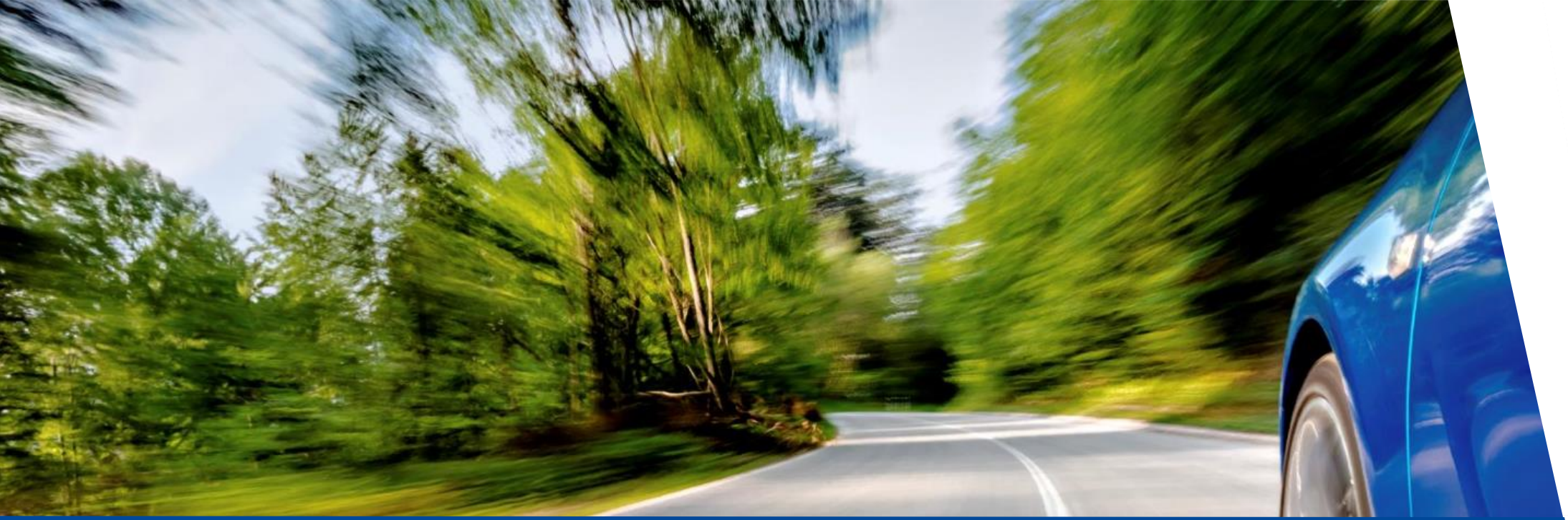


Measures to Improve Road Infrastructure Safety

Klaus Machata, KFV – Austrian Road Safety Board

EU Road Safety Exchange Launch Event | 09.10.2019 | Brussels

>90%

of crashes: human behaviour as causal factor

- anything to worry for infrastructure providers?

Fatal single vehicle collision on a straight road section

2018, motorway, straight section, noon, prefect weather conditions, speed limit 100 kph, single vehicle crash, family, father (driver) killed, ***crash cause unknown …***

