Fitting safety as standard

night time visibility for lorries

Dr H.L. Stipdonk

Brussels, January 12th, 2016

SWOV
INSTITUTE FOR
ROAD SAFETY RESEARCH

Our mission

Prevent
crashes,
reduce injuries,
save lives!

SWOV
INSTITUTE FOR
ROAD SAFETY RESEARCH

SWOV: Integral approach, services, cooperation

New knowledge: strategic

New knowledge: applied

Tailored knowledge

Training and education

General knowledge

Henk Stipdonk, SWOV

Expertise	physics, traffic theory, navigation safety, road safety, data, analysis
Team	data-experts, civil engineers, psychologists, mathematicians, …
Projects	Pendant, SafetyNet, DaCoTA, SafetyCube, SaferWheels, …
Methods	In depth analysis, data matching, empirical research, instrumented bicycles, …
Data sets	Crashes, mobility, hospital, violations, fleet, driving license, infrastructure, ...

SWOV
INSTITUTE FOR
ROAD SAFETY RESEARCH

Road safety by retrofit retroflection on lorries

- Facts
- Relevance of visibility
- Assessment of retrofit effects
- Assessment of retrofit effects in the Netherlands
- Assessment of retrofit effects in Europe
- Cost benefit ratio
- Final remarks

Facts

- EU Directive 2007/35/EG:
  - ❑ As from 10-07-2008, new model lorries (m > 7500 kg) and trailers (m > 3500 kg) must be fitted with contour marking.
  - ❑ As from 10-07-201, the same holds for older model vehicles with new licenses.
- A specific set of crashes is relevant:

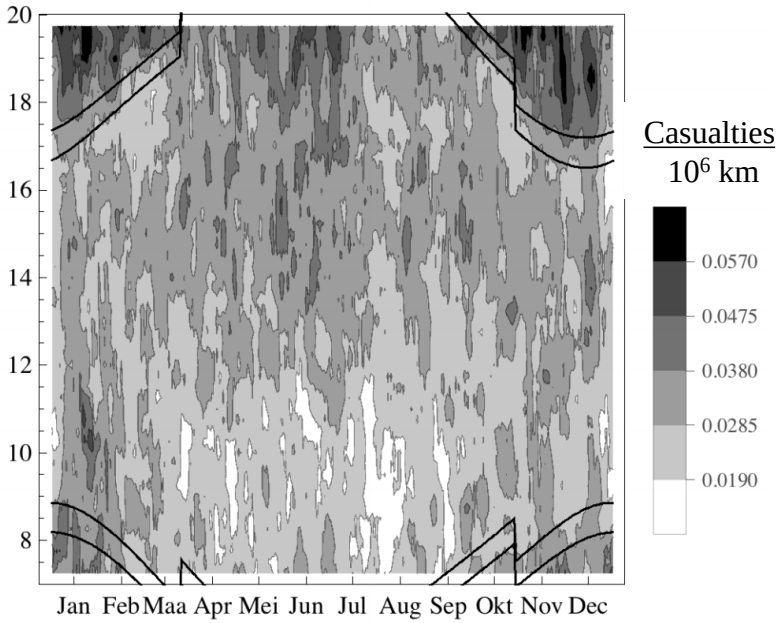
WITH at least 1 truck
ALSO other motorvehicle involved
ALSO twilight/dark
ALSO point of contact of truck: side or back
ALSO point of contact other vehicle: front

- Retroflective contour marking prevents 29% of these crashes (Morgan, 2001).

Relevance of conspicuïty of trucks

- Relevance of risk reduction at night:
- Darkness

  Passenger car risk by month and time of day : risk increase: factor 2
- Drowsiness
- Impaired driving

