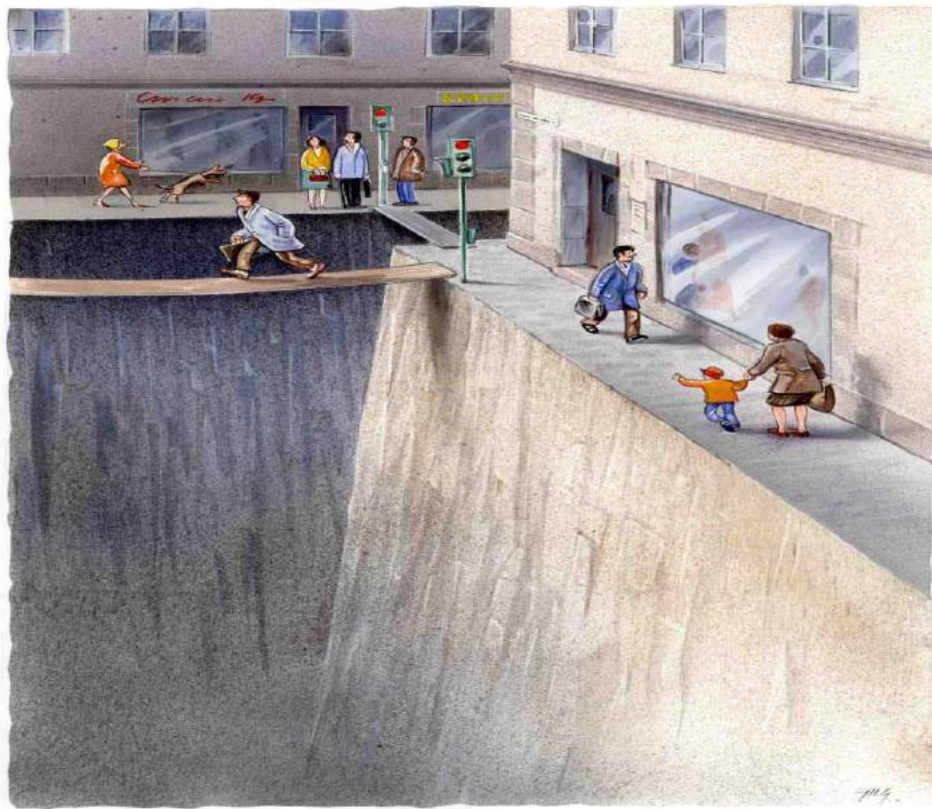
**Figure 2: Probability of Pedestrian Fatality by Impact Speed.**  
Derived from the Interdisciplinary Working Group for Accident Mechanics (1986) and Watz, Hoeffliger and Fehlmann (1983)













# Urban safety



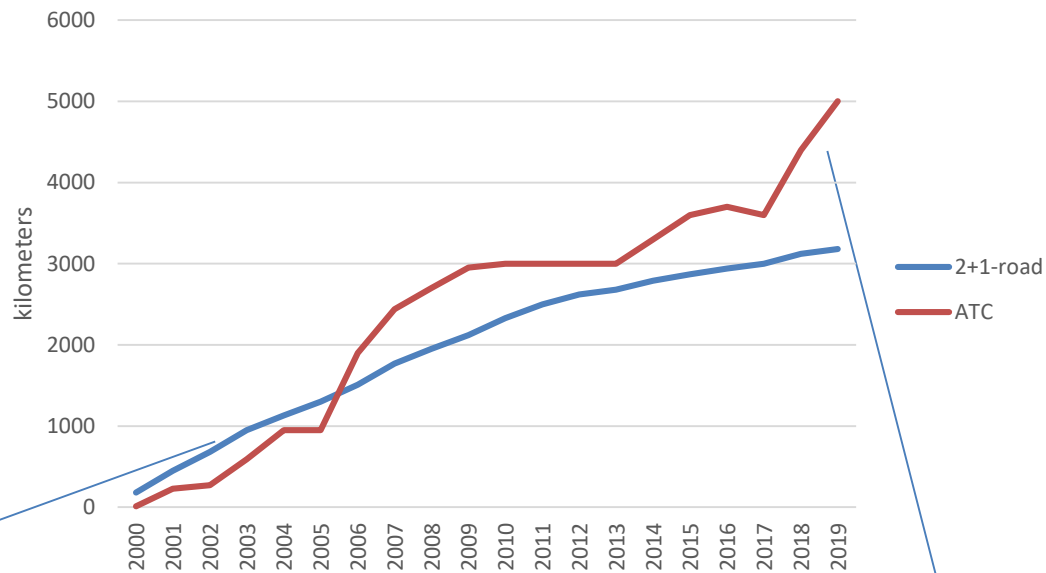


# Rural safety



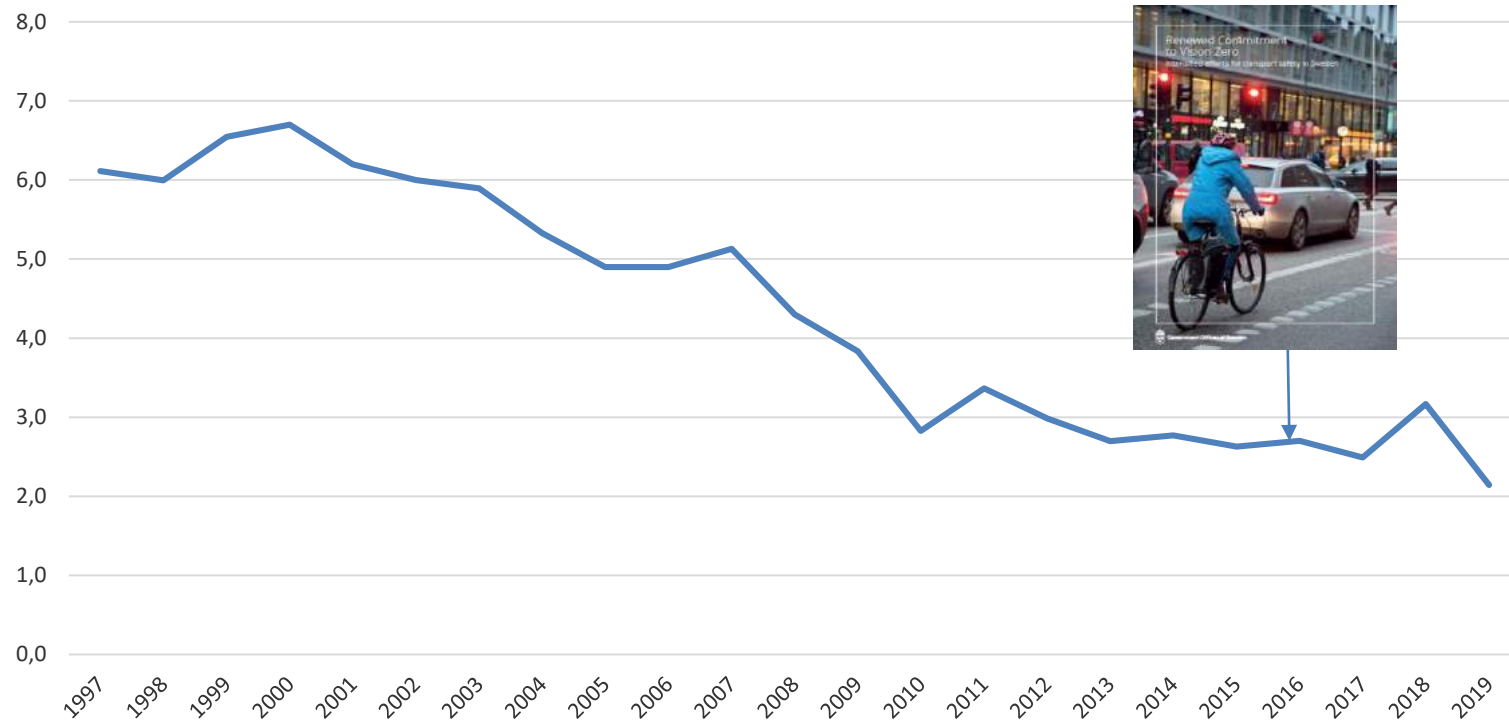


# Rural Safety





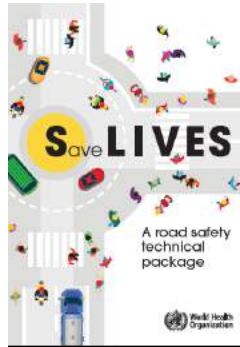
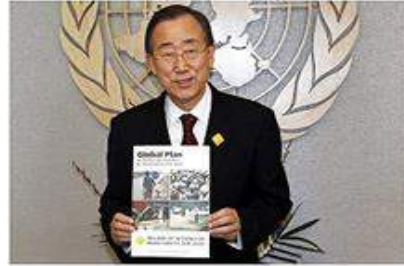
## Number of deaths in road traffic accidents per 100 000 population in sweden (1997-2019)





# Vision Zero, Safe System, Road to Zero....

## "We Have Many Names for the Things We Love!"





# VISION ZERO ACADEMY

STRIVING  
FOR EXCELLENCE IN  
TRANSPORT  
SAFETY



Model for safe traffic



# Model for safe traffic

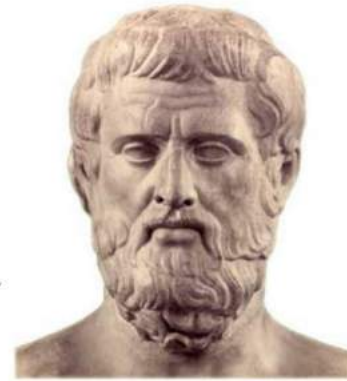
*Matteo Rizzi, STA*



# Vision Zero

ERRARE  
HUMANUM EST

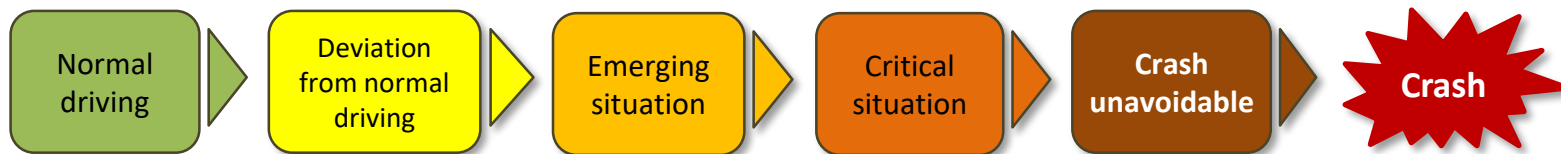
*Lucius Annaeus Seneca*



- **Humans have biomechanical limits**
- **Nobody is perfect** - we all make errors or mistakes sometimes
- All crashes should be survivable
- The road transport system needs to absorb such errors/mistakes, and to handle the impact energy in an crash

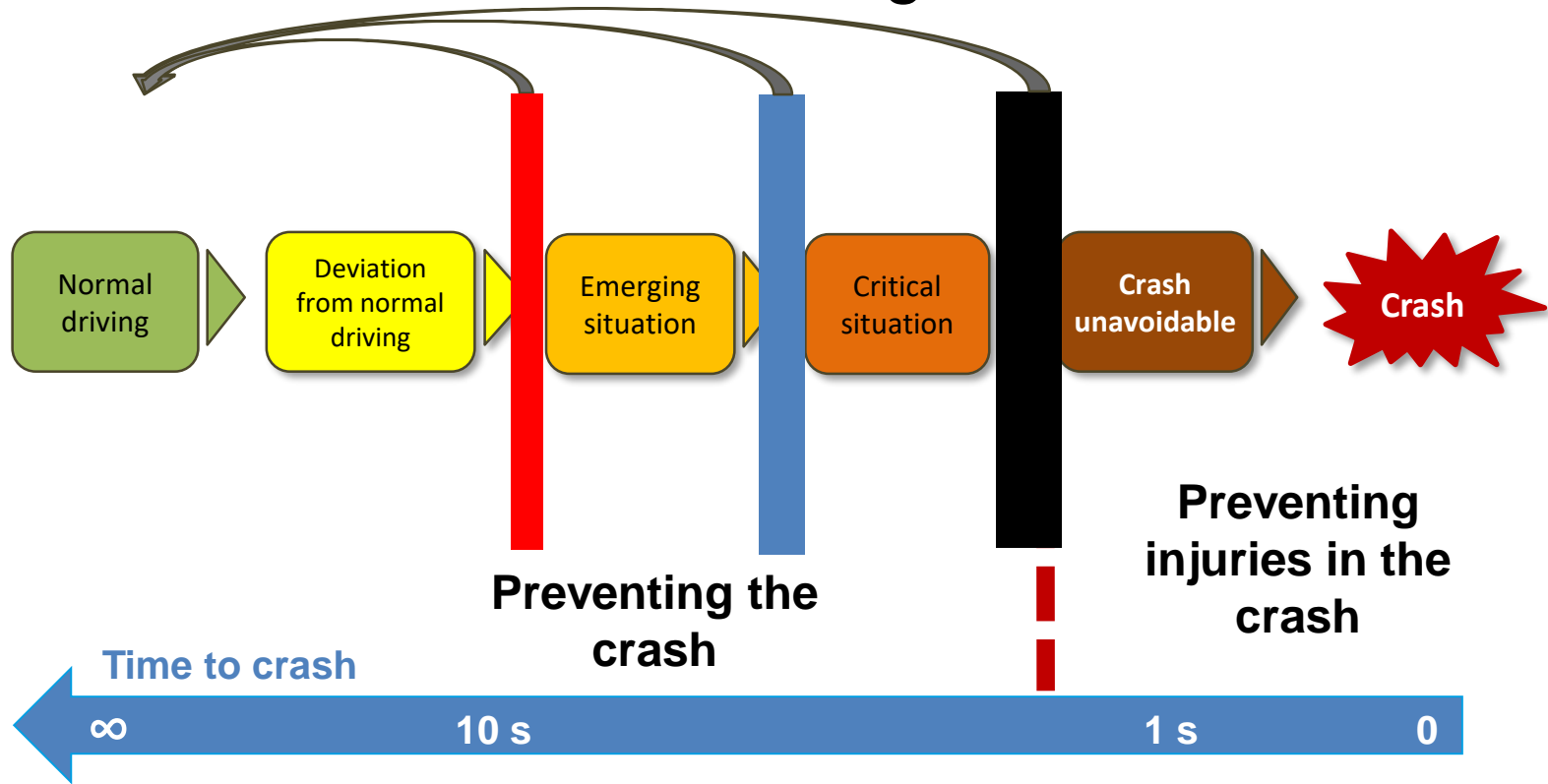


# Chain of events leading to a crash





# Chain of events leading to a crash



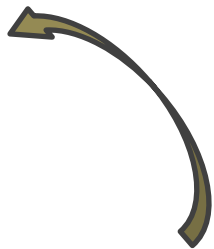


**Question:**  
what is the difference?



**Energy to handle in a crash**





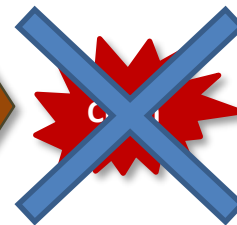
Impact energy  
can **not** be  
handled



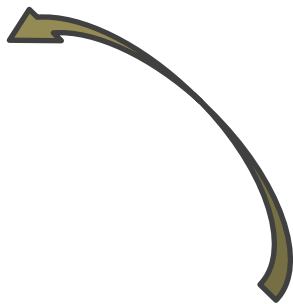
Normal  
driving



Crash  
unavoidable







Normal  
driving



Crash  
unavoidable



Impact  
energy can  
be handled





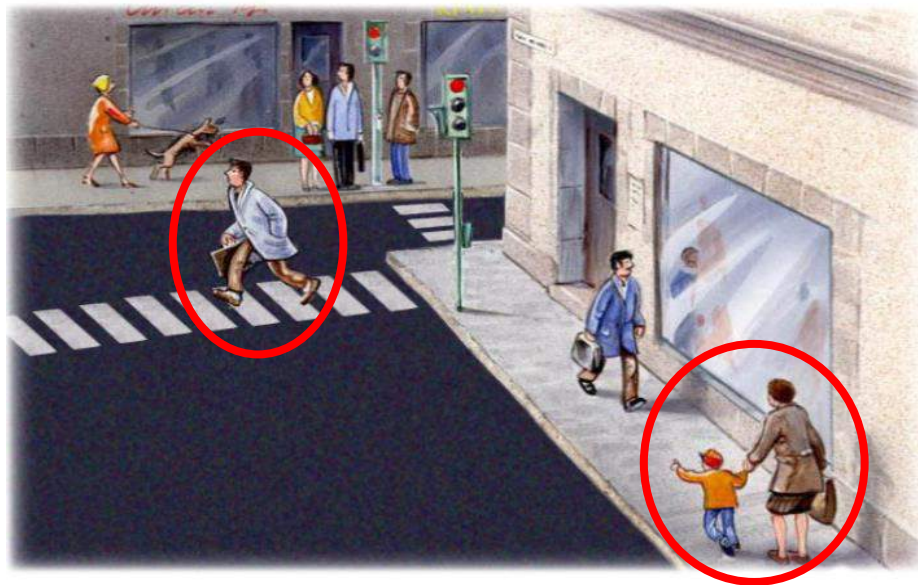
# In simple words

- The main goal is **not** to totally eliminate the number of crashes
- The main goal is to make sure that speed (energy) is **always** aligned with the ability to protect road users **when** a crash occurs
- The challenge is, we (humans) do not a very good perception of the dangers related to speed

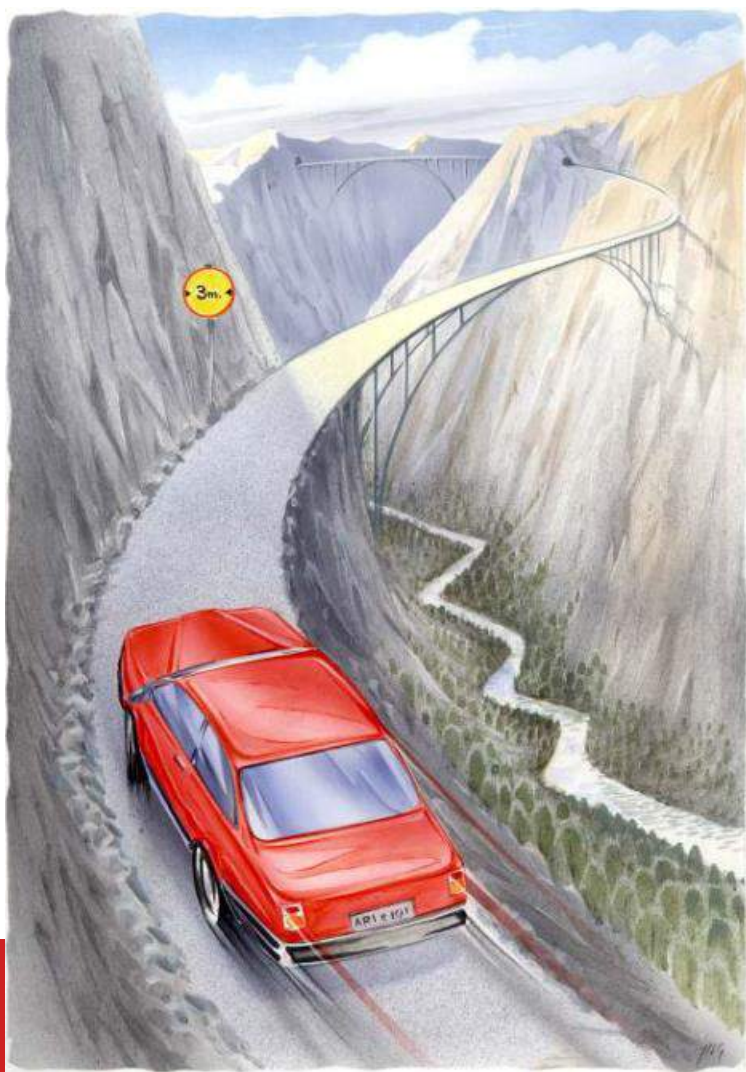


















# Speed is energy – and energy is the key factor

- **Design speed**            maximum speed to avoid serious injuries and fatalities
- **Posted speed**            speed limit
- **Operation speed**        actual driving speed