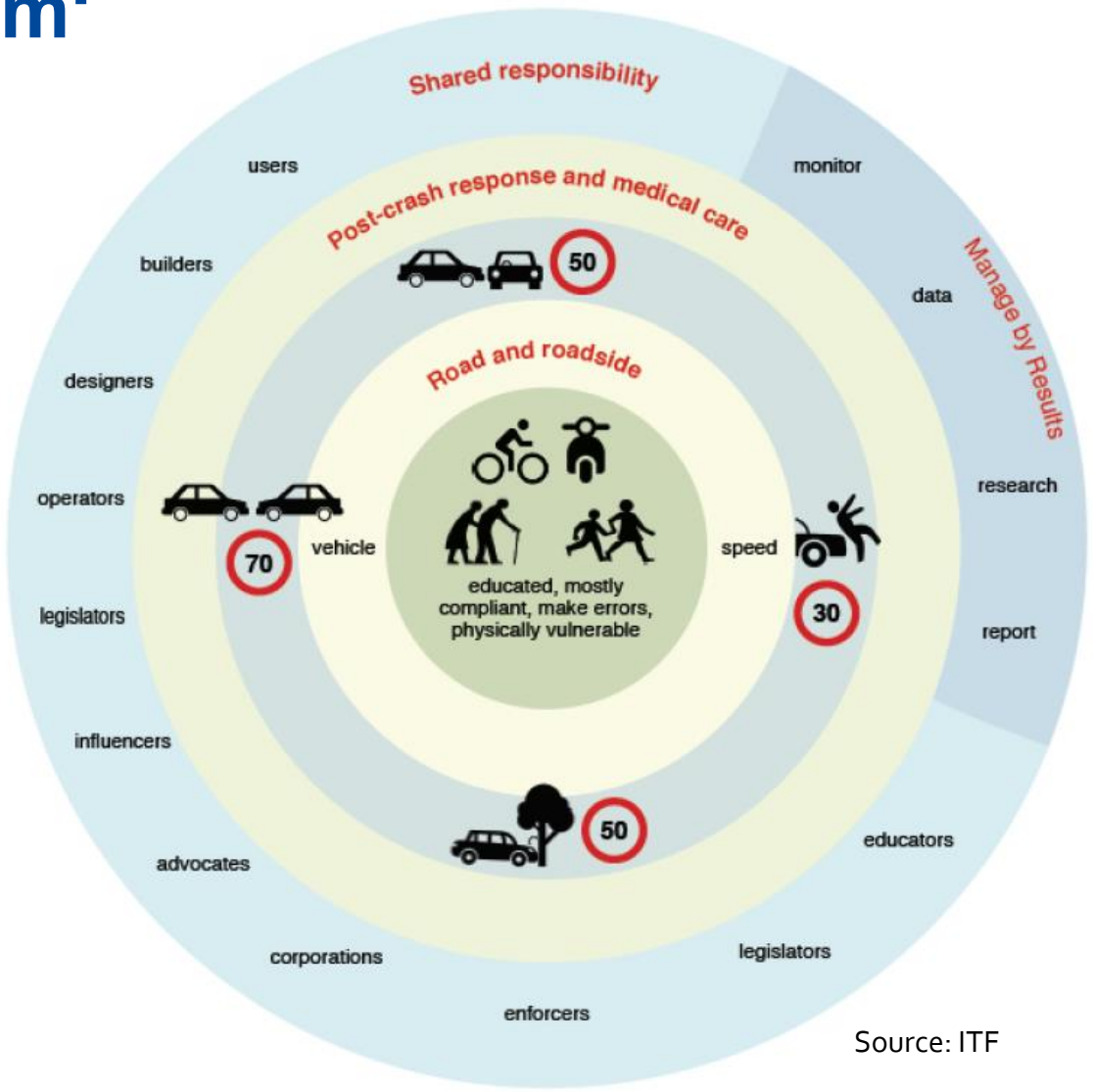
Why bother?

Trees do not jump on roads.

… and people do not jump off balconies.

The 4 principles of a ‚Safe System‘

1. Humans make **mistakes*, crashes** will always occur
2. Humans are **fragile**
3. **Shared responsibility** to prevent crashes resulting in **serious injury or death**
   - users
   - infrastructure & vehicle design, construction, maintenance
   - post crash care
4. **All parts of the system must be strengthened;** if one part fails, road users are still protected.



Source: ITF

* Safe System **expects people to act responsibly and to comply with safety-related traffic rules**

Change of paradigm: **Crash prevention → Injury prevention**

	Traditional	Safe System
What is the problem?	Crashes	Fatalities and severe injuries
What causes the problem?	Human factors	Humans make mistakes Humans are fragile
Responsibility?	Individual road users	Road users + system designers + …
Demand for road safety?	People don't want safety	People do want safety
What is the appropriate goal?	"Optimum" number of fatalities and serious	Eliminate fatalities and serious injuries

Think safe roads, not safer roads!

Source: Matts-Ake Belin, Trafikverket (modified)

Road design of the past – any problem?

rural

urban

What does Safe System imply for infrastructure design & maintenance?

- **Forgivingness** of the road environment
- **Predictability** of road course (self-explaining, self-enforcing > adequate speed level): consistency and continuity of design
- **Homogeneity** of mass, speed and direction
- **Functionality** of roads: hierarchically structured road network

Source: SWOV, Sustainable Safety (NL, 2008)

Safe System in practice

Rural roads

Safe System in practice: Sweden (2+1)

Safe System in practice: Sweden (1+1)

Source: Machata

Safe System in practice: Poland (1+1)

Safe System in practice: Estonia (1+1)

Safe System in practice: Finland (2+2)

