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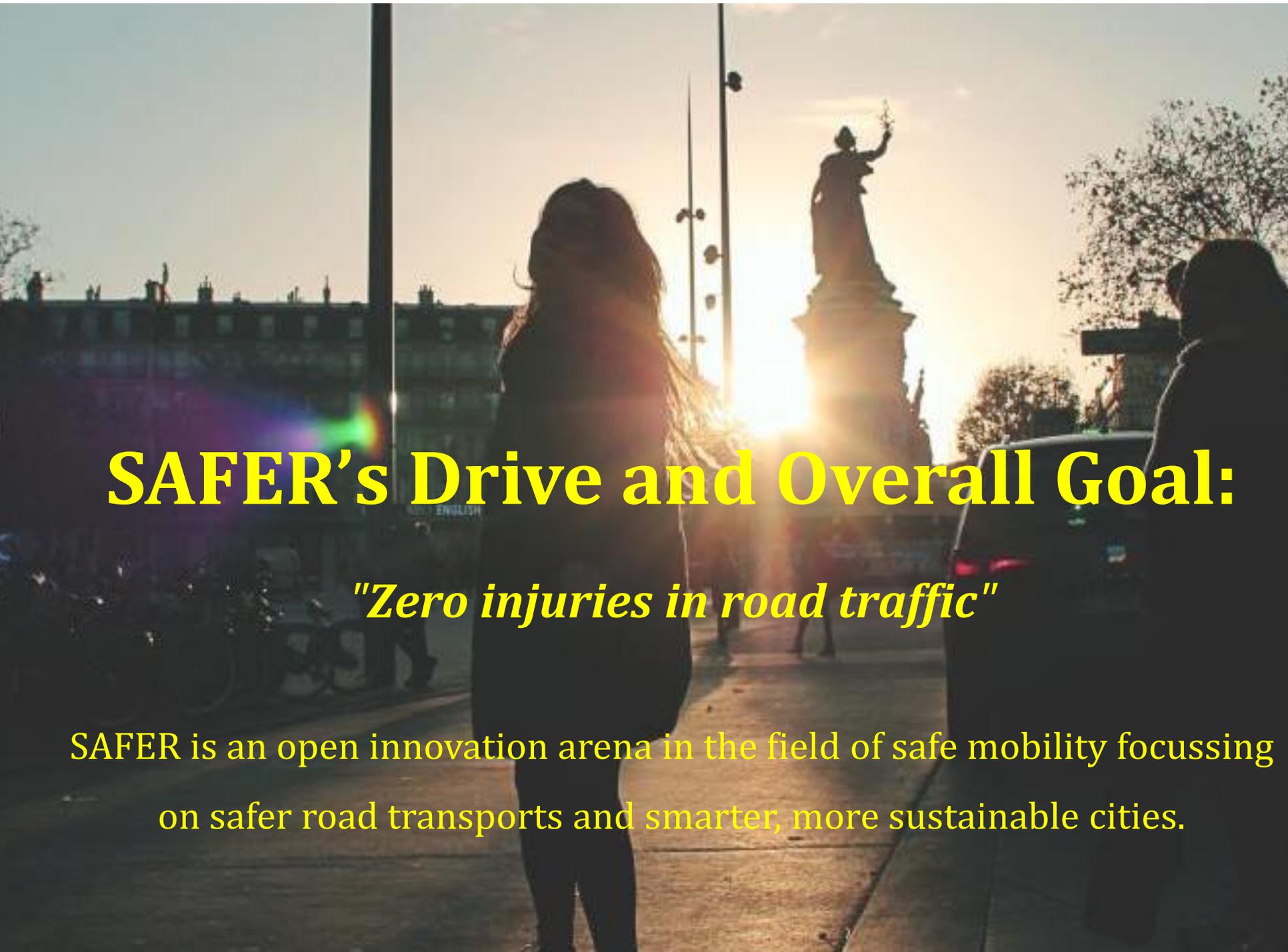
# Sustainable Urban Design for Road Safety

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*Intergovernmental Eleventh Regional Environmentally  
Sustainable Transport (EST) Forum in Asia 2-5 October  
2018 Shangri-La Hotel, Ulaanbaatar, Mongolia*



