

WELCOME! BEM VINDOS!
¡BIENVENIDOS!



Please **say hello!**

WELCOME! BEM VINDOS!
¡BIENVENIDOS!



Today's presentation is in English with
simultaneous translation to
Spanish and Portuguese

WELCOME! BEM VINDOS!
¡BIENVENIDOS!



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VEHICLE SAFETY; ROAD DESIGN, ENVIRONMENT AND
ROAD SAFETY

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VISION ZERO CHALLENGE

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INTRODUCING TODAY'S GUESTS

VISION ZERO
CHALLENGE



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Vehicle safety and emerging technologies

Rikard Fredriksson

Senior Advisor, Swedish Transport Administration

Associate Professor, Chalmers University of Technology



Vision Zero



[© movingbeyondzero.com](http://movingbeyondzero.com)



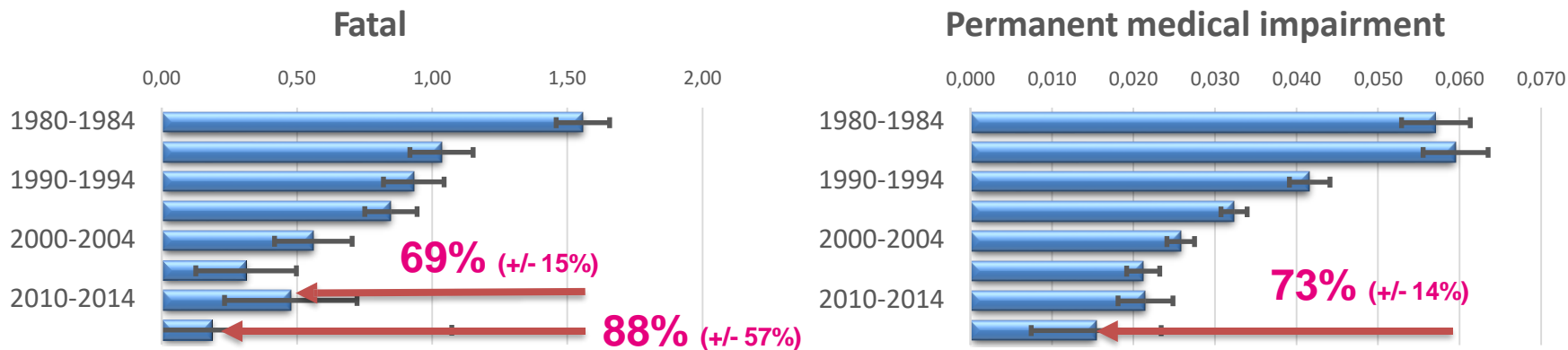
EuroNCAP partners 2020



Test labs

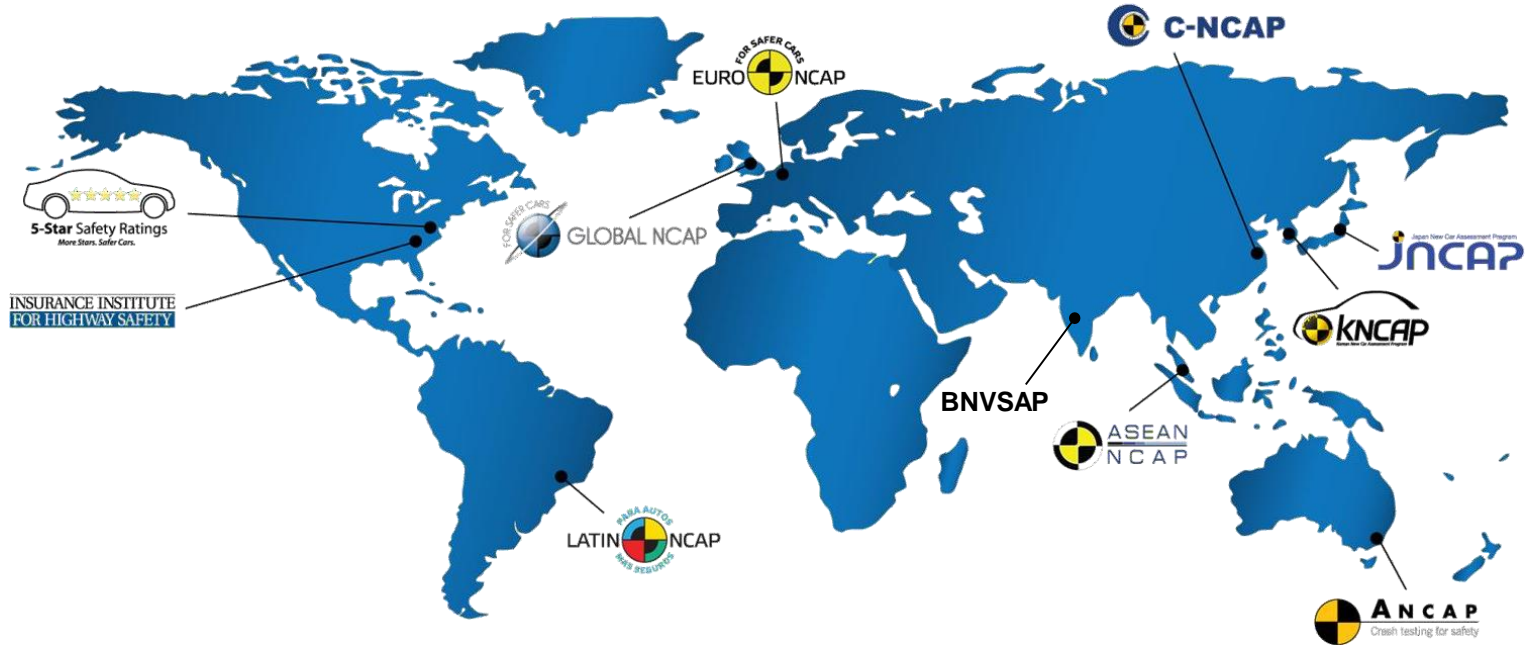


Development in crash safety



Kullgren et al 2019

NCAPs around the world



A Market for Safety



EuroNCAP tests & assessment



Adult occupant



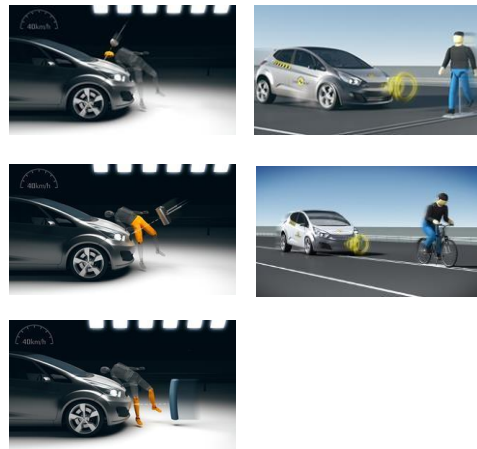
