

Road Safety: no Safe System without forgiving roads



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REPUBLIKE SLOVENIJE
ZA VARNOST PROMETA

PIN Posvet: "Z evropskim pristopom do boljše prometne varnosti"

Varna infrastruktura, varna vozila in varni udeleženci v prometu

23. junij 2017

WHAT WE DO



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Collaboration: The Dutch Road Safety Coalition



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Our European Context

Last 10 years

- 500,000 killed or serious trauma
 - Majority outside cities & towns
- 5 serious traumas per km on main roads



Annual crash cost 2% of GDP



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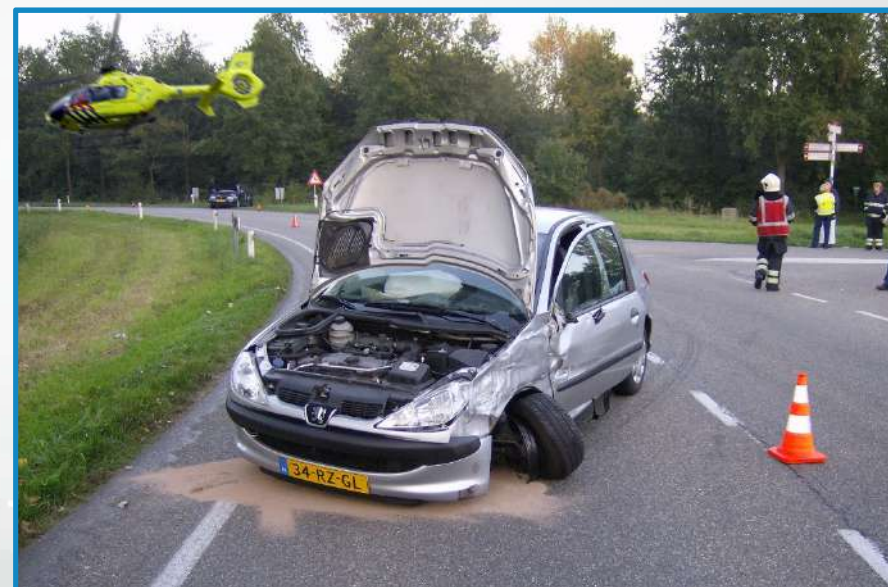
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Road Safety Development

Number of road fatalities is rising:

- Netherlands: 570 (2014) => 621 (2015) => 629 (2016)
- European Union: 25,700 (2014) => 26,000 (2015)
- Worldwide: 1.25 million



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Road Safety Development

As well as the number of casualties:

- Netherlands: approx. 21.000
- European Union: approx. 300.000
- Worldwide: don't know!



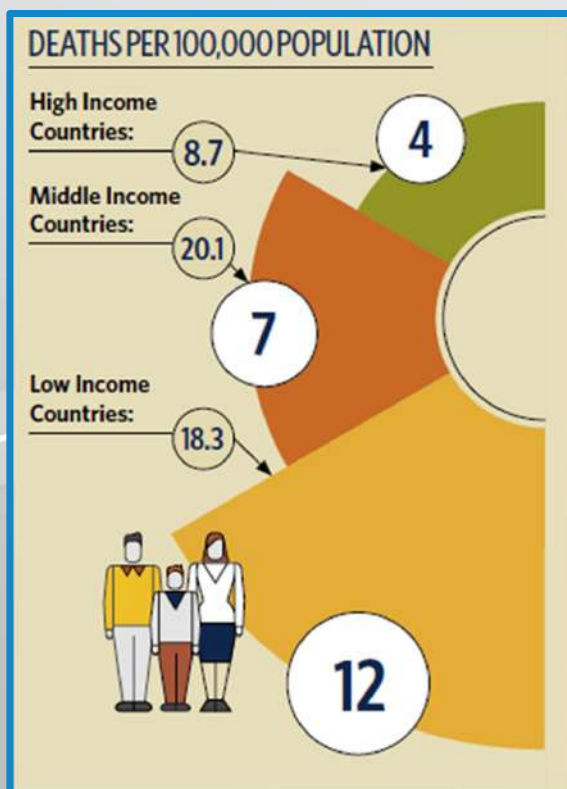
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Our aim



It will not happen with 'business as usual'... but it can be done

Action target:

- Reducing the number of road traffic deaths and injuries by 50% in 2020 compared to 2011
- In understandable figures: **saving 1.9 million lives**



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The Safe System



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Safe System approach

What we want:



• Safe drivers



• Safe vehicles



• Safe infrastructure



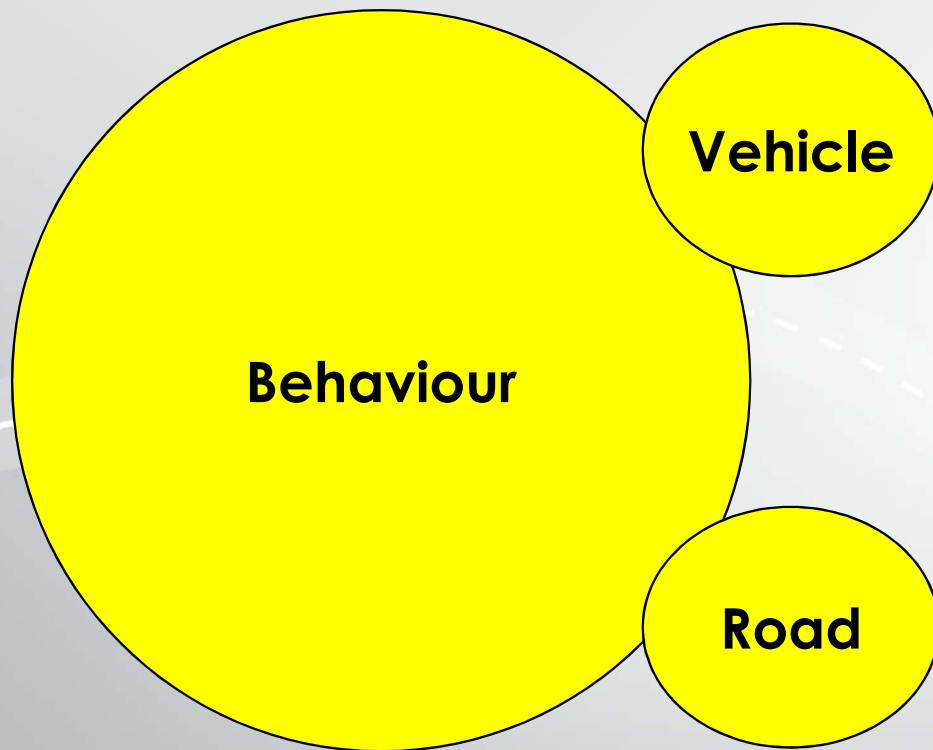
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Old "Fix the Driver" Model



Over 90% of accidents result from human error



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The human factor



- Don't use the quality of the driver as an excuse!
- People make mistakes, make the system forgiving!