# **SAFER's Drive and Overall Goal:**

***"Zero injuries in road traffic"***

**SAFER is an open innovation arena in the field of safe mobility focussing on safer road transports and smarter, more sustainable cities.**

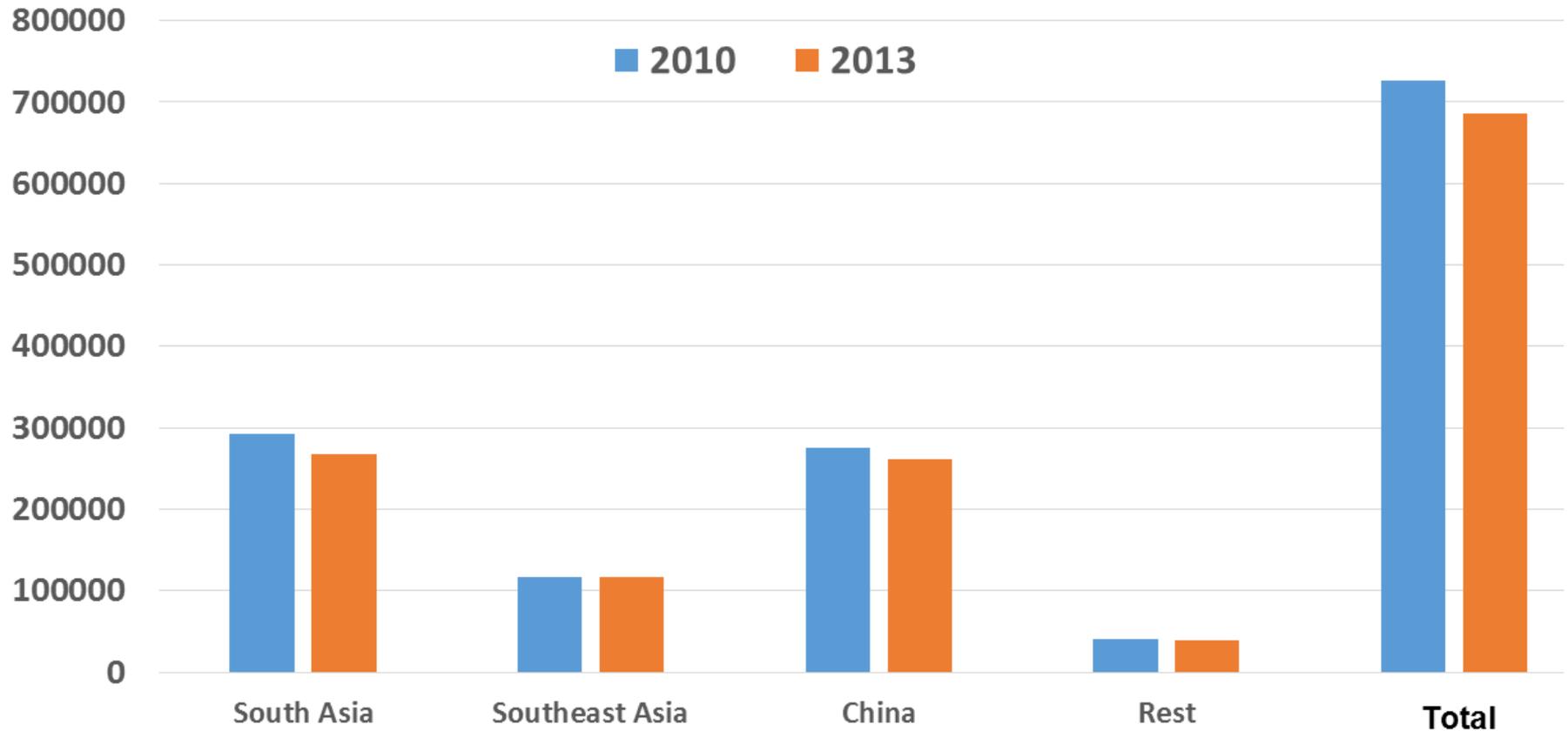
# OBJECTIVE

How can sustainable urban design for road safety contribute to *Zero Accidents* in Asia?