Safe System in practice: The Netherlands

60 kph rural access road

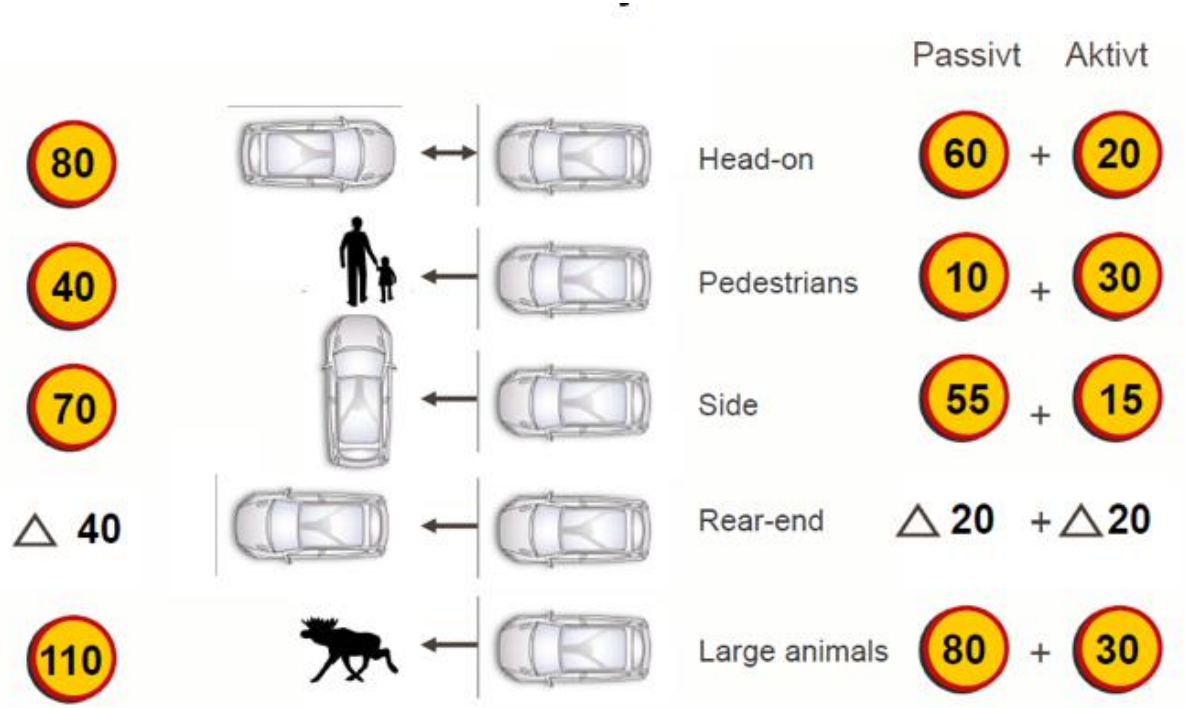
Safe System in practice: The Netherlands

80 kph rural distributor road

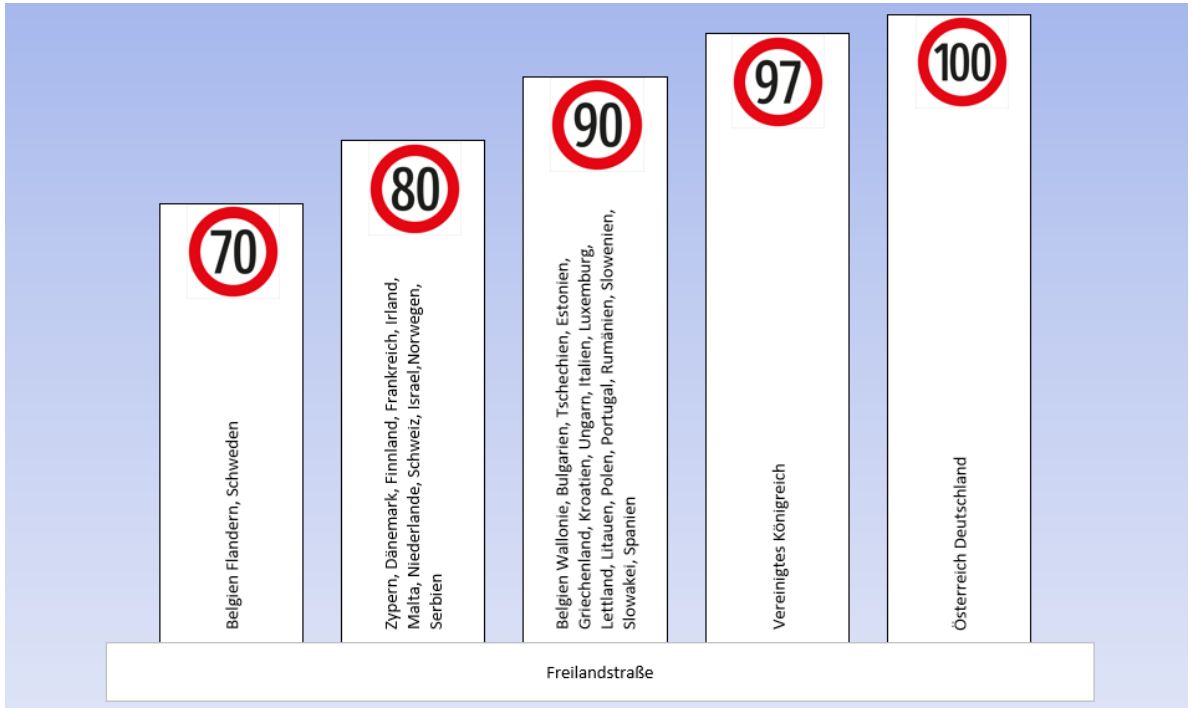
Safe System in practice: The Netherlands

100 kph rural distributor road

Safe System and Safe Speeds?



