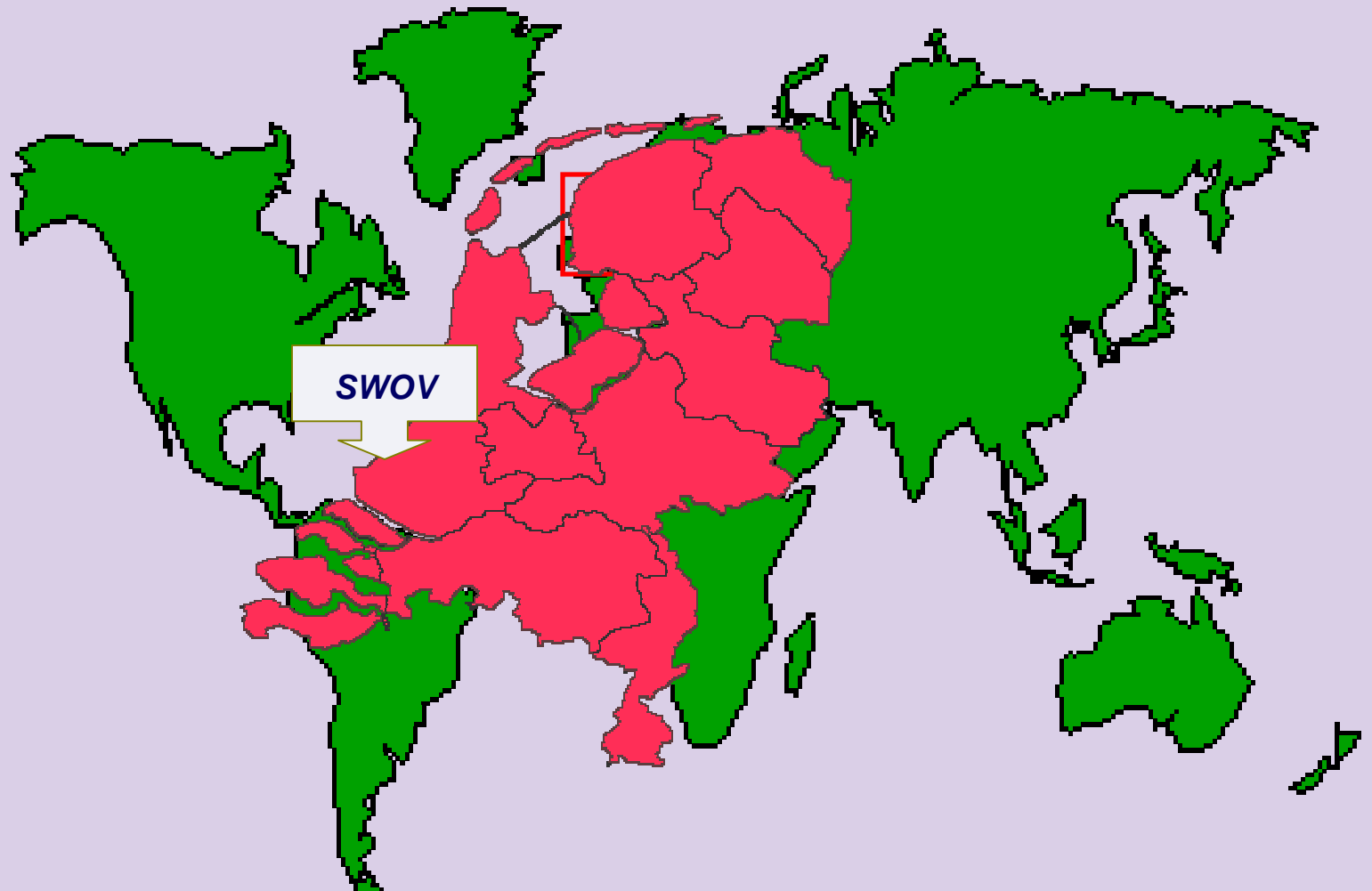


# Speed management in the Netherlands

*Fred Wegman*  
*Managing director*  
*SWOV Institute for Road Safety Research*

## Where we are...



## A country of flowers





## Of Sunflowers

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## Of windmills





## Of canals

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## Of beautiful canals

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## Of bicycles



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## Of a lot of bicycles



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## Of more and more bicycles



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## ...and of speedmanagement

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## About SWOV Institute for Road Safety Research

- Independent institute, founded in 1962
  - aims to improve road safety by 'evidence based' knowledge
  - research and knowledge dissemination to road safety professionals
- Four-years programme: 2003-2006, covering all road safety fields
- Financed by Dutch Ministry of Transport and others, international bodies (Europe)
- Research staff: 40

