SafetyCube

Lessons from applying the systems approach

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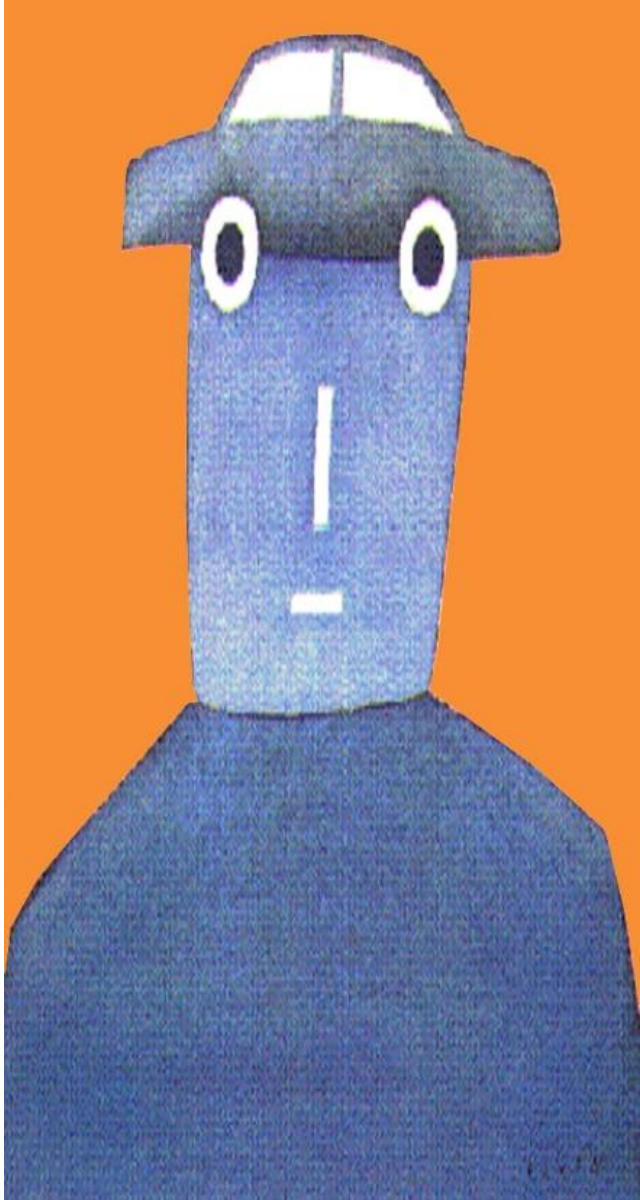
What is the systems approach?

- Safety (crashes) arises from the interaction of multiple components in a system.
- Departure from blame culture.
- The systems approach "concentrates on the conditions under which individuals work and tries to build defences to avert errors or mitigate their effects." (Reason 2000)



Systems approach in road safety

- It's not the drivers **fault!**

- Shared responsibility for crashes.
- 'Failure' of one component (e.g. drivers) could be compensated by improving another component (e.g. infrastructure) and combination of measures has a larger impact than any in isolation.

Systems approach in the DSS

- Road system:
  - *Infrastructure*
  - *Road users*
  - *Vehicles*
  - *Serious injury*
- Investigates the broad range of risks.
- Countermeasures developed in a particular area of the system have benefits across the system.

Co-ordinated analyses

- The Safe System: Behaviour, Infrastructure, Vehicles, Injury prevention.
  - *Common methodological approach*
- Taxonomy of risks and measures
  - *Comprehensive*
  - *Inter-linked*

SafetyCube Taxonomies

Three-level taxonomies
Separately for risks and measures

- **4 Categories**
  road user, infrastructure, vehicle, post impact care
- **88 Topics**
  e.g. distraction, roadside, crashworthiness
- **175 Specific topics**
  e.g. mobile phone use, no clear-zone, low pedestrian rating (NCAP)

Behavior	Infrastructure	Vehicle	Post Impact Care
Law and enforcement	Traffic flow	Frontal impact	Ambulances/helicopters
Education and voluntary training or programmes	Traffic composition	Side impact	Extraction from vehicle
Driver training and licensing	Formal tools to address road network deficiencies	Rear impact	Pre-hospital medical care
Fitness to drive assessment and rehabilitation	Speed management & enforcement	Rollover	Triage and allocation to trauma facilities
Awareness raising and campaigns	Road type	Pedestrian	First aid training drivers
	Road surface treatments	Child	
	Visibility / Lighting treatments	PTW	
	Workzones	Cyclist	
	Horizontal & vertical alignment treatments	HGV	
		Longitudinal	