Source: Claes Tingvall, Trafikverket



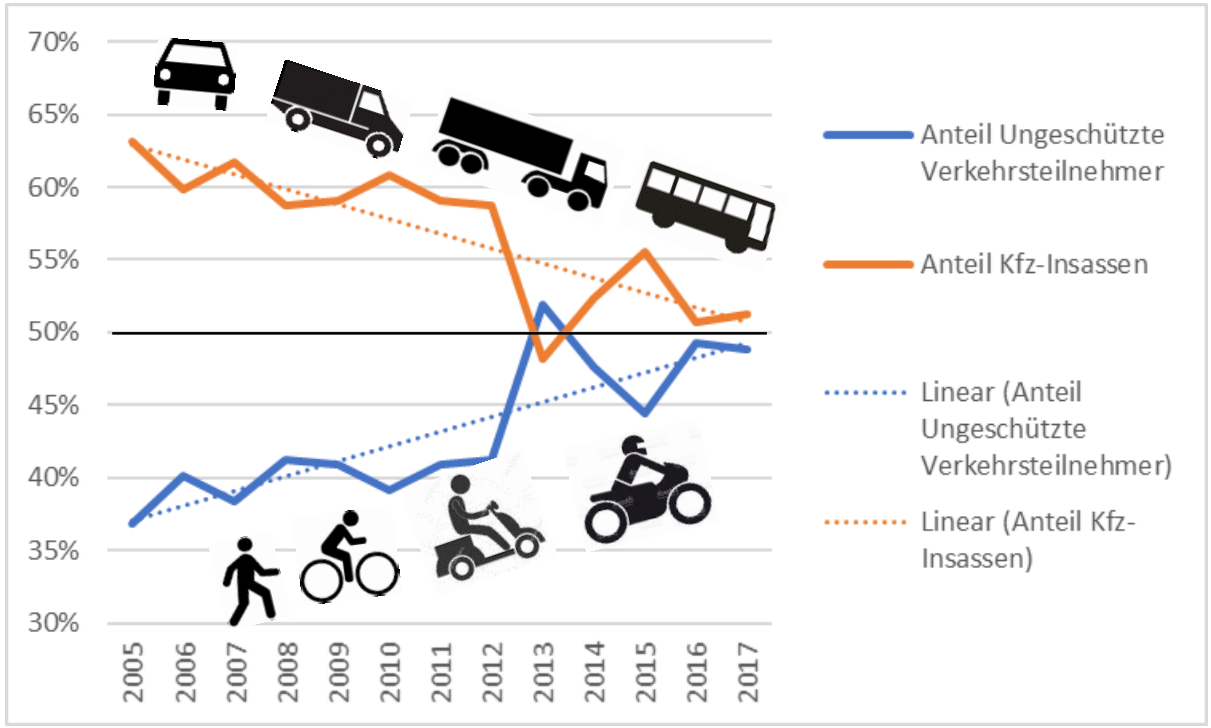
Source: ETSC PIN Flash 36

Safe System in practice

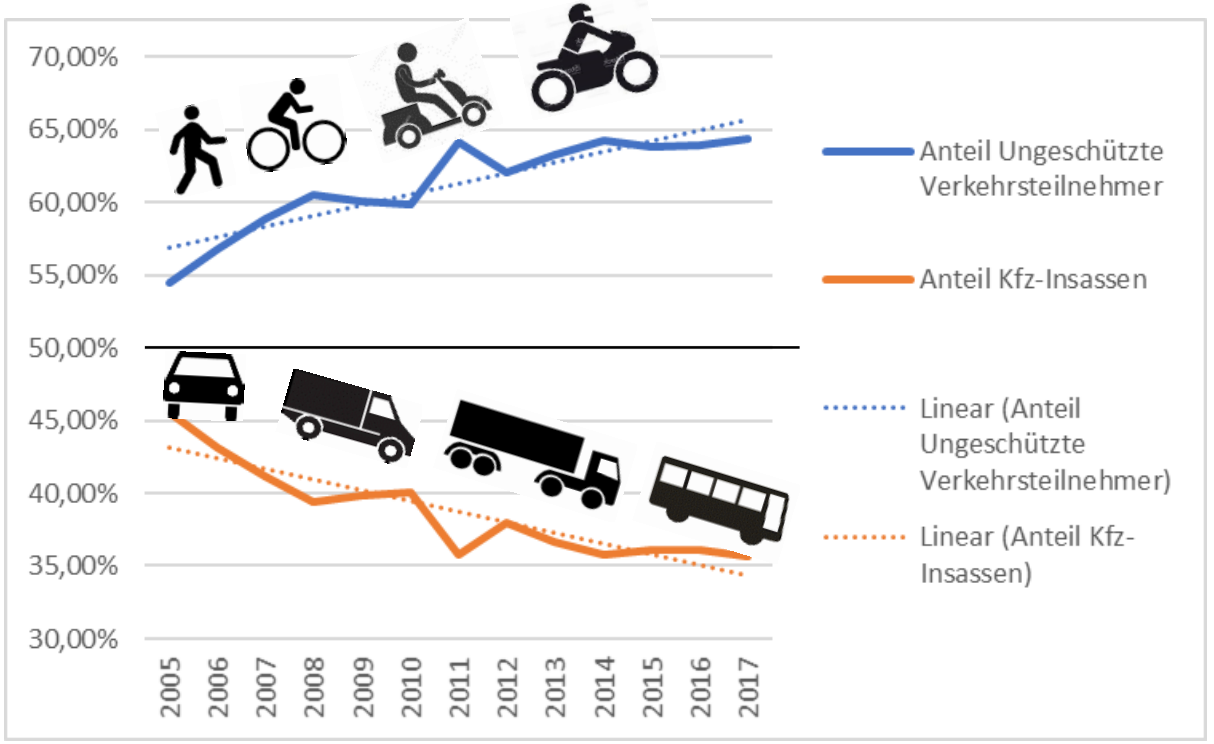
Urban roads

Shares of vulnerable road user victims increasing!

Fatalities



Serious injuries



Source: STATISTIK AUSTRIA, KFV

Design of urban road space