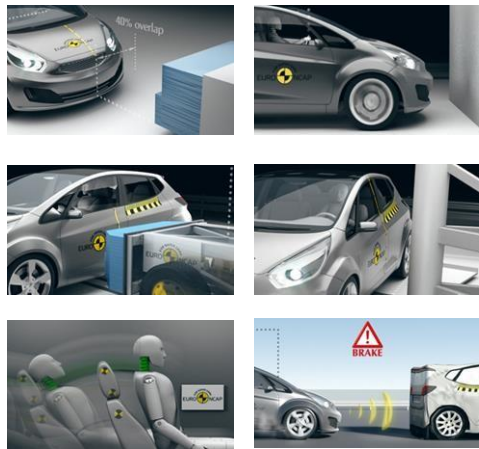
Child occupant



Vulnerable Road User























Safety assist

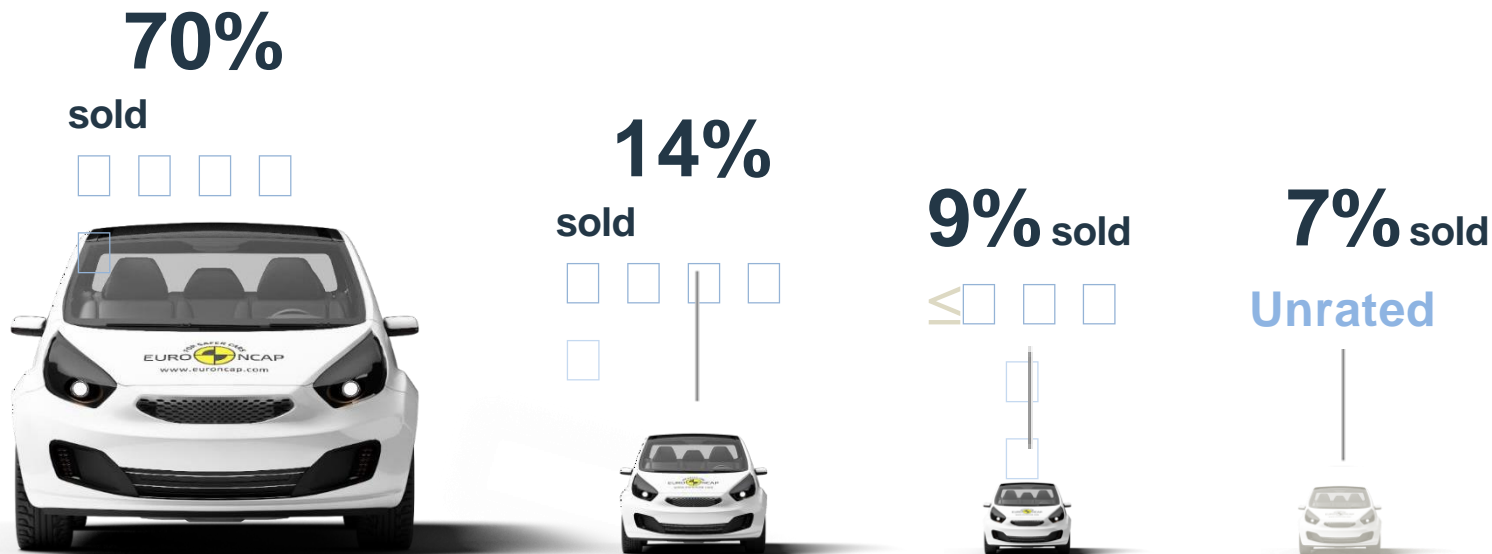


EuroNCAP 2019

- 55 tested cars
 - 75% 5 stars
 - 16% 4 stars
 - 9% 3 stars

	Renault Captur	Standard	★★★★★	85%	83%	70%	73%
	SEAT Alhambra	Standard	★★★★☆	89%	78%	59%	62%
	Subaru Forester	Standard	★★★★★	97%	91%	80%	78%
	Tesla Model X	Standard	★★★★★	98%	81%	72%	94%
	Volkswagen Sharan	Standard	★★★★☆	89%	78%	59%	62%
	Skoda Octavia	Standard	★★★★★	92%	88%	73%	79%
	Ford Explorer	Standard	★★★★★	87%	85%	61%	76%
	Mazda CX-30	Standard	★★★★★	99%	85%	80%	77%
	Mercedes-Benz GLB	Standard	★★★★★	92%	88%	78%	74%
	Opel/Vauxhall Corsa	Standard	★★★★☆	84%	86%	66%	69%
	BMW 1 Series	Standard	★★★★★	83%	87%	76%	72%
	BMW 3 Series	Standard	★★★★★	97%	87%	87%	76%
	Jeep Cherokee	Standard	★★★★☆	80%	78%	56%	69%
	Peugeot 208	Standard	★★★★☆	91%	86%	56%	71%
	Audi A1	Standard	★★★★★	95%	85%	73%	80%
	BMW Z4	Standard	★★★★★	97%	87%	91%	76%
	Ford Focus	Standard	★★★★★	96%	87%	72%	73%
	Mercedes-Benz CLA	Standard	★★★★★	96%	91%	91%	73%
	Mercedes-Benz EQC	Standard	★★★★★	96%	90%	75%	73%
	SsangYong	Standard	★★★★★	88%	85%	88%	74%