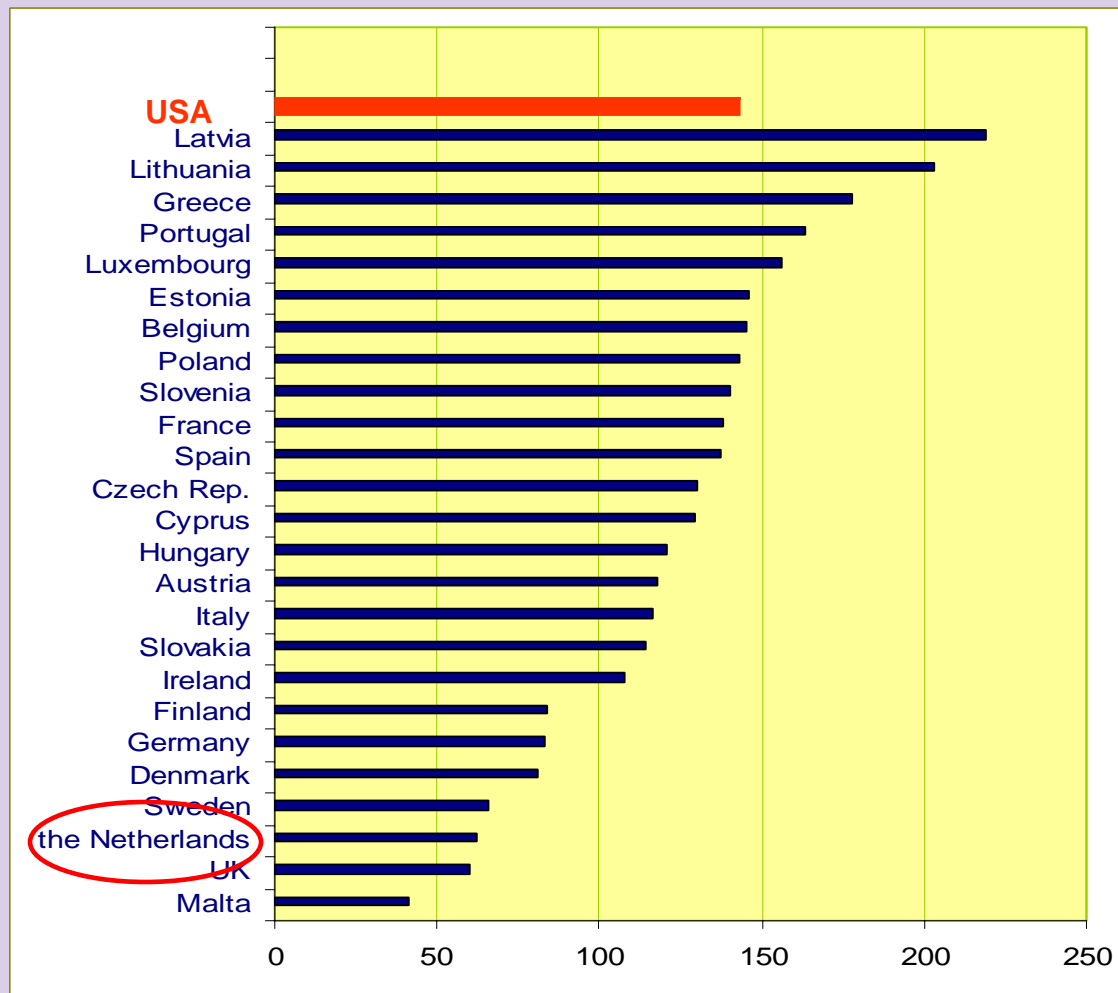
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## Some facts about the Netherlands

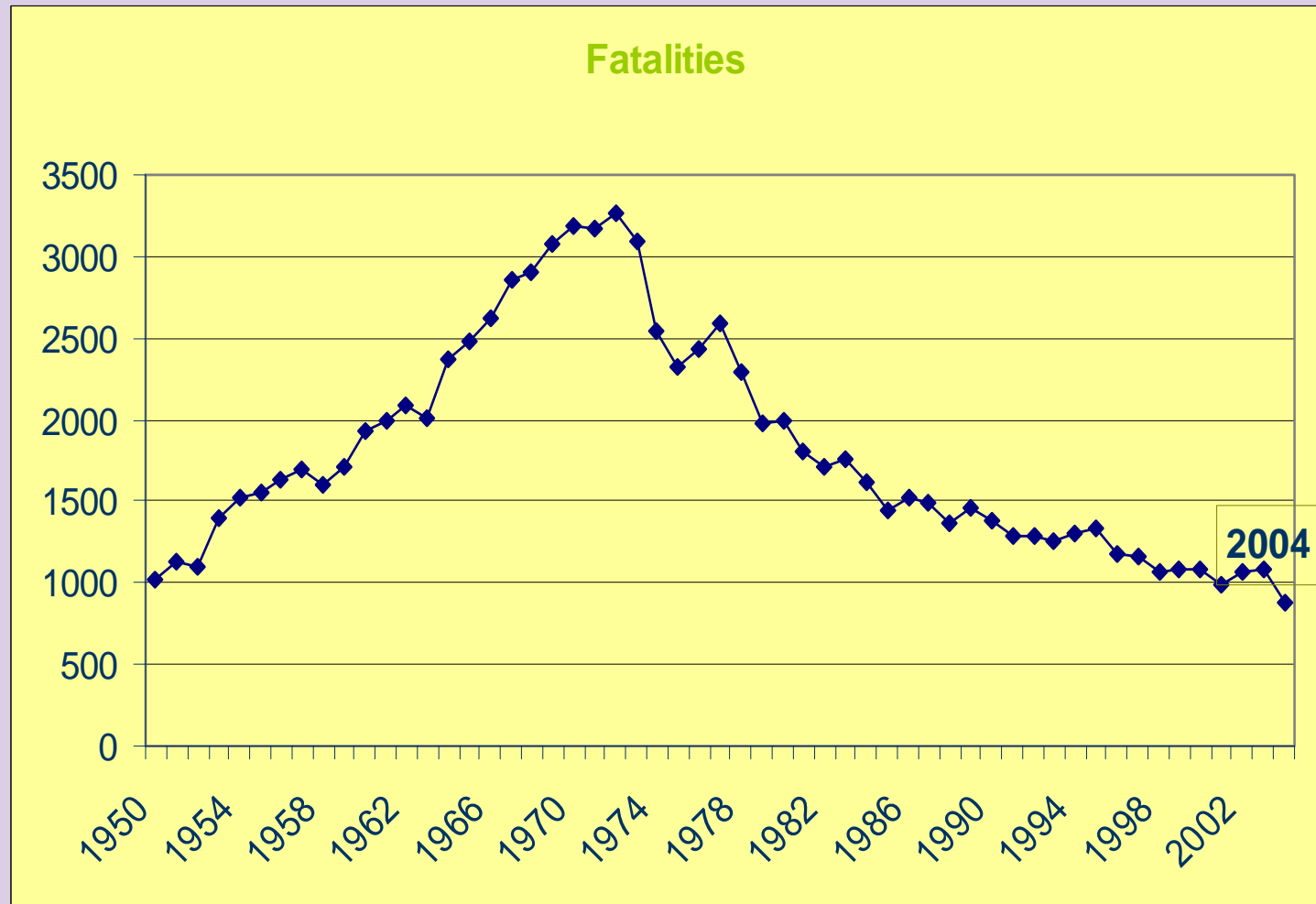
- 16.2 million inhabitants, 10.5 million with a driver's license (from the age of 18)
- 8.5 million registered motor vehicles
- 13 million bicycles
- 2,500 km of motorway; 130,000 km of paved roads
- Almost 200 billion travelled kilometres
- In 2004: 881 traffic fatalities and about 11,000 (registered) hospitalisations