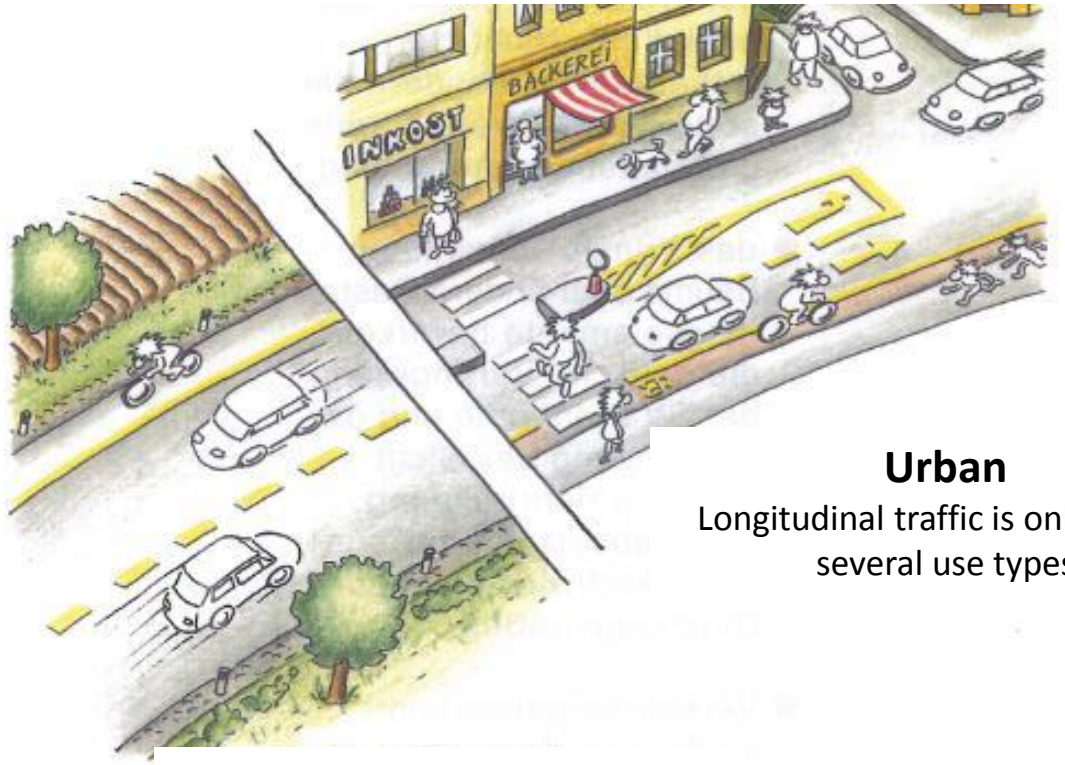
Speed: whatever …
Parking: wherever …

Design elements subdivide road space and **organise** traffic

Source: KFV

The visual appearance of a road influences on the behaviour of road users!

Urban thoroughfares should be designed for all users – not only for cars!