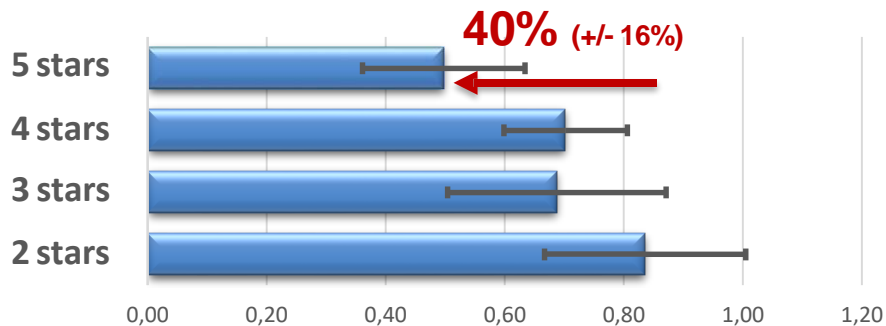
Market Coverage



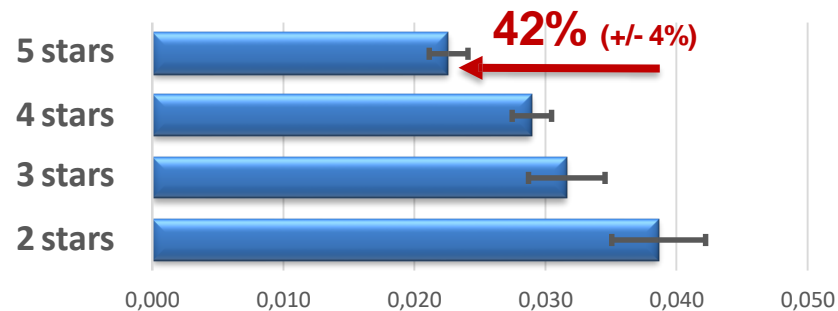
EU-28 passenger car and SUV sales, 2018. Total 15.3 million units.

Injury risk for star bands

Fatal



Permanent medical impairment

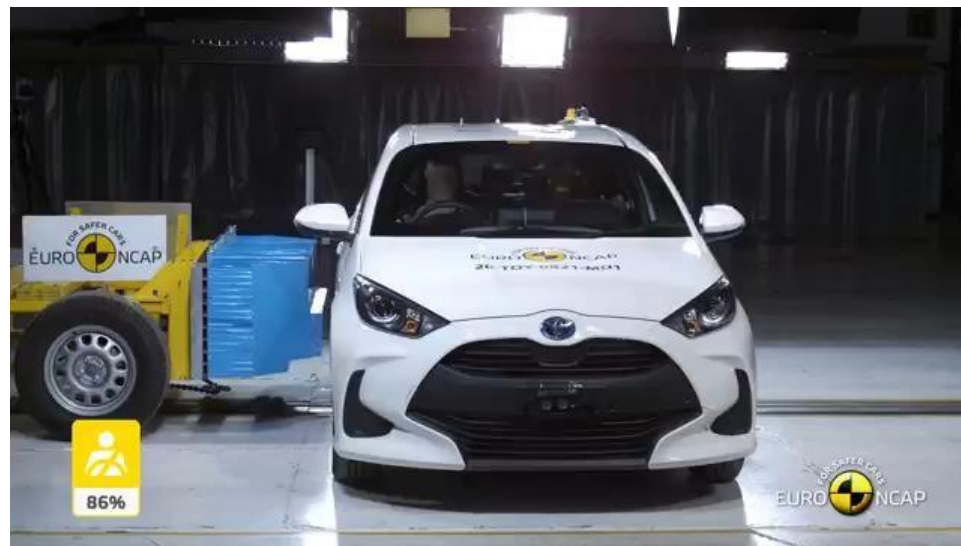


Kullgren et al 2019

What is new 2020?



Far-side Crash Protection



2020 Toyota Yaris with double center airbags

AEB Car-to-car

Turn-across-path



2020

AEB Pedestrian

turning




reversing




Rescue sheet - 2020


A3 SPORTBACK E-TRON



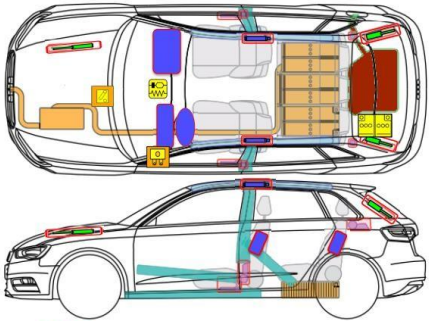
Audi
















FROM 2014





LIION












1. Identification/recognition

LACK OF ENGINE NOISE DOES NOT MEAN VEHICLE IS OFF. SILENT MOVEMENT OR INSTANT RESTART CAPABILITY EXISTS UNTIL VEHICLE IS FULLY SHUT DOWN. WEAR APPROPRIATE PPE

Characteristic features




The A3 e-tron can be identified by the e-tron logo, the orange cables (e. g. in engine compartment) and the charging socket.

2. Immobilisation / stabilisation / lifting

A) VEHICLE IMMOBILISATION




1. Check the wheels.
2. Set parking brake.
3. Place vehicle into park.

B) STABILISATION/LIFTING POINTS


3. Disable direct hazards / safety regulations


A) SWITCH OFF (IGNITION) (if on)






Press START-ENGINE-STOP button 1X without depressing brake pedal.

Warning: When pressing the START-ENGINE-STOP button and depressing the brake pedal at the same time, the engine will start!








DISCONNECT OF HIGH VOLTAGE SYSTEM


Alternative 1 - Engine compartment accessible

Localize emergency disconnect (Open safety disconnect)




Alternative 2 - Emergency disconnect fuse in passenger compartment


Localize emergency fuse (Open safety disconnect)



Fuse - Left hand drive (steering on right)



Fuse in glove compartment (steered wheel steering wheel right)



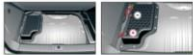







Disconnect 12 V battery

The 12 V battery is located in the luggage compartment below the luggage compartment floor. The cables of both terminals are fed out directly through the plastic cover.



the occupants


energy/liquids/gases/solids



Cut, breach, or touch high voltage components or Doing so could result in serious injury or death.

fire


USE AMOUNTS OF WATER



water submersion

transportation / storage


Handling traction wheels





DISTANCE FROM OTHER VEHICLES!

Additional information

TECHNICAL SUPPORT CONTACT DETAILS: XXX
LOCATION: LINK ERG
















First nine cars tested 2021

2021 - Betyg → OM 2021 BETYGEN

Tillverkare & modell • Sakerhetsutrustning • Självbetyg

	Citroen C4	Standard	★★★★☆	76%	83%	57%	63%
	Genesis G80	Standard	★★★★★	91%	87%	77%	91%
	Genesis GV80	Standard	★★★★★	91%	87%	66%	88%
	Dacia Logan	Standard	★★★☆☆	70%	72%	41%	42%
	Dacia Sandero Stepway	Standard	★★★☆☆	70%	72%	41%	42%
	VW ID.4	Standard	★★★★★	93%	89%	76%	85%
	Škoda ENYAQ iV	Standard	★★★★★	94%	89%	71%	82%
	Cupra Formentor	Standard	★★★★★	93%	88%	68%	80%
	Polestar 2	Standard	★★★★★	93%	89%	80%	86%

<https://www.euroncap.com/en>



AEB CYCLIST



What is next?