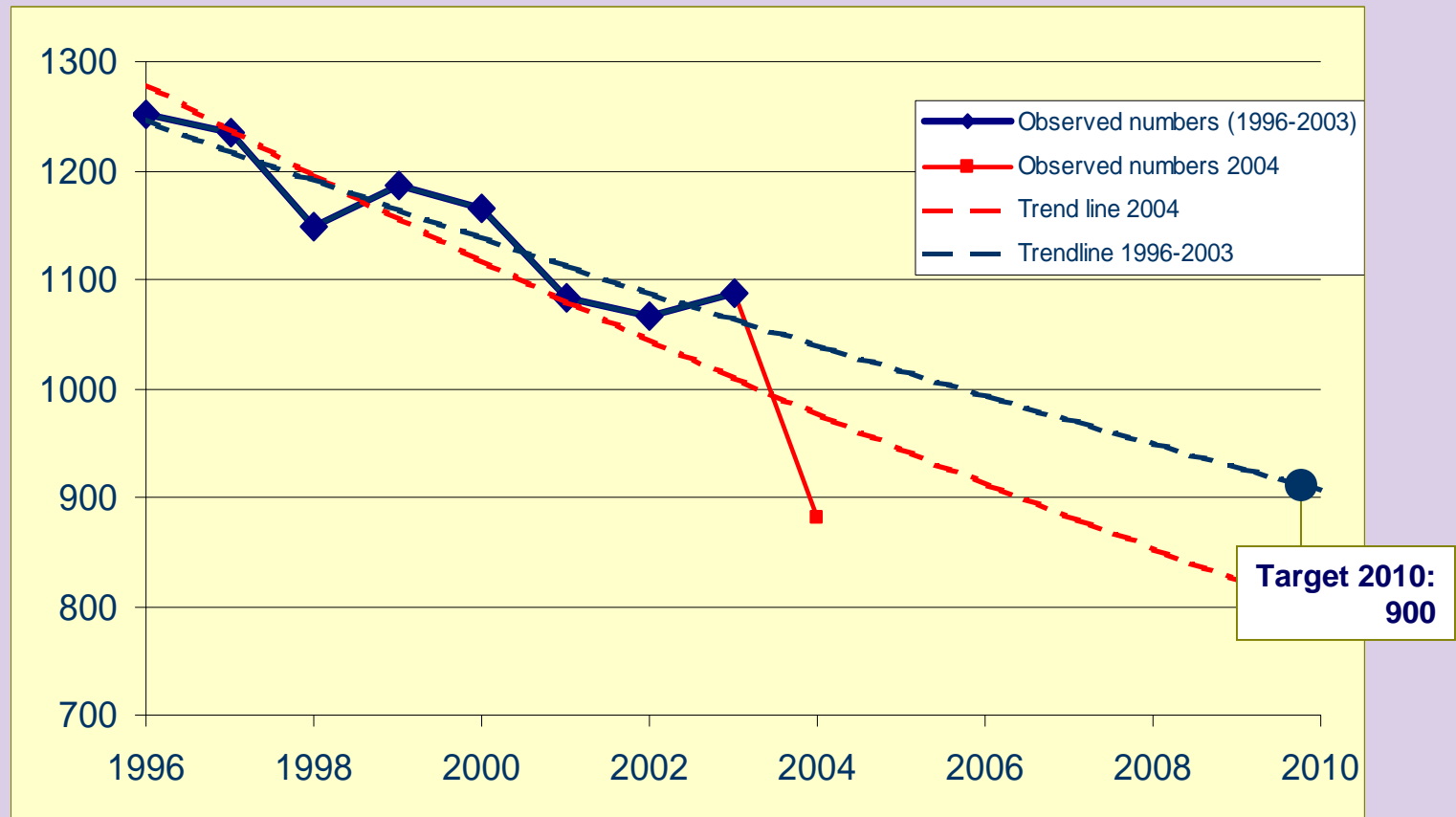
## Fatalities per 100,000 inhabitants (2003)