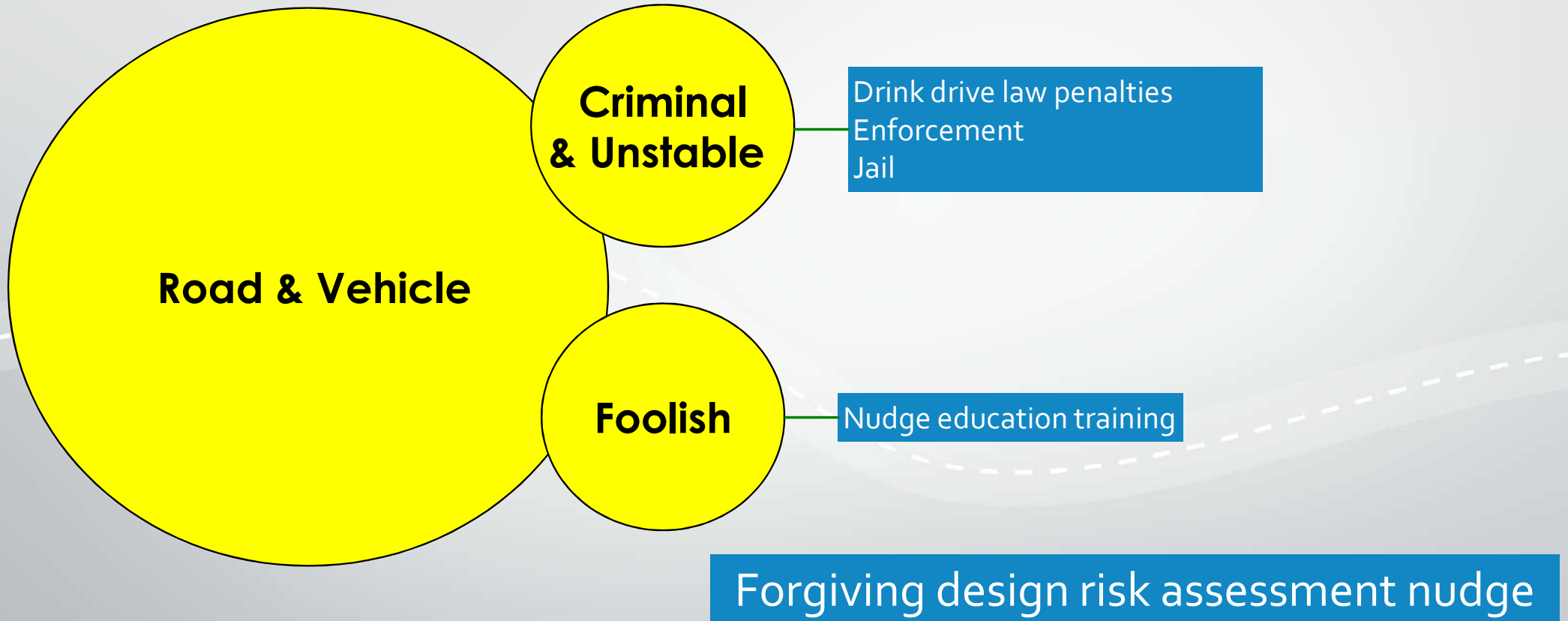
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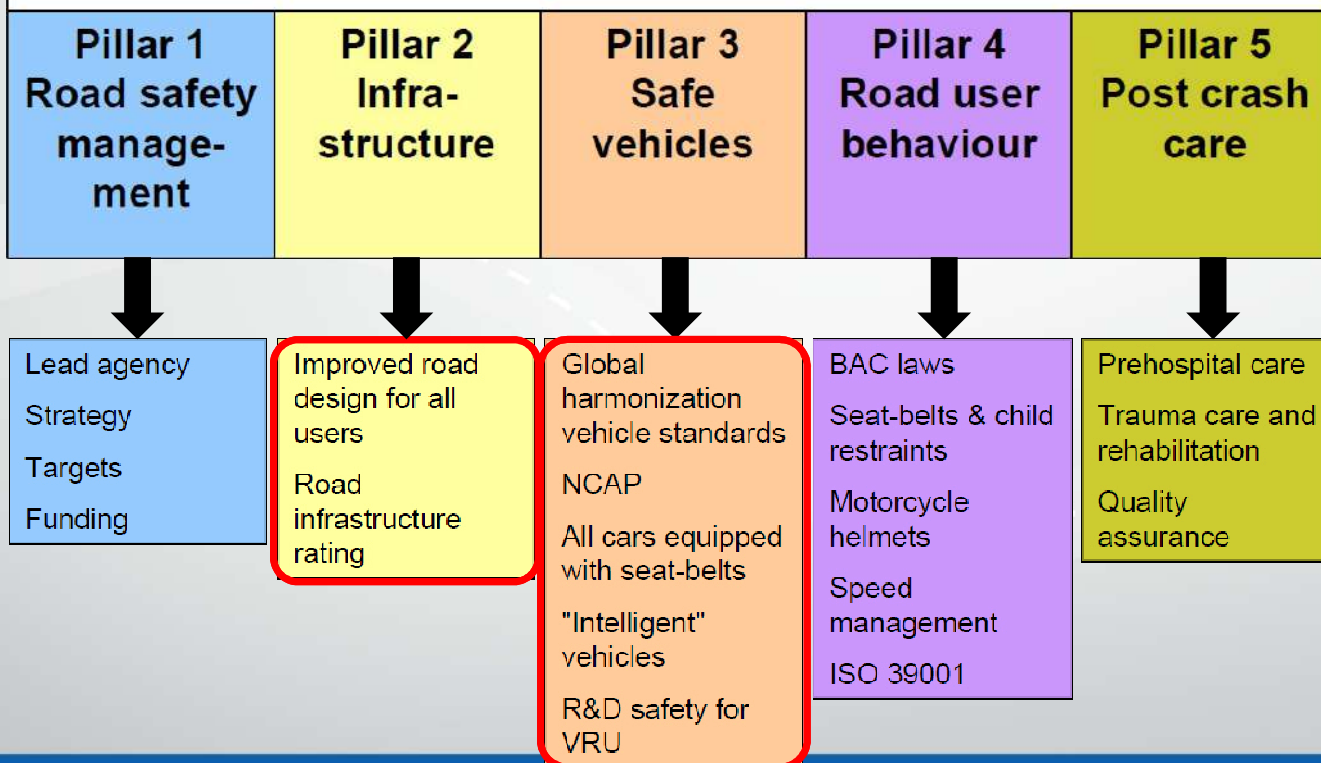
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Death Reducing Model



A framework for the Decade

National activities



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Assessment Programmes

Stars in road safety: safe system approach

- Vehicle safety
 - EuroNCAP
- Human safety
 - ...?
- Infrastructure safety
 - EuroRAP
 - iRAP



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Vehicle safety, we came a long way



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Vehicle safety

EuroNCAP:

- Internationally comparable standard
- Most cars are currently awarded 5 stars.
- Passive safety (in-car) systems are included in EuroNCAP.
- Not all safety systems included in EuroNCAP.
 - Unclear how drivers will react to these systems.
 - Consequences for star rating?