Bicyclist



New pedestrian

2023 Pedestrian Leg Impact Tests



AEB Car-to-car Next Steps

Crossing traffic



2023

Head-on



2023

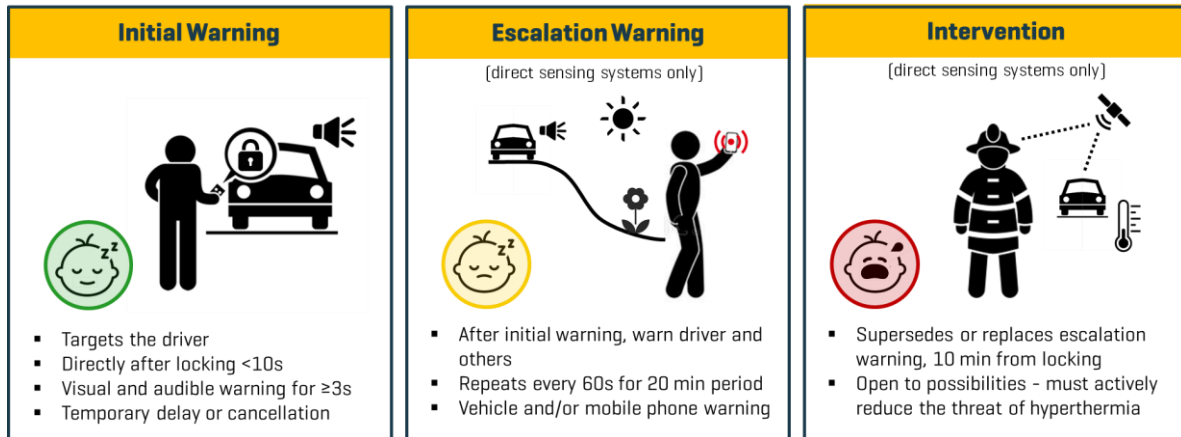
AEB Bicyclist

door opening



Child Presence Detection 2023

Euro NCAP Child Presence Detection General Requirements

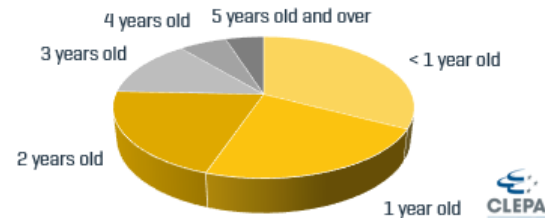


In-Vehicle Heatstroke Fatalities in the US



Period: 2000 - 2018
Average: 38 cases per year
Best: 25 (2015)
Worst: 51 (2018)
<http://noheatstroke.org>

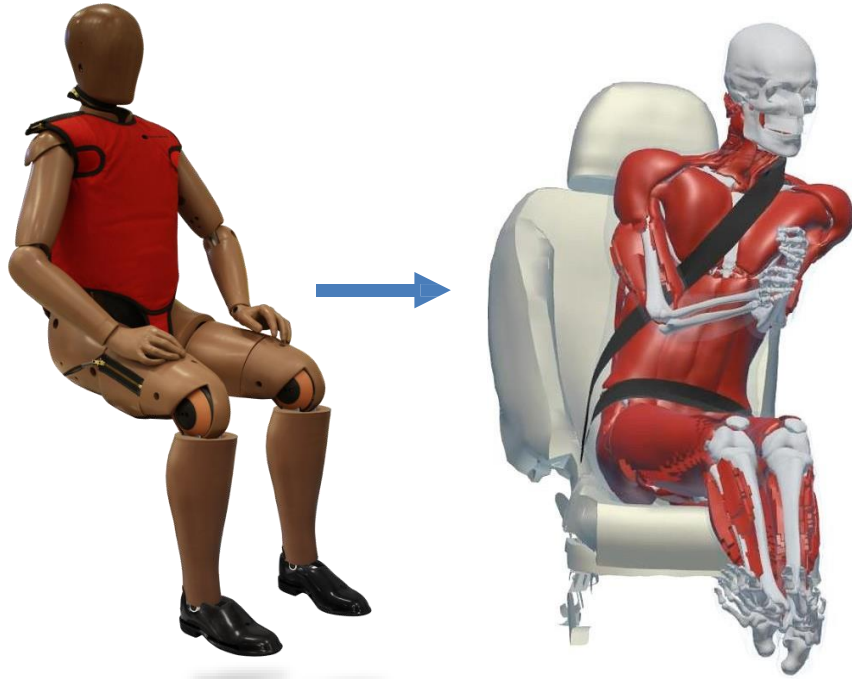
Age of In-Vehicle Heatstroke Victims



AEB Powered Two-wheeler (motorcycle)



Virtual testing and Human Modelling

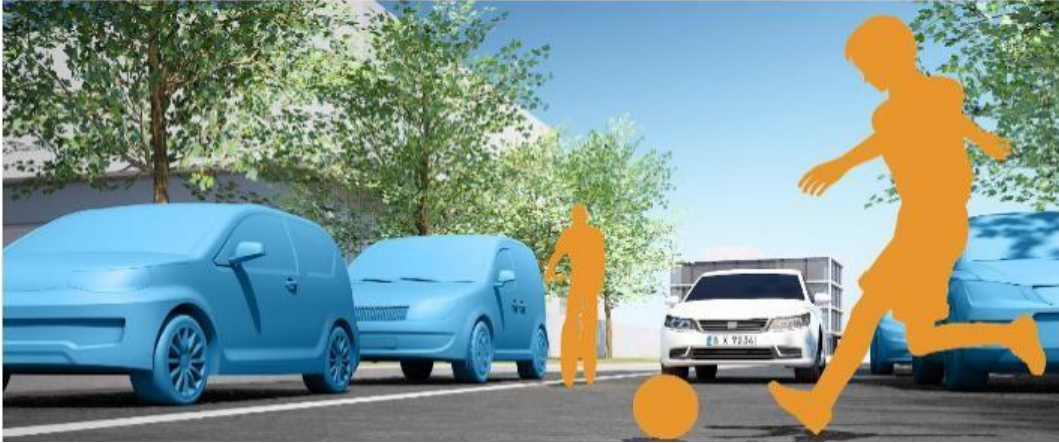


© Elemance

A paradigm shift ... enables

- large number of
 - crash speeds
 - occupant sizes
 - impact angles
- "real" (i.e. human) injury criteria
 - e.g. fracture or brain injury
 - (compared to acceleration and force in dummy)