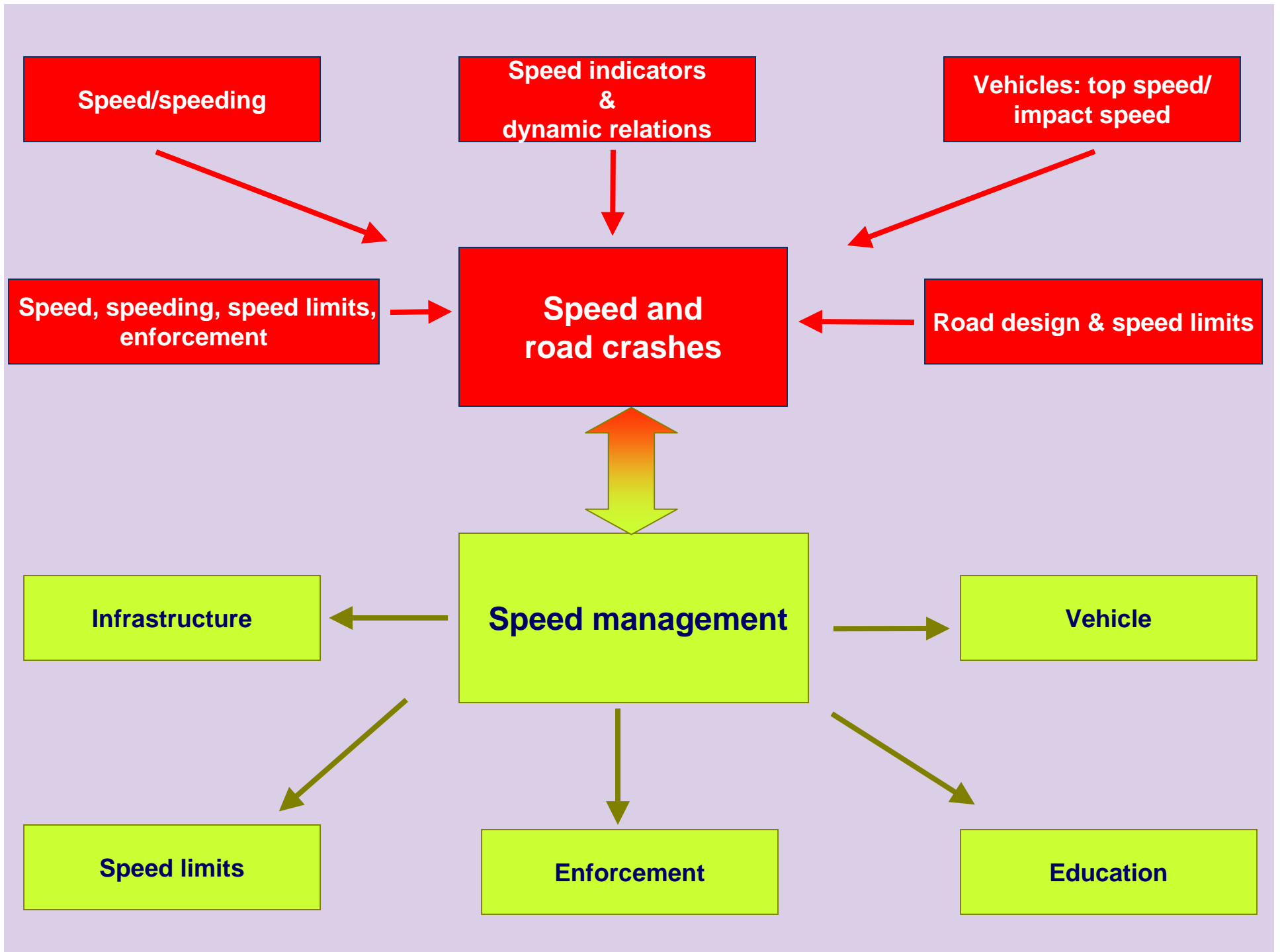
## Fatalities in the Netherlands since 1950



