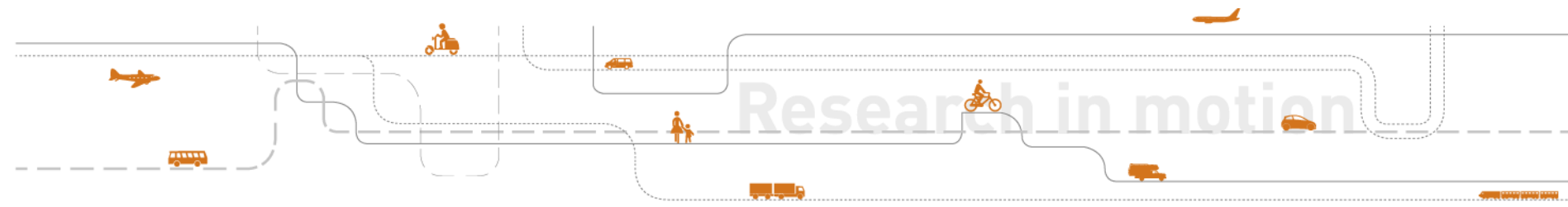


# The human being in the centre of Vision Zero

Torkel Bjørnskau

**TØI - Institute for Transport Economics, Norway**

Vision Zero in der Praxis,  
7<sup>th</sup> of December, 2016





- Body and brain
- Technology
- New challenges

Photo: Frank McKenna

# Body and brain

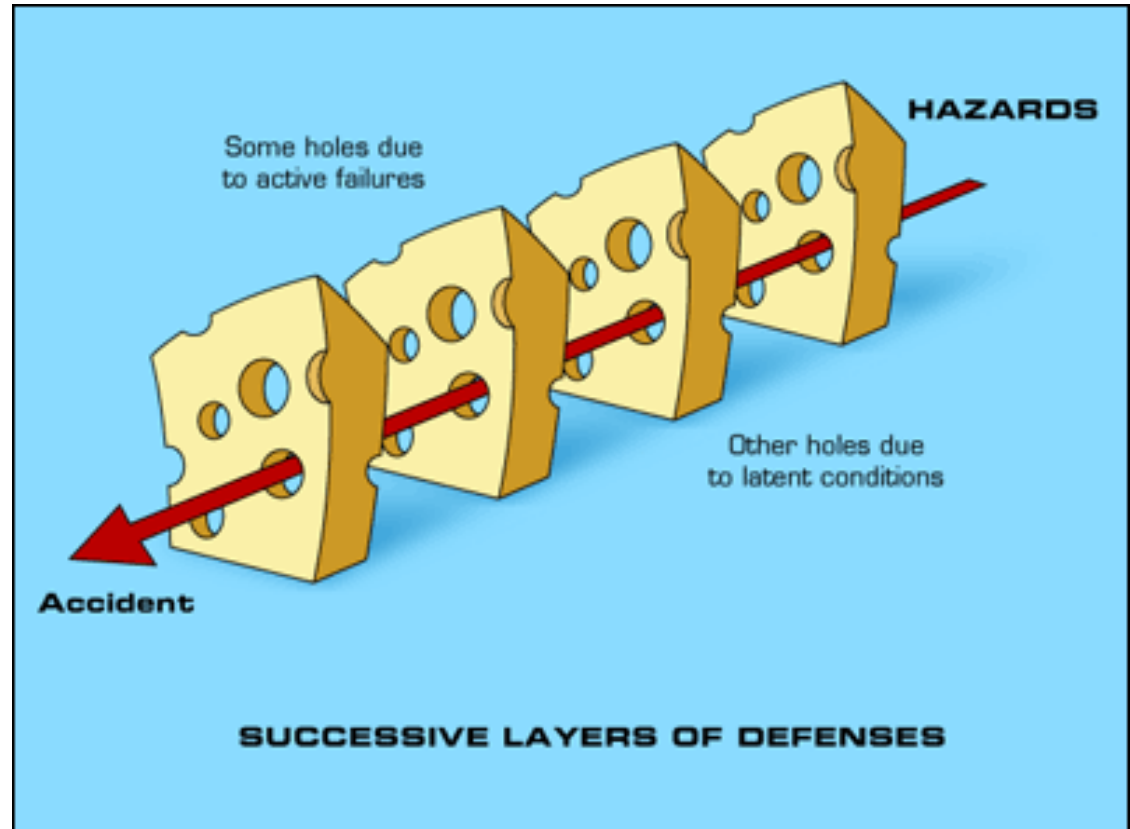
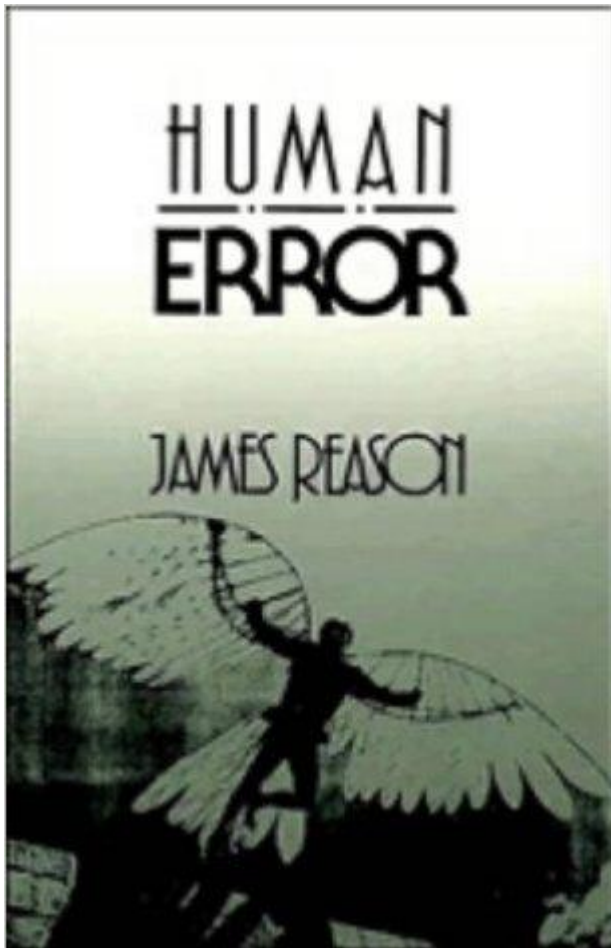