Virtual testing - Avoidance



Driver Attention



Occupant State Monitoring

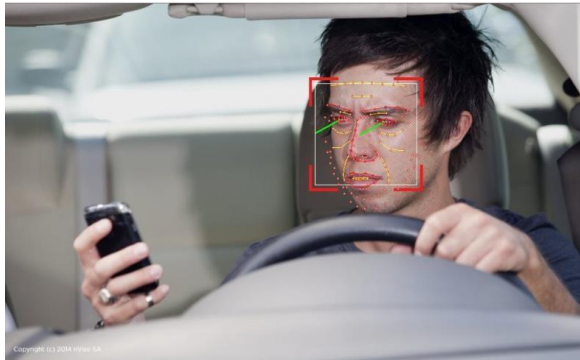
Impaired Driving

Fatigue

Distraction

Driving Under Influence

Sudden Sickness



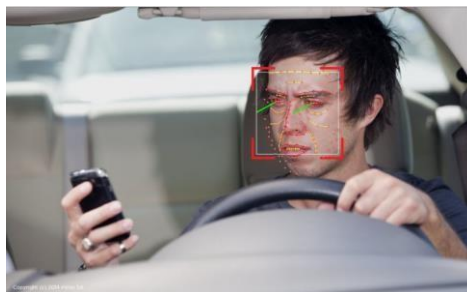
Occupant State Monitoring

- 2020



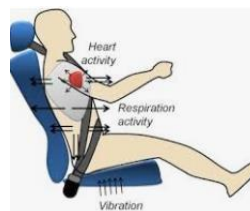
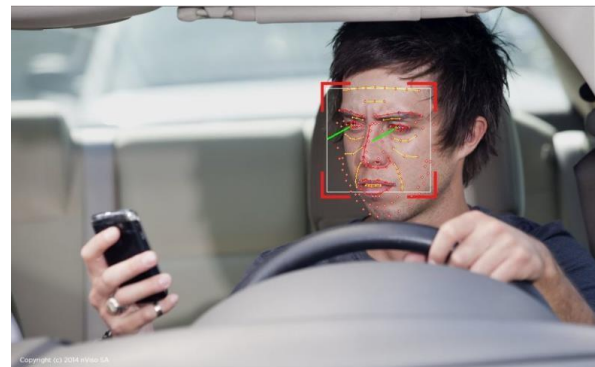
Indirect

- 2023



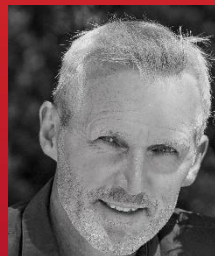
Indirect + Direct

- 2025



Direct only

Thanks!
Questions?



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**VISION
ZERO**

ACADEMY

STRIVING

FOR EXCELLENCE IN

TRANSPORT

SAFETY



Road Design

Dr. Lars Ekman

Lars.Ekman@Trafi

kyverket.se

VISION
ZERO ACADEMY



TRAFIKVERKET
SWEDISH TRANSPORT ADMINISTRATION



Identify the safe system



the safe system

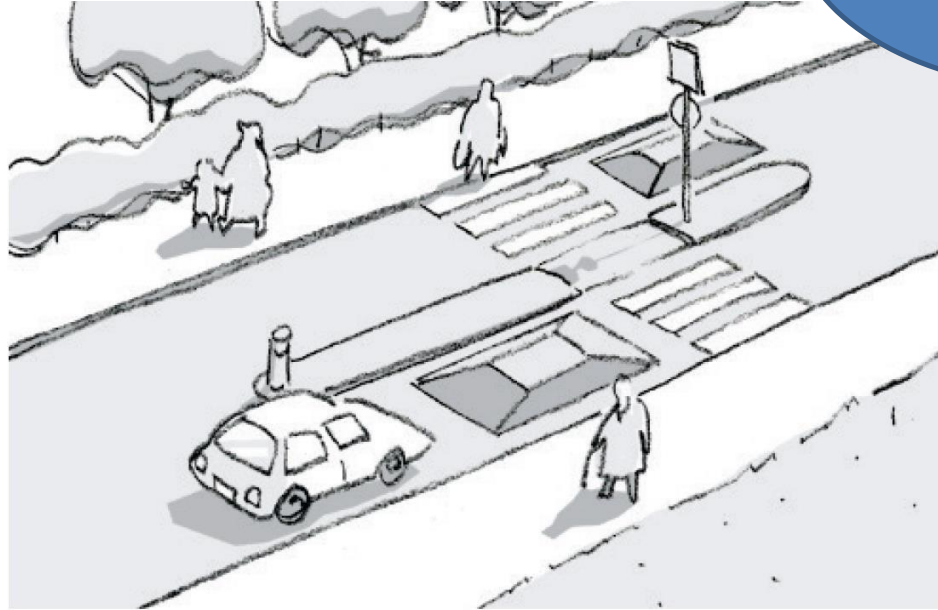


Pedestrians crossing roads and streets



Separation



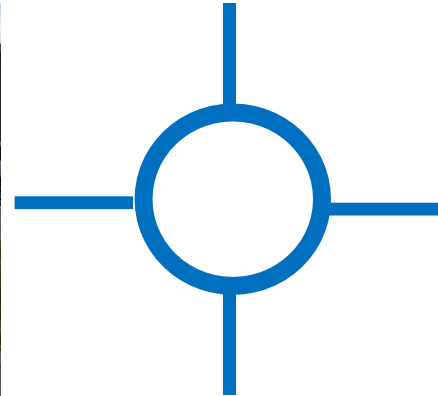
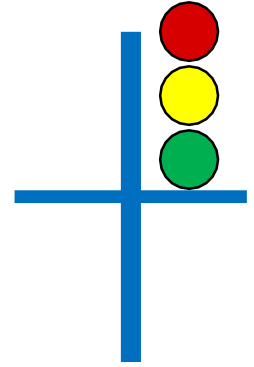