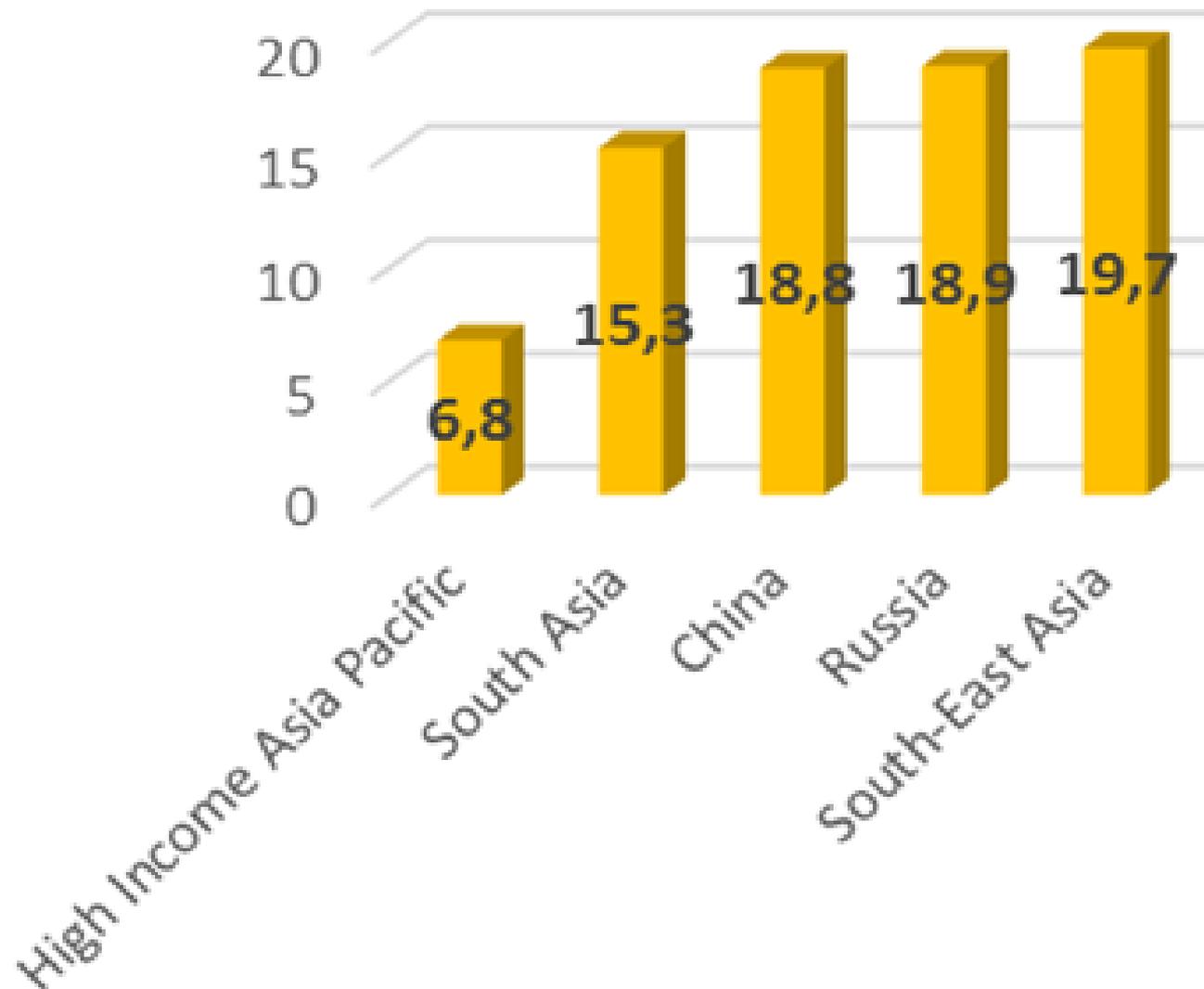


**“Zero accidents”** is the **3<sup>rd</sup> Vision Zero** in the 2013 EST Bali declaration towards Next Generation Transport Systems in Asia