Photo: Ashley Bean



Photo: Jesse Orrico

# Brain – problem 1



*Reason, J. (1990) Human Error. Cambridge: University Press, Cambridge.*

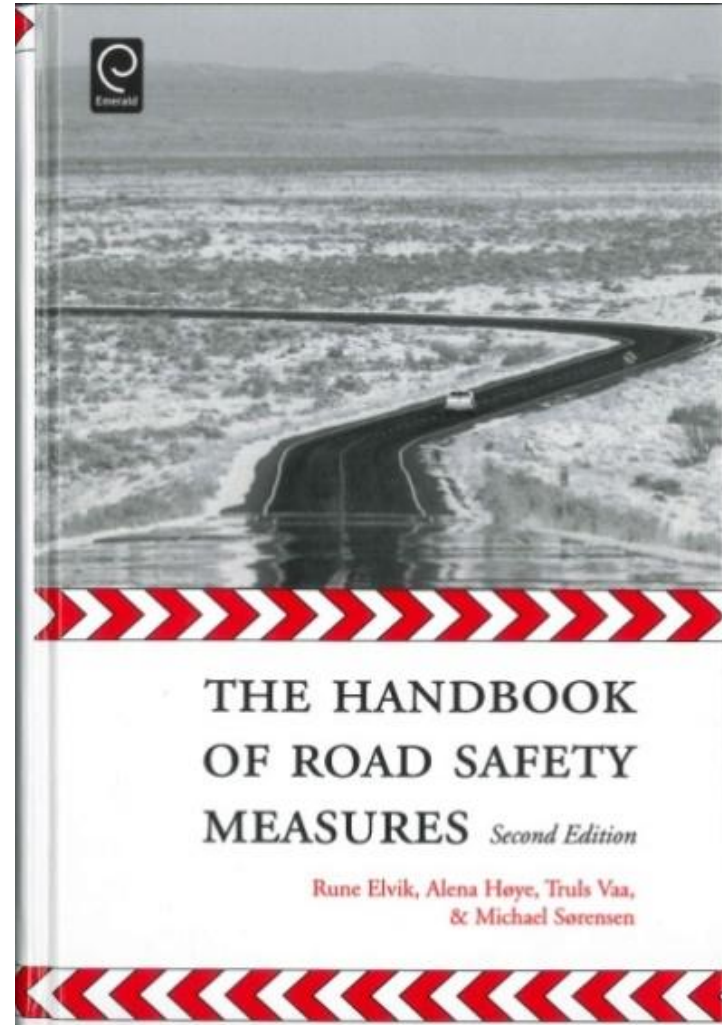
# William Haddon - Barriers and road safety



The first Administrator of the US National Highway and Traffic Safety Administration in 1966:

- Seat belts for all occupants
- Energy-absorbing steering column
- Penetration-resistant windshield
- Dual braking system
- Padded instrument panel