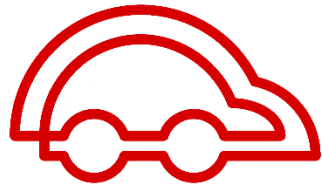
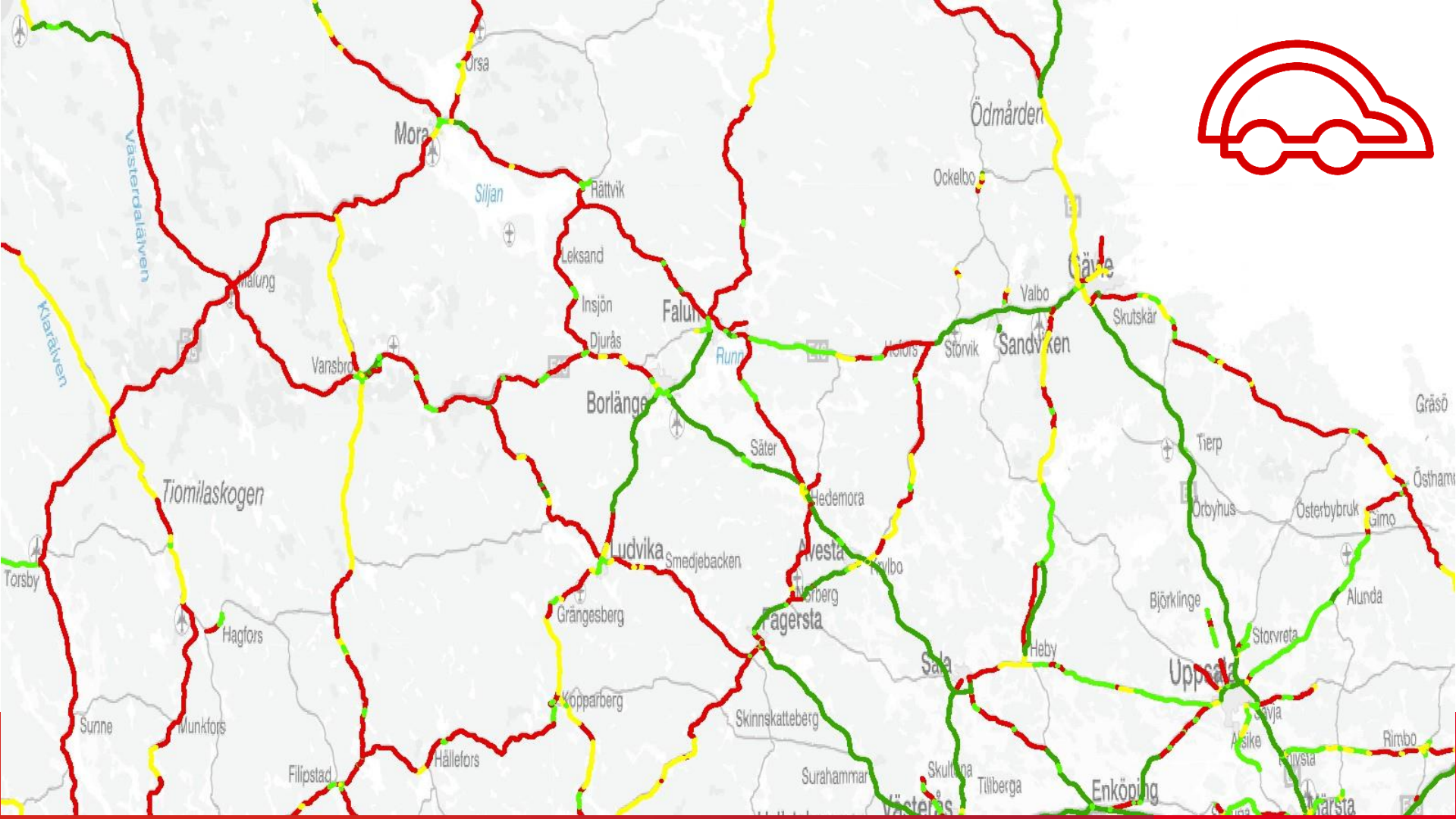