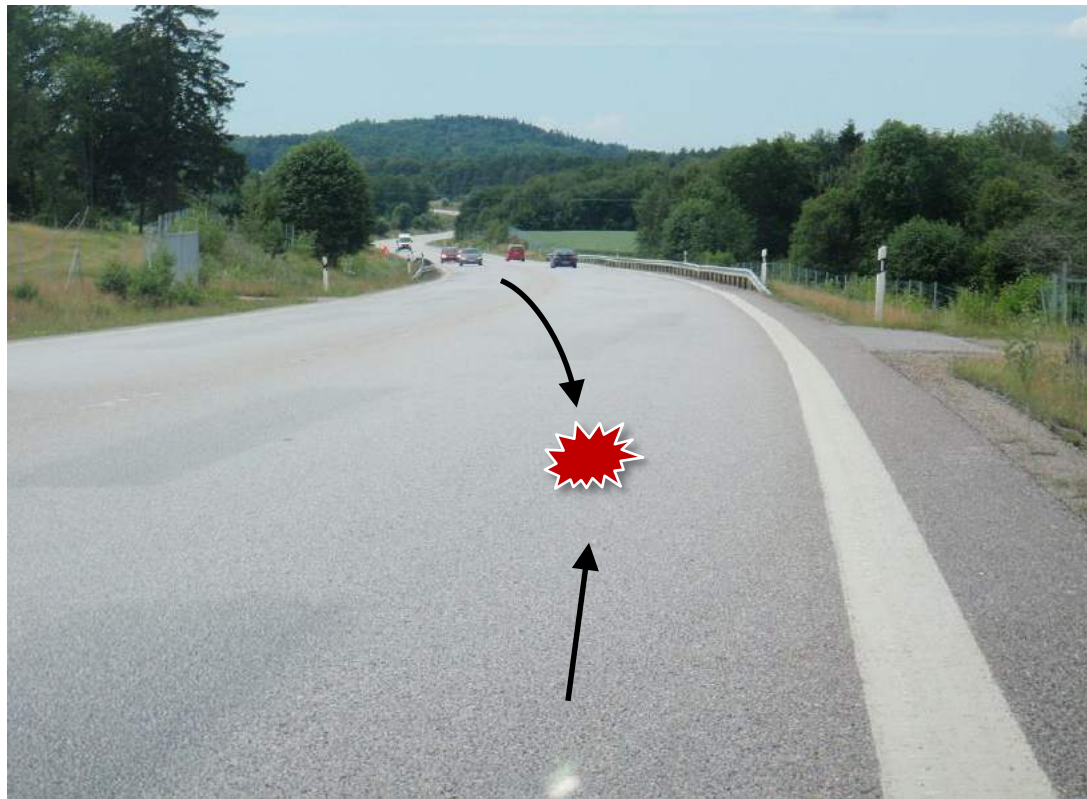
**Design speed = posted speed = operation speed ➡ SAFE SPEED**



# A tragic example

STA's in-depth studies of fatal crashes

- 90 km/h speed limit
- Road width 13 m
- AADT 5500  
Annual Average Daily Traffic
- Head-on collision between  
two passenger cars





# Car nr 1, BMW 320 - model year 2007

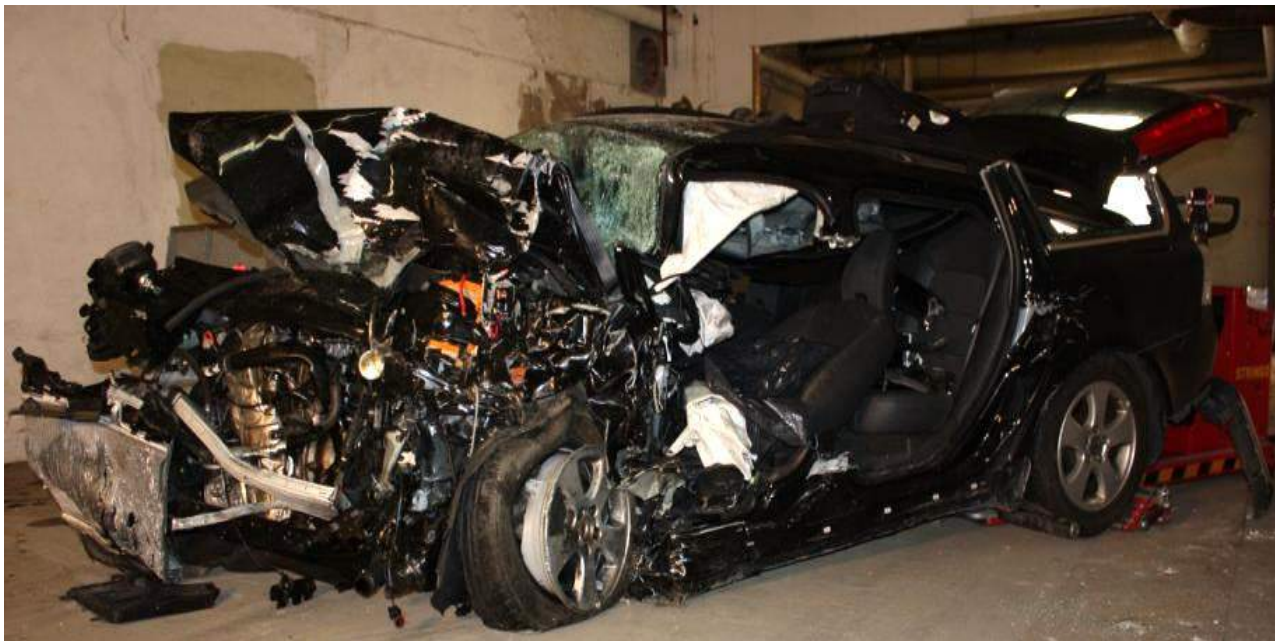
5 stars EuroNCAP (2005)





# Car nr 2, Volvo V70 - model year 2010

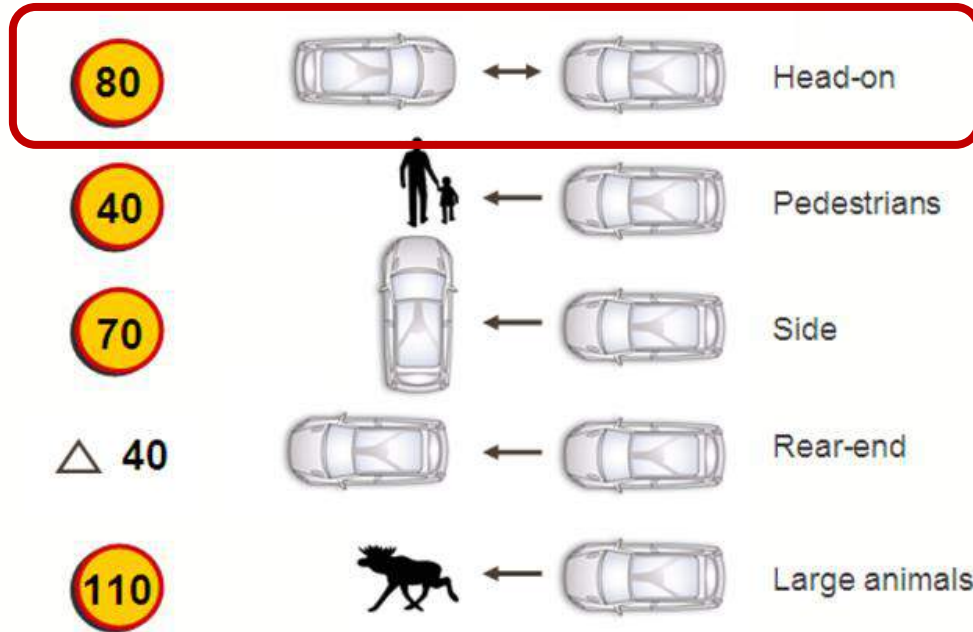
5 stars EuroNCAP (2007)





# Design speeds for modern cars

VERY IMPORTANT SLIDE





**The posted speed limit is  
higher than the design speed**





# Speed is energy – and energy is the key factor

- **Design speed**

**=**

- **Posted speed**

maximum speed to avoid serious injuries and fatalities

speed limit

- **Operation speed**      actual driving speed



# Speed is energy – and energy is the key factor

- **Design speed** maximum speed to avoid serious injuries and fatalities

- **Posted speed**

=

- **Operation speed**

speed limit

actual driving speed



# Summary

- Humans have biomechanical limits
- Nobody is perfect - we all make errors or mistakes sometimes
- The road transport system needs to absorb such errors/mistakes, and to handle the impact energy in an crash
- Speed is energy - and energy is the key factor
- Safe speed can only be achieved with a combination of countermeasures that support and complete each other





# Vehicle safety and emerging technologies

*Rikard Fredriksson*

*Senior Advisor, Swedish Transport Administration*

*Associate Professor, Chalmers University of Technology*





# Vision Zero



© [movingbeyondzero.com](http://movingbeyondzero.com)



# EuroNCAP partners 2020



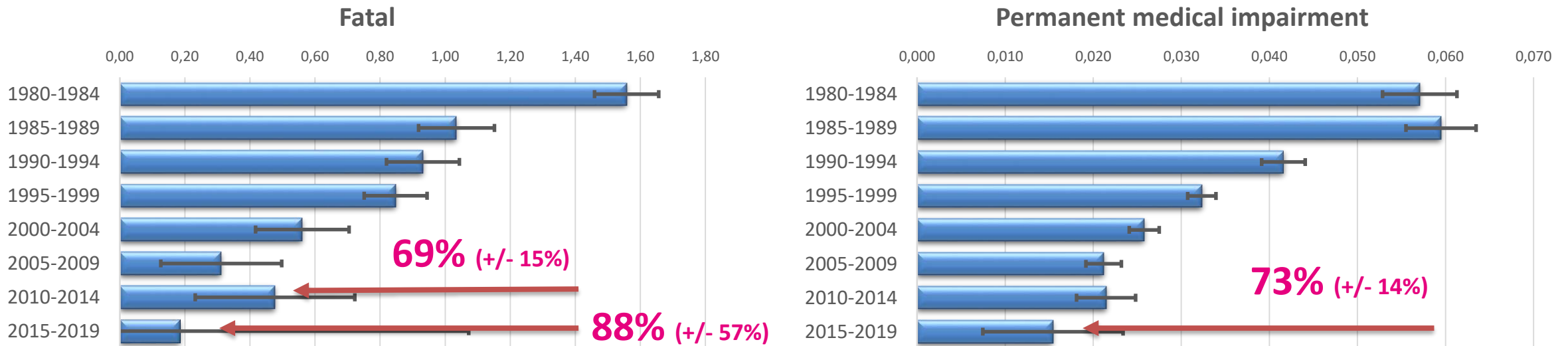


# Test labs





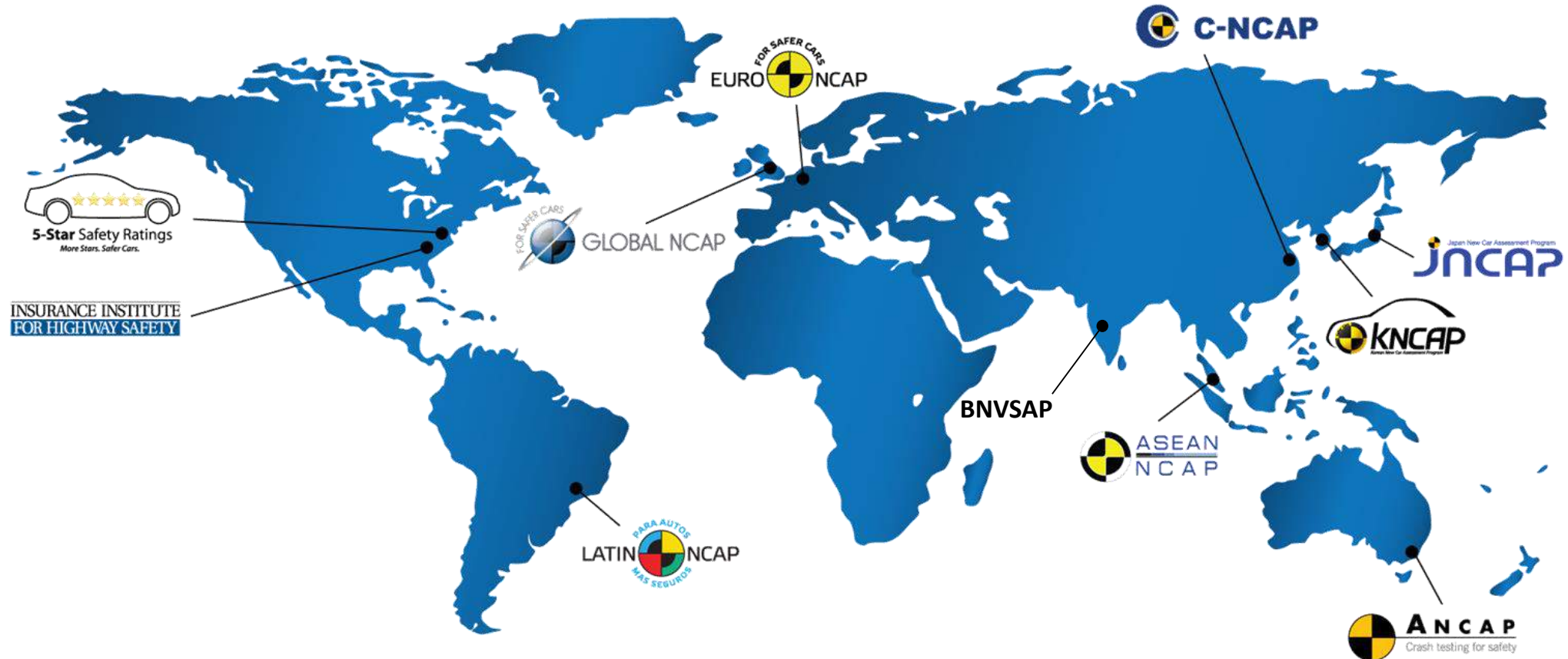
# Development in crash safety



*Kullgren et al 2019*



# NCAP's around the world





# A Market for Safety





# EuroNCAP tests & assessment



Adult occupant



Child occupant



Vulnerable Road User
























Safety assist





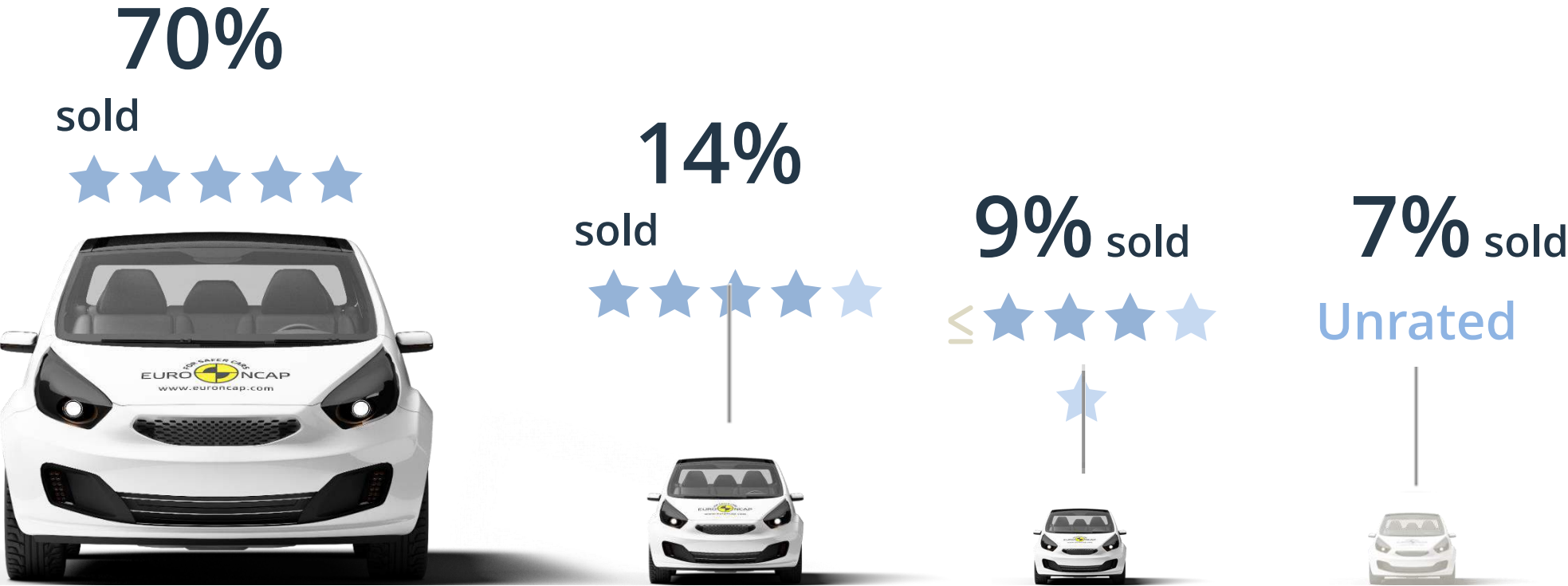
# EuroNCAP 2019

- 55 tested cars
  - 75% 5 stars
  - 16% 4 stars
  - 9% 3 stars

	Porsche Taycan	Standard	★★★★★	85%	83%	70%	73%
	Renault Captur	Standard	★★★★★	90%	83%	75%	74%
	SEAT Alhambra	Standard	★★★★☆	89%	78%	59%	62%
	Subaru Forester	Standard	★★★★★	97%	91%	80%	78%
	Tesla Model X	Standard	★★★★★	98%	81%	72%	94%
	Volkswagen Sharan	Standard	★★★★☆	89%	78%	59%	62%
	Skoda Octavia	Standard	★★★★★	92%	88%	73%	79%
	Ford Explorer	Standard	★★★★★	87%	88%	61%	76%
	Mazda CX-30	Standard	★★★★★	90%	88%	80%	77%
	Mercedes-Benz GLB	Standard	★★★★★	92%	88%	78%	74%
	Opel/Vauxhall Corsa	Standard	★★★★☆	84%	88%	66%	69%
	BMW 1 Series	Standard	★★★★★	83%	87%	76%	72%
	BMW 3 Series	Standard	★★★★★	97%	87%	87%	76%
	Jeep Cherokee	Standard	★★★★☆	80%	78%	56%	69%
	Peugeot 208	Standard	★★★★☆	91%	88%	56%	71%
	Audi A1	Standard	★★★★★	95%	85%	73%	80%
	BMW Z4	Standard	★★★★★	97%	87%	91%	76%
	Ford Focus	Standard	★★★★★	96%	87%	72%	73%
	Mercedes-Benz CLA	Standard	★★★★★	96%	91%	91%	75%
	Mercedes-Benz EQC	Standard	★★★★★	96%	90%	75%	75%
	SsangYong	Standard	★★★★★	88%	85%	88%	74%