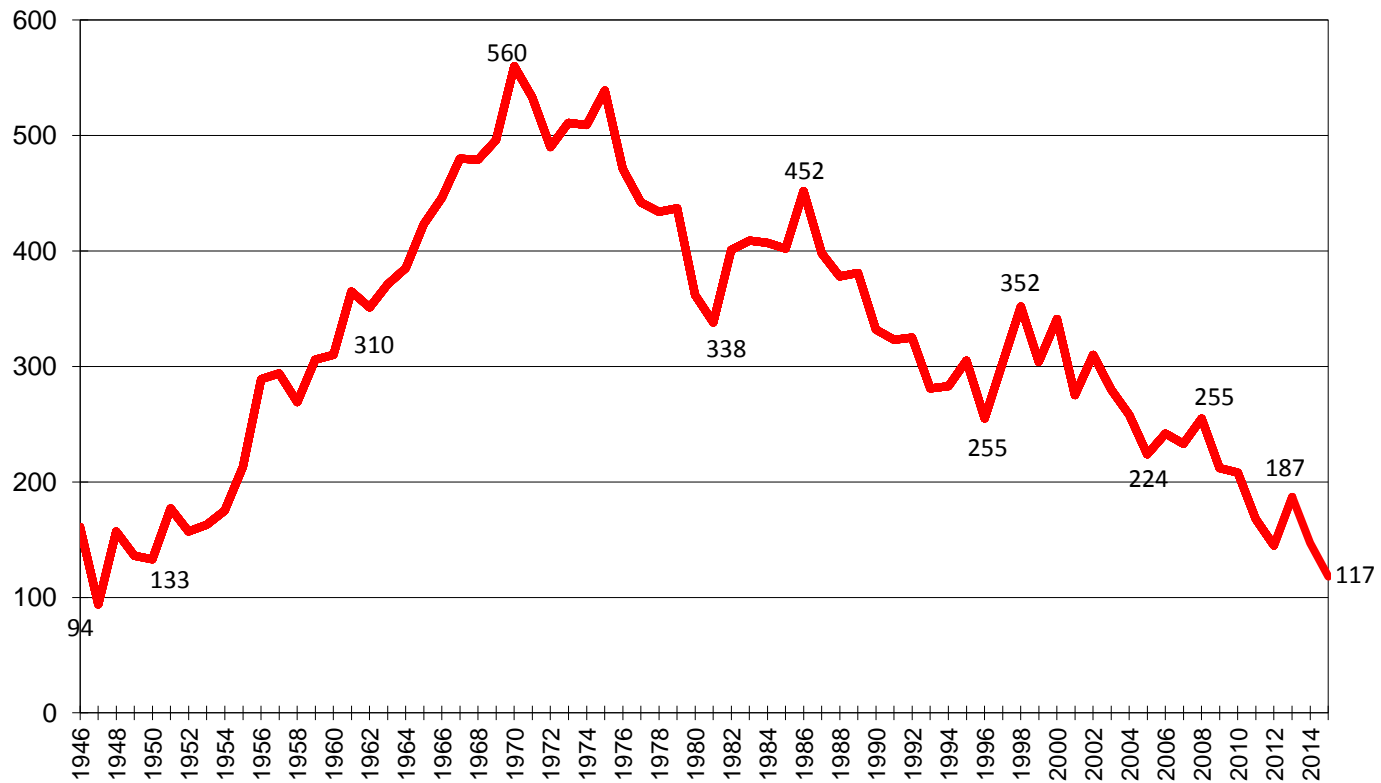
# Seat belts



# Separation

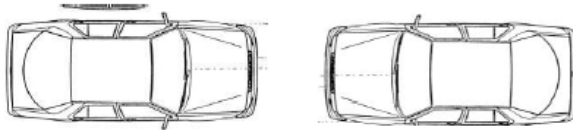


# Road fatalities in Norway 1946-2015

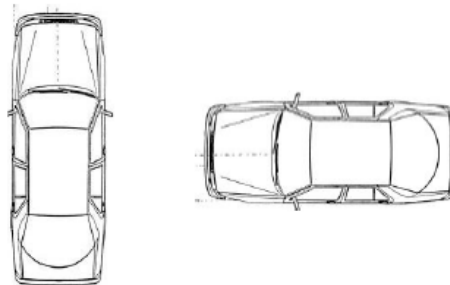




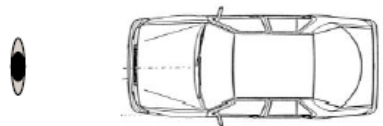
# Speed



A safe car can protect occupants up to 70-80 km/h in a head-on collision



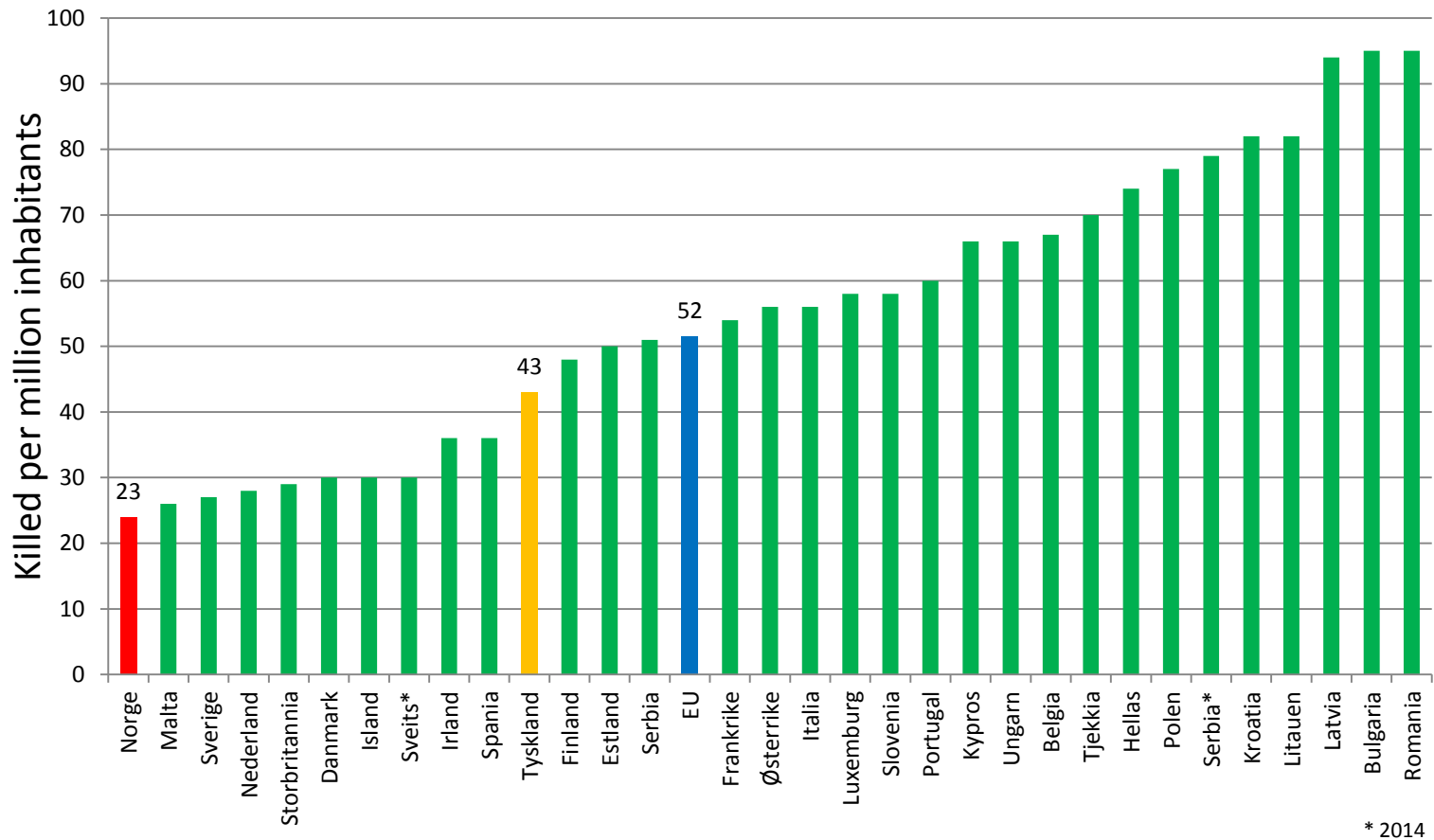
A safe car can protect occupants up to 50 km/h in a side collision



Most unprotected road users survive if a car travelling 30 - 40 km/h hits them

Source: Anna Vadeby, VTI

# Killed in traffic accidents - 2015



Source: ETSC (March 2016)

# Brain – Problem 2

## Behavioural adaptation - speed

«.. more efficient brakes .. will not in themselves make driving safer.»  
(Gibson & Crooks 1938, p. 458).



*Kilde: Gibson J. J. & Crooks L. E. (1938): A theoretical field analysis of automobile driving. The American Journal of Psychology, 51, 453-471*