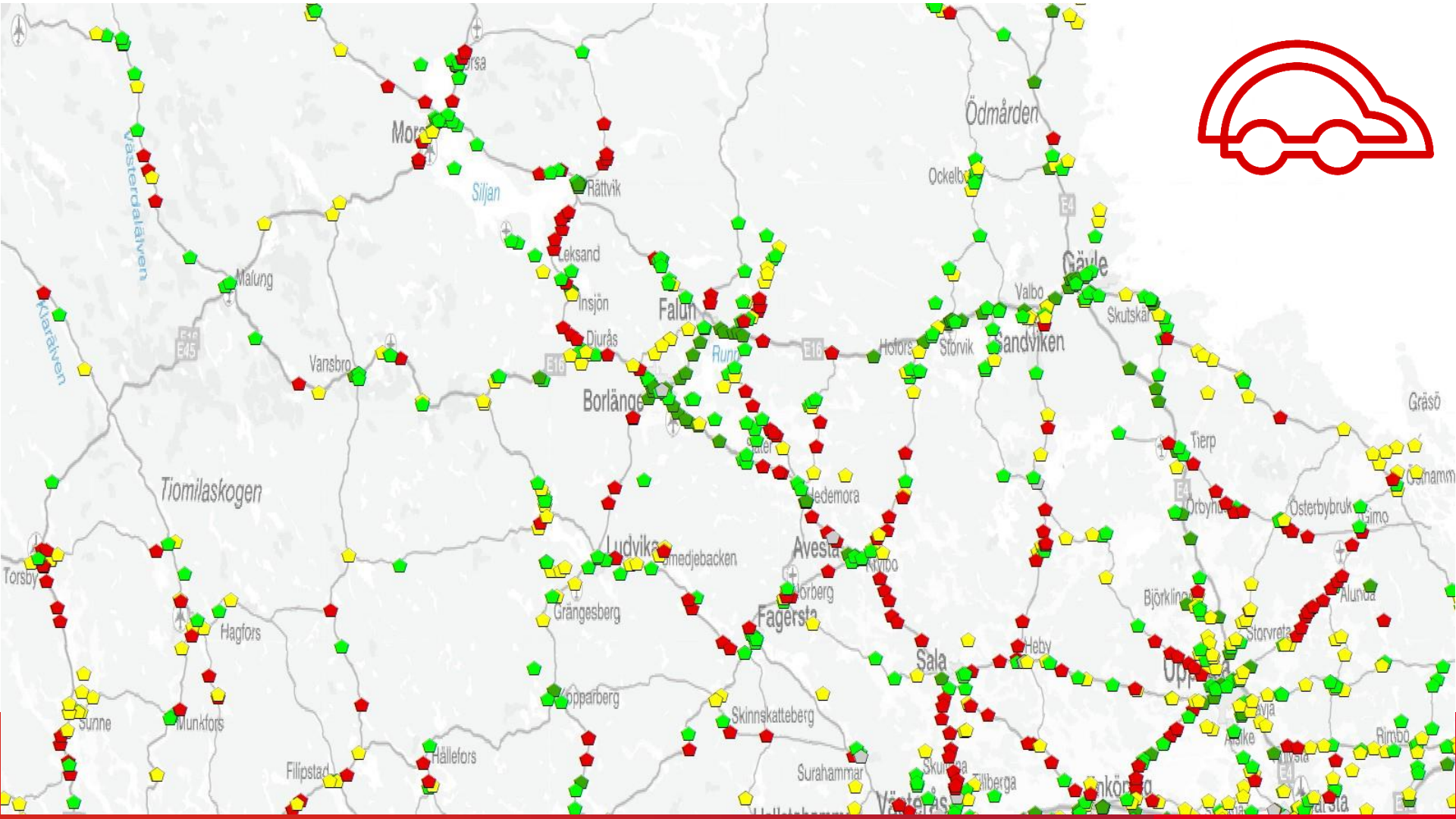


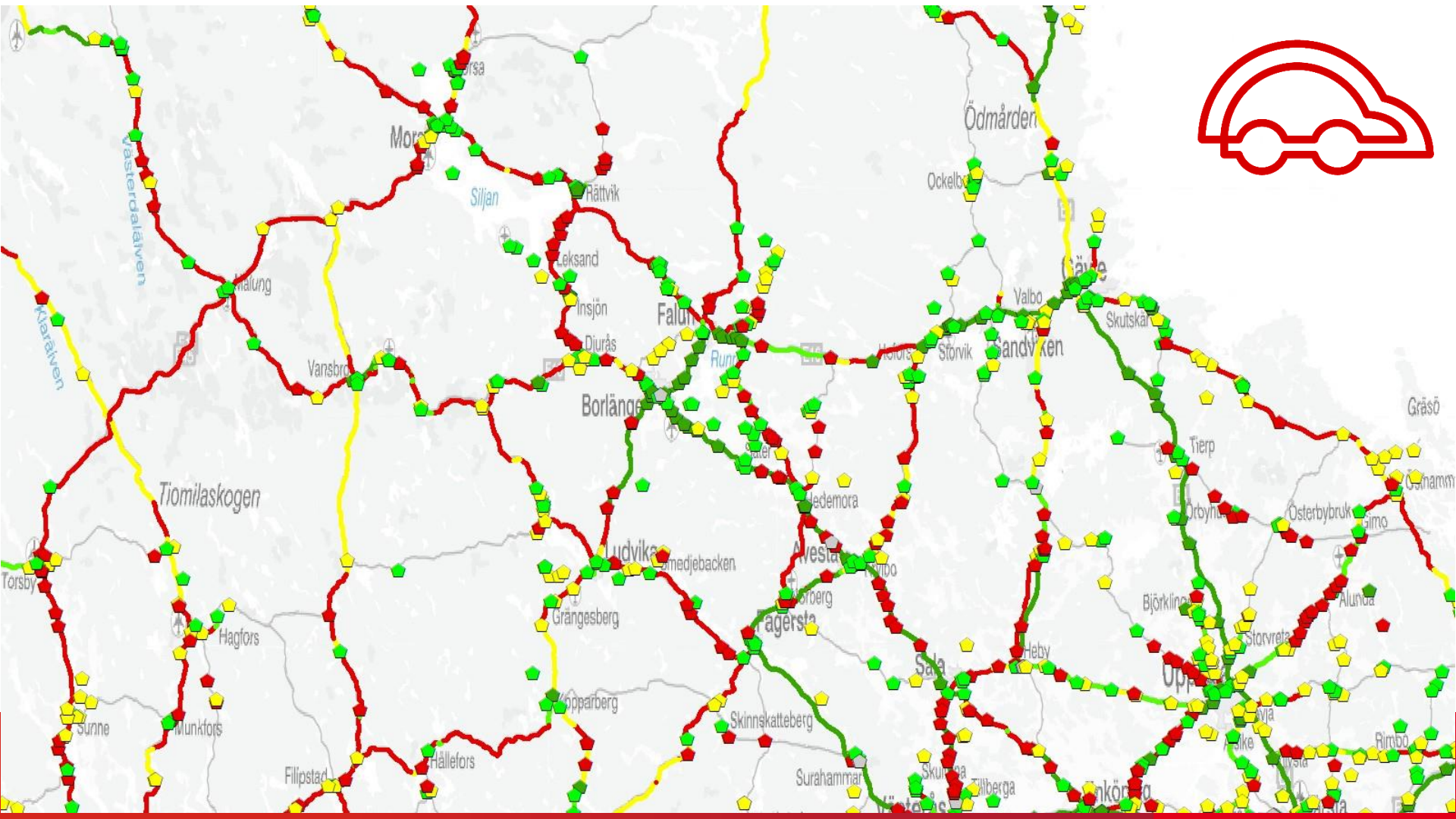







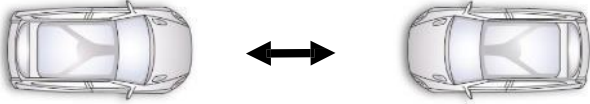






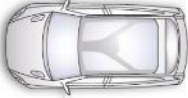





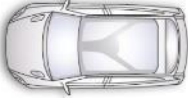





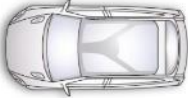





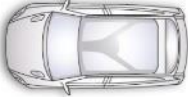








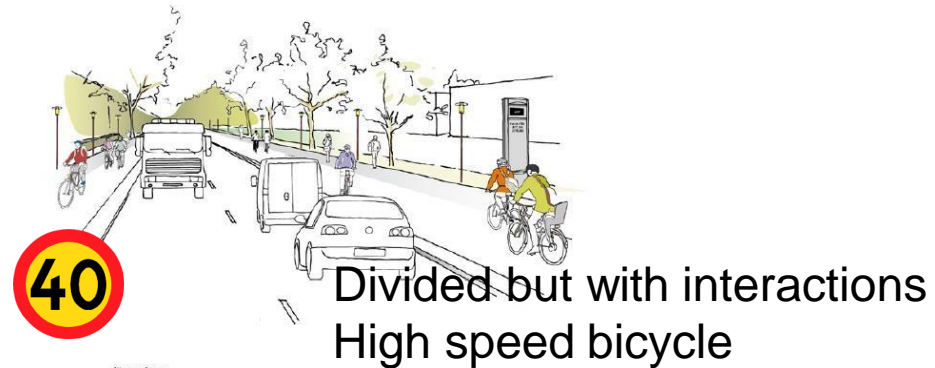