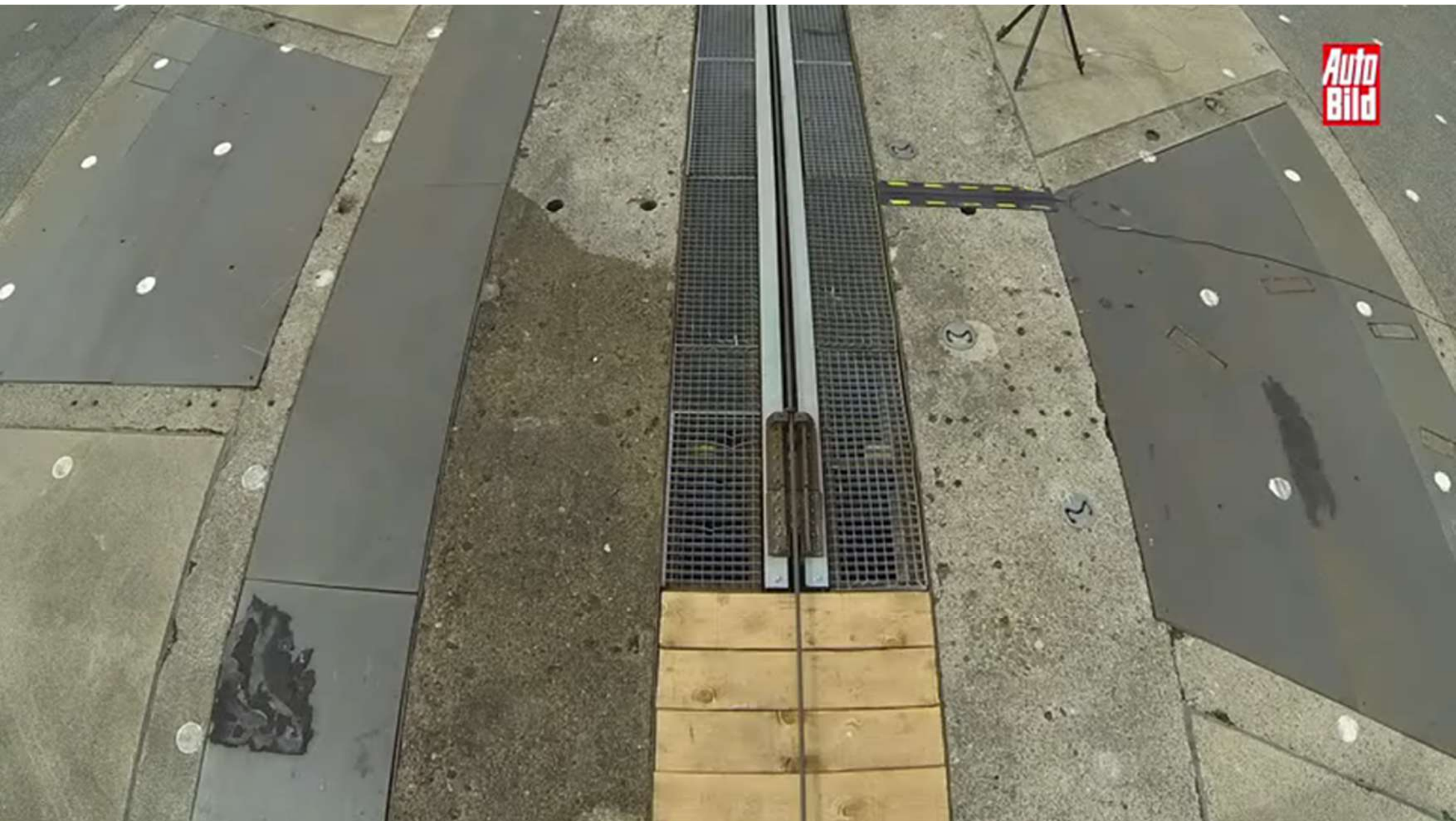


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Who is EuroRAP?

- NCAP's sister
- Vision zero inspired
- Civil society, authorities, experts
- Founded iRAP (and EIRA)



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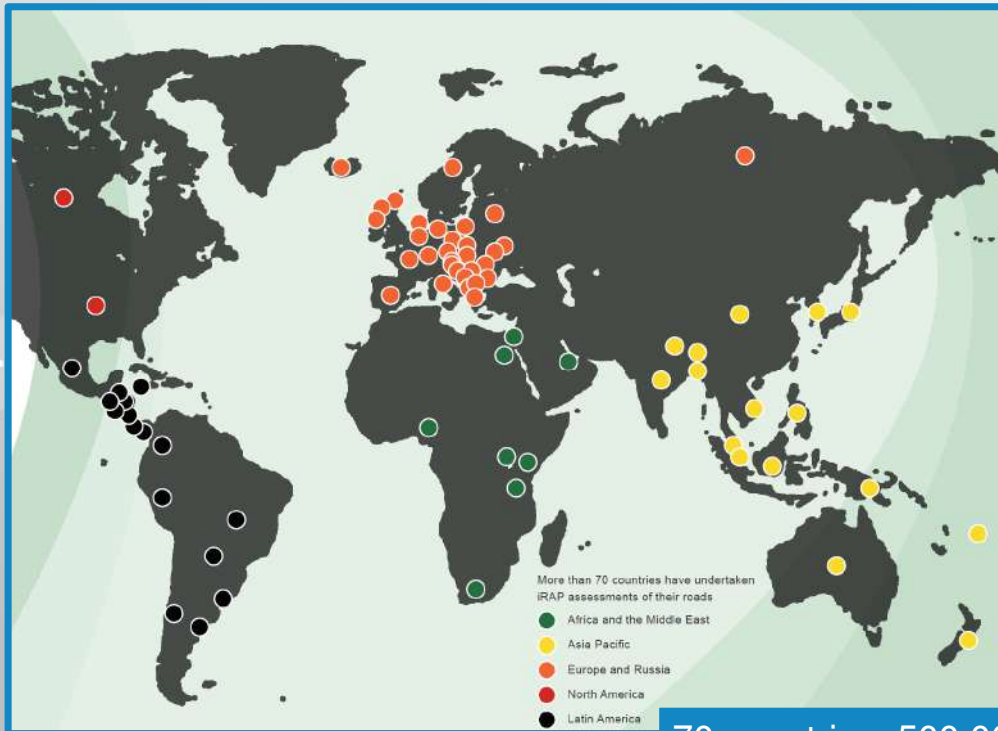
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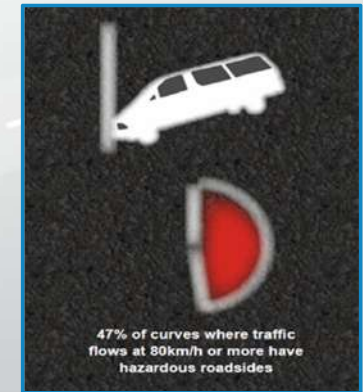
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Big Data