# Market Coverage

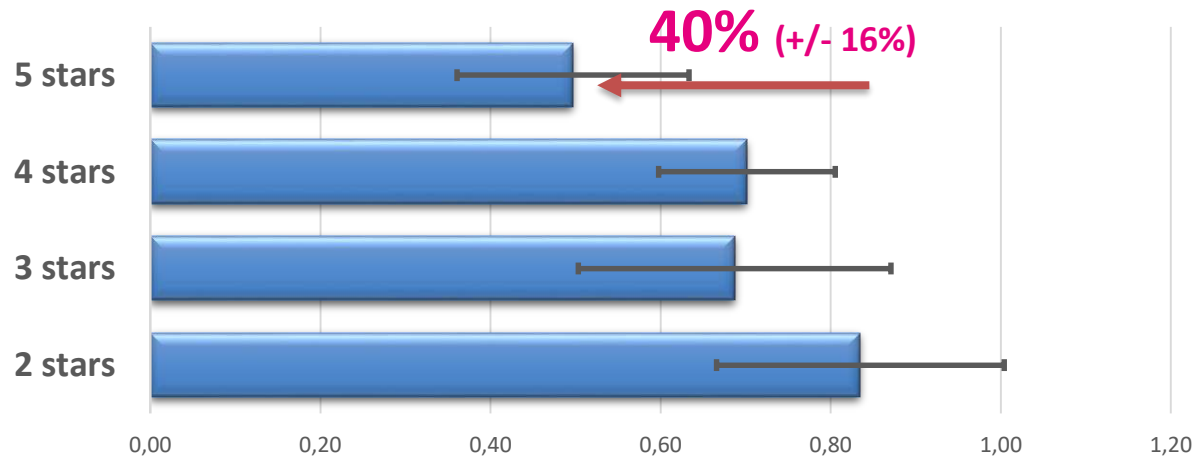


*EU-28 passenger car and SUV sales, 2018. Total 15.3 million units.*

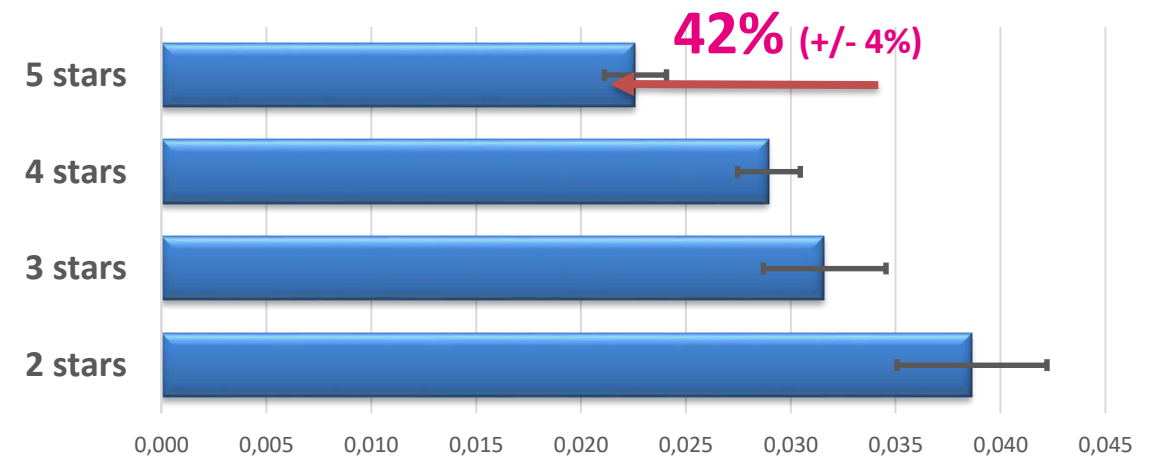


# Correlation to Euro NCAP - injury risk for star bands

Fatal



Permanent medical impairment



*Kullgren et al 2019*



# What is new 2020?





# Far-side Crash Protection



2020 Toyota Yaris with double center airbags



# AEB Car-to-car

Turn-across-path



2020



# AEB Pedestrian

turning






reversing



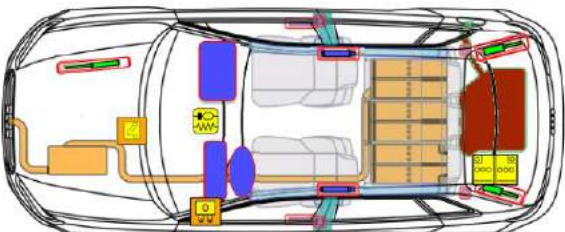
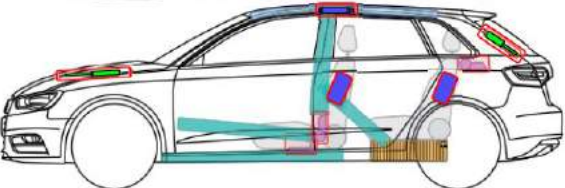


# Rescue sheet - 2020




## A3 SPORTBACK E-TRON

FROM 2014

	Airbag		Seat belt pretensioner		Airbag inflator/stored gas inflator		Gas strut preloaded spring		High strength zone
	Low Voltage battery		SRS control unit		High Voltage power cable		High Voltage battery pack		Disconnect high Voltage
	Low Voltage fuse		Fuel tank gasoline						


### 1. Identification/recognition

LACK OF ENGINE NOISE DOES NOT MEAN VEHICLE IS OFF. SILENT MOVEMENT OR INSTANT RESTART CAPABILITY EXISTS UNTIL VEHICLE IS FULLY SHUT DOWN. WEAR APPROPRIATE PPE.

**Characteristic features**

The A3 e-tron can be identified by the e-tron logo, the orange cables (e.g. in engine compartment) and the charging socket.





### 2. Immobilisation / stabilisation / lifting

**A) VEHICLE IMMOBILISATION**


1. Chock the wheels.
2. Set parking brake.
3. Place vehicle into park.



**B) STABILISATION/LIFTING POINTS**


### 3. Disable direct hazards / safety regulations

**A) SWITCH OFF IGNITION (if on)**


Press START-ENGINE-STOP button TX without depressing brake pedal.

Warning: When pressing the START-ENGINE-STOP button and depressing the brake pedal at the same time, the engine will start!






### OF HIGH VOLTAGE SYSTEM


**Alternative 1 – Engine compartment accessible**

Localize emergency disconnect  
Open safety disconnect




**Alternative 2 – Emergency disconnect fuse in passenger compartment**


Locate emergency fuse  
Disconnect emergency fuse






Box – left hand drive (covering of left)




Box in glove compartment (head drive (covering wheel right))




Disconnector 12 V battery

The 12 V battery is located in the luggage compartment below the luggage compartment floor. The cables of both terminals are fed out directly through the plastic cover.




### the occupants

### energy/liquids/gases/solids

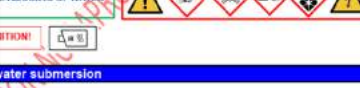


cut, breach, or touch high voltage components or Doing so could result in serious injury or death.

### fire



BE AWARE OF AMOUNTS OF WATER



**CAUTION!**

### water submersion

### transportation / storage




Fixed traction wheels

**BATTERY RE-IGNITION!**

KEEP DISTANCE FROM OTHER VEHICLES!



### additional information

TECHNICAL SUPPORT CONTACT DETAILS: XXX  
LOCATION: LINK ERG





























# First two cars tested 2021

2021 - Rating				
Make & Model	Safety Equipment	Overall rating	Adult Occupant	Child Occupant
 Cupra Formentor	Standard	★★★★★★	93%	88%
 Polestar 2	Standard	★★★★★★	92%	89%

<https://www.euroncap.com/en>

2020 - Rating

ABOUT 2020 RATING

Make & Model	Safety Equipment	Overall rating				
 Audi A3	Standard		89%	81%	68%	73%
 Honda e	Standard		76%	82%	62%	65%
 Hyundai i10	Standard		69%	75%	52%	59%
 Isuzu D-MAX	Standard		84%	86%	69%	83%
 Kia Sorento	Standard		82%	85%	63%	87%
 Land Rover Defender	Standard		85%	85%	71%	79%
 SEAT Leon	Standard		92%	88%	71%	80%
 Honda Jazz	Standard		87%	83%	80%	76%
 Mazda MX-30	Standard		91%	87%	68%	73%
 VW ID.3	Standard		87%	89%	71%	88%
 Toyota Yaris	Standard		86%	81%	78%	85%





AEB CYCLIST





# What is next?





# Bicyclist



# New pedestrian

## 2023 Pedestrian Leg Impact Tests





# AEB Car-to-car Next Steps

Crossing traffic



2023

Head-on



2023



# AEB Bicyclist

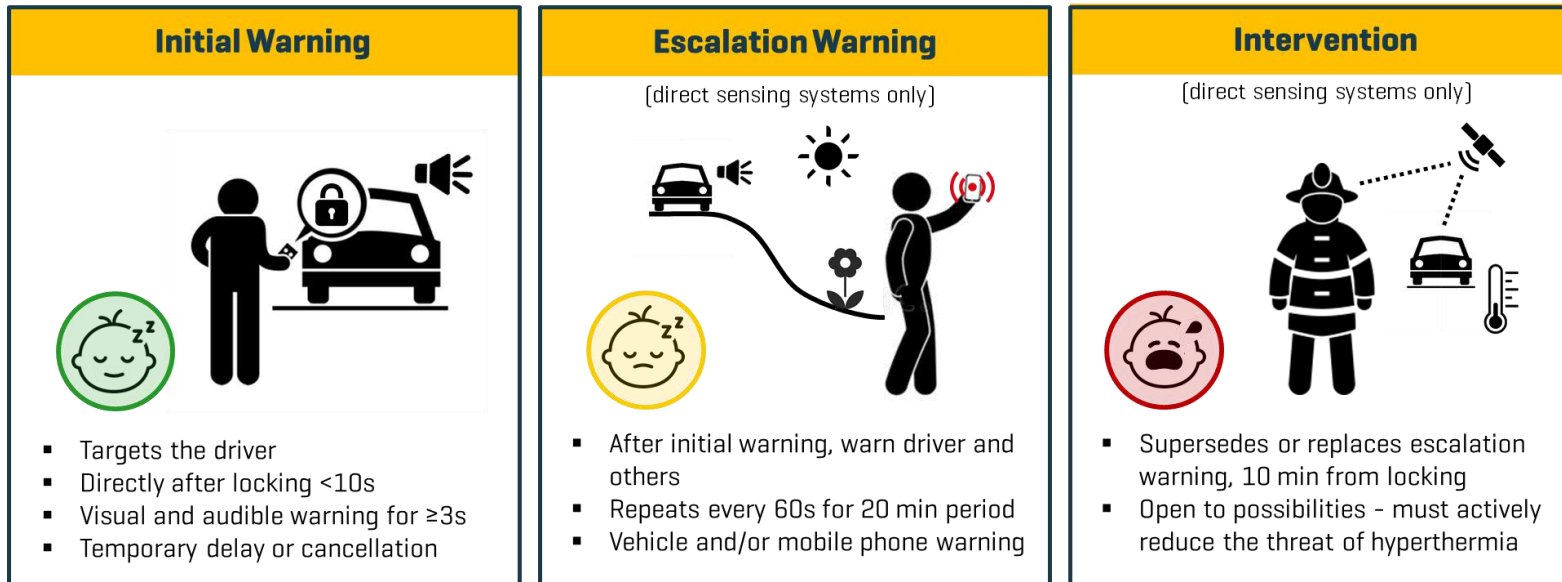
door opening





# Child Presence Detection 2023

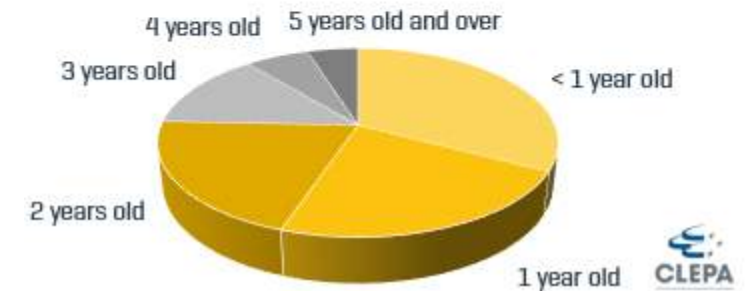
## Euro NCAP Child Presence Detection General Requirements



## In-Vehicle Heatstroke Fatalities in the US



## Age of In-Vehicle Heatstroke Victims



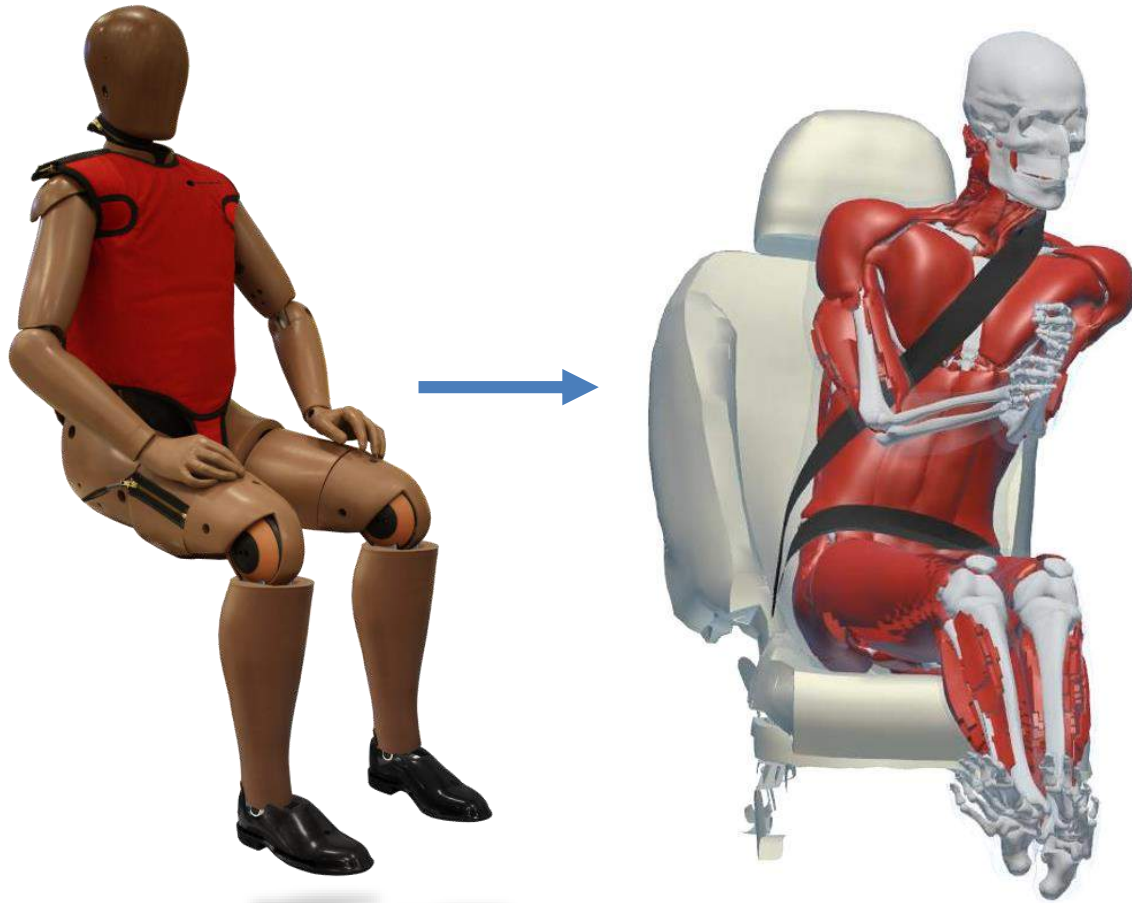


# AEB Powered Two-wheeler (motorcycle)





# Virtual testing and Human Modelling



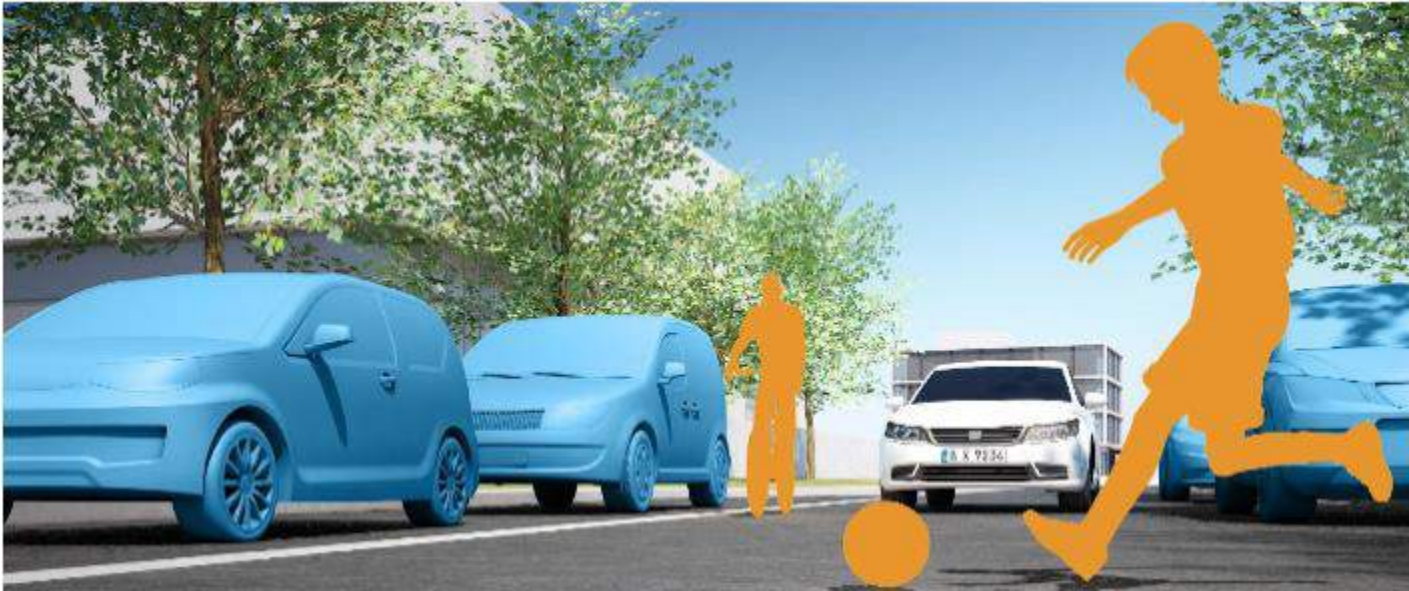
© Elemance

A paradigm shift ... enables

- large number of
  - crash speeds
  - occupant sizes
  - impact angles
- "real" (i.e. human) injury criteria
  - e.g. fracture or brain injury
  - (compared to acceleration and force in dummy)