Source: KFV

Urban
Longitudinal traffic is only one of several use types

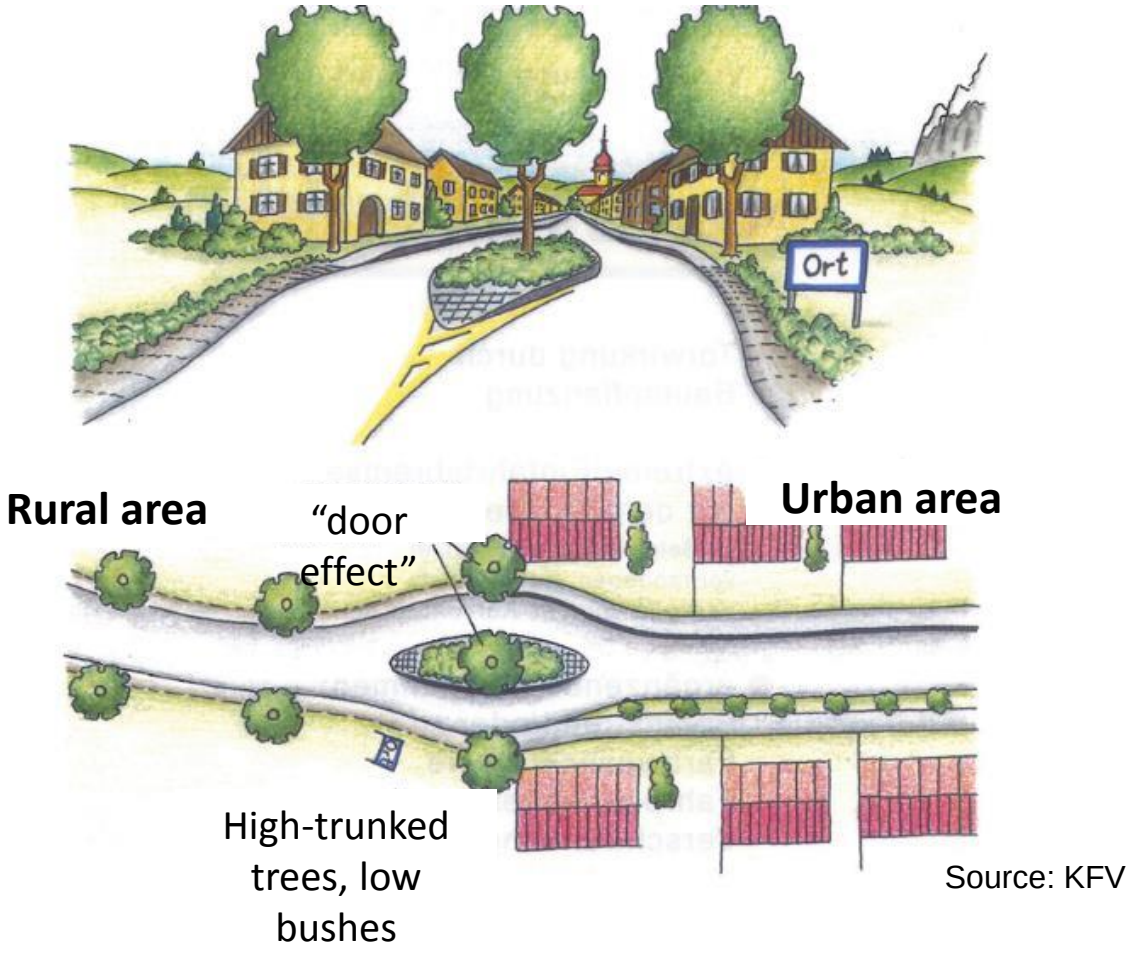
Rural
Mostly longitudinal traffic

Treatment of urban thoroughfares in practice

- Reduction of number of lanes
- Implementation of pedestrian crossings, central islands, road furniture…