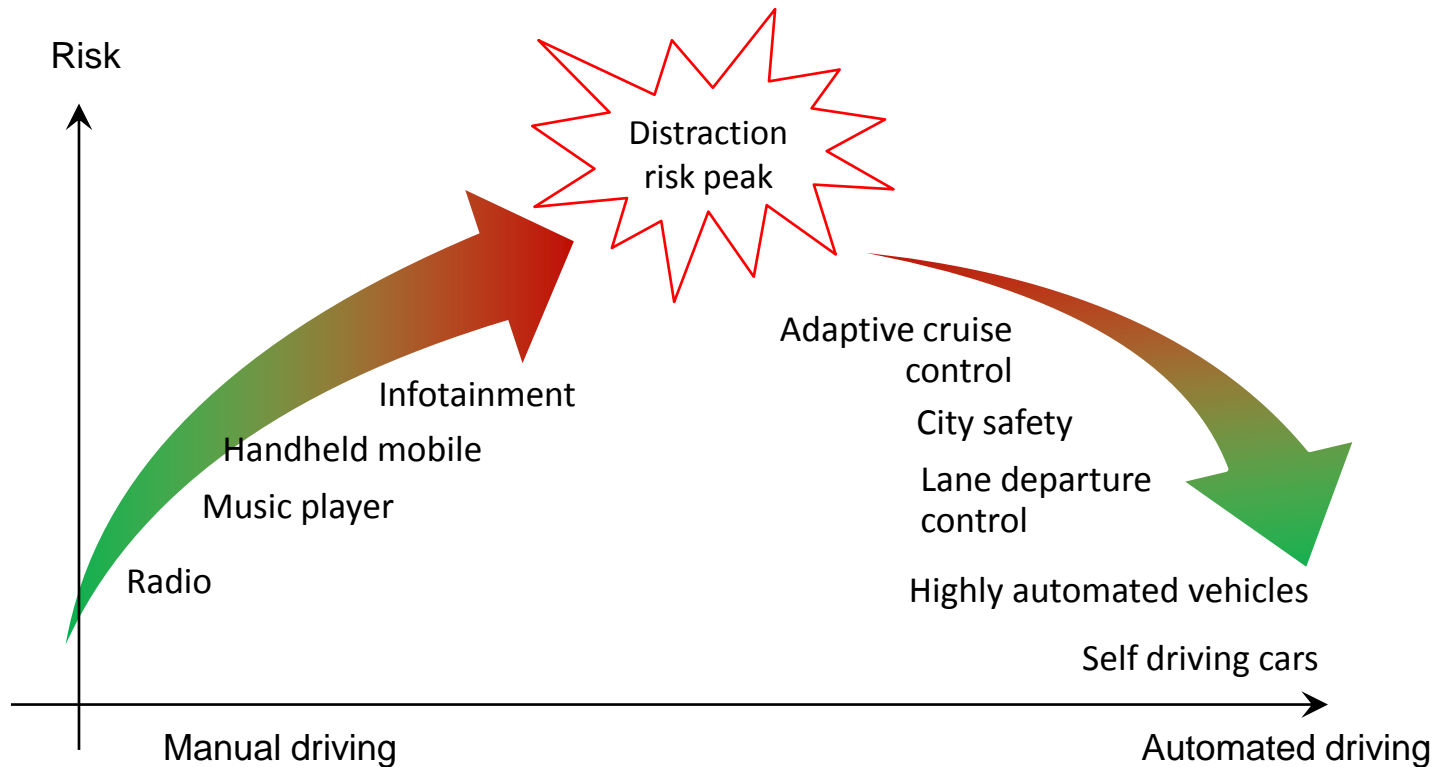
# Improved lighting = increased speed



# Intelligent cars - ADAS



# Distraction – an increasing problem



Source: The "DIAMOND" proposal to H2020

# Eventually saved by self-driving cars?

## News

### Governments race to outline future plans for self-driving cars

📅 November 29, 2016 📄 News