# Virtual testing avoidance





# Driver attention





# Occupant State Monitoring

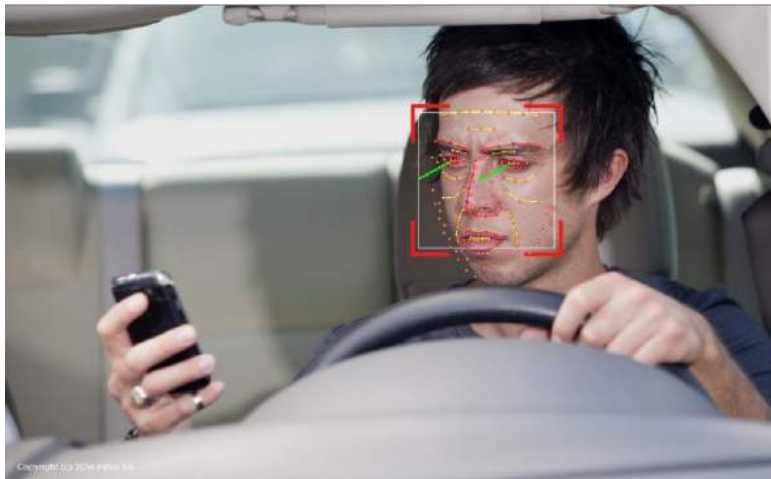
## Impaired Driving

Fatigue

Distraction

Driving Under Influence

Sudden Sickness





# Occupant State Monitoring

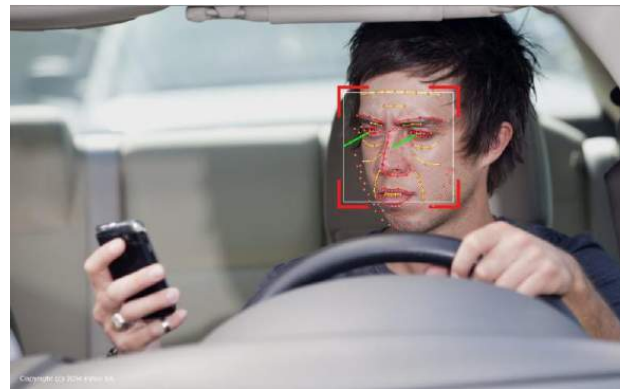
■ 2020



Indirect

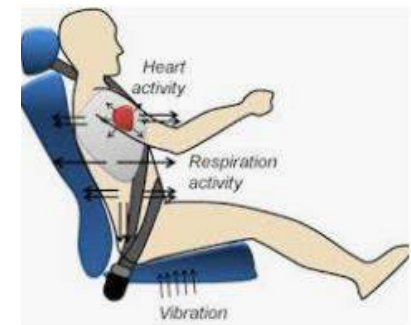
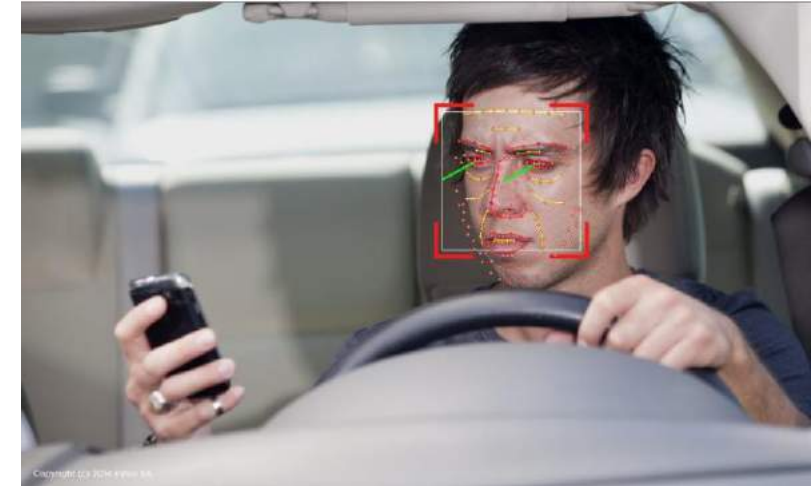


■ 2023



Indirect + Direct

■ 2025



Direct only



Thanks!  
Questions?



[rikard.fredriksson@trafikverket.se](mailto:rikard.fredriksson@trafikverket.se)



TRAFIKVERKET  
SWEDISH TRANSPORT ADMINISTRATION



# VISION ZERO

ACADEMY

STRIVING  
FOR EXCELLENCE IN  
TRANSPORT  
SAFETY



Road Design



*Dr. Lars Ekman*  
*Lars.Ekman@Trafikverket.se*







# Identify the safe system



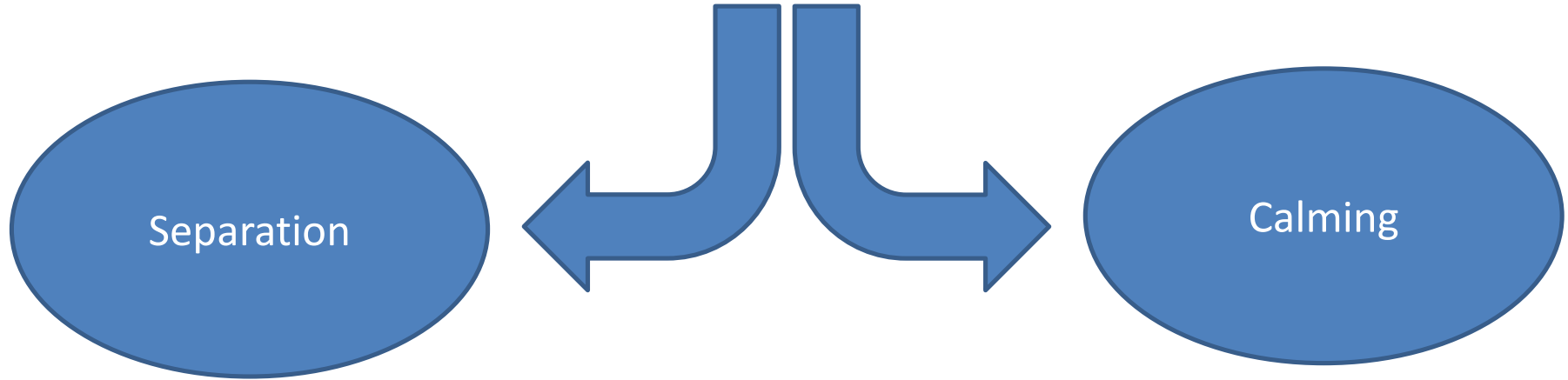


# the safe system





# Pedestrians crossing roads and streets





# Separation











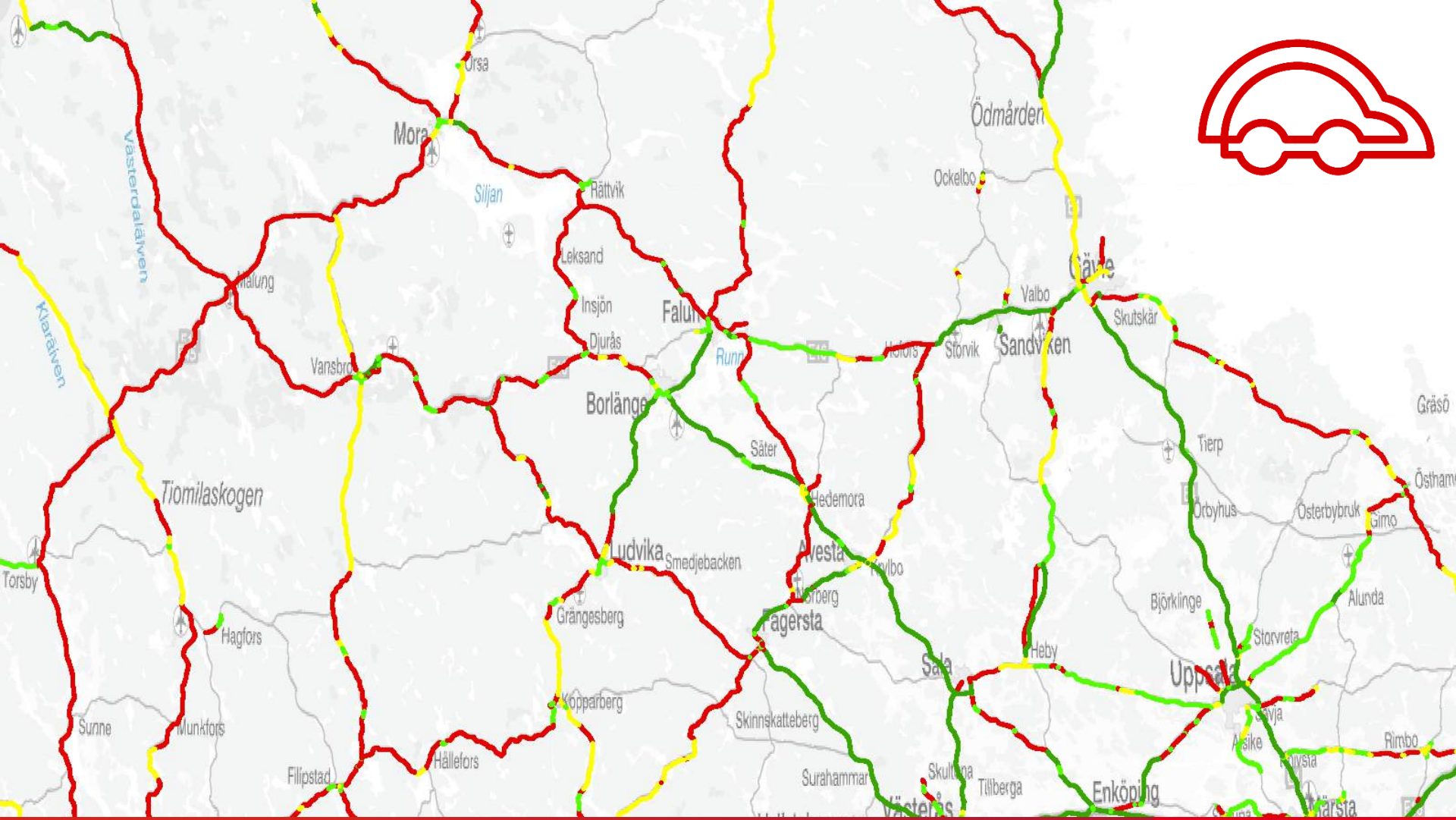




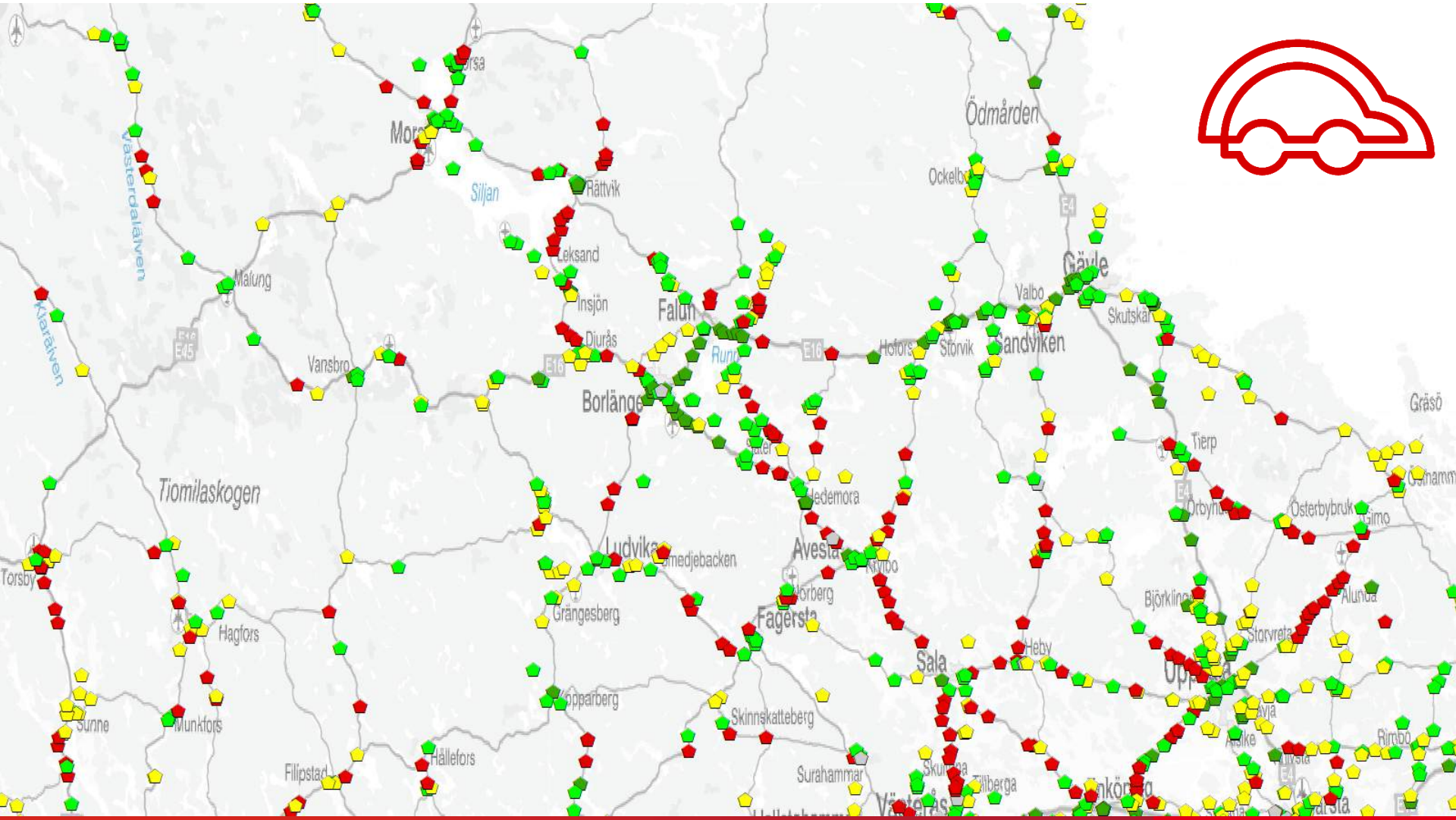




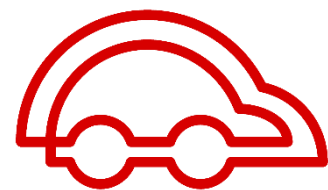
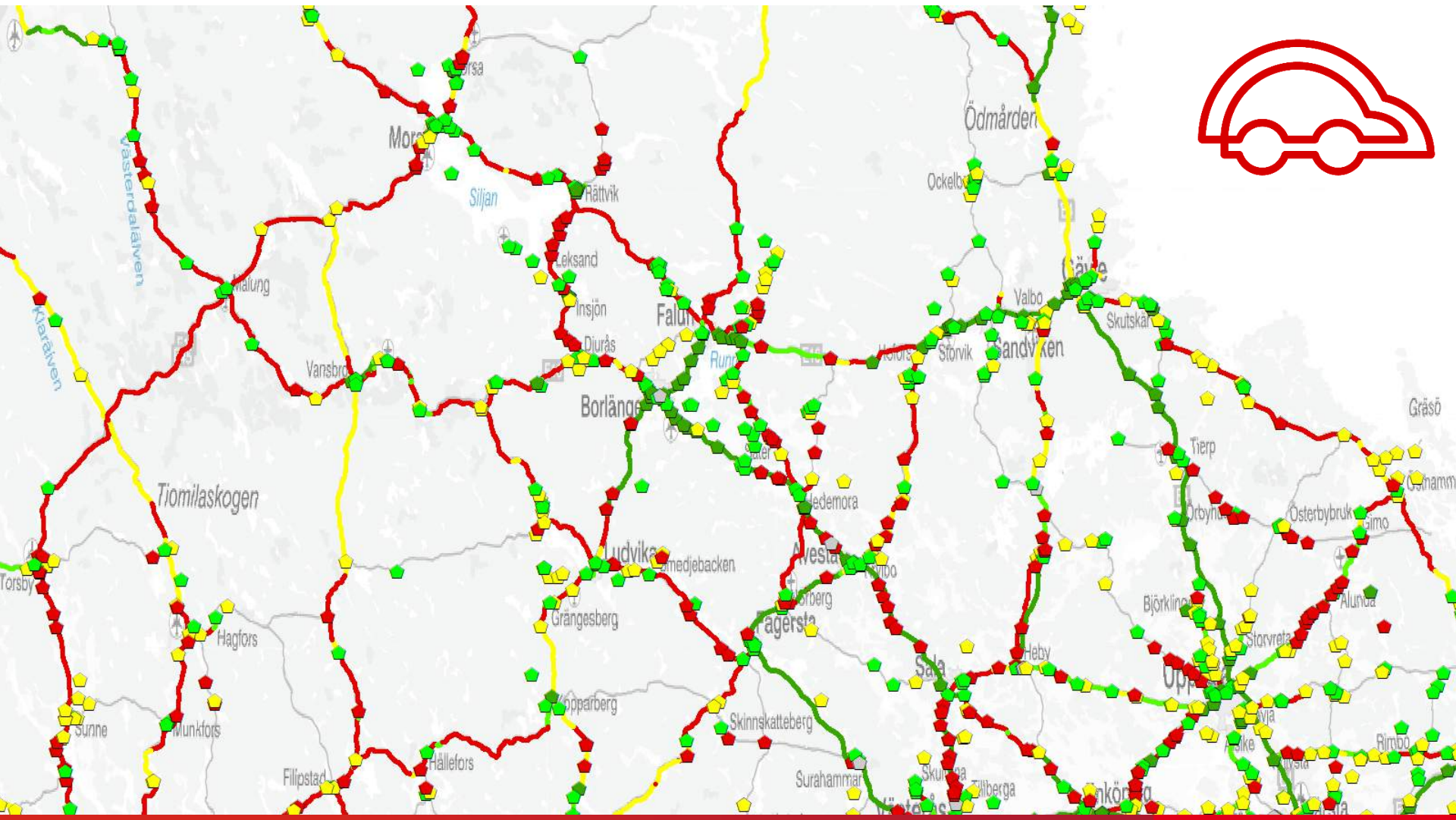











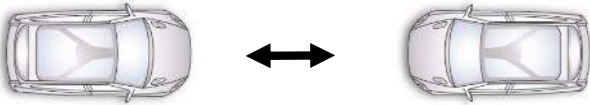



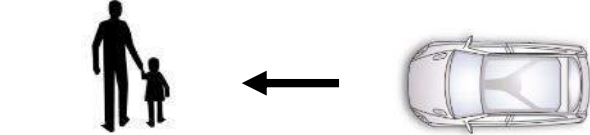



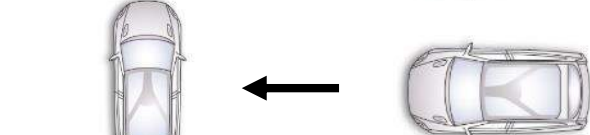



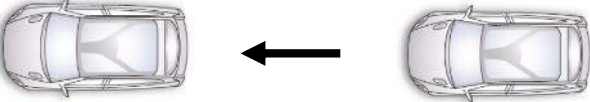



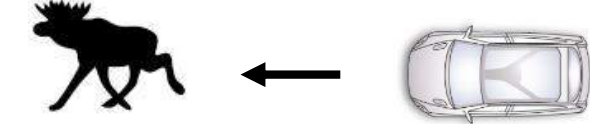










# Division of Responsibilities/ Boundary Conditions

					Contribution passive safety	Contribution active safety
		↔		Head-on		
		←		Pedestrians		
		←		Side		
 40		←		Rear-end	 20	 20
		←		Large animals		