Hundreds of clubs, NGOs, universities, charities, governments, banks, volunteers



70 countries; 500,000 km inspected



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Motivated partners

Every day, four people die on Australian roads.

Driver error? Maybe. Often, it's the design of the road that turns what could have been a minor crash into a killer. **Safer roads save lives.**



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Infrastructure safety

EuroRAP/iRAP:

- Internationally comparable standard
- 3 stars is considered an 'acceptable minimum' for now
- Currently, worldwide many roads have 3 stars or less
- 'En route' to 3 stars and more:
 - 58,490 kilometre of roads have been tested in Europe until now



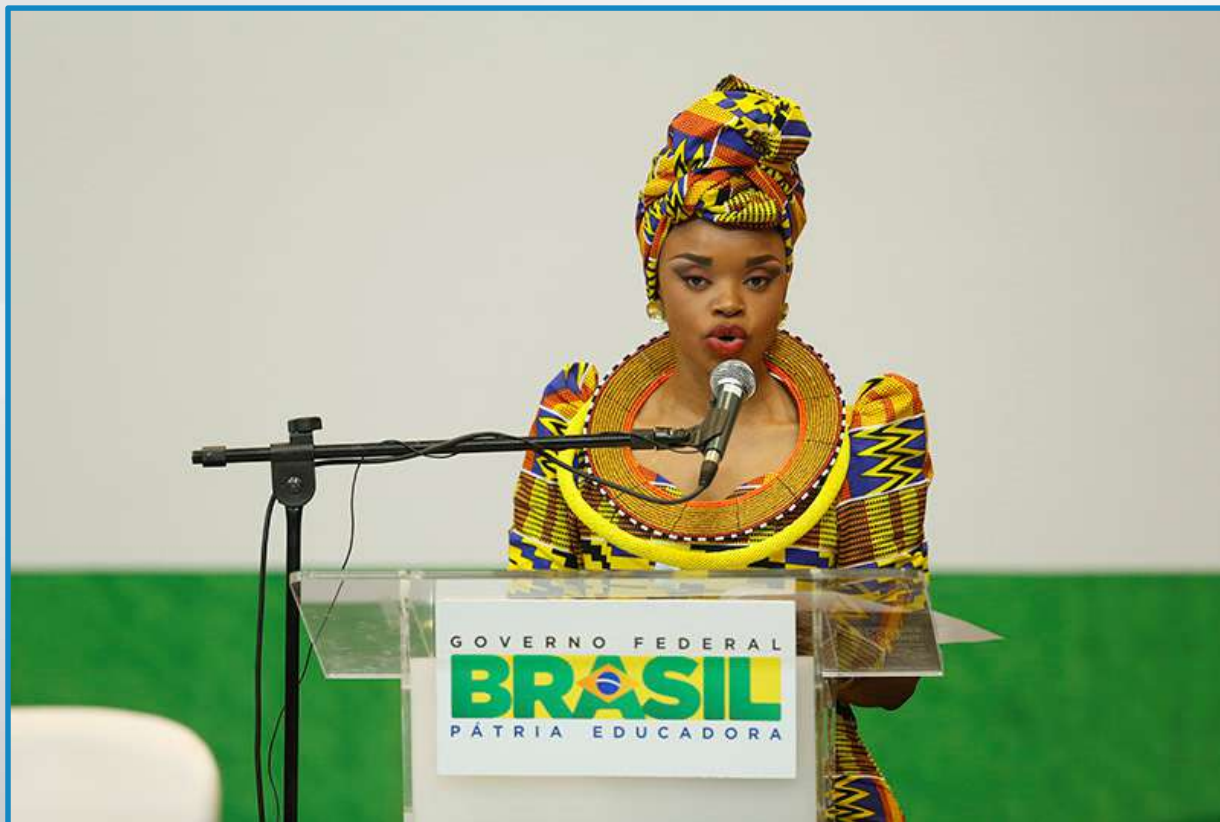
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3* minimum: no excuse