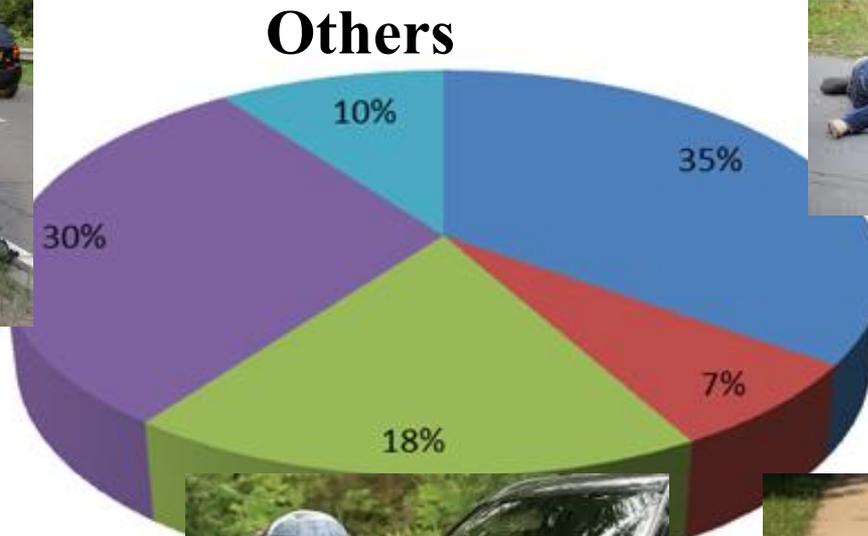
# Road traffic fatalities in Asia



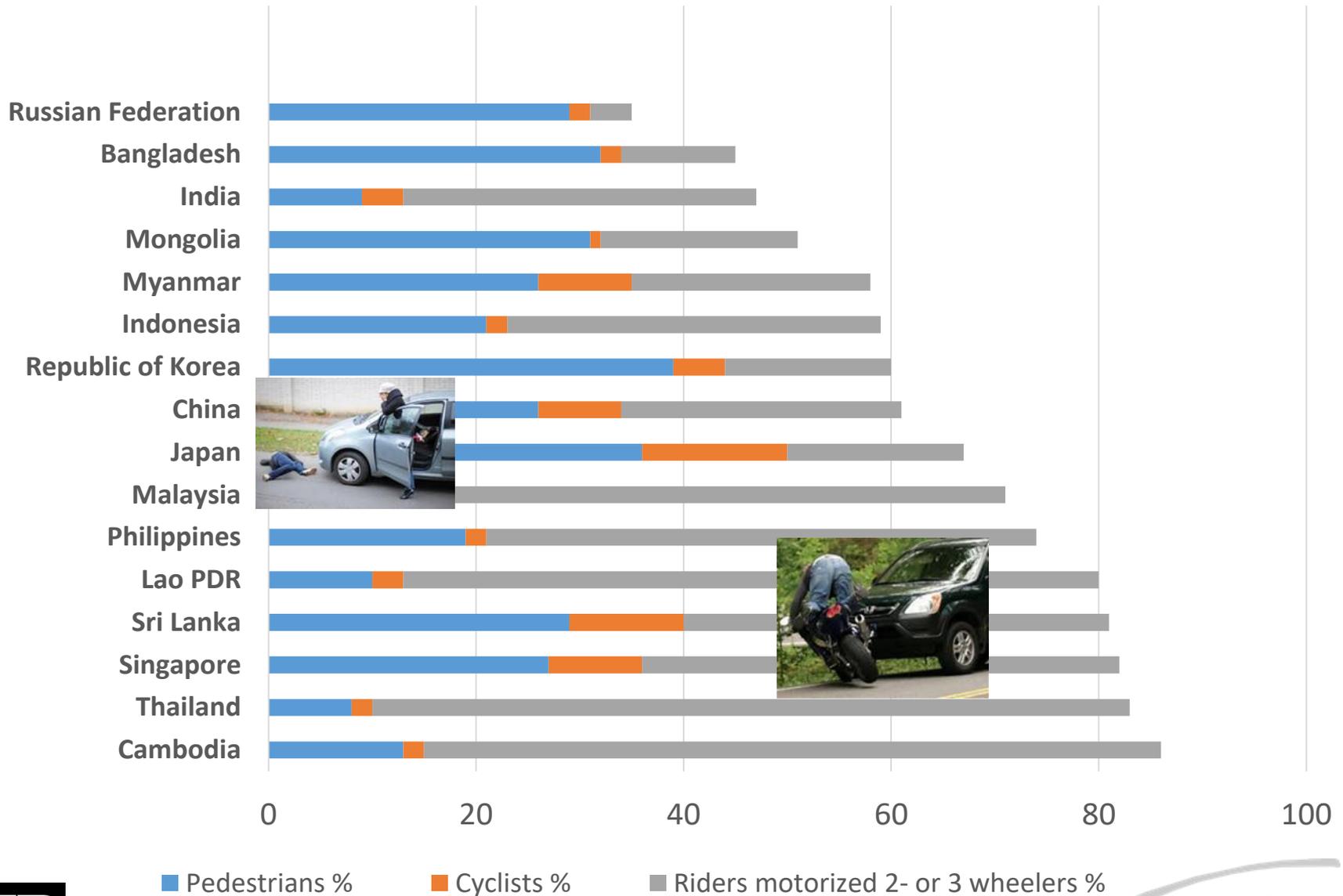
# Death rate/100.000 pop. in Asia



# Fatalities Asia per transport mode