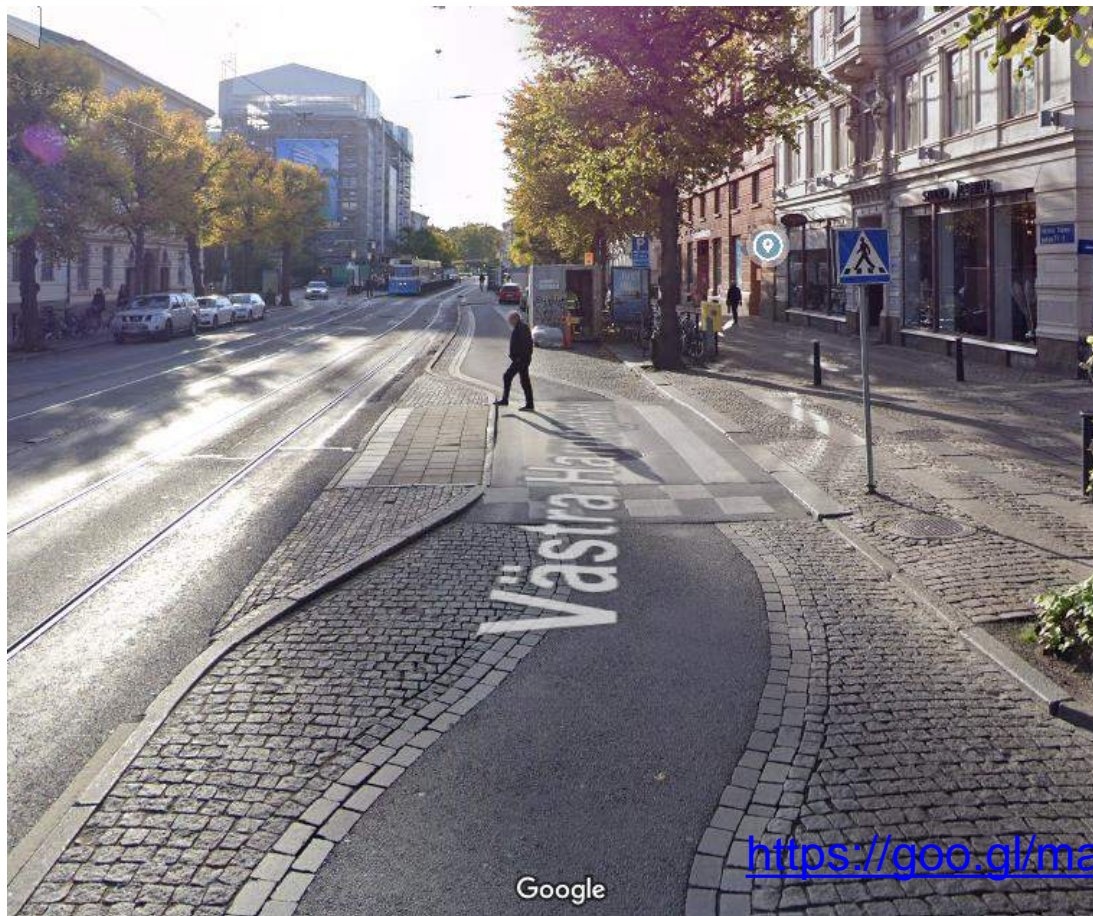


# Speed as the regulator for interactions in urban areas



Divided but with interactions  
High speed bicycle



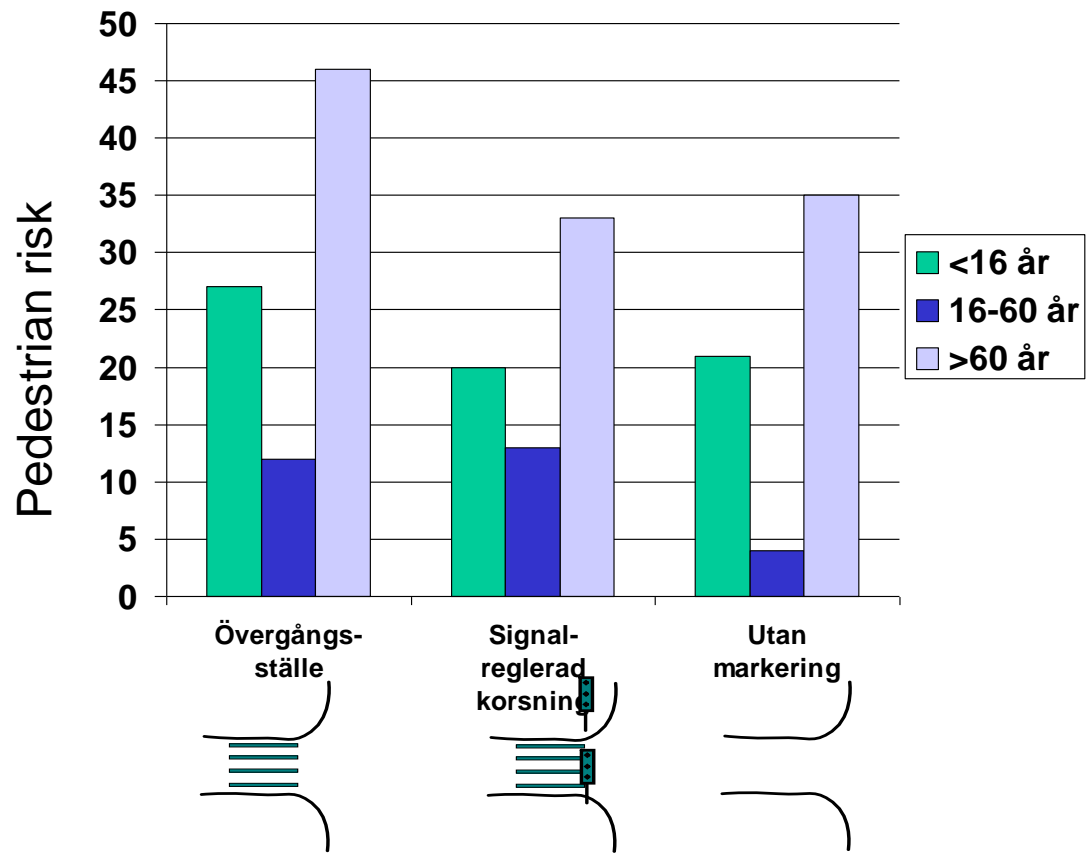


<https://goo.gl/maps/1ijGRpgVz9Zxuyij7>

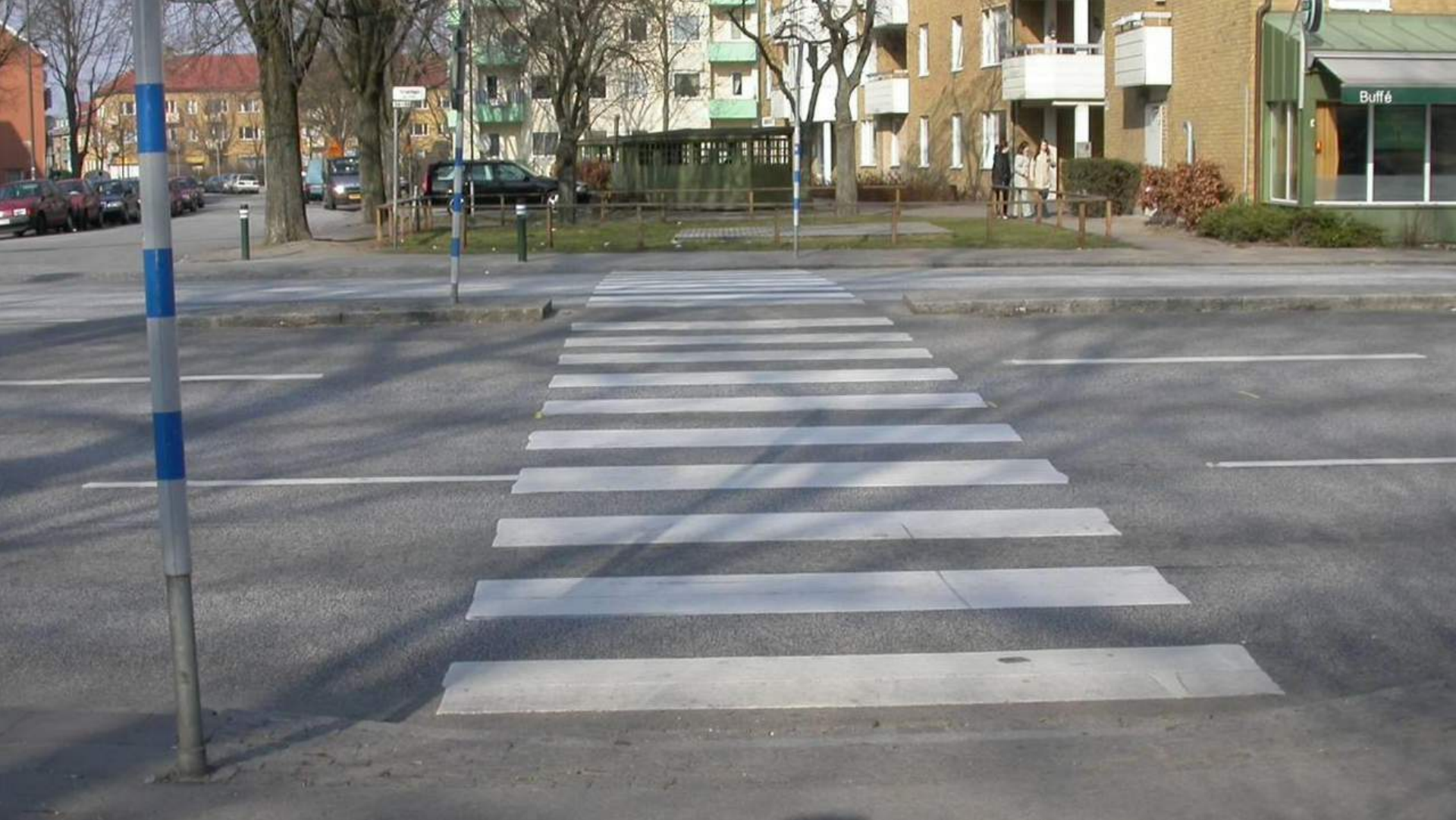














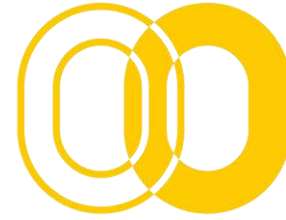


[Google](#)









VISION ZERO  
TOGETHER WE  
SAVE LIVES

*Thanks*

Dr Lars Ekman  
Lars.Ekman@trafikverket.se





# VISION ZERO

ACADEMY

## STRIVING FOR EXCELLENCE IN TRANSPORT SAFETY



Results – Safety  
Benefits of  
implemented  
measures



# Results – Safety Benefits of Implemented Measures

Matteo Rizzi, STA

with the contribution of

*Anna Vadeby, Senior Researcher in Traffic Safety at VTI*

*Associate Professor at Chalmers University of Technology*



# Content

## Overview of road safety work in Sweden

- 2+1 roads and speed management
- Overall analysis of car fatalities reduction 2000-2010





# The problem

- 1990's: 25% of fatalities and 20% of severely injured occurred on 3,5% of national roads  
(3 500 km of total 100 000 km national roads)
- 13 m wide roads
- Main problem **head-on** and **run-off** crashes causing more than 70 % of all fatalities





# The solution: 2+1 roads

- **Redesign the same road to a 2+1 road** with medium barrier
- First 2+1 road in 1998





# Speed on 2+1

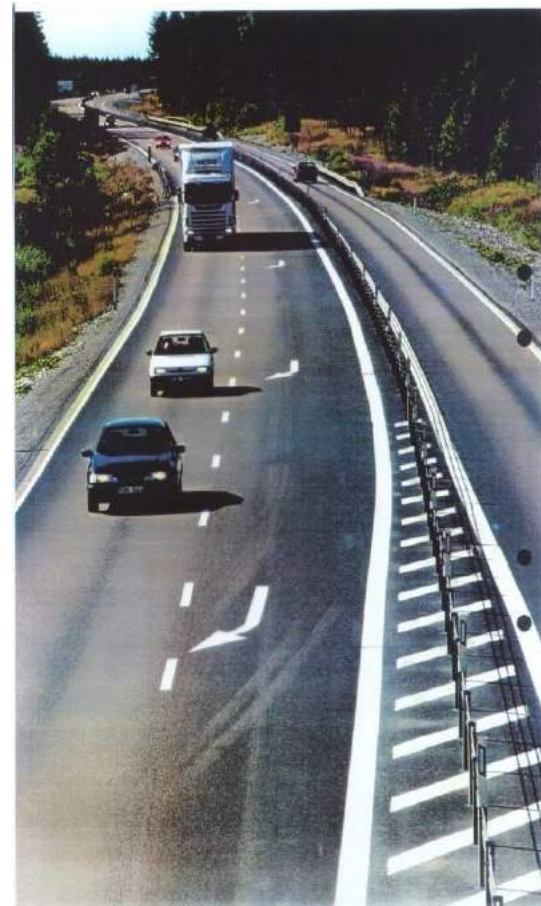
- Mean speed (cars) increased ~2 km/h at speed limit 90 km/h
- Floating car studies confirm a good level-of-service at high traffic flows, up to 1300-1400 veh/h in one direction
- Capacity estimated to be 1600 - 1700 veh/h in one direction during a 15 minute period





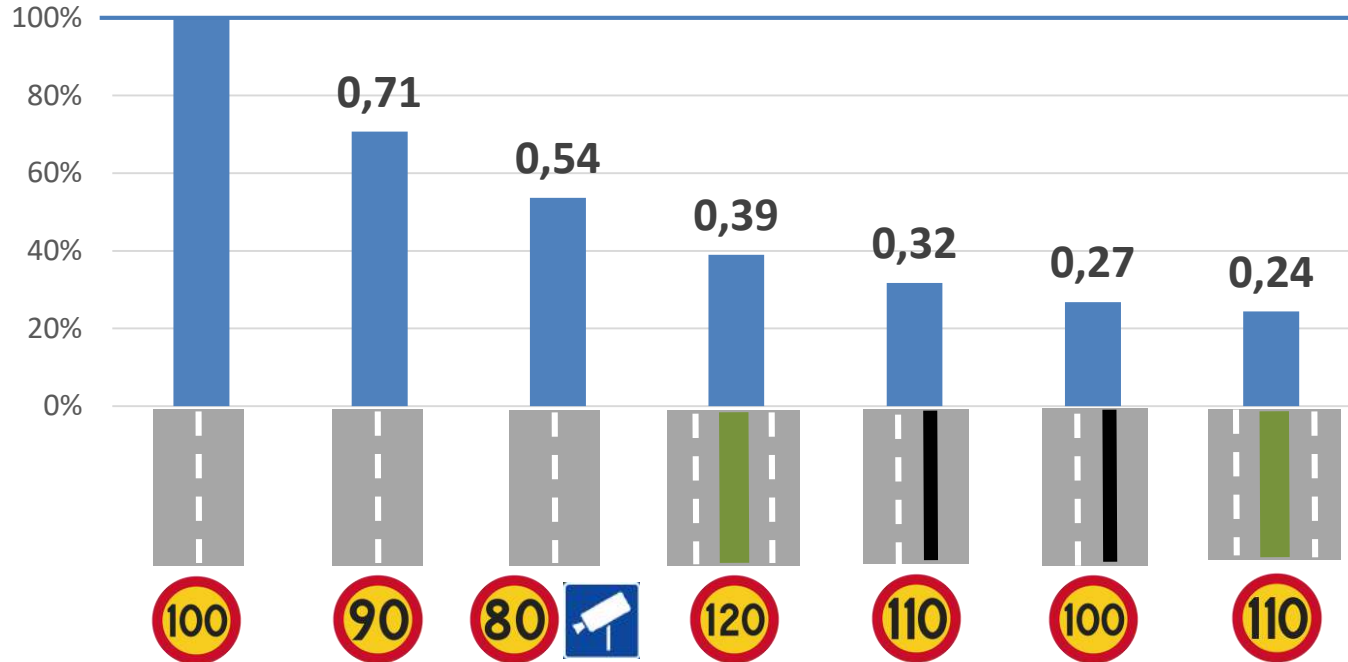
# Traffic safety effects (2009)

- Fatalities decreased by 77 %
- Fatalities and seriously injured decreased by 51 % (110 km/h) and 63 % (90 km/h)
- All injury crashes – no major changes





# Share of fatally and severely injured car occupants in injury crashes in Sweden





# Road safety improvements during 2000-2010

The proportion of traffic flow on roads with median barrier increased from 26% to 41%



Road side barriers have been installed and the road side area has been cleared from fixed objects



In urban areas roundabouts have replaced intersection with transversally moving vehicles

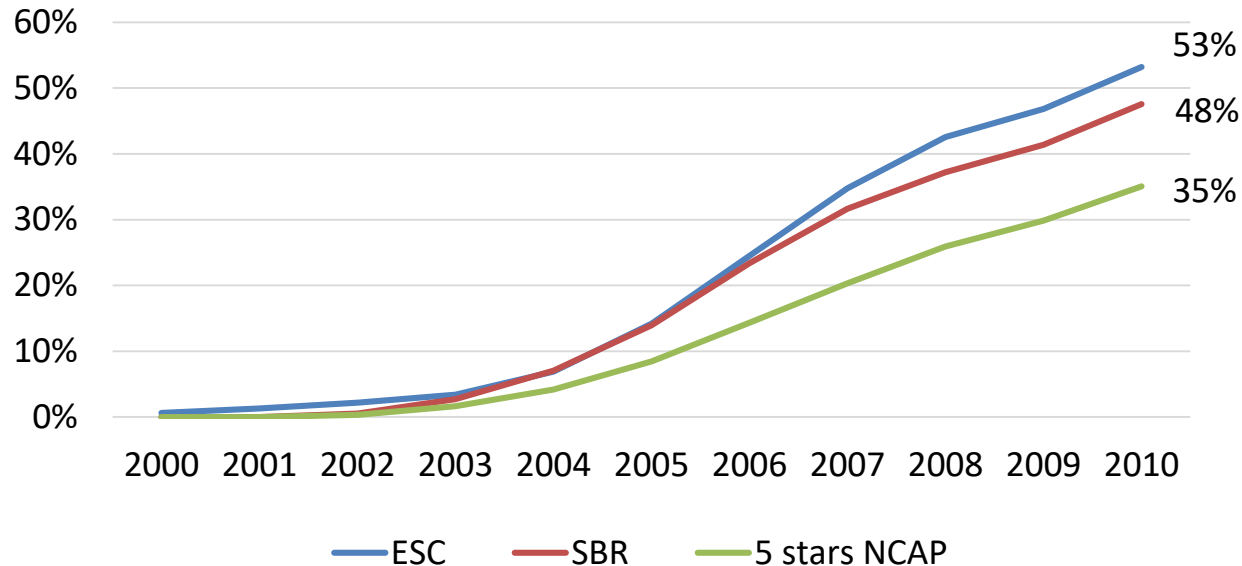


Audio Tactile Lane Markings (ATLM) have been milled in the middle of the road on 4 000 km of rural roads



