



European
Investment Bank

The Safe System approach

and what it means to 'system owners'

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The road transport system



*Road user
+ Vehicle + Road*



The road transport system

A high risk environment

- Mix of road users with different speeds
- Numerous conflicts
- Small margin for error
- Potential fatal consequences
- Drivers constantly need to
 - Observe
 - Perceive, assess, understand
 - Decide
 - React
- 8 out of 10 drivers believe they are 'better than average'



High exposure to risk

Professional driving

- A highly hazardous activity
- Involves risks far higher than those encountered in virtually any other occupation
- Impose substantial risks on other road users



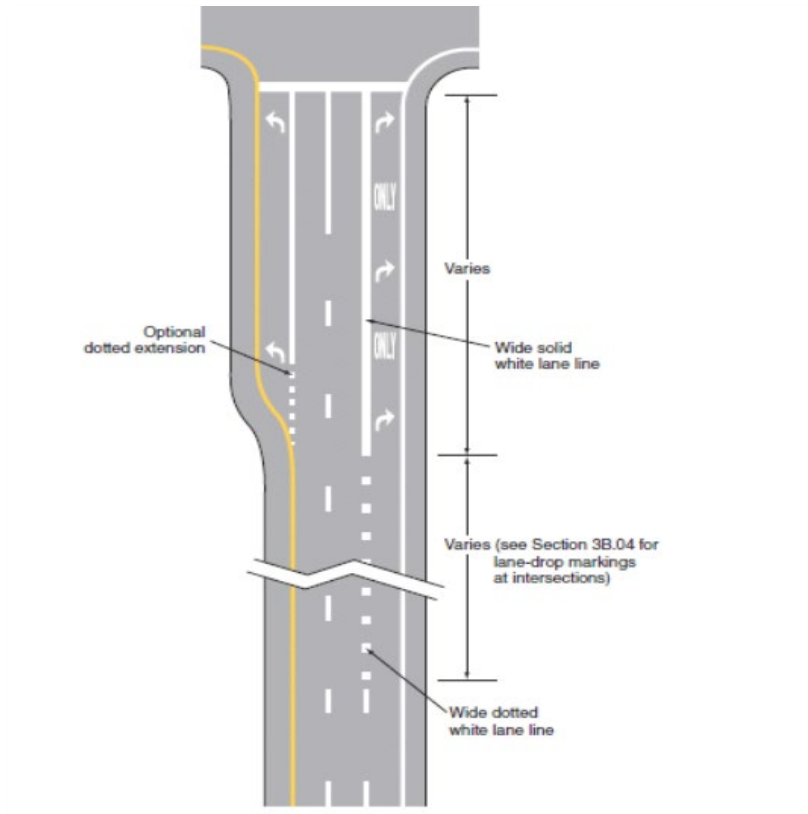
‘The number one killer of our youth’ (WHO)

- The leading cause of premature death for children and young adults 5-29 years.
- Inside as well as outside the EU.
- Road accidents kill more children than HIV, AIDs, malaria and diarrhea **combined**.



Good design standards are needed BUT

What the design engineer sees



What you (sometimes) get.

