Where we are…
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-year programmes: 2003-2006, covering all road safety fields
- Financed by Dutch Ministry of Transport and others, international bodies (Europe)
- Research staff: 40

www.swov.nl
Some facts about the Netherlands

- 16.2 million inhabitants
- 8.5 million registered motor vehicles
- 13 million bicycles
- 2,400 km of motorway; 120 000 km of paved roads
- In 2004: 881 traffic fatalities and about 11,000 (registered) hospitalisations
Fatalities in the Netherlands since 1950

Fatalities


0 500 1000 1500 2000 2500 3000 3500

Fred Wegman
October 2005
www.swov.nl
Fatalities since 1996

![Graph showing the trend of fatalities since 1996](image)

- **Target 2010:** 900
Explanations for 2004?

- 2003 - 2004: -19%
- Trend: -2.75% per year
- Improving safety quality of road traffic
…just one accident

- 18 years old
- Just passed his driving test
- Saturday night
- Drives his friends home
- …from a disco
- Windy dyke
- It’s raining
- Misjudges a bend
- Drives too fast
- Trees alongside the road
Cause?

- A young, inexperienced driver
- Driving at night
- In the rain
- With inappropriate speed
- An unexpected sharp bend
- Bold tyres
- Trees in a bend

*Don’t look for one single cause or one culprit!*
New road safety paradigm

- Human errors are and will always be made
- Making human errors less likely by:
  - Eliciting the desired/safe behaviour
  - Making undesired error less likely
- Forgiving to human error by:
  - Providing an opportunity to correct an error
- Reducing the consequences once a crash has become inevitable by system design based on ‘human tolerance’
Safety interventions

- Legislation (alcohol, seat belts)
- Enforcement
- Vehicle safety (passive)
- Education (licensing, publicity)
Safety effects of improving roads

- High quality implementation of ‘basic’ road safety actions
- Low-cost engineering measures
- Safe road sides
- Speed management (limits, engineering measures, enforcement)
- Take into account country-specific problems and conditions (the Netherlands: cyclists, motorized two-wheelers)
High quality implementation of ‘basic’ road safety actions
Low-cost engineering measures
Safe road sides
Speed management: limits
Speed management: engineering
Speed management: enforcement
Country-specific problems

<table>
<thead>
<tr>
<th>Source</th>
<th>Sweden</th>
<th>Britain</th>
<th>Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle safety, seat belts, drinking and driving</td>
<td>48%</td>
<td>54%</td>
<td>46%</td>
</tr>
<tr>
<td>Local road engineering</td>
<td>4%</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Other vulnerable road users-related measures</td>
<td>38%</td>
<td>29%</td>
<td>31%</td>
</tr>
<tr>
<td>Other car occupant measures</td>
<td>10%</td>
<td>7%</td>
<td>18%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
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</tbody>
</table>
## Plans in SUNflower-countries 2000-2010

<table>
<thead>
<tr>
<th>Percentage of total savings in each country</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vehicle improvements</strong></td>
<td>20 (including ITS contribution)</td>
</tr>
<tr>
<td><strong>Road engineering and speed management</strong></td>
<td>59 (including traffic control)</td>
</tr>
<tr>
<td><strong>Behaviour excluding speed enforcement</strong></td>
<td>15 (novice drivers, enforcement)</td>
</tr>
<tr>
<td><strong>Other measures</strong></td>
<td>6 (emergency care)</td>
</tr>
</tbody>
</table>
Sustainable safety: the Vision

- Sustainable development (UN Brundtland Commission) adapted to road traffic safety:

- *We do not wish to hand over to the next generation a road traffic system in which – inevitably – a road accident toll as today has to be expected*
Aim of sustainable safety

- Drastically reduce the probability of accidents in advance by means of infrastructural design
- Where accidents still occur: influence the accident process to virtually exclude severe injury
Sustainable safe traffic system has

- Proper road design adapted to limitations of human capacity
- Vehicles which simplify driving tasks and protect the vulnerable human being
- Road users who are adequately educated, informed and, if necessary, controlled
Road classification

Flow function

Distributor function

Access function
Road Safety in the Netherlands

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
- Round-abouts
  - Fatal and serious accident reduction: 63% (SWOV, 1995)
Categorisation of roads

~100%
Road Safety in the Netherlands

Fred Wegman
October 2005
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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 (950 hours per week)
  - Five priorities (speeding, alcohol, seatbelts, red lights, helmets)
Number of fines for speeding: 1995-2004

Number of fines (millions):

- 1995: 1
- 1996: 2
- 1997: 3
- 1998: 4
- 1999: 5
- 2000: 6
- 2001: 7
- 2002: 8
- 2003: 9
- 2004: 10
Regional project: effect on speed violations

- 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

Saving: \[1 - \frac{122}{1090/1986}\ = 1 - 0.79 = 21\%\]

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<thead>
<tr>
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<tbody>
<tr>
<td>Enforcement</td>
<td>281</td>
<td>122</td>
</tr>
<tr>
<td>No enforcement</td>
<td>1,986</td>
<td>1,090</td>
</tr>
</tbody>
</table>
Succes factors of Dutch road safety (1)

- Vision: Sustainable Safety

- Targets: 2002 - 2010: -15%
  2002 - 2020: -40%

- Securing all party Parliamentary support
Succes factors of Dutch road safety (2)

- Road safety plans integrated in National Transport and Traffic Plan
- Leadership role defined
- Multi-sectoral intergovernmental coordination
- Results framework, monitoring and evaluation
- Securing sustainable funding
- Developing delivery partnerships
- Managing decentralization of road safety