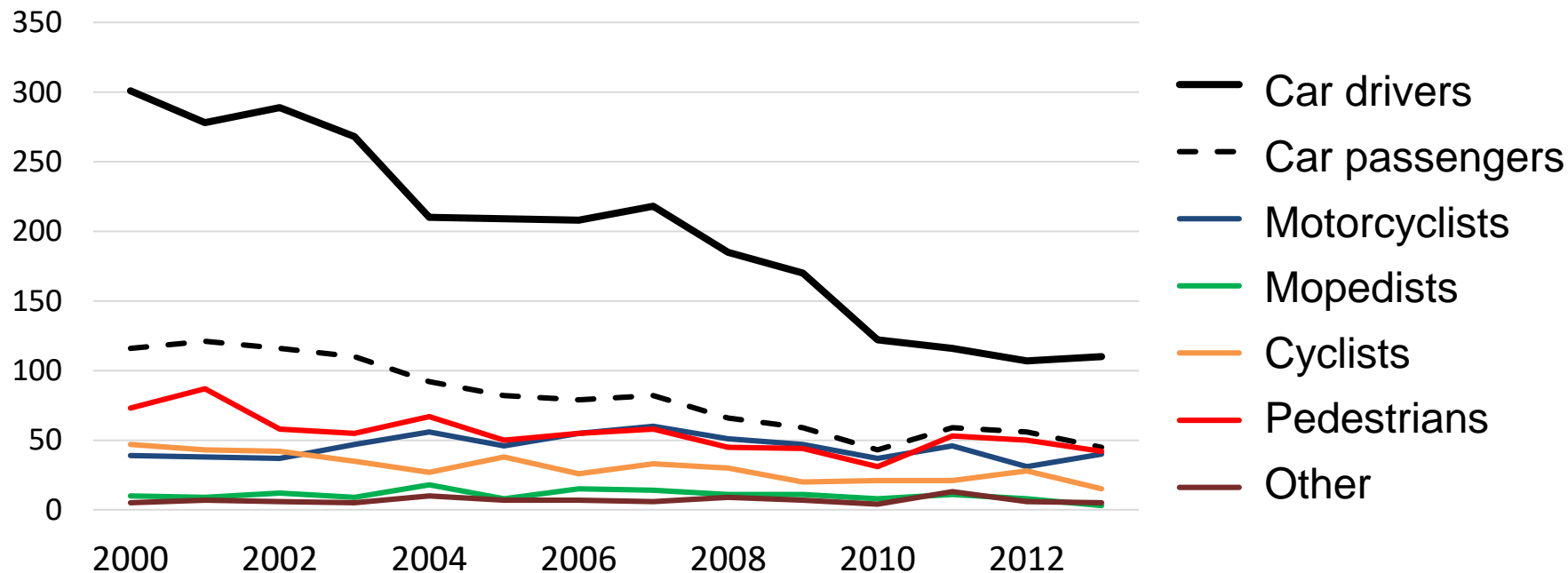


# Percentage of vehicle mileage with Electronic Stability Control, Seat Belt Reminders and 5 stars NCAP (crashworthiness)





# Road traffic fatalities in Sweden





# Fatality addressed by median barrier

2000



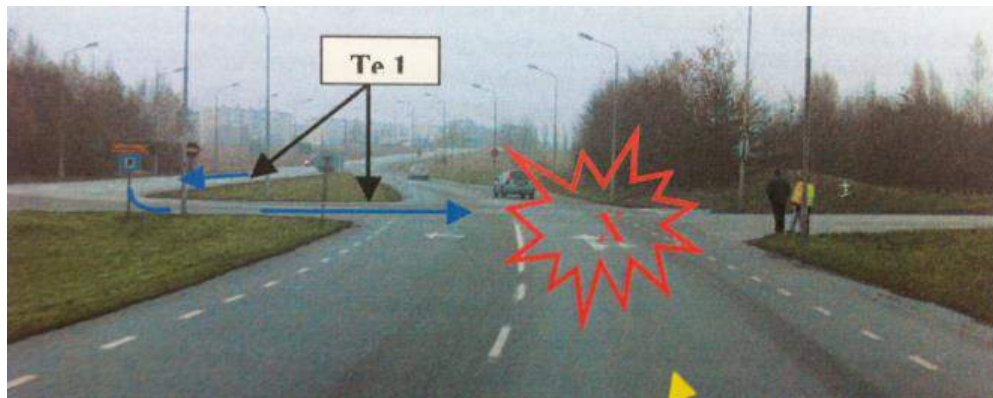
2010





# Fatality addressed by roundabout

2000



2010





# Not addressed: local intervention by removing one single tree

2000



2010





# Most effective interventions between 2000 and 2010

	Number of saved	
	lives	%
<b>Median barrier</b>	<b>65</b>	<b>20%</b>
<b>Car crashworthiness</b>	<b>39</b>	<b>12%</b>
<b>Electronic Stability Control</b>	<b>22</b>	<b>7%</b>
<b>Side barrier</b>	<b>18</b>	<b>5%</b>
Seat Belt Reminders	6	2%
Roundabouts	7	2%
Roadside	2	1%
Rumble strips	3	1%
Total calculated reduction	162	49%
Actual reduction	176	53%



# Summary

- 2+1 roads are a successful measure to increase safety on rural roads
- Fatalities were reduced by approximately 50% between 2000 and 2010 with road, vehicle and speed interventions
- It takes time to achieve the full benefits of vehicle safety technologies



**Matts-Åke Belin PhD**  
**Director Vision Zero**  
**Academy**  
**Adj. Professor Royal**  
**Institute of Technology**  
**(KTH)**  
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**TRAFIKVERKET**  
**SWEDISH TRANSPORT ADMINISTRATION**



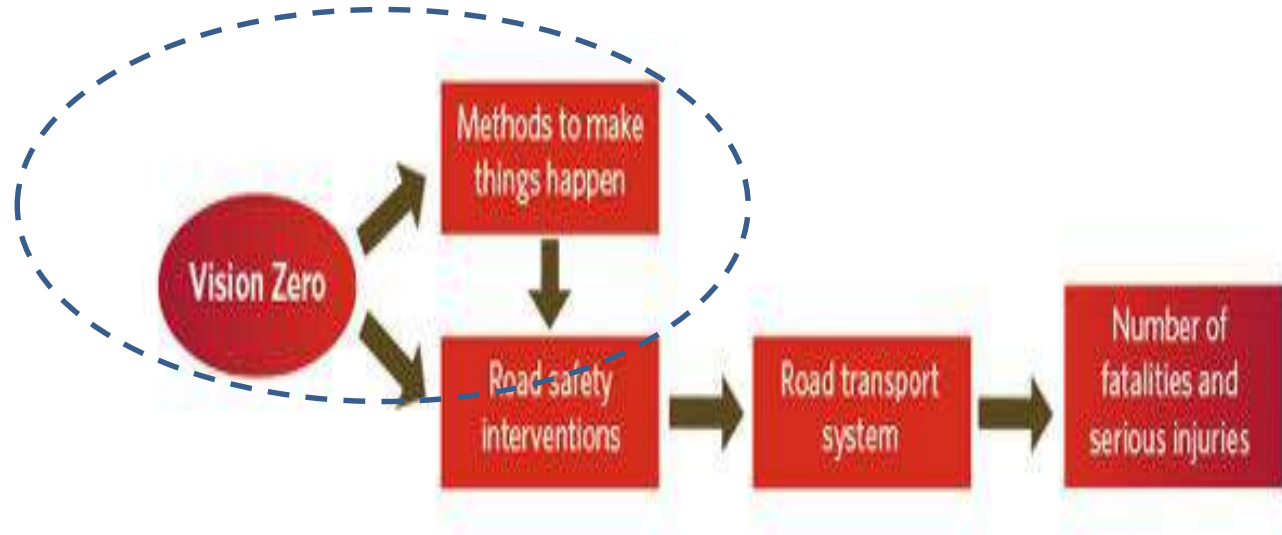


# Vision Zero a policy innovation

- Ethical imperative that it can never be ethically acceptable that people are killed or seriously injured when moving within the road transport system
- A safe philosophy based on the overall aim to control for harmful energy
- System perspective where humans (biological, psychological and social capabilities) are put at the center (People will make mistakes. Plan, design and maintain a system for people rather than the other way around)
- Working methods and processes which includes the whole society, research, business, industry, public stakeholders and non governmental organizations. (Not only a matter for public authorities)
- A chain of responsibility which starts and ends with **all professional organizations** which have a stake in the function, design and the use of the road transport system



# Vision Zero change also the way we do things



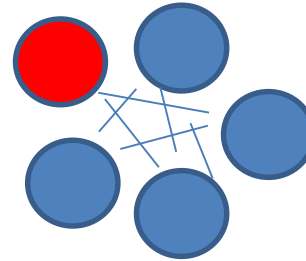
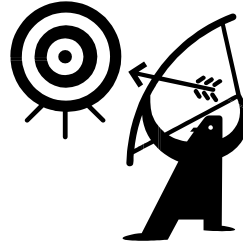
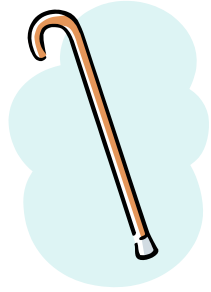


## Vision Zero - strong focus on changing organizations behavior





# Governance strategies to influence different stakeholders



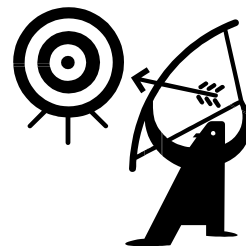
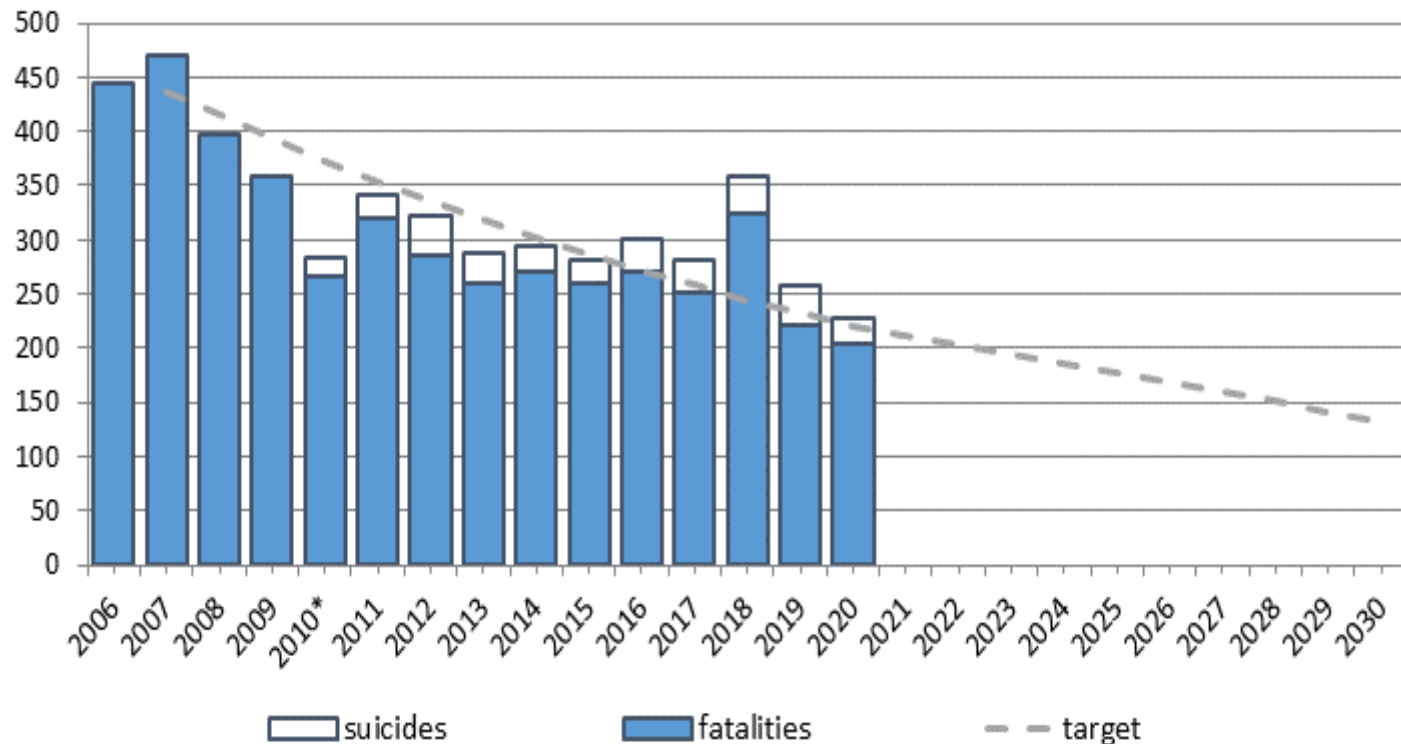


# Management by objectives





# Road traffic fatalities in Sweden and target for 2030

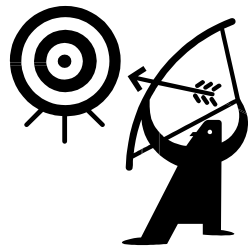




Road Safety Performance Indicator		Starting point	2019	National target 2020
1 a.	Speed, state road network	43 %	● 47 %	80 %
1 b.	Speed, state road network, average travel speed	82 km/h	● 78,1 km/h	77 km/h
2.	Speed, municipal road network	64 % (2012)	● 65 %	80 %
3.	Sober traffic	99,71 %	● 99,75 %	99,90 %
4.	Use of seatbelt	96 %	■ 98,4 %	99 %
5 a.	Use of cycle helmets	27 %	● 47 %	70 %
5 b.	Use of moped helmets	96 %	● 93 %	99 %
6.	Safe passengers cars	20 %	■ 79 %	80 %
7.	Increase in regulatory compliance motorcycle	–	–	Target not set
8.	Safe state roads	50 %	● 80 %	90 %
9.	Safe pedestrian & bicycle crossings	19 %	● 28 %	35 %
10.	Maintenance of cycle paths	18 %	● 19 %	70 %
11.	Systematic road safety work, ISO 39001	–	–	Target not set
	Number of fatalities	440	■ 221	220
	Number of severe injuries	5 400	■ 3 800	4 100

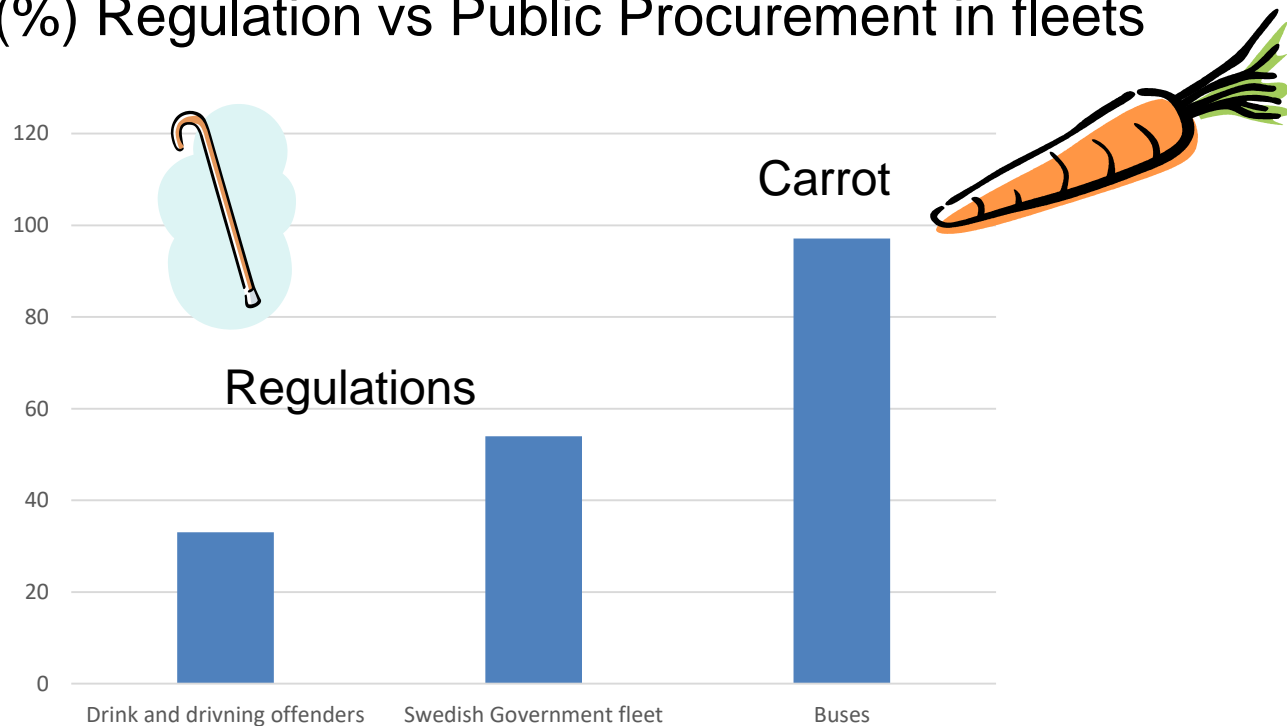
■ In line

● Not in line



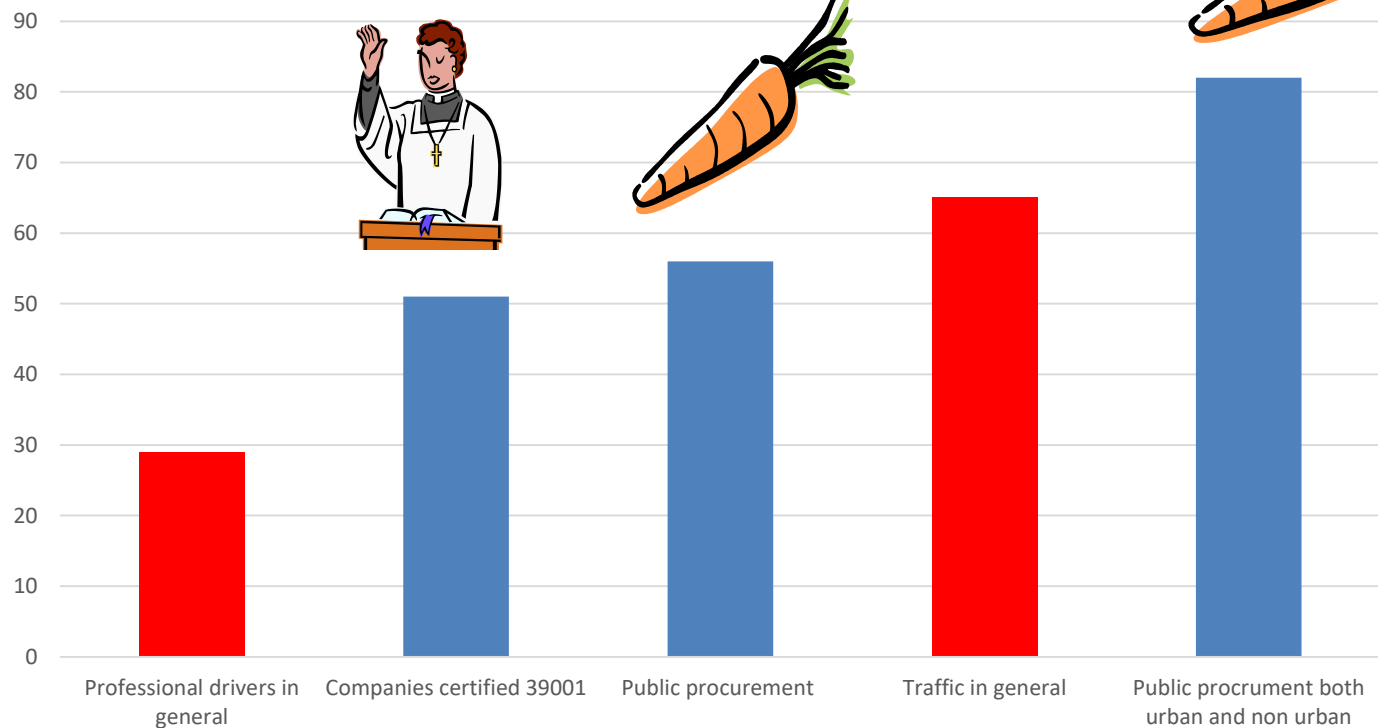


## Alco lock (%) Regulation vs Public Procurement in fleets





# Speed compliance professional transport (%)





# Network collaboration

## Volvo Cars and the Swedish National Road Administration in joint offensive against traffic accidents



Sep 08, 2008 | ID: 16892

Aa- | Aa+ |   

Volvo Car Corporation and the Swedish National Road Administration will work together to avoid or lessen the effects of road accidents. This is the thrust of the declaration of intent that Volvo Cars' President and CEO Fredrik Arp and the Swedish National Road Administration's Director General Ingemar Skogö signed at the start of the traffic safety seminar today in Työsand.

The Swedish National Road Administration has worked on its Vision Zero approach since 1997, while Volvo Car Corporation presented a vision in 2007 whose aim is to design cars that do not crash. In the shorter term, this means that by the year 2020, nobody should be injured or killed in a Volvo.