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Economic cost per km travelled



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Minimum Rational Safety Levels



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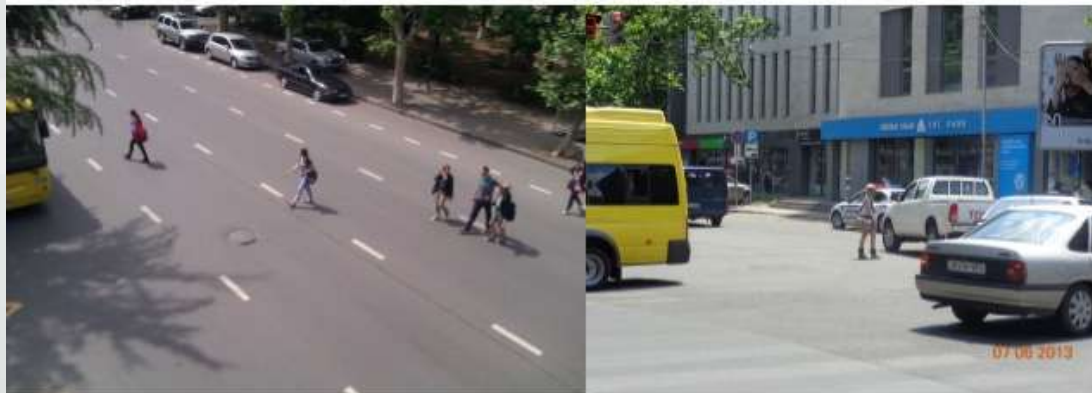
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We know the solutions

Places that kill pedestrians and cyclists



Jaywalking

We need safe footpaths, safe crossings



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Mobility related trends and issues

- Sensing, I.O.T
- *Automated vehicles and connected car*
- Sustainability
- **Urbanisation**
- Smart cities
- Ageing population
- **Utter confidence in technology**



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Trend: Automated driving and connected car



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First steps towards automated driving

- Many assistive technology systems already available:
 - Automatic Cruise Control (ACC)
 - Lane Departure Warning System (LDWS)
 - Internet of things (IOT) /Connected car
 - Radar / Lydar
- Reliability of safety systems?
 - Issues: uniformity, touch screens
 - Driver aid or just another distraction
 - Example: LDWS



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Automated driving



Levels

- 0. No automation
- 1. Driver assistance
- 2. Partial automation

Feet off

- 3. Conditional automation

Hands off

- 4. High automation

Eyes off

- 5. Full automation

Brains off



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Perverse effect of automated driving

How forgiving is the technology?

Level	Name	Narrative definition	Execution of steering and acceleration/deceleration	Monitoring of driving environment	Fallback performance of dynamic driving task	System capability (driving modes)
<i>Human driver monitors the driving environment</i>						
0	No Automation	the full-time performance by the <i>human driver</i> of all aspects of the <i>dynamic driving task</i> , even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a
1	Driver Assistance	the <i>driving mode</i> -specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the <i>human driver</i> perform all remaining aspects of the <i>dynamic driving task</i>	Human driver and system	Human driver	Human driver	Some driving modes
2	Partial Automation	the <i>driving mode</i> -specific execution by one or more driver assistance systems of both steering and acceleration/deceleration using information about the driving environment and with the expectation that the <i>human driver</i> perform all remaining aspects of the <i>dynamic driving task</i>	System	Human driver	Human driver	Some driving modes
<i>Automated driving system ("system") monitors the driving environment</i>						
3	Conditional Automation	the <i>driving mode</i> -specific performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> with the expectation that the <i>human driver</i> will respond appropriately to a <i>request to intervene</i>	System	System	Human driver	Some driving modes
4	High Automation	the <i>driving mode</i> -specific performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> , even if a <i>human driver</i> does not respond appropriately to a <i>request to intervene</i>	System	System	System	Some driving modes
5	Full Automation	the full-time performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> under all roadway and environmental conditions that can be managed by a <i>human driver</i>	System	System	System	All driving modes



Stimulate distraction!