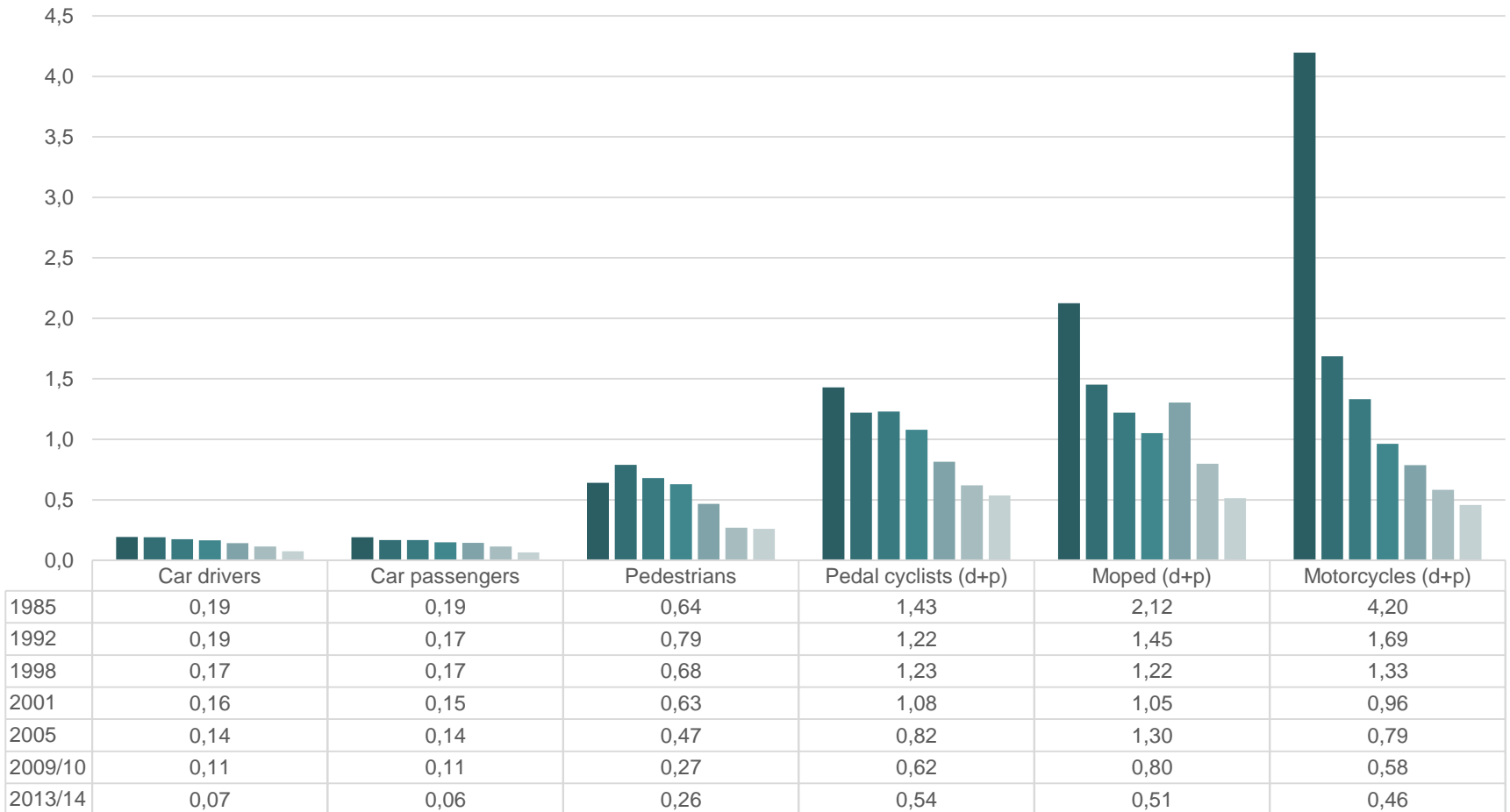


BMW BLOG



# Killed or injured per million personkm

## Norway 1985 - 2014



■ 1985 ■ 1992 ■ 1998 ■ 2001 ■ 2005 ■ 2009/10 ■ 2013/14

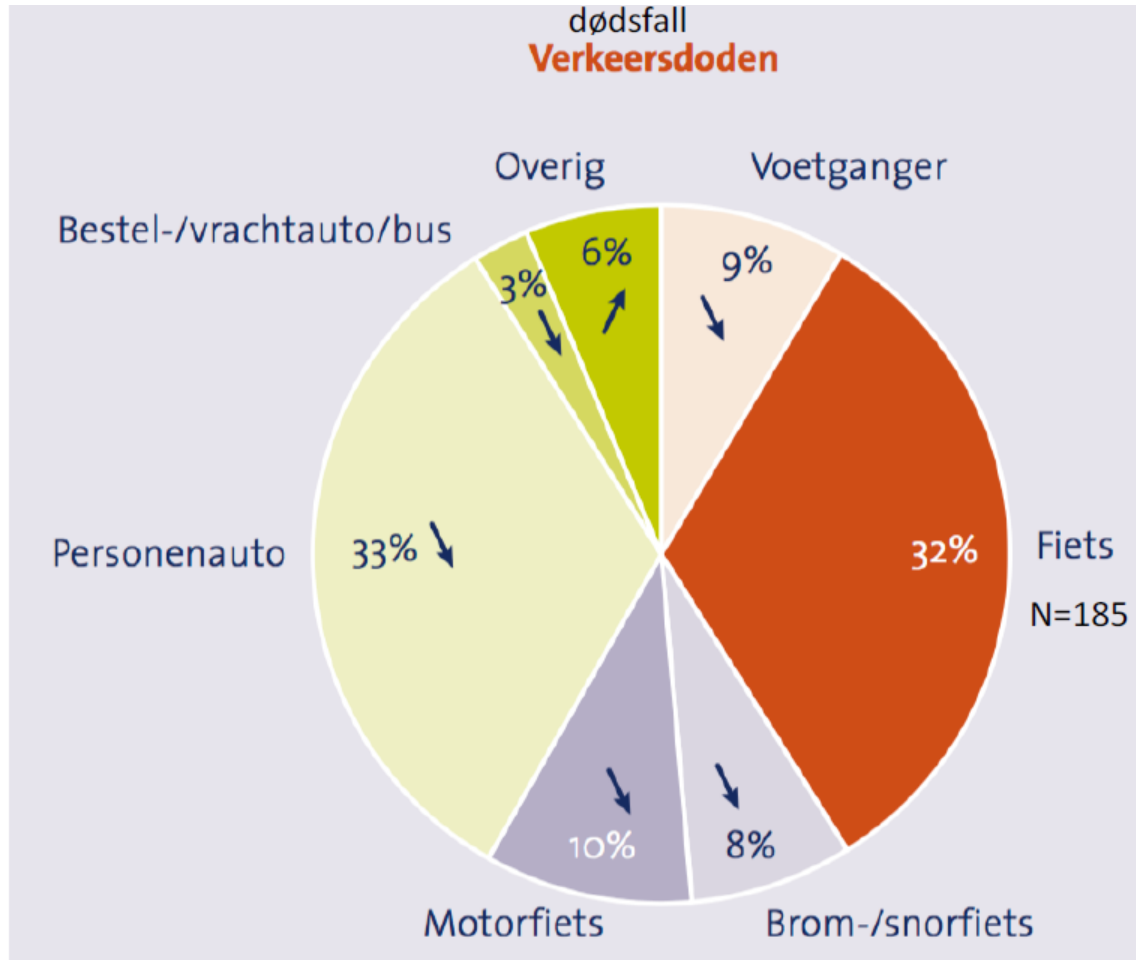
# New challenges



**GLAD I OPPMERKSOMHET:** Den italienske sykkelegenden Mario Cipollini har aldri vært redd for å by på seg selv. Foto: Facebook