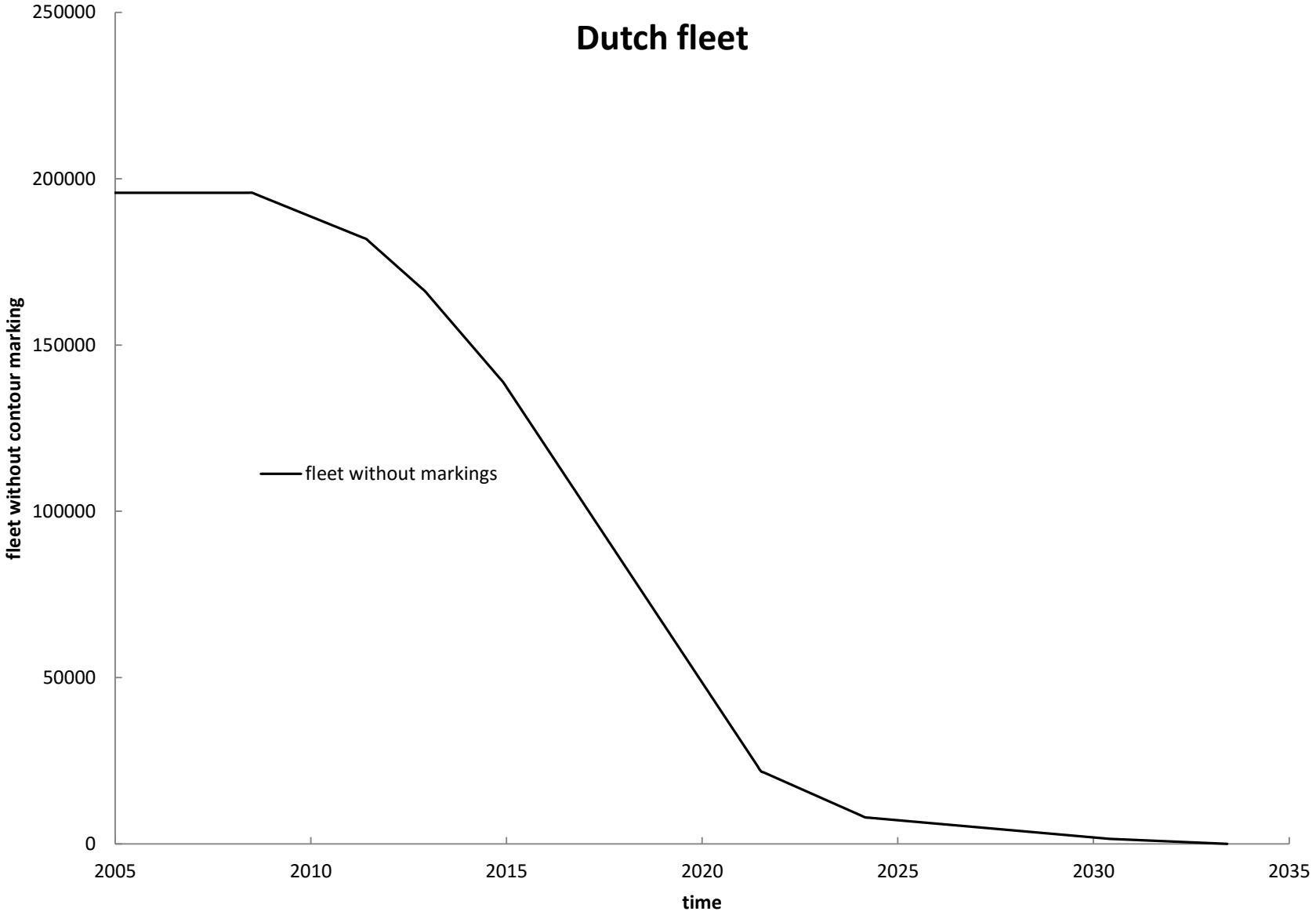


Assessment *retroflective* contour marking effect

Basic facts

- Netherlands, 1998-1999: 1170 road deaths
- Of these: ≈ 10 are relevant, 3 will be prevented
- 10 years later, this number has not changed, hence:
- Crashes not prevented by enforcement, sustainable safety and other regular measures
- Reduction from fitted retroflective tape only
- Retofit: effective only for older lorries

Assessment of *retrofit* effects



Result of retrofit effects in the Netherlands

- 2015-2028: -8 road deaths, - 42 SRI, -1250 crashes
- Societal benefit to cost ratio: between 1.1 and 2.1
- Transport companies: b/c = between 0.3 and 0.6
- Fleet without markings decreases with time
- Effect decreases
- Costs decrease as well