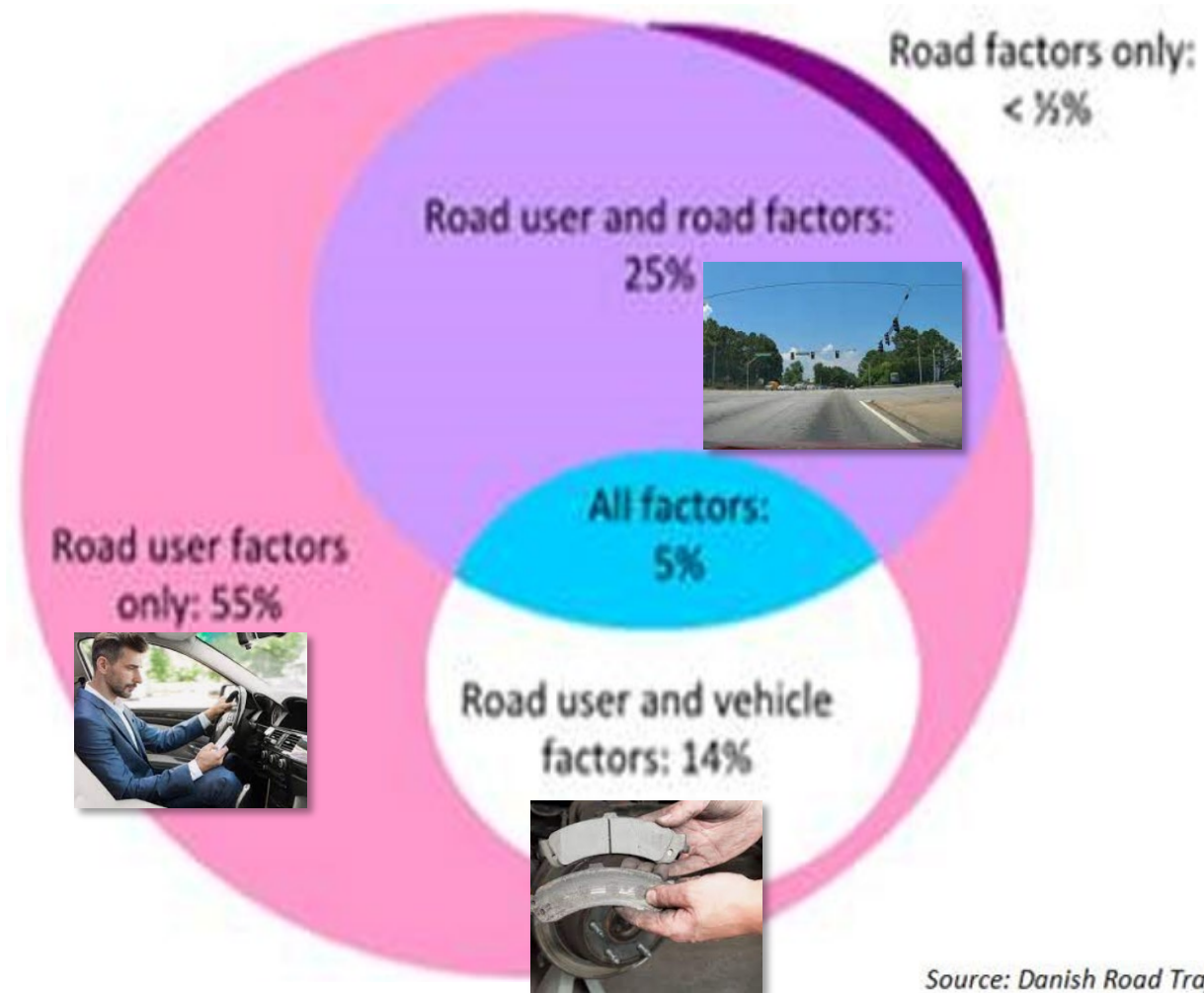


Road accidents

The result of multiple contributing factors