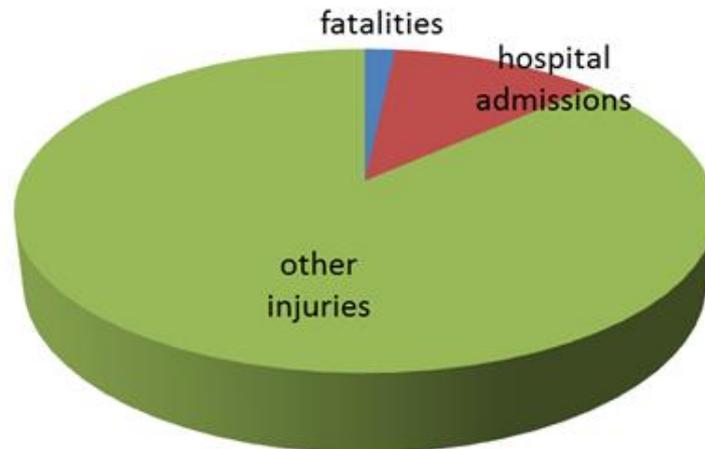
# Vulnerable Road Users in Asia (2013)



# Fatalities are just the top of the Iceberg

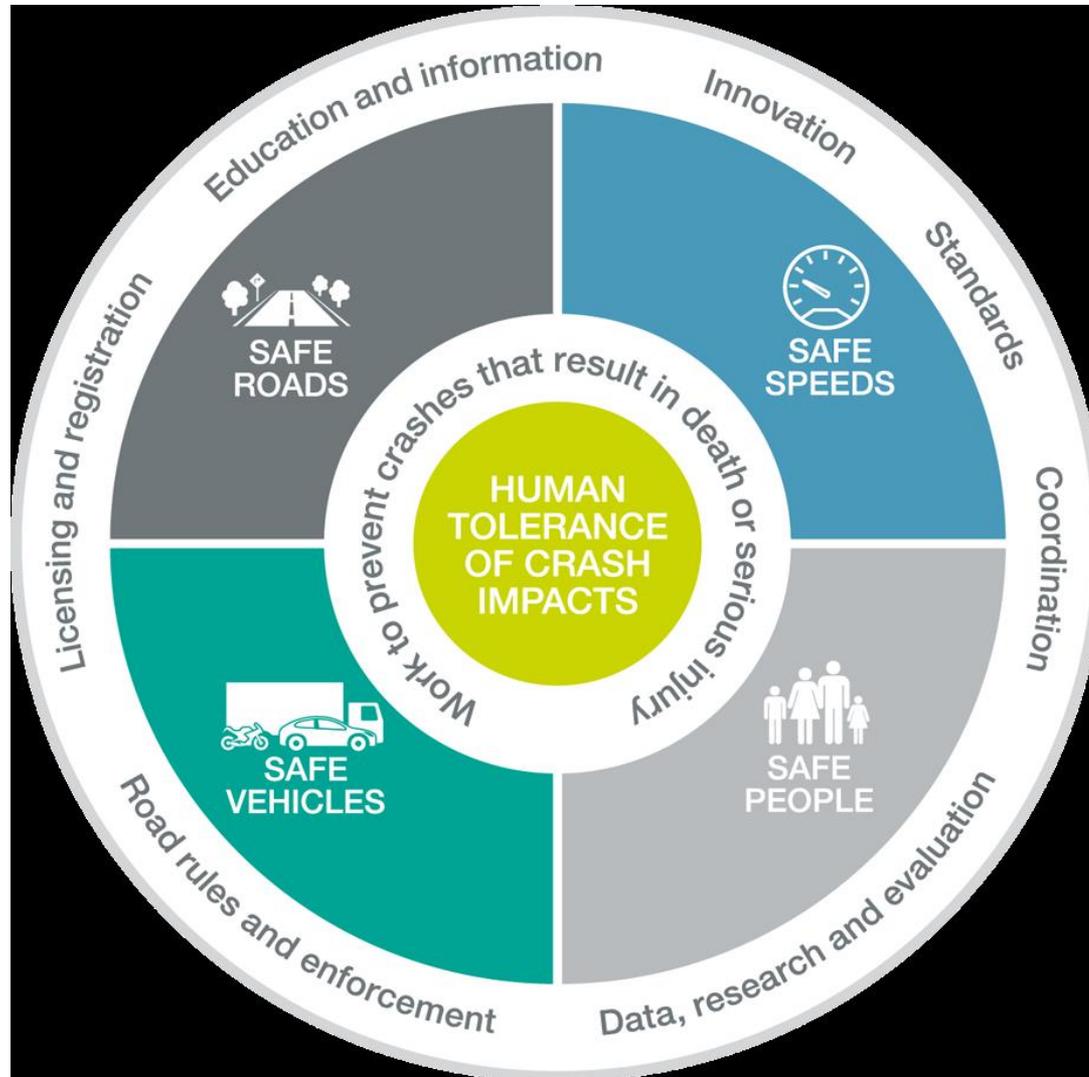
(WHO 2013/2015 and Worldbank/IHME 2014)