Source: KFV

Approach to urban area



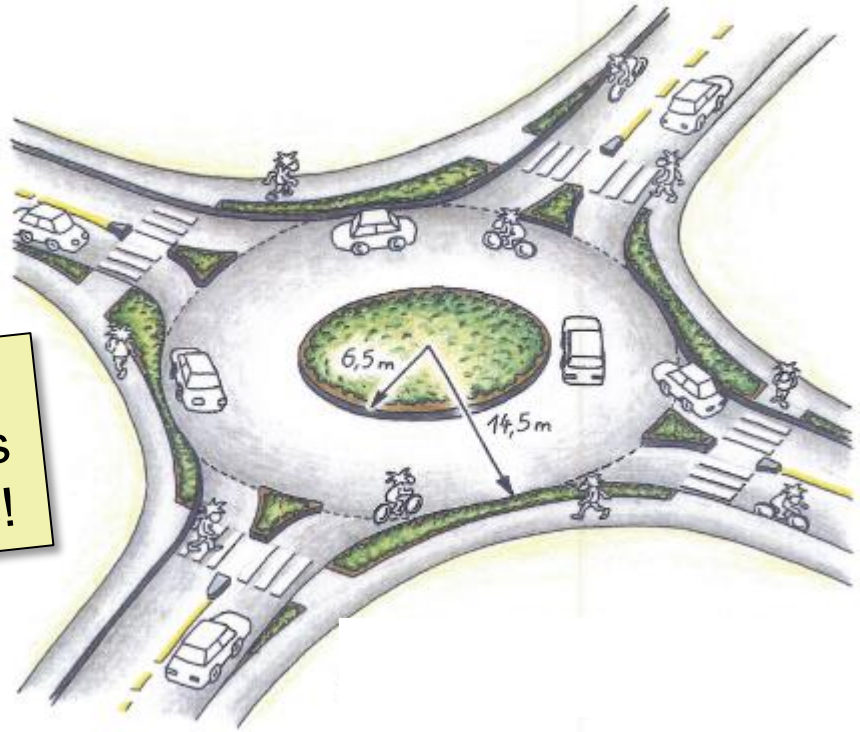
Source: KFV

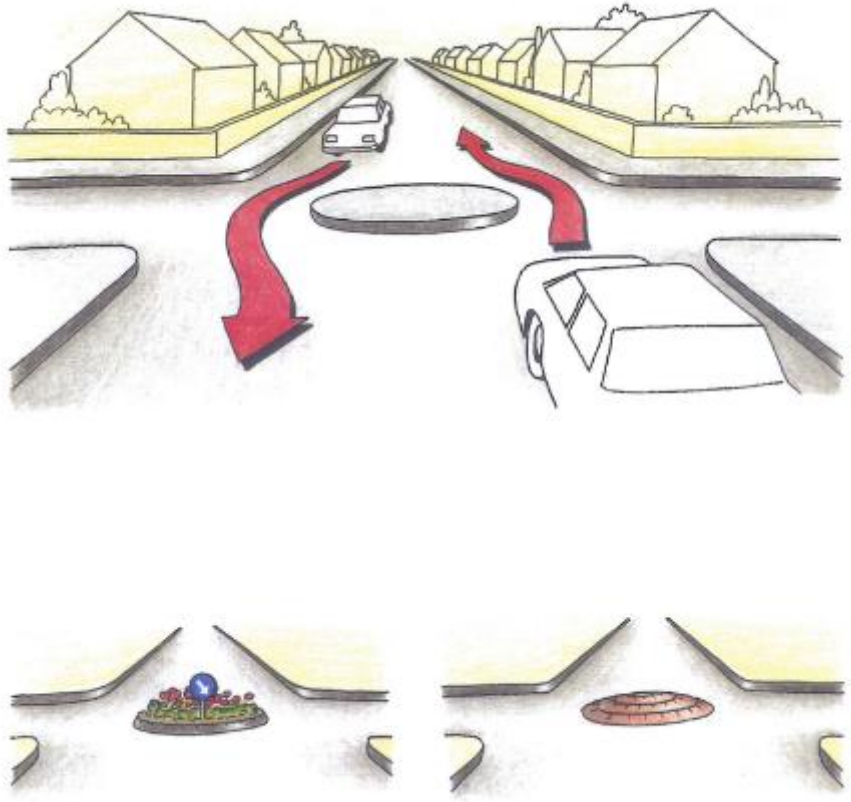
Approach to urban areas in practice

Source: KFV

Roundabouts: Thoroughfares and residential areas

Potential safety issues for bicyclists!





Source: KFV

Roundabouts in practice

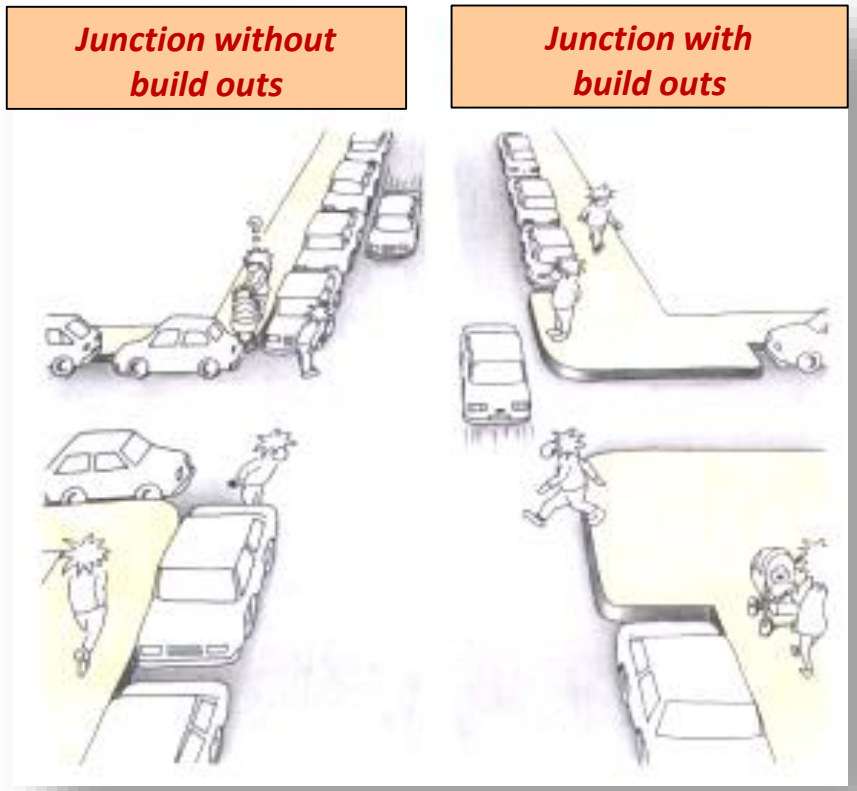

Hall in Tirol


Tarvisio


Schärding

Source: KFV

Crossing aids for pedestrians (1)