Photo: Facebook

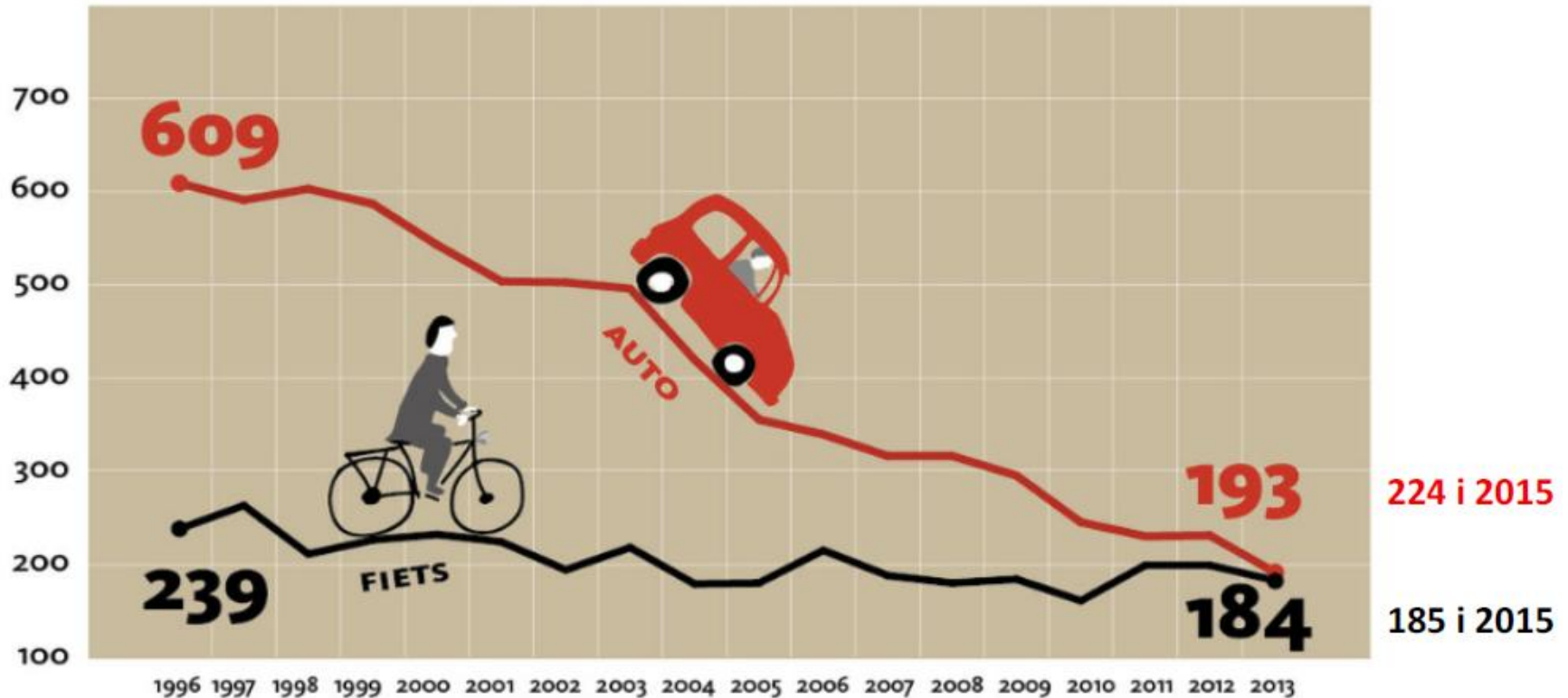
# Road fatalities in The Netherlands



SWOV R-2015-20

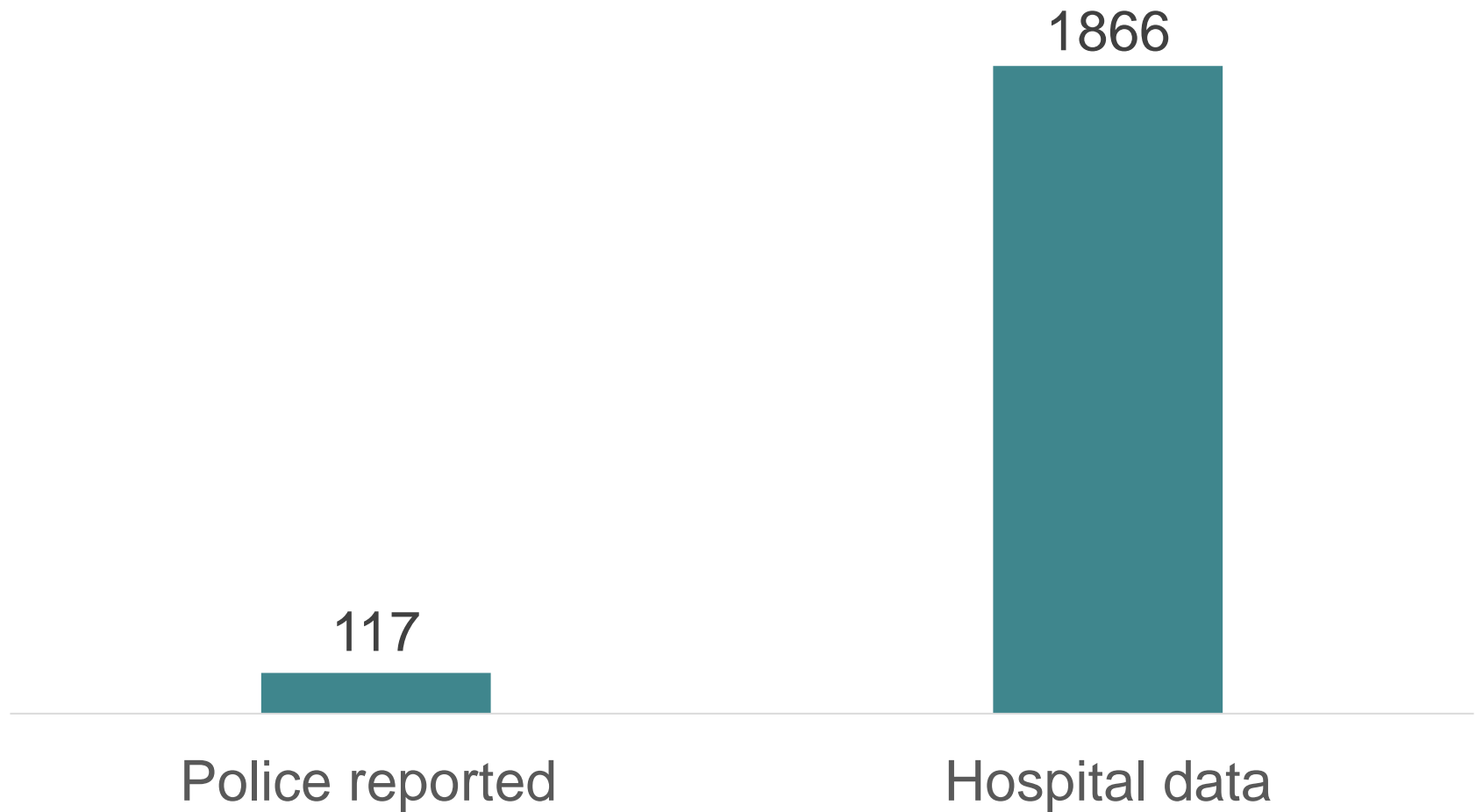
Source: Marjan Hagenzieker, SWOV

# Road fatalities in The Netherlands



Source: Marjan Hagenzieker, SWOV

# Cyclists injured in Oslo in 2014



# Cyclist injuries in Sweden 2007-12

Data from STRADA

	All injuries	Serious	Very serious
Single	77 %	78 %	73 %
Cycle/Motorvehicle	12 %	12 %	16 %
Cycle/Cycle	7 %	7 %	7 %
Cycle/Moped	1 %	1 %	1 %
Cycle/Pedestrian	1 %	1 %	1 %
Cycle/Other	1 %	2 %	2 %
Total	44 098	8 411	1 098

*Niska, A. & Eriksson, J. (2013). Cycling accident statistics. Background information to the common policy strategy for safe cycling. VTI-rapport 801/2013.*

# Key challenges ahead for Vision 0

- The mix of automated and manual driving
- Distraction
- Increase of cyclists and pedestrians



Thank you for your attention!

Photo: Everton Vila