# Fatalities since 1996







## Speed management: engineering





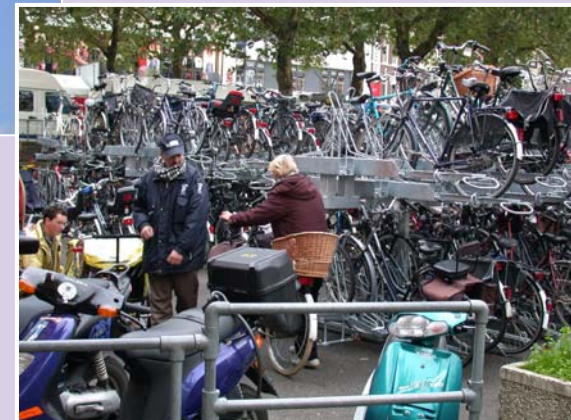
## Speed management: limits



## Speed management: enforcement



## Country-specific problems





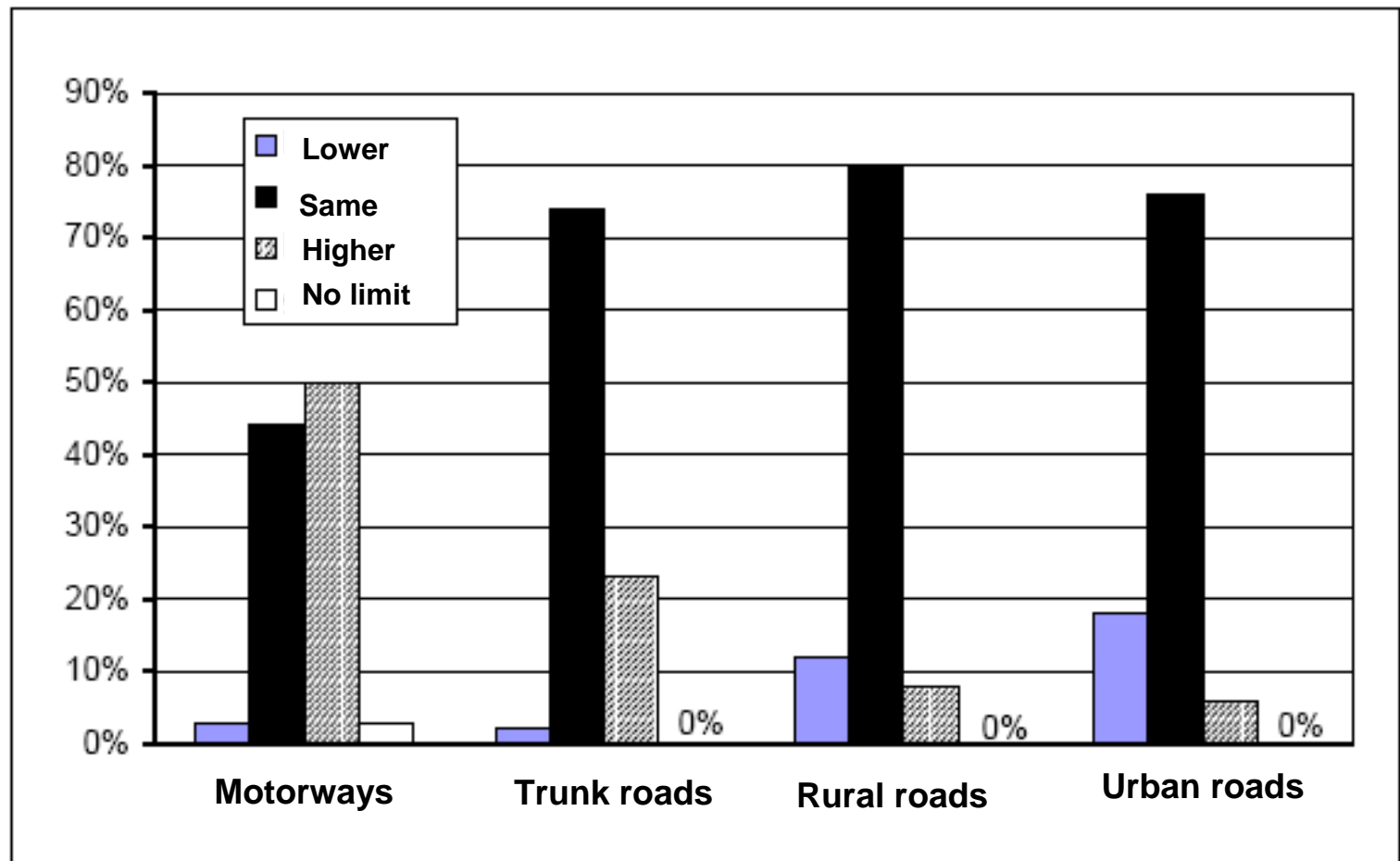
## Speed and crashes (Elvik, et al. 2004)

- Very strong statistical relationship between speed and road safety
- When speed goes down, injuries go down; when speed goes up, injuries go up
- Causal direction between speed and road safety is clear
- Clear dose-response relationship between changes in speed and changes in road safety
- Relationship can be explained by laws of physics (stopping distance,  $\frac{1}{2} mv^2$ )