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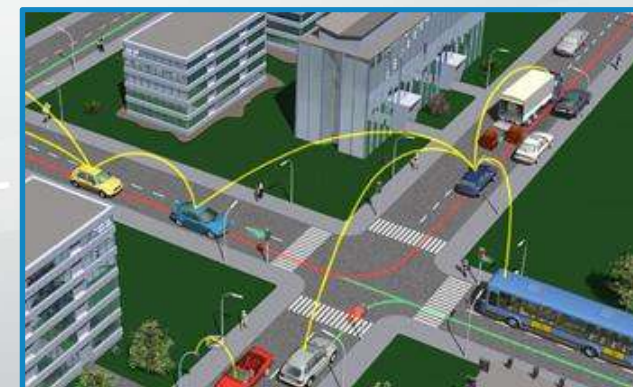
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Automated driving

- Automated cars do not yet 'communicate' with infrastructure (roads that cars can read).
 - Uniformity of lining (?)
 - Snow, pollution, bad road quality etc.
- Businesses independently go ahead and develop automated cars without taking infrastructure into account (e.g. Nissan)
 - Autonomous develops into 'autistic' and 'selfish'
- Full benefits only after V2I / V2X communication.
 - Deployment in 15 years at least



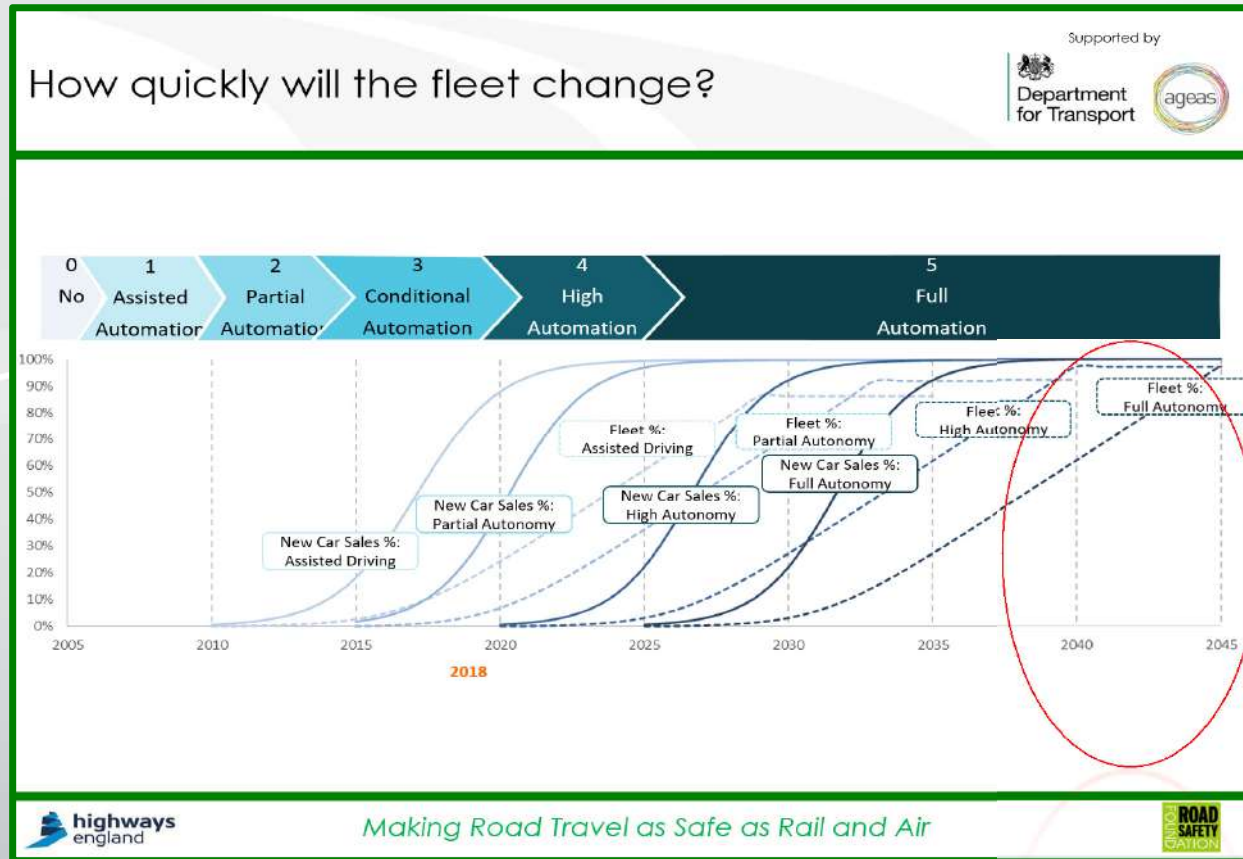
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The need to invest in safe roads!



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Technology: road safety heaven?

Considerations:

- 'Traditional' cars will be on the road for at least 15 more years, if not longer
- Safety of ITS is still unreliable (touch screens, uniformity)
- Perverse effects of technology
- 'Analogue' drivers
- Relation between star rating vehicle and infrastructure.



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Dutch Road Safety Coalition



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Over 55 organisations



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Dutch Road Safety Coalition

- 55 organisations; usual and unusual suspects
- Sharing the same passion
- All want to contribute to improve Road Safety
- Also because they feel they have an interest
 - Financial
 - Social responsibility
 - Insurers, car lease operators, politicians, etc
- Have written a manifesto:
 - Offering their actions on Road Safety to the Government
 - Asking for support
- Initiative from ANWB who just coordinate and facilitate



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Enjoying dinner, but more important: work together



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Verkeersveiligheid: een nationale prioriteit



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Collaboration is not easy

**Great things
never came
from comfort
zones.**



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Let's safe some lives!