- Better visibility
- Better accessibility

Source: KFV

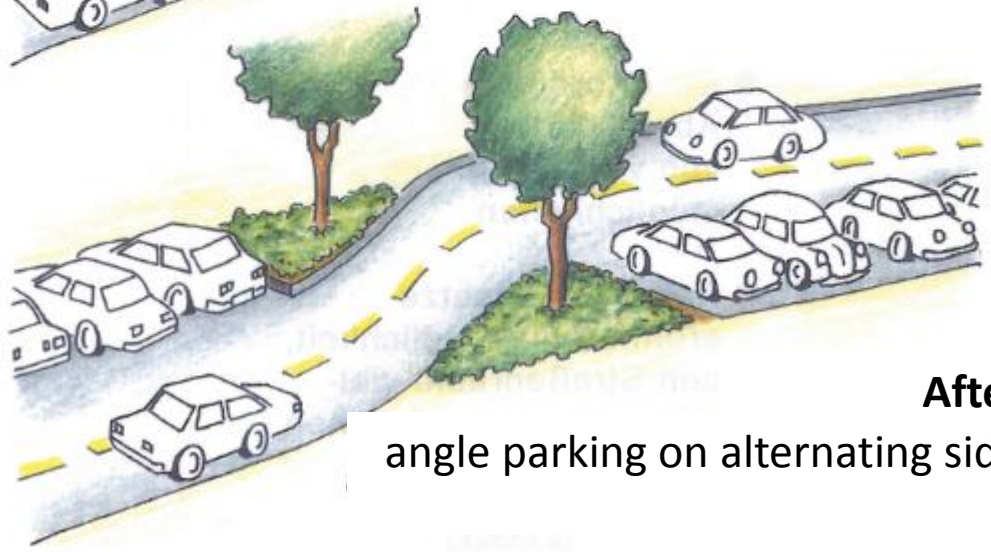
Crossing aids for pedestrians (2)

- Refuge islands
- Where possible: illumination

Source: KFV

Horizontal alignment

Before: curb-side parking both sides



After: angle parking on alternating sides

Source: KFV

Horizontal alignment measures in practice

Avoid straight lines …

Source: KFV

30km/h sections & zones

- Make sure that 30km/h is a credible speed limit …

Source: KFV

Change often requires a long a political process for decades…

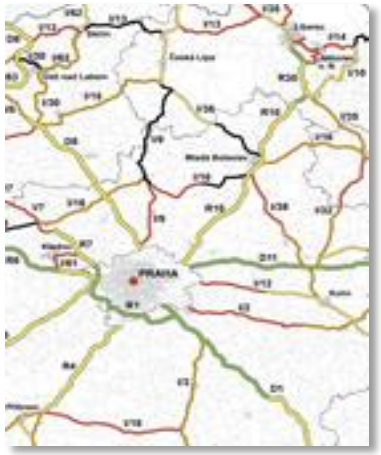
Vienna, **Encounter Zone** Mariahilfer Straße

EU Directive on Infrastructure safety management (recast)

- TERN + “primary roads” + EU funded roads; Vision = application on all roads!

Network-wide Road Assessment — *proactive (“built-in” safety)*

Road Safety Impact Assessment | Road Safety Audits | Road Safety Inspections | High Risk Site Management | Safety Ranking and Management … — *reactive*



New infrastructure indicator in the Netherlands

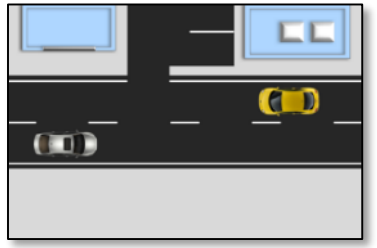
Proactive safety work on provincial 80 kph roads using indicator *ProMeV Light* (in addition to reactive high-risk sites treatments):

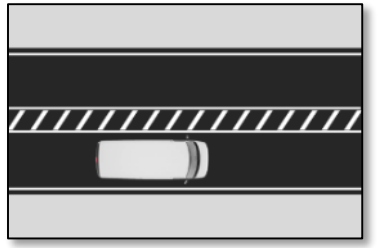
1. Frequency of **access roads** to private property, fields, enterprises, …

2. Type of **median**, road markings or other separation of driving directions

3. Distance between **obstacles** (trees, ditches) and the edge of the road

+ **AADT** for prioritisation!





First results: need for action on 15% of the provincial road network

Source: SWOV, EIRA

Best Practice collections & guidelines

- SafetyCube: European Road Safety Decision Support System
  https://www.roadsafety-dss.eu

- ETSC PIN Publications
  https://etsc.eu/projects/pin/

- Several WHO Guidelines for VRU Safety
  http://www.who.int/roadsafety/publications/en/
  - Pedestrian Safety
  - Helmets
  - Speed Management
  - Data Systems

- PIARC Road Safety Guidelines
  http://www.piarc.org/en/knowledge-base/road-safety/

Thank you!

Klaus Machata
KFV (Kuratorium für Verkehrssicherheit – Austrian Road Safety Board)
Schleiergasse 18 | A-1100 Wien
Tel: +43-(0)5 77 0 77-0 | Fax: +43-(0)5 77 0 77-1186
E-Mail: klaus.machata(at)kfv.at | www.kfv.at