## As background: speed limits in the Netherlands

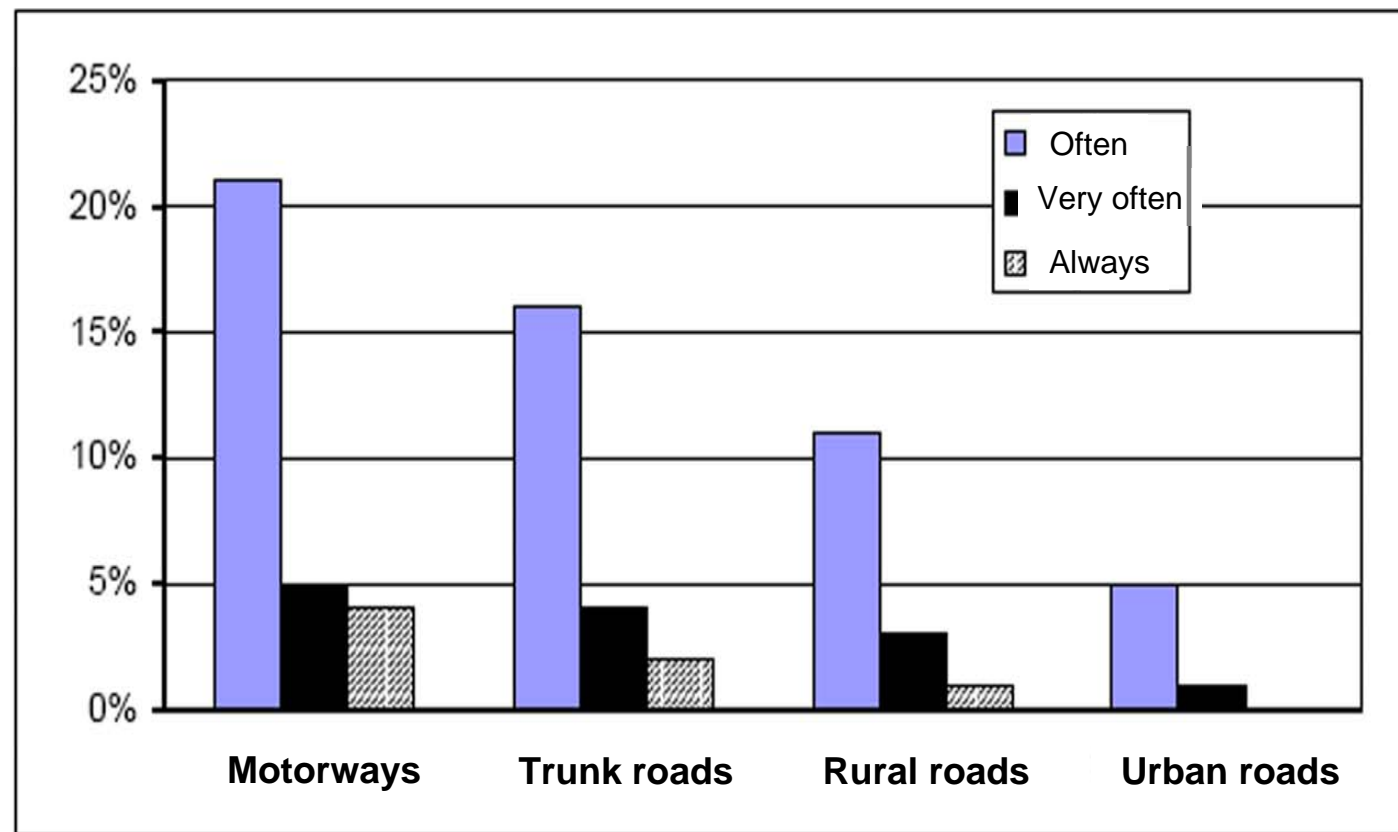
- 1957: urban streets: 50 km/h
- 1974: rural roads: 80 km/h  
trunk roads: motorways: 100 km/h
- 1976: residential streets: 'woonerf'
- 1983: residential streets: 30 km/h-zones
- 1988: motorways 120 km/h or 100 km/h (and a very short stretch of 80 km/h)
- 1995/1996: speed limiters for lorries (> 12 ton) and buses (>10 ton)

## Opinions on speed limits (Sartre, 2003)





## Exceeding speed limits (self-reported)



## Current speeding behaviour (measured)

Type of road	Speed limit	% Exceeding limit
Motorways	120 km/h	~ 40%
	100 km/h	~ 45%
Trunk roads	100 km/h	~ 20%
Rural roads	80 km/h	~ 45%
Urban roads	50 km/h	25-70%

**Speed management is an integral and prominent component of Dutch road safety policy in our**

***Sustainable Safety Vision***



## Sustainable Safety vision

- Vision developed early nineties;  
implementation since mid nineties
- Aim: prevent crashes and minimise the  
chance of serious injury
- Speed management is a central element
- Type of measures:
  - Infrastructure, supported by
  - Enforcement
  - Education and publicity
  - Vehicle measures

## Three Sustainable Safety principles

- **Functionality**
  - A limited number of mono-functional road categories (flow, distributor, access)
- **Homogeneity**
  - Eliminate large differences in speed, mass and direction
- **Predictability**
  - Prevent uncertainty amongst road users: recognition of road function, design consistency, predictable road course

## Homogeneity and speed

When motorised and vulnerable road users resp. non-motorised traffic mix, speed must be low:

- Extension of 30 km/h zones in built-up areas
- Introduction of 60 km/h zones in rural areas
- Speed reduction measures at junctions
  - Speed humps and raised intersections
  - Roundabouts