SafetyCube Links between Risks & Measures

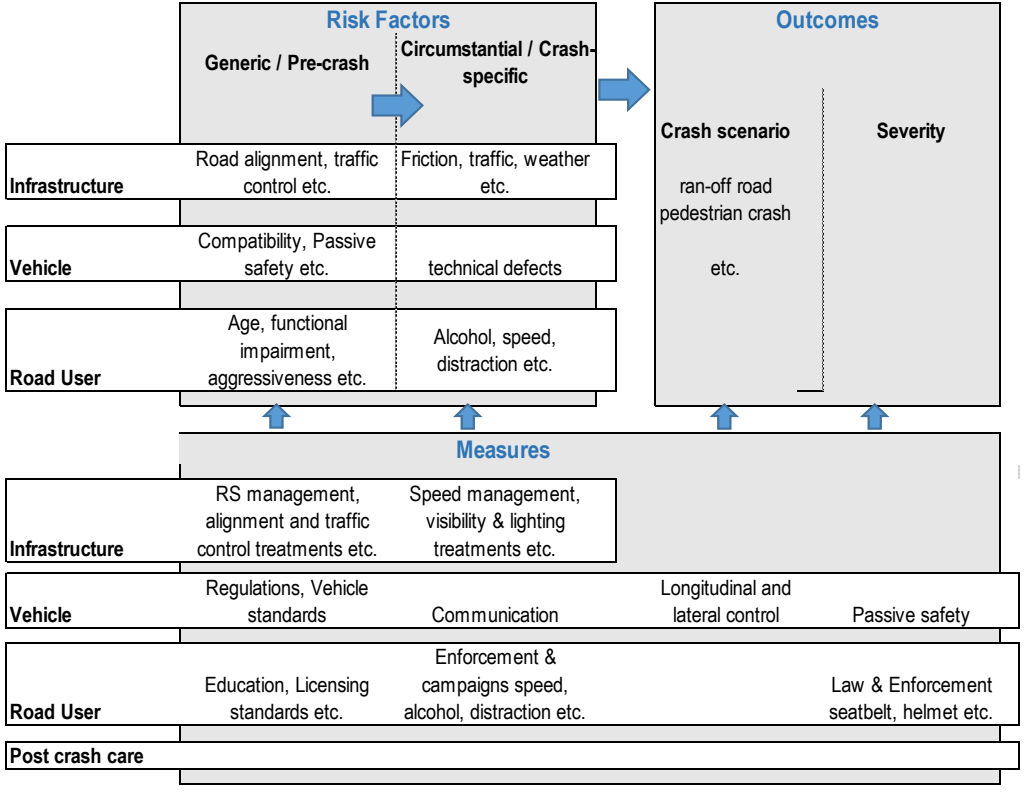
Based on a dedicated methodology

- **Sequence of crash events**
- Pre-crash events → crash → consequences/outcomes

- Risk factors can be:
  - *Generic (e.g. alignment deficiency)*
  - *Circumstantial (e.g. alcohol)*

- Measures may address:
  - *Generic risks: (e.g. road safety audit)*
  - *Circumstantial risks (e.g. enforcement)*

Validated through studies and synopses results



Example

- https://www.roadsafety-dss.eu/

Challenges

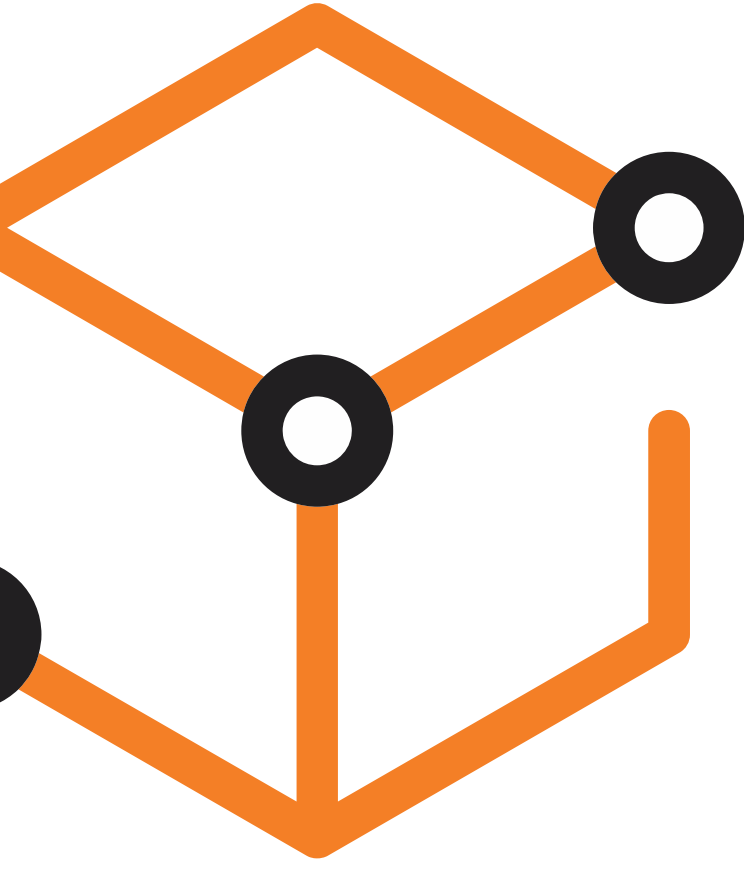
- **Silos in research** > broad searches, synthesis of findings.
- **Silos in partnership expertise** > communication, common methodology, cross WP involvement
- **Volume of topics to cover** > inclusive approach
- **Linking process** > dedicated methodology.
- **Combined effects of measures** > lack evidence
- **Serious injury** > dedicated area of DSS

Future directions of systems safety

- Expansion of DSS content.
- Challenging the culture of transport safety.
  - *Serious injury*
  - *Measures in combination*
  - *"90% of crashes are caused by human error"*

SafetyCube DSS
Delivering a system centered tool

- The SafetyCube DSS considers the transport system with a holistic view point
- SafetyCube DSS is the first integrated road safety support system **developed in Europe**
- SafetyCube DSS **offers for the first time** scientific evidence on:
  - risks and not only measures
  - risks and measures not only on infrastructure
- SafetyCube DSS aims to be **a reference system** for road safety in Europe, constantly improved and enhanced



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