In the Asian EST region, in addition to **700.000 fatalities**, road accidents cause almost **50 million injuries** of which **6 million** requiring hospital admission



# How to achieve safe urban road design?

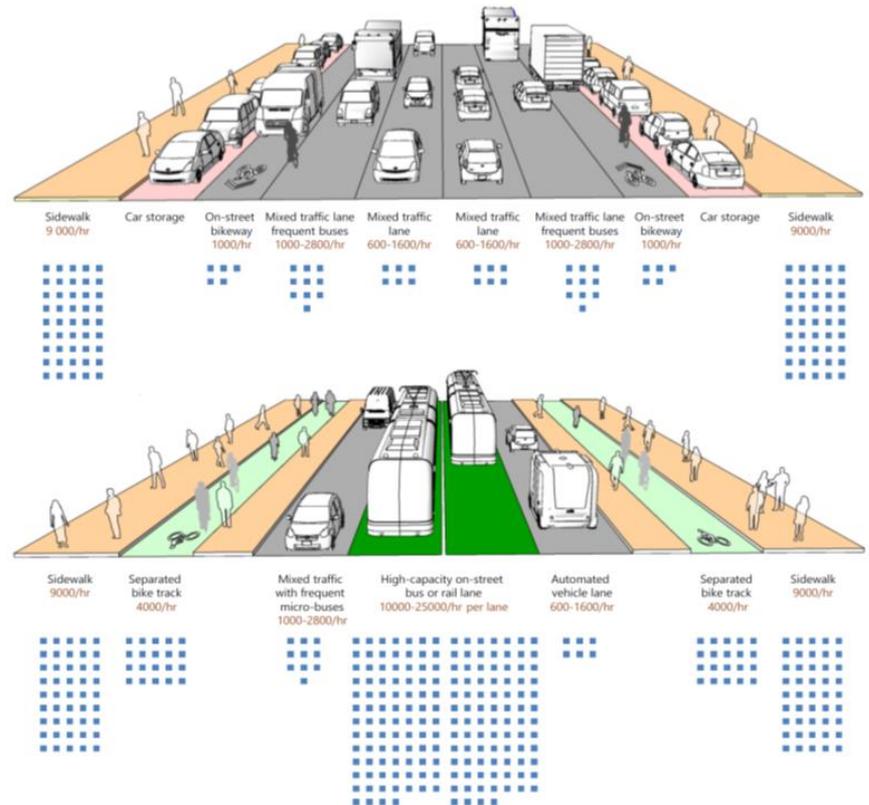
## The Safe System Approach



# Designing sustainable safe systems

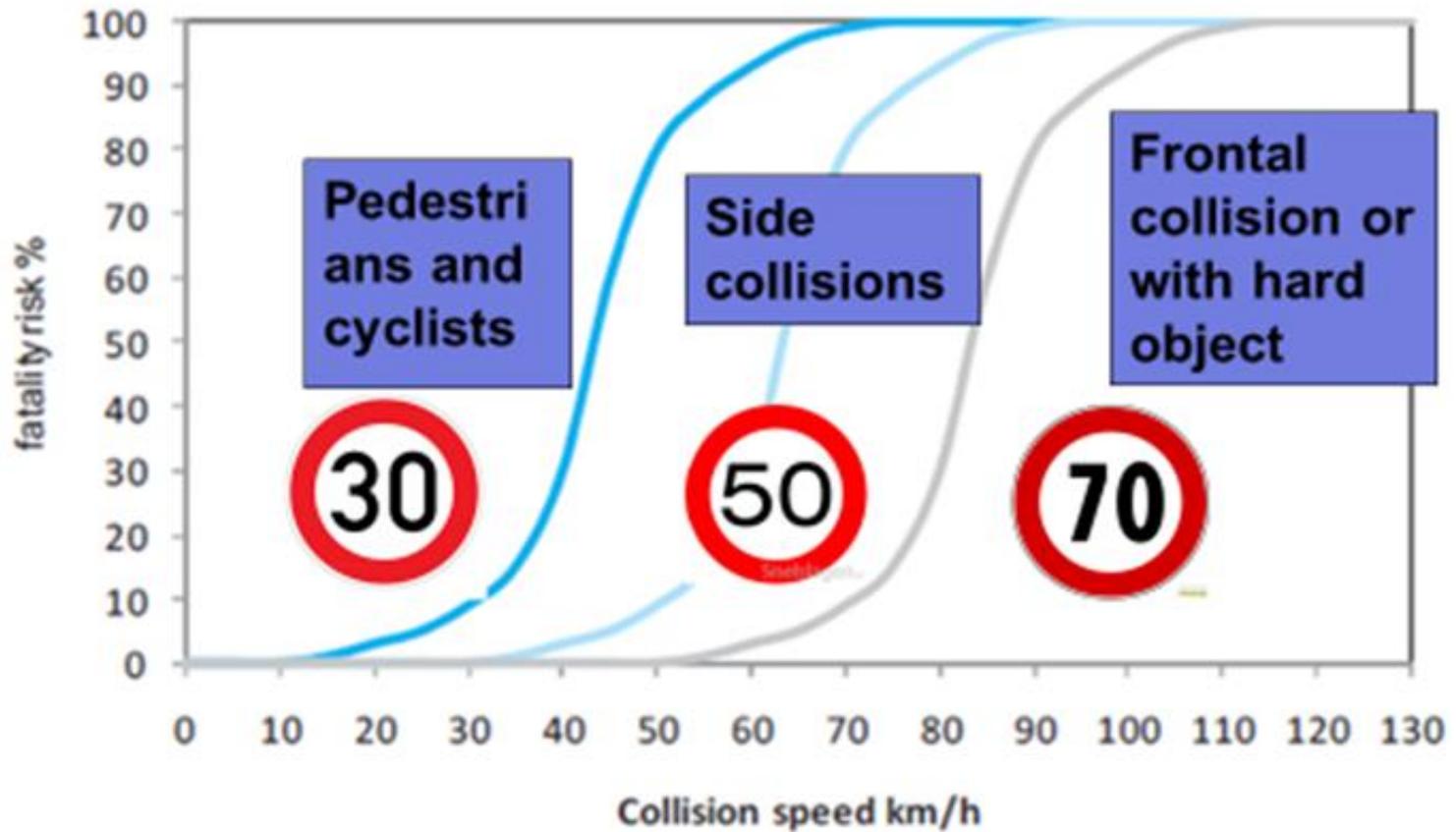
Start already during the planning stage of land use and transportation projects to minimize travel needs and integration of safe sustainable transport modes (compact and connected urban design)

Figure 13: Moving more people with fewer vehicles



: Adapted from (NACTO, 2017).