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Just if there is some time left.....



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Urbanisation

- In 2020, 80% of the European population lives in urban regions
- In 2030, over 60% of the world population lives in urban regions
- Accelerated growth of urban populations imposes higher requirements on the infrastructure in and around cities.
- 21 of the 25 most fast growing cities are in countries with upcoming economies.
- Livability and road safety increasingly under pressure
- Need for efficient and safe use of limited space
- New means of transport are emerging



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Bicycle use...



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...more bicycle types...



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New means of transport...



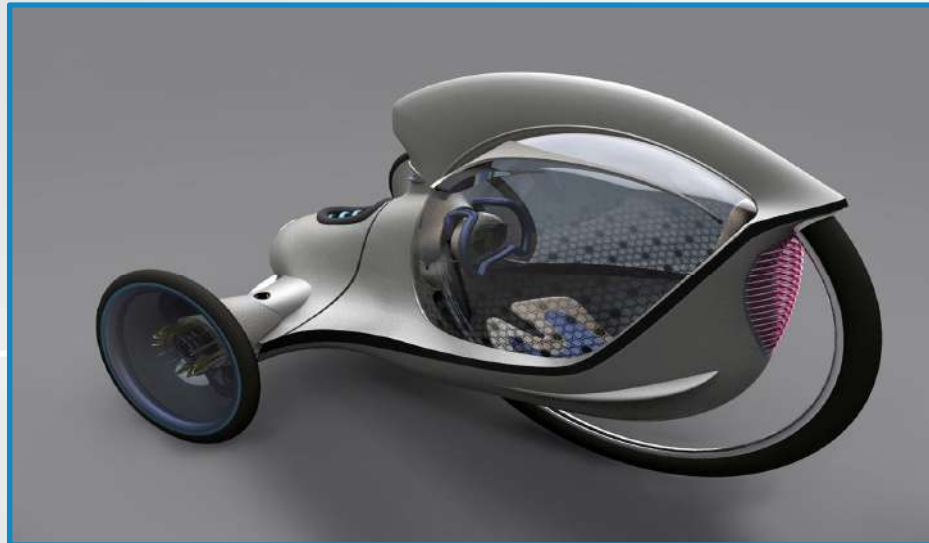
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...including LMV's...



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...and multiple purpose vehicles



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Questions and discussion



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“...ometne varnosti”
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New development: CycleRAP

- Developing a method to assess cycling infrastructure
- 'Extended Star Rating for Bicyclist' in EuroRAP



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Why CycleRAP?

- Number of road victims among cyclists no longer decreasing (+/- 180)
- Over 50% of the total number of seriously injured in traffic are cyclists
- Mostly one-bicycle accidents
- Infrastructure often part of the problem; also in the future!



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'EuroRAP for cyclists'

Aims ANWB:

- Contribute to safe cycling
- Contribute to reducing the number of road victims with 50%



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Star rating

- Developed by SWOV, commissioned by ANWB
- Safety score for cycling infrastructure
- Building on EuroRAP method
- Looking at risk prevention
- Based on 23 road characteristics + amount of traffic



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Next steps

- First version CycleRAP method ready in summer 2016.
- Pilots carried out in Friesland, Amsterdam, Rotterdam/The Hague.
- Many road authorities are interested
- Ambition is to involve members
 - Regional level
 - Local level

anwb

Home Provincies Hoe werkt het? Meer over ANWB en verkeersveiligheid

Friesland

Stem op de onveilige weg die je als eerste verbeterd wilt hebben

Klik op het wegdeel dat jij onveilig vindt

N359 Aantal stemmen: 12

vind je dit wegdeel ook onveilig? stem nu wegvoeren en stuur je stem in.

Ja, ik vind dit wegdeel ook onveilig

Opmerking: geef in max 130 tekens aan waarom jij deze weg onveilig vindt. Denk aan de breedte van de weg, gevoel tempo de weg, trapezanten etc.

Geslacht* Man Vrouw

Voornaam*

Tussenvoegsel

Achternaam*

E-mail*

ANWB lid* Ja Nee

Ja, ik wil graag via e-mail op de hoogte gehouden worden, over voor mij relevante producten, diensten en aanbiedingen van de ANWB.

*Verplicht in te vullen. In uw adres wordt niet getoond bij je reactie. Voor en achternaam worden wel getoond.

Stem



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23. junij 2017

Conclusions

- Safety of ITS is still unreliable (touch screens, uniformity)
- 'Traditional' cars will be on the road for at least 15 more years; drivers remain 'in charge' for now.
- Relation automated cars and infrastructure needs to be addressed
 - Roads that cars can read
- Urbanisation will have a huge impact on mobility
 - Investments in infrastructure remain necessary in the near future, but demands are likely to change.
 - Continuous need to anticipate on new means of transport
- Municipal road authorities will become leading



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