## Speed humps and raised intersections



## Roundabouts

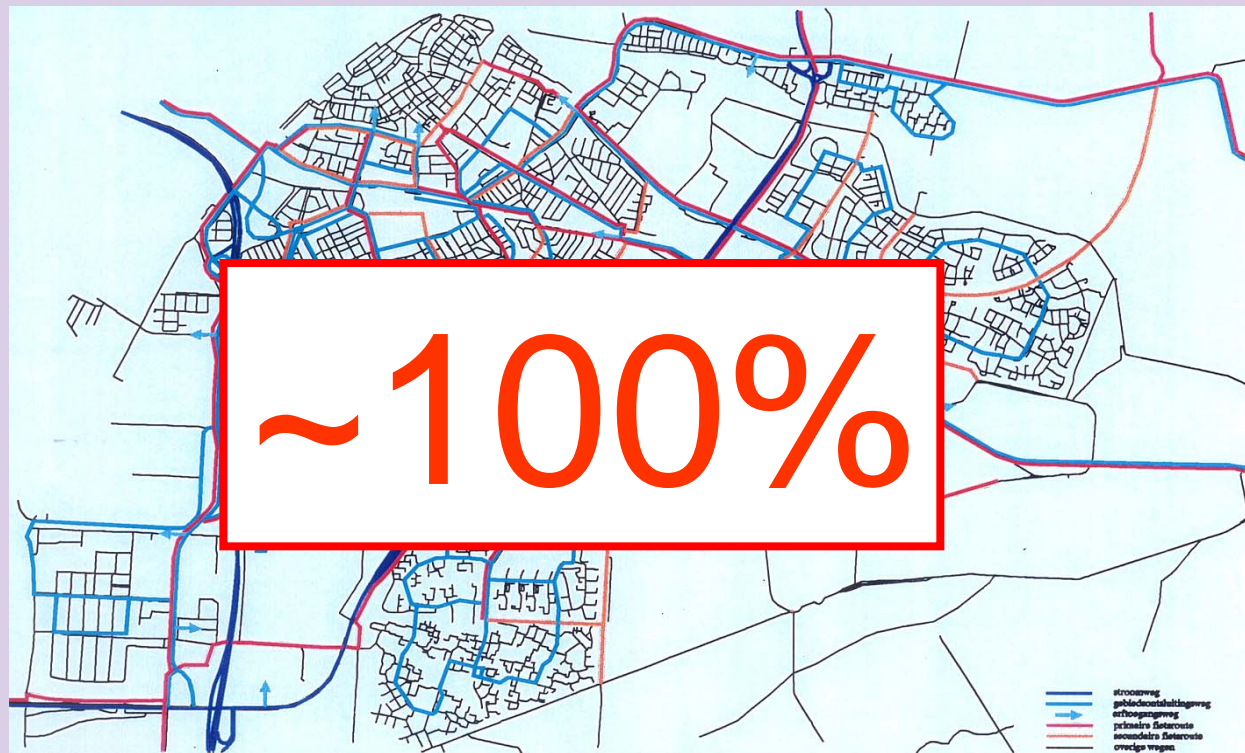


## Effects of infrastructural measures

- Categorisation of roads (~ 100%)
- **30 km/h zones**
  - Currently approx. 50% implemented (30,000 km)
  - Injury accident reduction: 22% (SWOV, 1993)
- **60 km/h zones**
  - Currently approx. 50% implemented (12,500 km)
  - Injury accident reduction: 25% (Waterboard, 2004)
  - Largest accident reduction at junctions
- **Roundabouts**
  - Implemented: 1000 in 1994; 2000 in 2001, 3000 in 2004
  - Fatal and serious accident reduction: 63% (SWOV, 1995)



## Categorisation of roads





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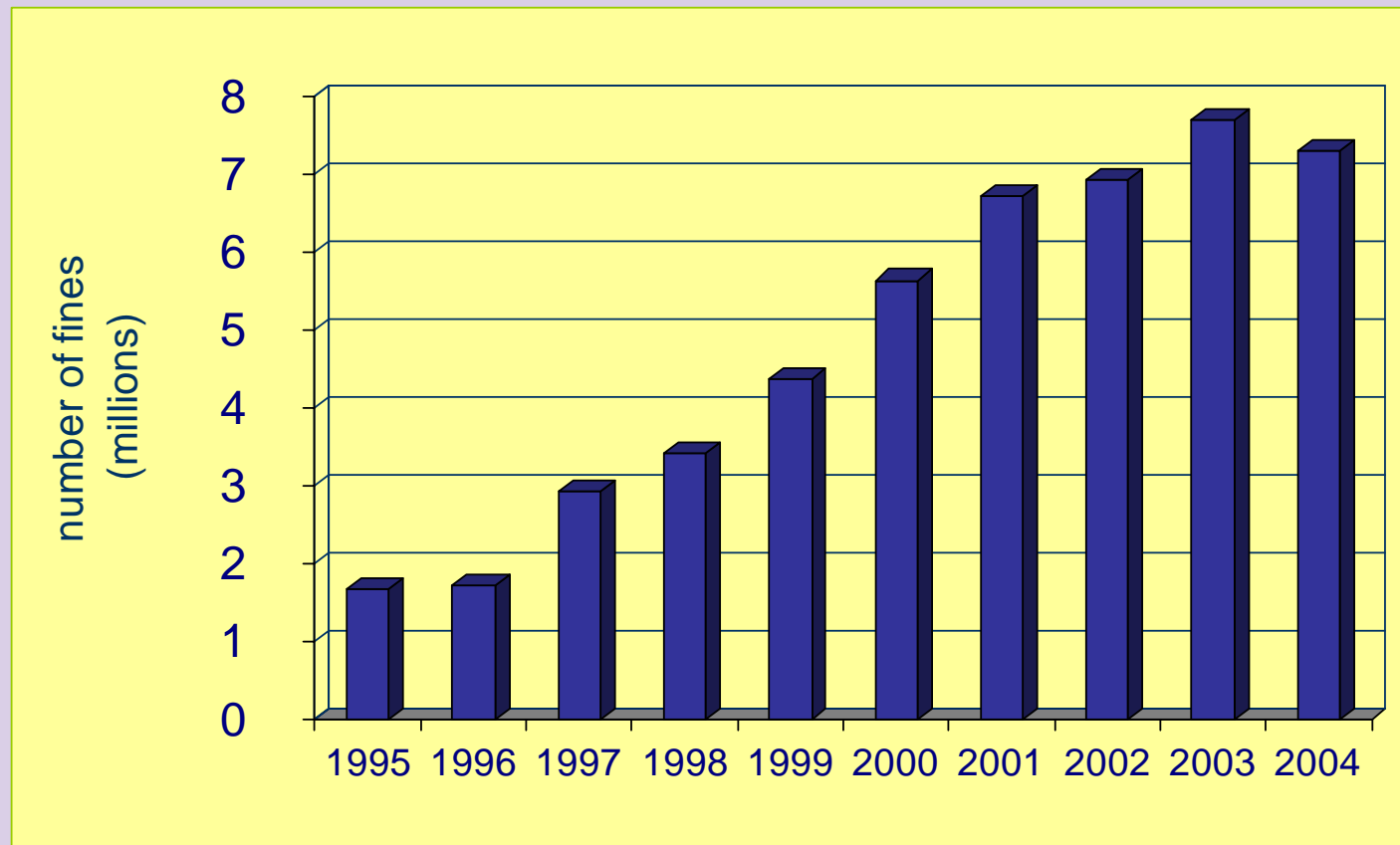