# Speed risk and sustainable speed limits



# How to achieve sustainable speeds?

- Education of people (limited effect) and enforcement of the speedlimits
- Vehicle technologies like Automatic Emergency Braking and intelligent speed adaption (ISA)
- Traffic calming measures

## Dashboard of road safety measures in Asian EST region

# Traffic Calmic measures

- Speed humps
- Speed cushions
- Chicanes
- Chokers
- Curb extensions
- Raised pedestrian crossings
- Traffic circles
- Roundabouts



# Safe roads for Non Motorized Traffic (NMT)

ESCAP Minist. Conf. on Transport (*Dec. 2016, Moscow*):

- Goal 2: Making roads safer for vulnerable road users
- Goal 3: Making roads safer and reducing the severity of road crashes *and as target (a.o.):*

increase separate/secure road space for pedestrians and cyclists in urban and suburban areas (where space permits)



## Safe roads for Non Motorized Traffic (cont.)

- Special attention is needed for e-bikes (helmets) and in particular speed pedelecs that can replace mopeds and motorcycles (separate lanes?)
- Good integration of NMT with Public Transport is crucial.

*Note that using Public Transport is > 10 x as safe /km travelled than driving a car.*



# Examples other VRU safety issues



Highway through a city



Blind spots trucks



Improved sidewalk (right)

# Examples of cost-benefit ratio's of road and enforcement related safety measures

	Benefit-cost ratio		Benefit-cost ratio
Road-related		Enforcement-related	
Bypass roads	1.38	Speed enforcement	1.49
Pedestrian bridge or tunnel	1.47	Speed cameras	2.11
Converting T-junction to roundabout	1.86	Section control (co-ordinated speed cameras)	1.58
Converting X-junction to roundabout	2.62	Feedback signs for speed	2.35

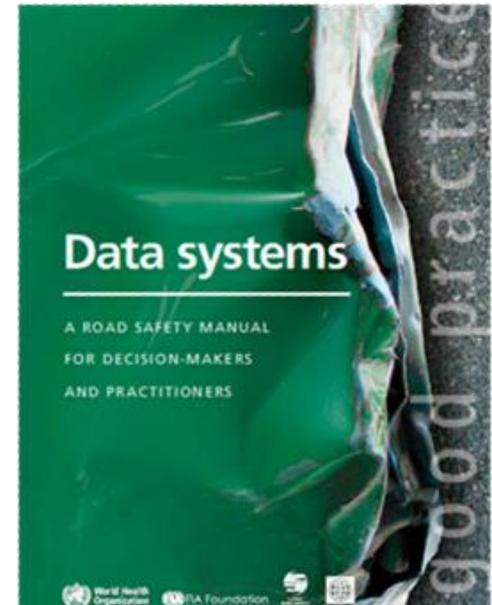
*See: Wismans et al, 9th EST Forum 2017*

# Discussion and conclusions

- Non Motorized Transport (NMT), well integrated with public transport, is the ultimate form of sustainable urban road transport, provided that it is safe and comfortable.
- The basis for designing a safe sustainable urban road system is the Safe System Approach.
- In order to obtain a safe sustainable urban transport system measures are needed on 1) the system level (urban planning), 2) speed, 3) road design (traffic calming and separation of NMT), 4) human behaviour (enforcement) and vehicle safety (AEB etc...)

# Recommendations

- For reliable impact assessment of road safety measures, accurate reliable accident data systems have to be available
- Urban infrastructure investments that benefit NMT are strongly recommended. If such measures cannot (yet) simply be implemented in existing infrastructure with mixed traffic, strict speed measures ( $< 30$  km/h) should be introduced and enforced



# Recommendations (cont.)

- In the stage of road network and public transport planning road safety should be taken into account from the beginning and in any cost-benefit analysis (CBA) next to mobility and environmental impact road safety should be included in the analysis.
- Since public transport is much safer per km travelled than other forms of transport, the effect of mode shifts from less safe to safer forms of transport should be taken into account in a CBA of new public transport systems

# Thanks for your attention





[www.chalmers.se/safer](http://www.chalmers.se/safer)

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