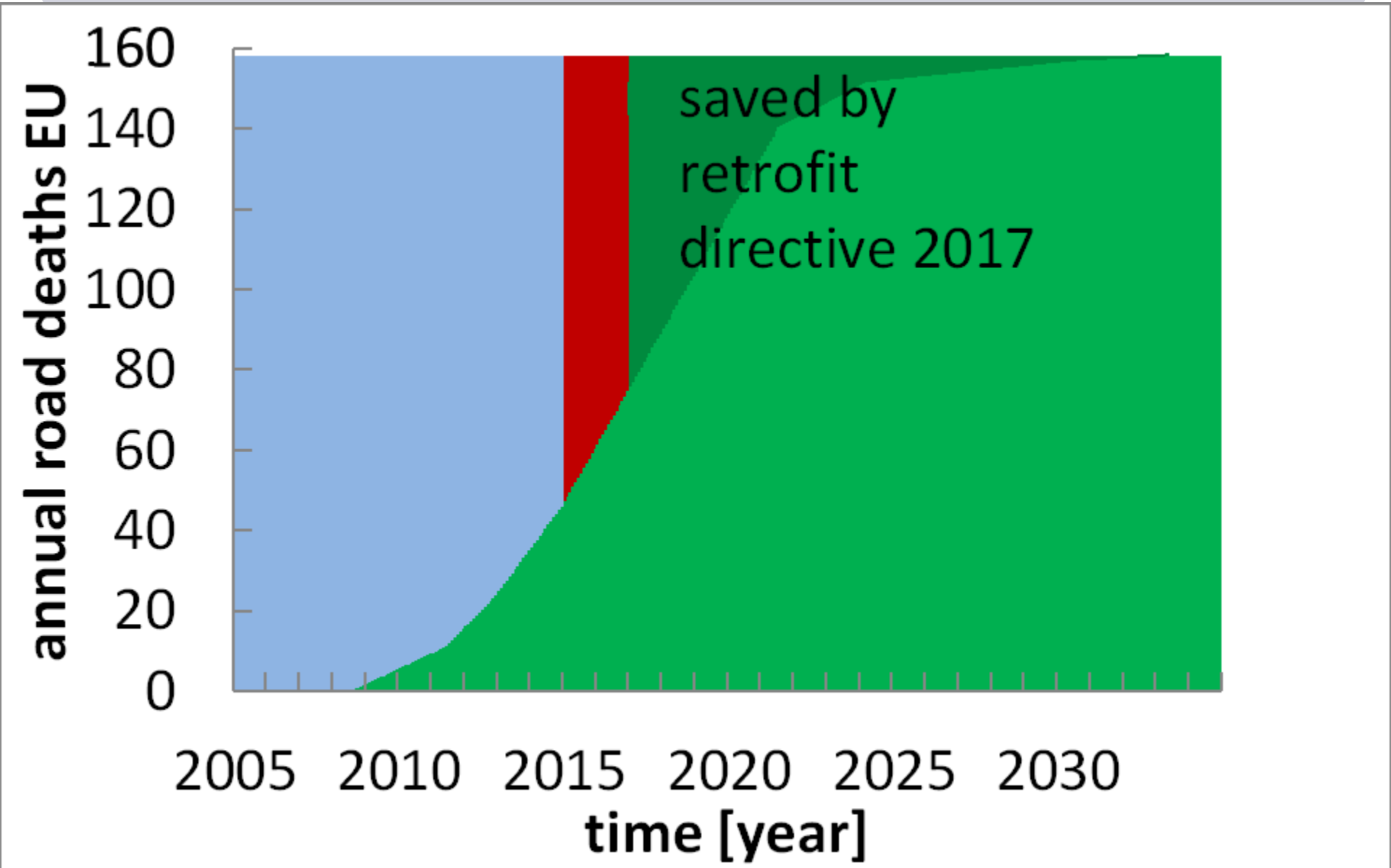
Assessment of *retrofit* effects in Europe

- Rough estimate only: EU = NL times factor
- Factor based on mortality ratio.
- Factor based on fleet size ratio
- Cost: factor = 2/3 (EU average: lower p.c. GDP)
- Material damage (in €): factor 2/3.
- Lifetime lorries in NL = lifetime lorries in EU

Results of retrofit effects in Europe

- 2015-2030:
  - ❑- 421 road deaths,
  - ❑- 2240 Serious Road Injuries,
  - ❑- 67 500 crashes
- Societal benefit to cost ratio: between 3 and 6
- Transport companies b/c : between 1 and 2

Result of retrofit effects in Europe



Final remarks

- Assessment is quite complex, the actual expected effect may be different.
- Effect calculated as from 2015. Benefit and cost decrease with time.
- Assumption about lifetime of trucks for Europe very conservative (old Dutch lorries are sold to companies outside NL). Hence: assessed effect is underestimated.