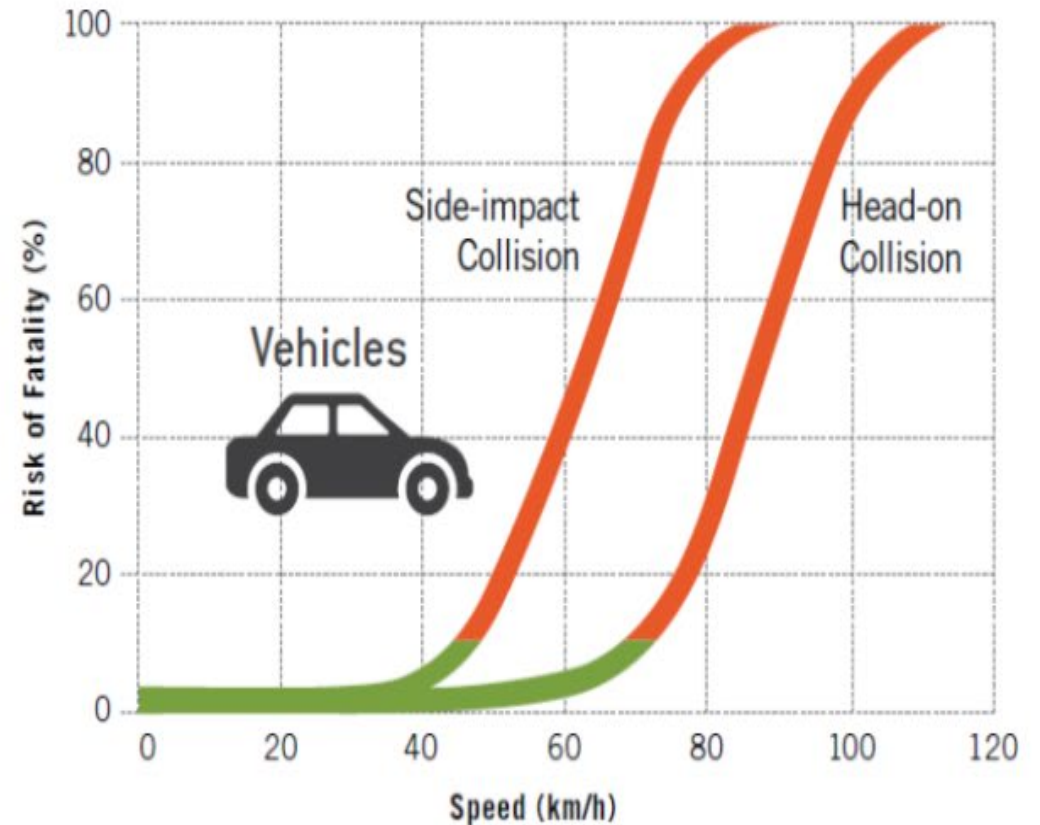
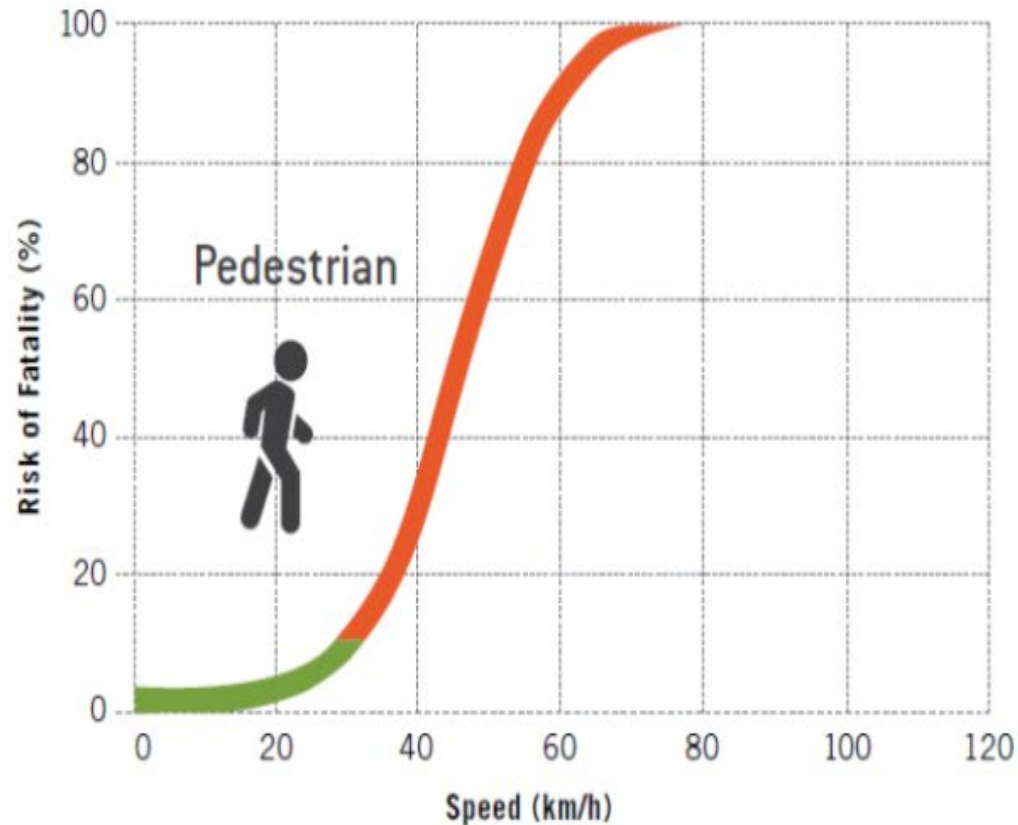