### Media Contacts

#### **Per-Åke Fröberg**

Director Volvo Cars Heritage

Volvo Car Group

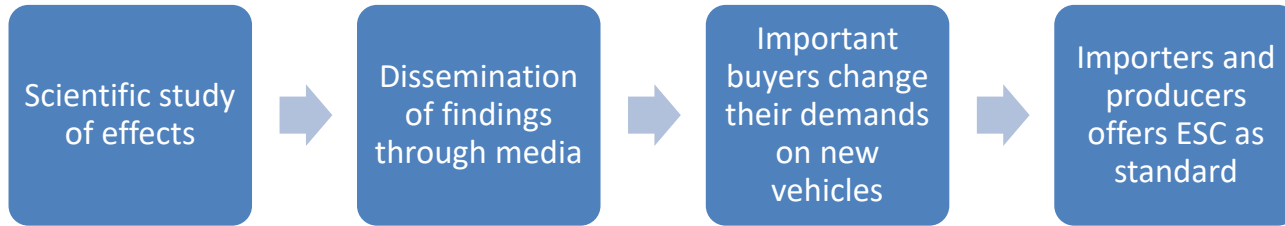
Phone: +46 31 3257654

[per-ake.froberg@volvocars.com](mailto:per-ake.froberg@volvocars.com)

### Related Images

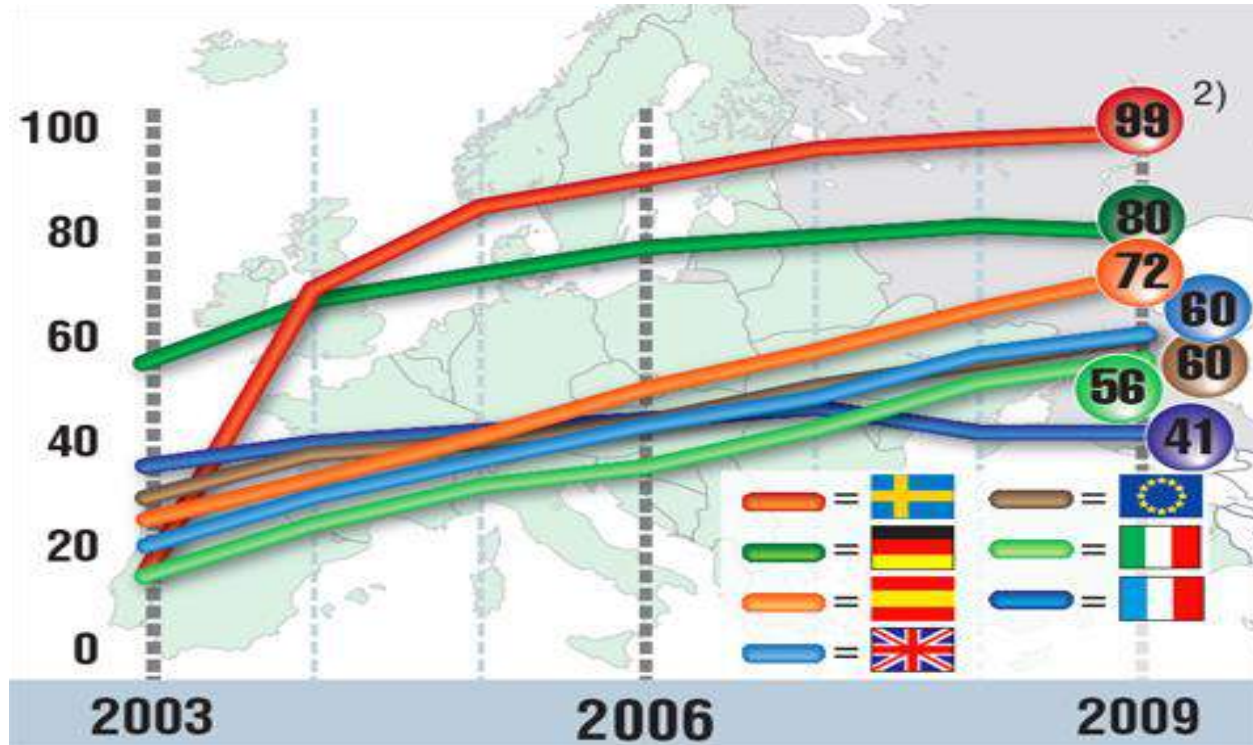


# Dissemination of scientific results and consumer information





# ESC new cars fitment rate 2009





Research program on policy and implementation – how to make things happen and get organizations to contribute to a safe system





# VISION ZERO

ACADEMY

STRIVING  
FOR EXCELLENCE IN  
TRANSPORT  
SAFETY



Evidence based approach -  
the need of data



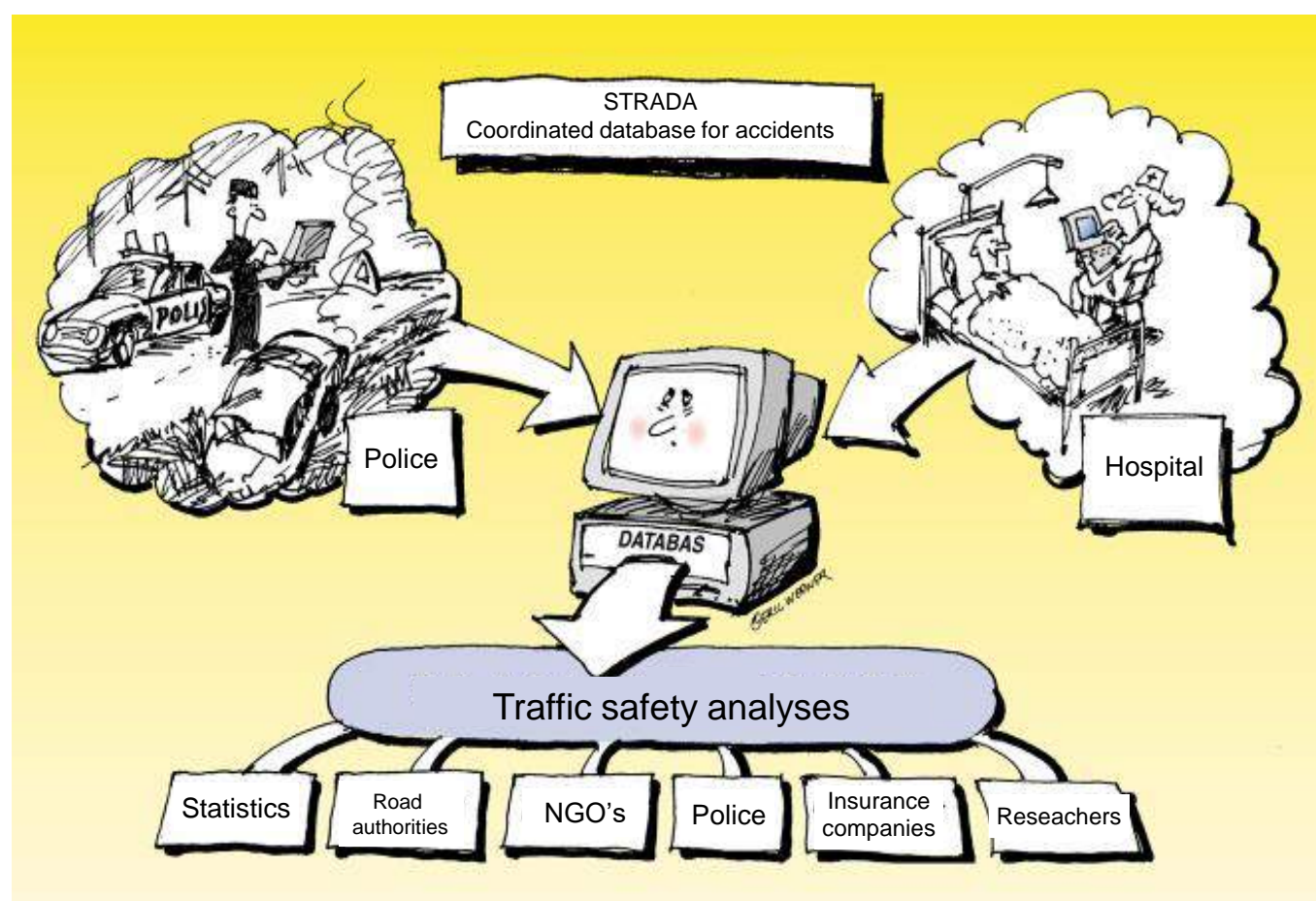
# Evidence based approach - the need of data

*Kenneth Svensson*  
*Special adviser traffic safety*  
*Swedish Transport Administration*



# STRADA

## Swedish Traffic Accident Data Acquisition







<b>Polisrapport</b> <b>Vägrafrikolyckor</b>		Olycks-ID 1247774	Polisens daterummer K-837151/17
Län Skåne län	Kommun Kristianstad	Olycksfille 2017-07-06 18:15 Osaker tid	Olyckstyp K (korsande-motorfordon)
Olycksplats Industrigatan, Korsningen till Tegelbruksvägen i Kristianstad		Position i karten Saker position	
Originalsize finns			
Beskrivning av händelseförloppet			
Mc kommer körandes på industrigatan. Pb1 kommer på Tegelbruksvägen. Pb1 har väjningsplikt men ser Inte Mc. Mc kor in i vänster sida av bilen.			
Värdetillståndanden	Väges	Beläggstyp	
Upphållsväder	Vägbanan torr	Tättbebyggt område	
Yrformländen	Festtyp	Attribut	
Dagsljus	Gatu-/Vagkorning		
Vagnnummer/Gatunamn	Väg A: Tegelbruksvägen	Väg B: Industriegatan	
Högsta tillåtna hastighet	40 km/h	40 km/h	
Vagttyp	Annan allmän väg	Annan allmän väg	
Trafikanvisning	Okant	Huvudled	
Trafikreglering	Vajningsplikt		
Trafiksignal	Saknas	Saknas	
Gatu-/vågelysning	Uppgift saknas		

Nr	Strafkindseregion (enkel personer totalt i fordönet)	Räfer och idn	Alder och idn	Förern	Passagerare	Rekonstrade	Stämndel förfördel	Cyrlings skärning	Rapporterad av styv.				
				Fam	Bak	Öland	Död	Sår	Undring	Önskad	Öland		
1 Personbil (1)	875619	45-K	X						X			N	N
2 Motorcykel (tung) (1)	233294	25-M	X						X			N	3

<b>Trafikskadejournal</b>					
Sjukhus Stockholm, Södersjukhuset	Glystadiella 2010- <input type="text"/> - <input type="text"/>	Bilam 2010- <input type="text"/> - <input type="text"/>	Bilam med <input type="checkbox"/> Ösakert datum <input type="checkbox"/> Ösakert klockslag	Bilam med <input type="checkbox"/> Ösakert datum <input type="checkbox"/> Ösakert klockslag	På bil på plats Nej
Rider och kör OO - Kvinna	Referensnr <input type="text"/>	<input checked="" type="checkbox"/> Hem <input type="checkbox"/> Inlagd på avd.	<input type="checkbox"/> Annat sjukhus		Utsedd (dagur)
<input type="checkbox"/> Död vid ankömst	<input type="checkbox"/> Avvek				
Län Stockholms län	Kommun Stockholm	Glystadiella Högdalens busstation	Position i bilen Säker position		
Användningsområde Snarvade på den väldigt höga kanthen vid busstationen.					
Förare Buss-/Spårvarneshållplats	Aktivitet	Befvägsgenomfört	Tattbebyggat område		
Vagnmätare/haveri Annat					
Högskan var Fotgångare	I konflikt med	Diverse omständigheter På fritiden			
Mallförändring Förare	Skadestyrning				
När: A25 Z	ISS +	RPRD 1% 0,35	RPRD 10% 0,03	Glystadiella OO (Fotgångare singel)	

Lätt el., ■ Mätlig el., ■ Allvarig el., ■ Svår el., ■ Kritisk el., ■ Maximal el., ■ Ölsand el., ■

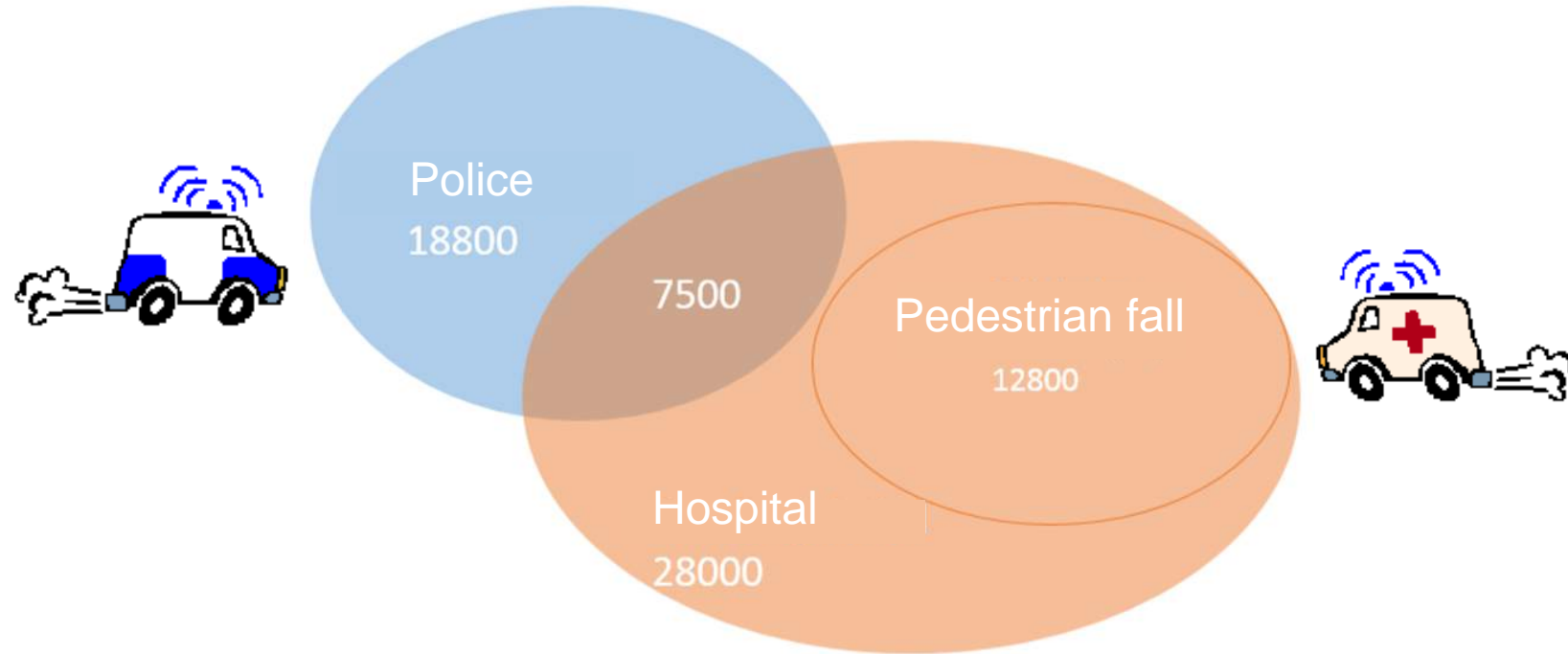



Skador

- Skeletal - Ulna fracture NFS - Proximal Ulna fracture [olecranon]



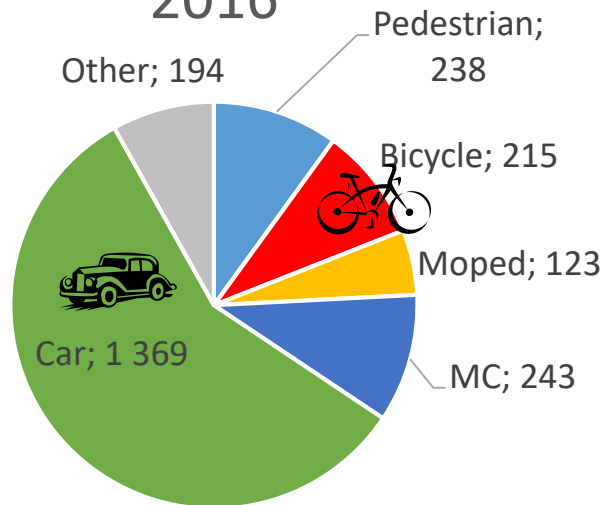
# Coverage, from Police and Hospital



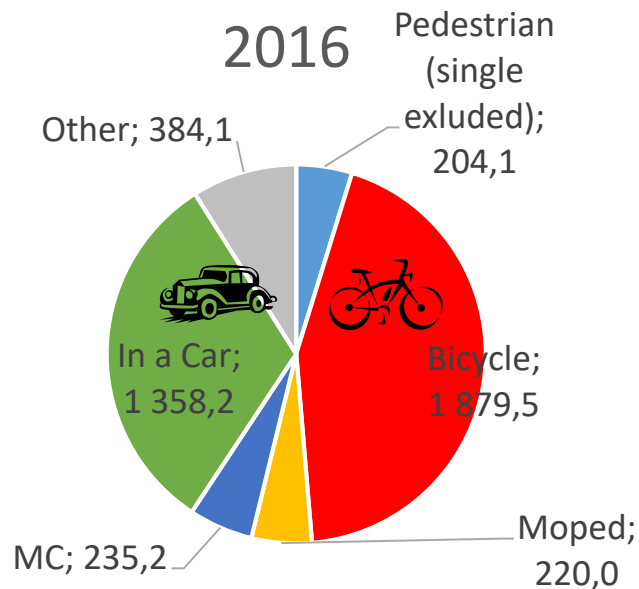




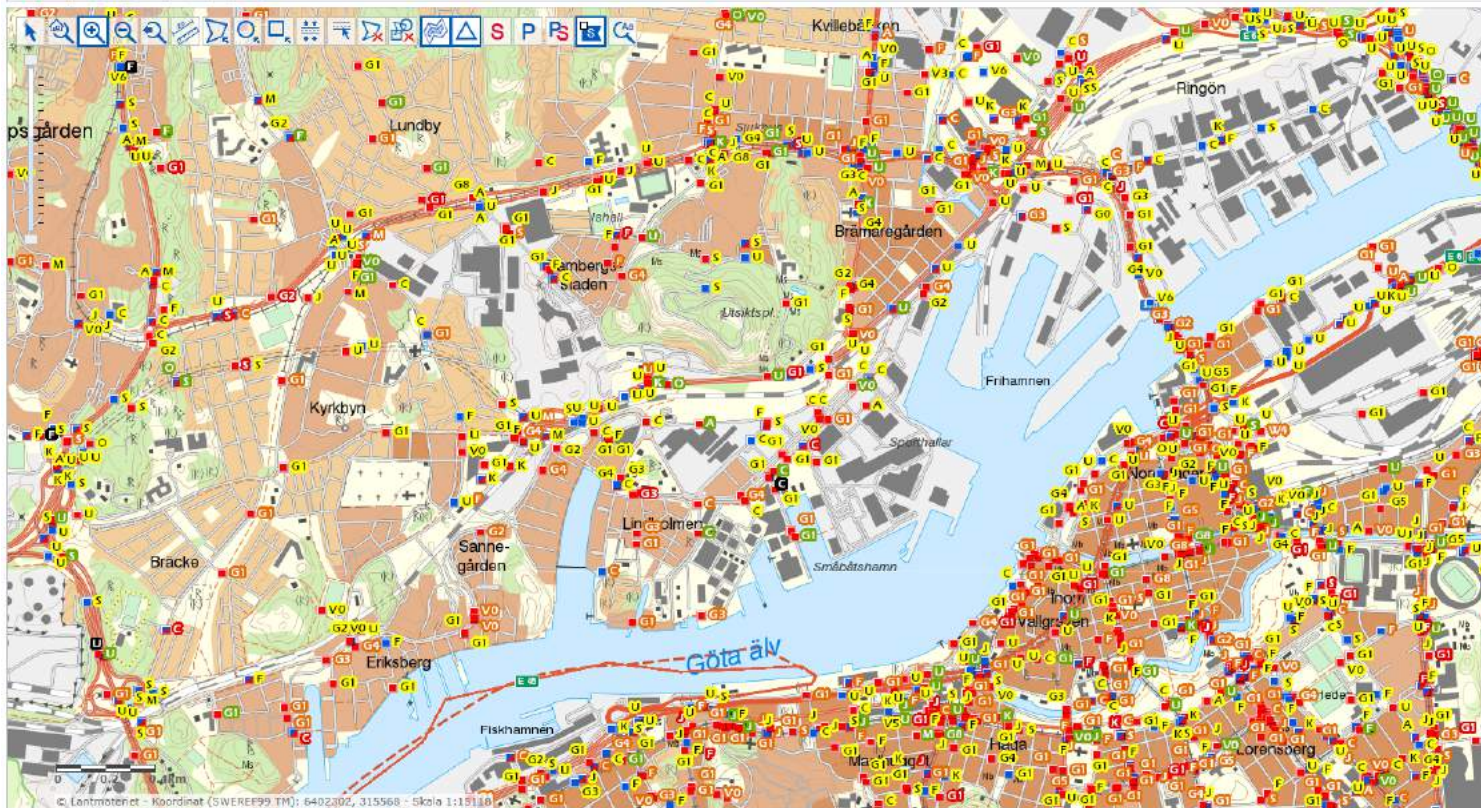
## Police, severe injuries 2016



## Hospital Seriously injured 2016







5256

olyckor varav 5142 visas i kartan

Sida 1 av 27

Olycksid:

Sök

Expandera

- 1126456, P + S 2015-01-05 X
- 1126493, F 2015-01-04 X
- 1126494, P + S 2015-01-05 X
- 1126804, P 2015-01-06 X
- 1126950, S 2015-01-04 X
- 1127507, P 2015-01-05 X
- 1127524, P + S 2015-01-07 X
- 1127591, P 2015-01-09 X
- 1127610, P + S 2015-01-10 X
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- 1127675, P + S 2015-01-12 X
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- 1127857, P 2015-01-09 X
- 1128037, P + S 2015-01-11 X
- 1128215, P + S 2015-01-13 X
- 1128337, P + S 2015-01-12 X
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- 1128377, P + S 2015-01-13 X
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- 1128841, S 2015-01-08 X
- 1129212, S 2015-01-17 X
- 1129255, S 2015-01-14 X
- 1129266, S 2015-01-07 X
- 1129332, S 2015-01-13 X
- 1129347, S 2015-01-14 X
- 1129530, P 2015-01-16 X
- 1129532, P + S 2015-01-17 X
- 1129537, P 2015-01-17 X

NU ÄR DET DAOS FÖR NÄSTA TRÄNING.

ÄR DU REDO ATT BÖJA?

JÄ SENSARE HOPPA ÖVER





# In-depth studies of fatal accidents

In Sweden all fatalities in road traffic undergo an in-depth study by accident investigators at the Swedish Transport Administration.





# What is an in-depth study?

Detailed investigation into each fatal road accident with the main objective to identify what caused the fatal injuries

Routine since 1997 and is regulated in the government's instruction to the Transport administration

Accident investigators gather information on each fatal accident





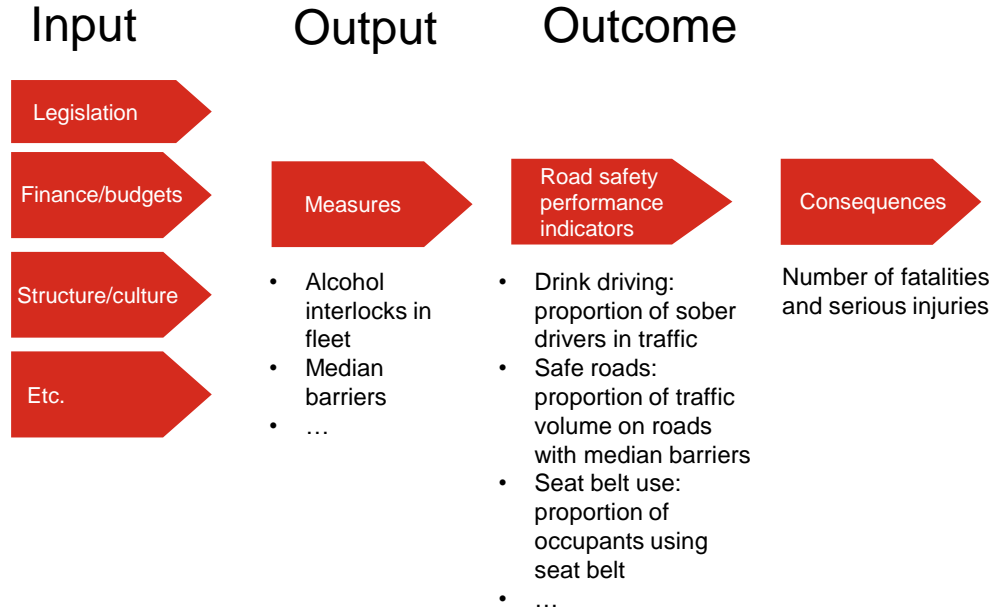
# Three questions to be answered

- What happened?
- Why did it happen?
- What can be done to ensure that it does not happen again?

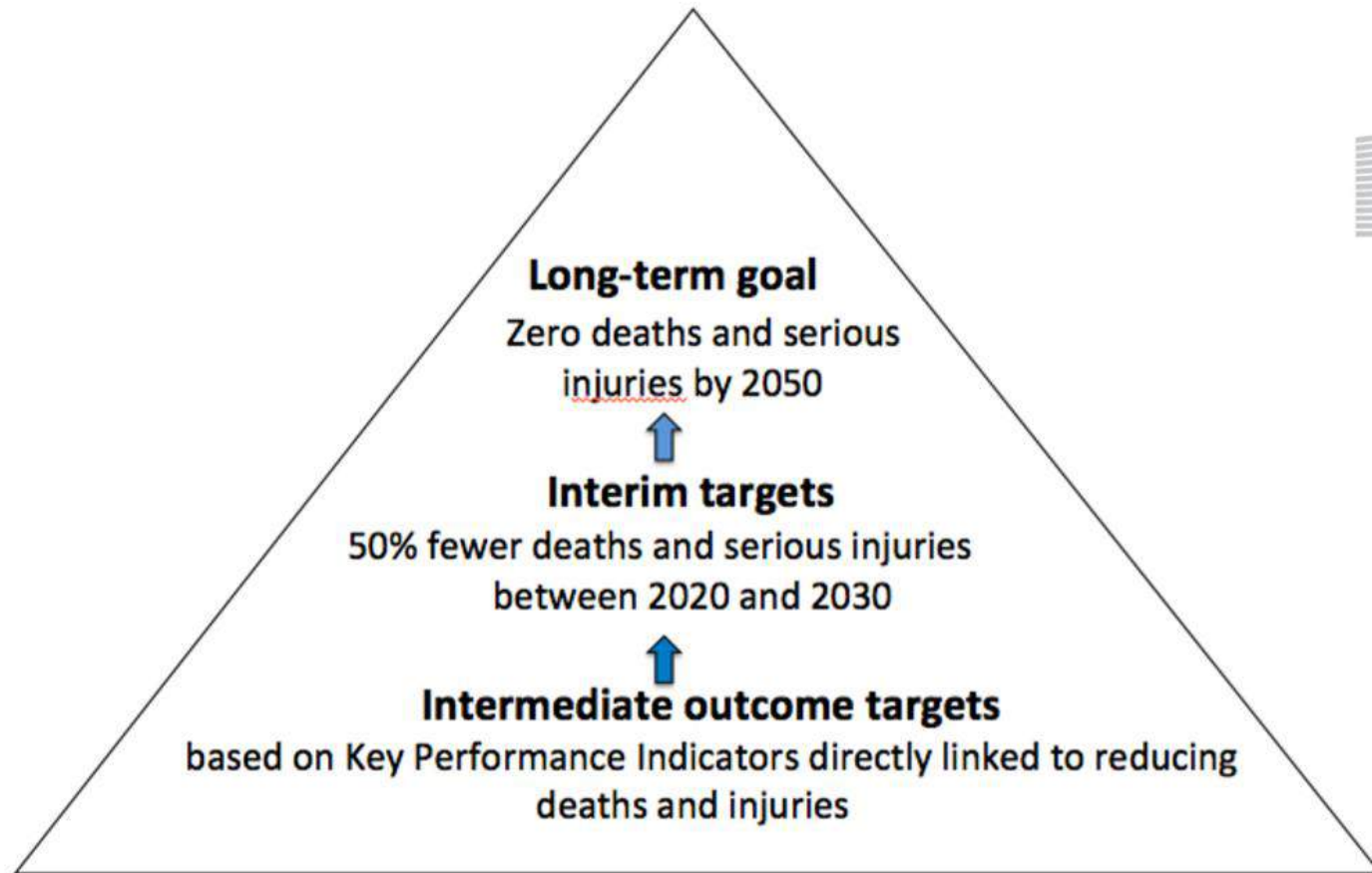




# Road Safety Performance Indicators









# Key Performance Indicators EU



Indicator	Proposed definition
1. Speed	Percentage of vehicles traveling within the speed limit.
2. Safety belt	Percentage of occupants using the safety belt and percentage of children using a child restraint system
3. Helmet	Percentage of motorcyclists, moped riders and cyclists wearing a protective helmet.
4. Alcohol and drugs	Percentage of drivers, riders and cyclists without alcohol or drugs impairing driving.
5. Distraction	Driver distraction indicator.
6. Vehicle fleet	Vehicle fleet safety indicator.
7. Infrastructure	Road infrastructure safety indicator.
8. Post-crash care	Post-crash care performance indicator.



# Controlling of harmful energy





# When data is missing

Even if there is a lack of data it is possible to work proactively with traffic safety if the work is based on the principles of Vision Zero





# Thank you for listening!

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**Adj. Professor Royal**  
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**TRAFIKVERKET**  
**SWEDISH TRANSPORT ADMINISTRATION**





Table 1: Leading causes of death, all ages, 2016

Rank	Cause	% of total deaths
All Causes		
1	Ischaemic heart disease	16.6
2	Stroke	10.2
3	Chronic obstructive pulmonary disease	5.4
4	Lower respiratory infections	5.2
5	Alzheimer's disease and other dementias	3.5
6	Trachea, bronchus, lung cancers	3.0
7	Diabetes mellitus	2.8
8	Road traffic injuries	2.5
9	Diarrhoeal diseases	2.4
10	Tuberculosis	2.3

2016 WHO Global Health Estimates

8<sup>th</sup>

leading cause of death for  
people of all ages

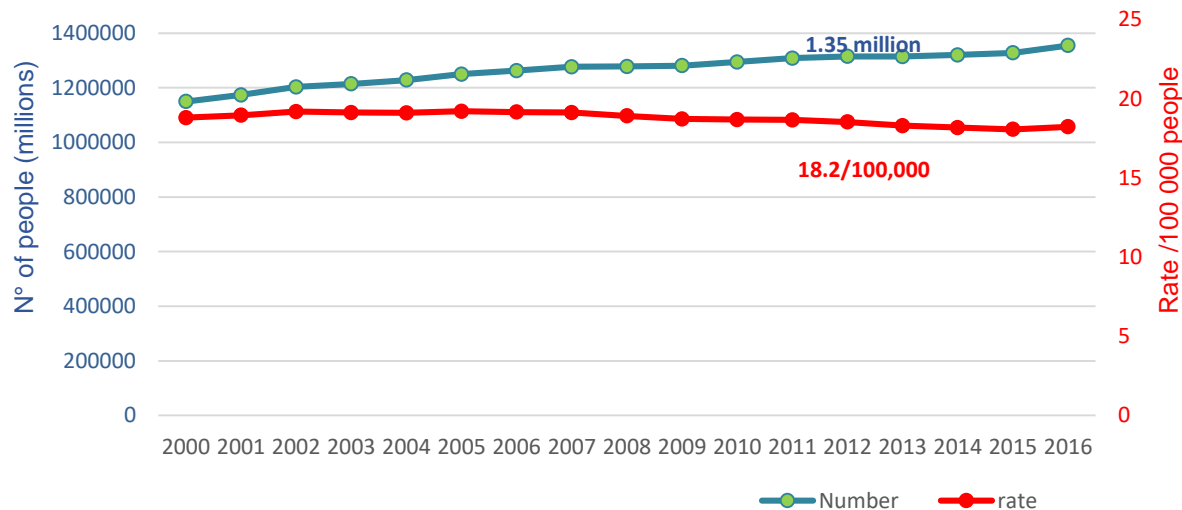
#1

cause of death for children  
and young adults aged 5-29  
years

Global Status Report on Road Safety 2018, World Health Organization



# There are signs of progress



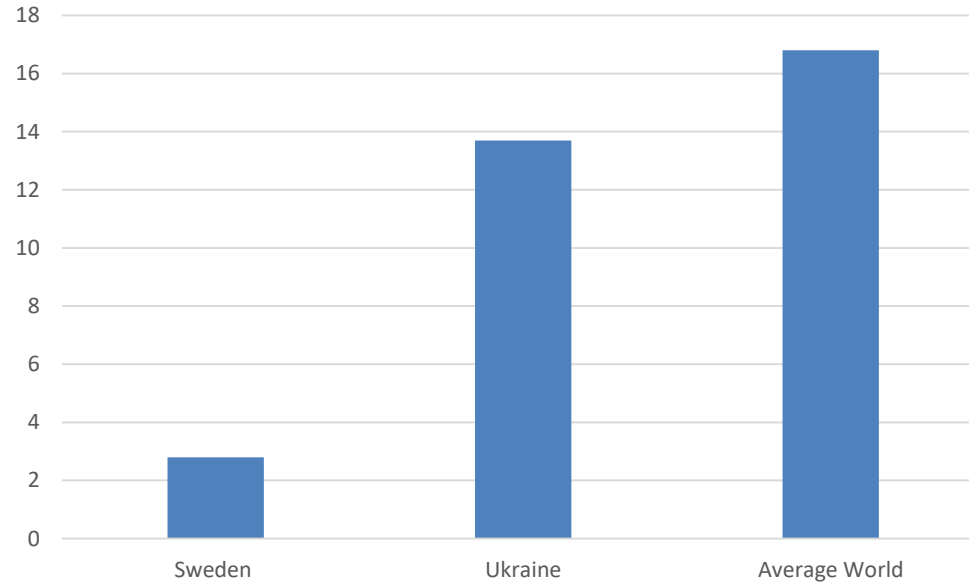
# 18.2

rate of death per 100 000 has stabilized but the number of people and motor vehicles has increased.

Global Status Report on Road Safety  
2018, World Health Organization



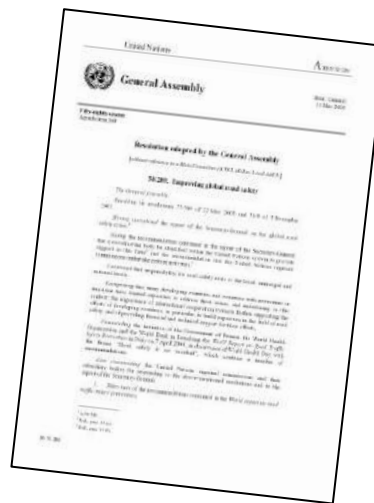
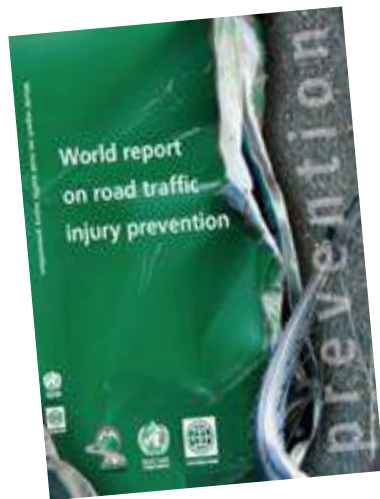
# Number of deaths per 100 000 inhabitants



Global Status Report on Road Safety 2018, World Health Organization



## Year 2004 – Road Traffic Injuries on the UN Agenda





## United Nations Road Safety Collaboration

 [UN Road Safety Collaboration](#)[About](#)[Advocacy](#)[Publications](#)[Networks](#)[Funding opportunities](#)[Decade of action](#)[Road safety week](#)

### About the UN Road Safety Collaboration

In April 2004, the UN General Assembly resolution A/RES/58/289 on "Improving global road safety" invited WHO, working in close cooperation with the UN regional commissions, to act as coordinator on road safety issues across the UN system. The World Health Assembly accepted this invitation in May 2004 and WHO subsequently set up the UN Road Safety Collaboration (UNRSC) which holds biannual meetings to discuss global road safety issues.



The Collaboration is an informal consultative mechanism whose members are committed to road safety efforts and in particular to the implementation of the recommendations of the *World report on road traffic injury prevention*. The goal of the Collaboration is to facilitate international cooperation and to strengthen global and regional coordination among UN agencies and other international partners to implement UN General Assembly resolutions and the recommendations of the world report thereby supporting country programmes.

### UN Road Safety Collaboration meetings

[29th meeting](#)[Previous meetings](#)

### Partners

[UN Road Safety Collaboration partners](#)[Terms of reference of the UNRSC](#)  
pdf, 62kb[Decade of Action for Road Safety 2011-2020 Secretariat](#)[Terms of reference](#)[United Nations Road Safety Collaboration > About the UN Road Safety Collaboration](#)

#### Resources

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[Publications](#)  
[Events](#)  
[Networks](#)  
[Funding opportunities](#)  
[Decade of Action](#)

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Stockholm Declaration  
Third Global Ministerial Conference on Road Safety: Achieving Global Goals 2030  
Stockholm, 19-20 February 2020

We, Ministers and Heads of Delegations as well as representatives of international, regional and sub-regional governmental and non-governmental organizations and the private sector gathered in Stockholm, Sweden, on 19 and 20 February 2020 for the Third Global Ministerial Conference on Road Safety.

Russia 2009



Brazil 2015



Sweden 2020







Seventy-fourth session  
Agenda item 12  
Improving global road safety

- need to promote an integrated approach to road safety such as **a safe system approach and Vision Zero**...strengthen national intersectoral collaboration, including engagement with non-governmental organizations and civil society and academia, as well as businesses and industry
- Proclaims the period 2021–2030 as the **Second Decade of Action for Road Safety, with a goal of reducing road traffic deaths and injuries by at least 50 per cent from 2021 to 2030**
- Calls upon **businesses and industries** of all sizes and sectors to contribute to the attainment of the road safety-related Sustainable Development Goals, including by applying safe system principles to their entire value chain...
- Encourages Member States and **private sector** entities that have not yet done so to establish an effective mechanism to reduce the number of crashes, road traffic fatalities and injuries caused by professional drivers, including drivers of commercial vehicles, owing to job-specific hazards...
- Decides to convene **a high-level meeting of the General Assembly**, no later than the end of 2022, on improving global road safety with a view to addressing gaps and challenges as well as mobilizing political leadership and promoting multisectoral and multi-stakeholder collaboration in this regard



14 SDG goals (17 goals) are definitely interrelated by sound road safety work – Vision Zero approach