## Speed enforcement

- Change of law -1992
  - 'Minor' offences settled administratively
  - Massive introduction of speed/safety camera's
  - Fines sent to license plate holder
  
- Regional targeted enforcement projects -1999
  - Extra police officers: 28 in each of 25 police regions
  - Information and communication officer
  - Financed by revenues from fines
  - Targets in terms of efforts (e.g. 950 hours per week)
  - Five priorities (speeding, alcohol, seatbelts, red lights, helmets)

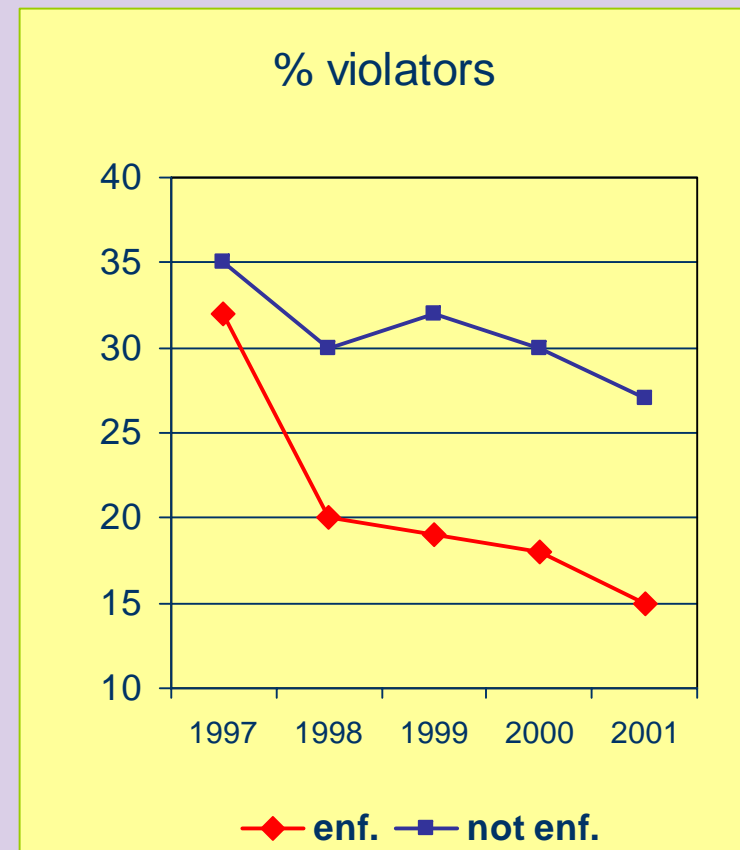


## Number of fines for speeding: 1995-2004



## Regional project: effect on speed violations (SWOV, 2004)

- Before (1997) vs. After (1998-2001)
- Enforced roads vs. similar non-enforced roads; speed limit 80
- Development of the number of speed violations (>87km/h)



## Regional project: effect on road safety

- Enforced roads vs. all other rural roads in same region
- Number of fatal and serious injuries resulting from motor vehicle accidents
- Before (1990-1997) vs. After (1998-2002)
- Saving:  $1 - \frac{122 / 281}{1090 / 1986} = 1 - 0.79 = 21\%$

	1990-1997	1998-2002
Enforcement	281	122
No enforcement	1,986	1,090

## Success elements

- Intensity of the enforcement
- The duration of the project
- Publicity
  - at the spot
  - in general (mass media!)
- Credibility: dangerous roads!
- Mobile camera's: unpredictability
- Certainty of paying the fine



## Recent developments on enforcement

- Increasing number of “automated section controls” (on motorways and major rural roads)
  - Efficiency: high
  - Effectivity: first indications are very positive (<1% violators), reduction of crashes
  - Public acceptance: rather high
  
- Increasing number of unobtrusive video cars
  - Aiming to catch the ‘excessive speeder’ and other excessive violators
  - Efficiency and effectivity: some doubts
  - Public acceptance: very high

## Summing up:

- Speed and speeding are important factors in road safety and road safety policies in the Netherlands
- Sustainable safety: avoid encounters with high impact speeds and mass differences
- Legal and infrastructural measures are the basis supported by enforcement
- Public acceptance and understanding of speed limits and speed enforcement is important
- Successful approach, but still a long way to go

## Future developments (SWOV, 2004)?

- Enhance the credibility of speed limits
  - Speed limits more in accordance with road design, road function and road environment
  - Ideally, a system of dynamic, flexible speed limits – the role of Intelligent Speed Adaptation (ISA)
  - More communication on the backgrounds of speed limits
- Enhance the credibility of speed enforcement
  - Focus on objective or subjective ‘logical’ spots
  - Wider use of automated section control
  - Communicate to road users the need for enforcement and its effects

## Speed cameras: a cry for “REVENGE”





**Thank you  
for your attention**