Contributing factors



Source: Danish Road Traffic Accident Investigation Board (2014)

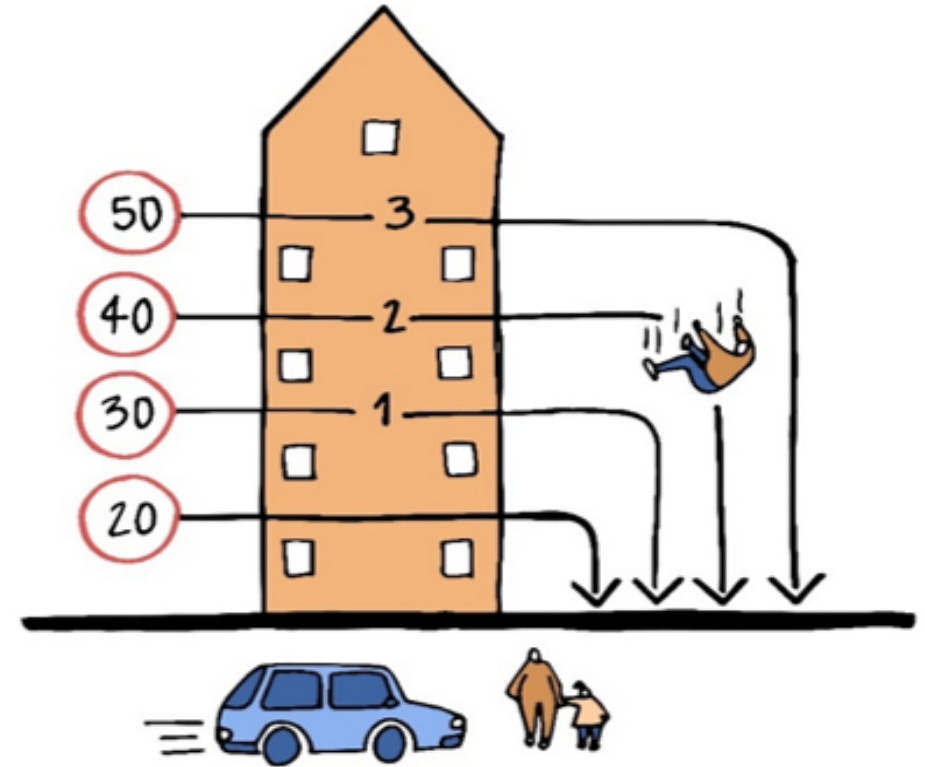
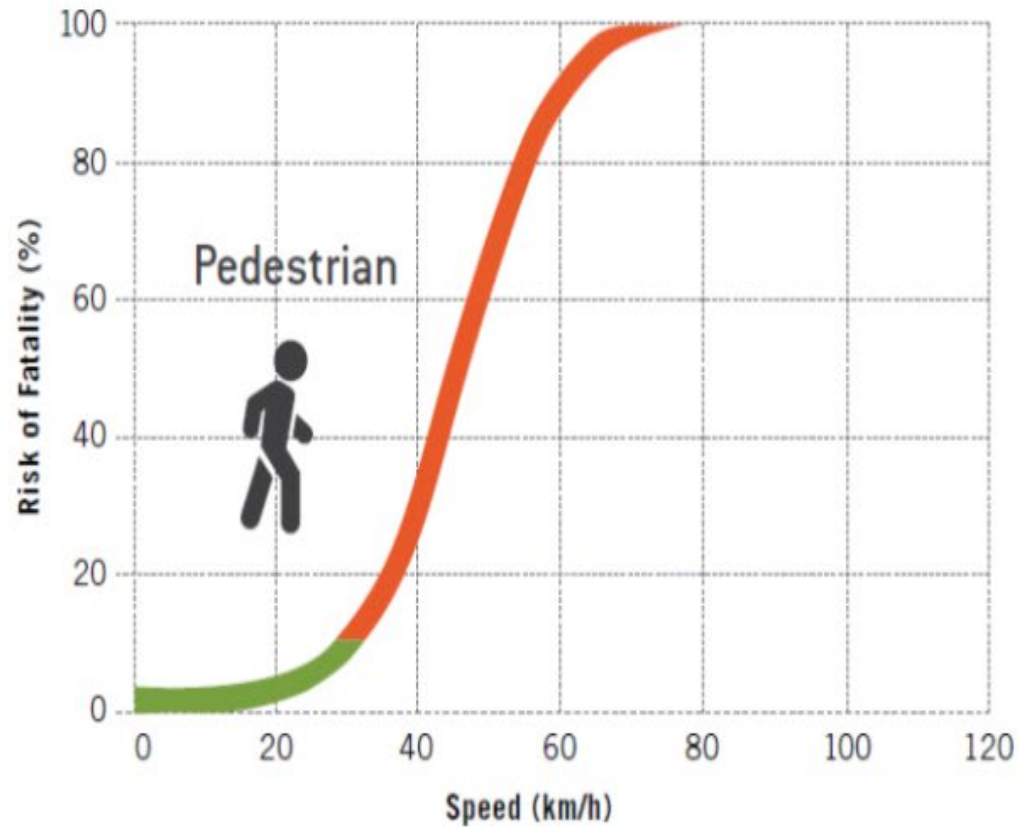
Why speed is so important: $E = \frac{1}{2} * m * v^2$



Crash involving vehicles vs vehicle and vehicles vs pedestrian/cyclist

Source: Austroads Balance between harm reduction and mobility in setting speed limits: a feasibility study (2005)

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Contributing factors

Common road design related factors

- Mismatch between road function and speed
- Mismatch btw. road alignment, cross section, and environment
- Poor intersection layout and junction visibility
- Accesses to properties along the road
- Lack of protection for pedestrians and cyclists
- Poor signs, markings and lighting
- Hazardous road sides
- Potholes, drainage and pavement friction
- Road side advertising and distractions



The Safe System approach

A philosophy based on the Zero Vision

- Road users make mistakes
 - irrespective of who they are
- Road deaths should not be accepted
- Minimize the risk of road user error
- When errors occur: minimize the risk of death and serious injury

⇒ **The road transport system should be designed so nobody is likely to get killed**

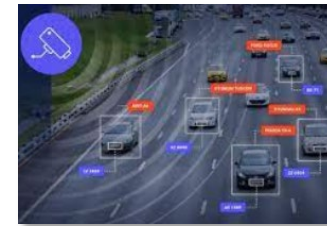
The road transport system should also be used so nobody is likely to get killed - but subject to a separate workshop.



The future - but when?







ITS
ADAS
Automation



The Safe System approach (continued)

What it means for 'system owners' - infrastructure owners and operators

Desirable design characteristics	Key principles	
Self-explaining roads	Predictability, simplicity, visibility, conspicuity	
Forgiving roads and roadsides	Remove/soften/protect hard objects, adequate lane widths, safety zones, emergency lanes, crash barriers/cushions,	
Separation of hard and soft road users	Separate hard and soft road users effectively - or integrate them safely	
Manage speeds	Adapt speed limits to match the expected type and risk of collision, self-enforcing traffic calming measures, transition zones and gates.	

THANK YOU



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