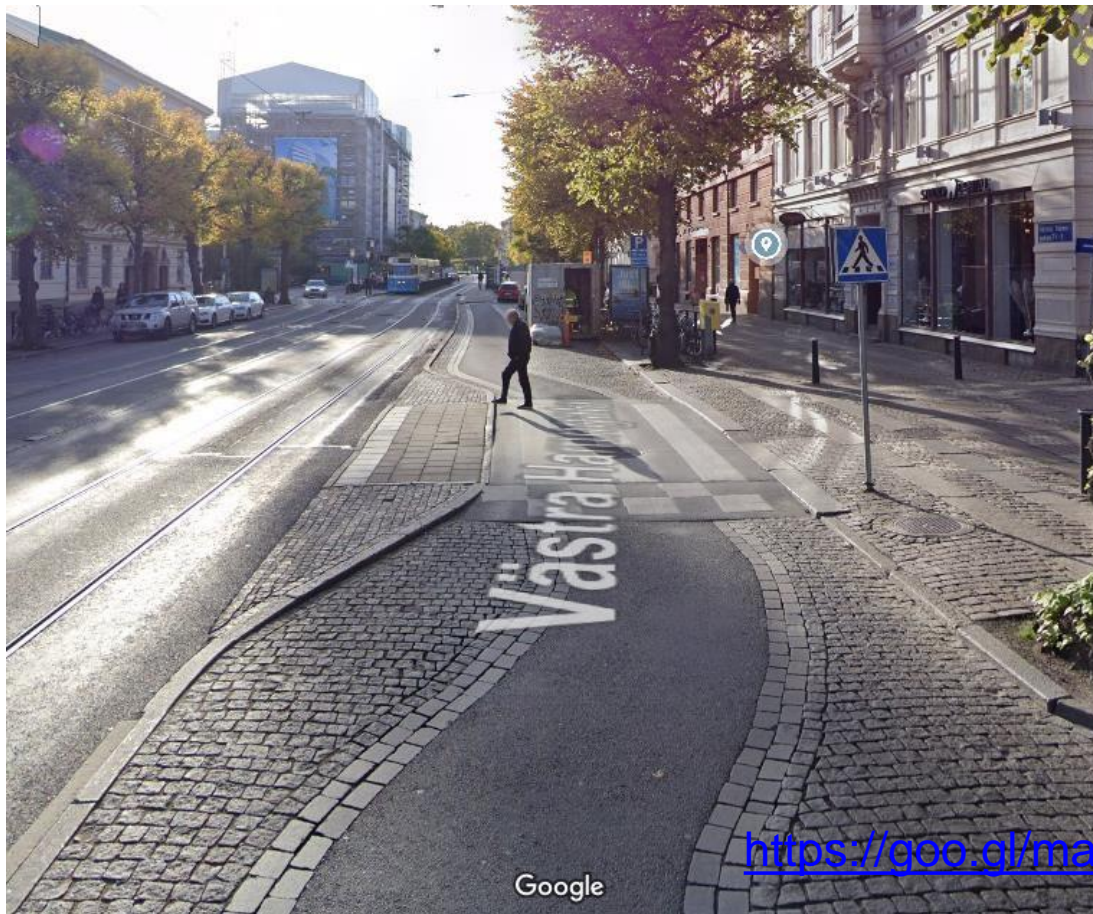
Division of Responsibilities/ Boundary Conditions

					Contribution passive safety	Contribution active safety
				Head-on		
				Pedestrians		
				Side		
 40				Rear-end	 20	 20
				Large animals		



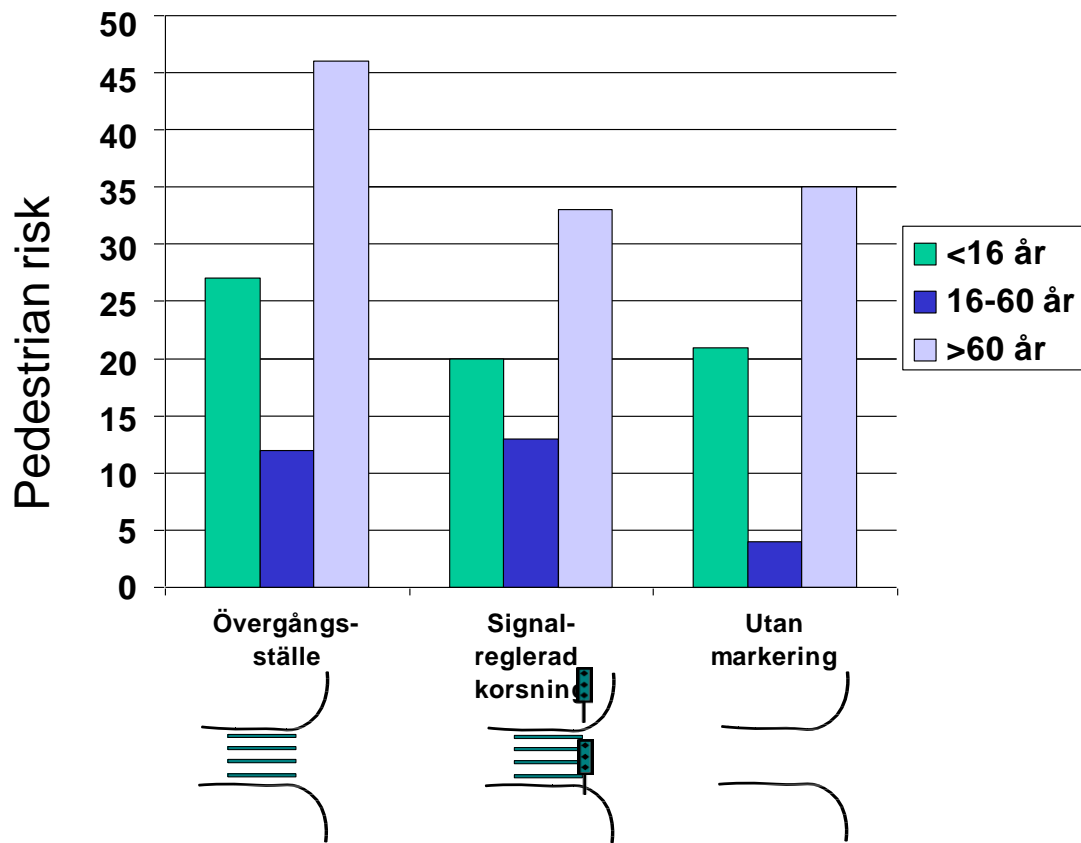
Speed as the regulator for interactions in urban areas

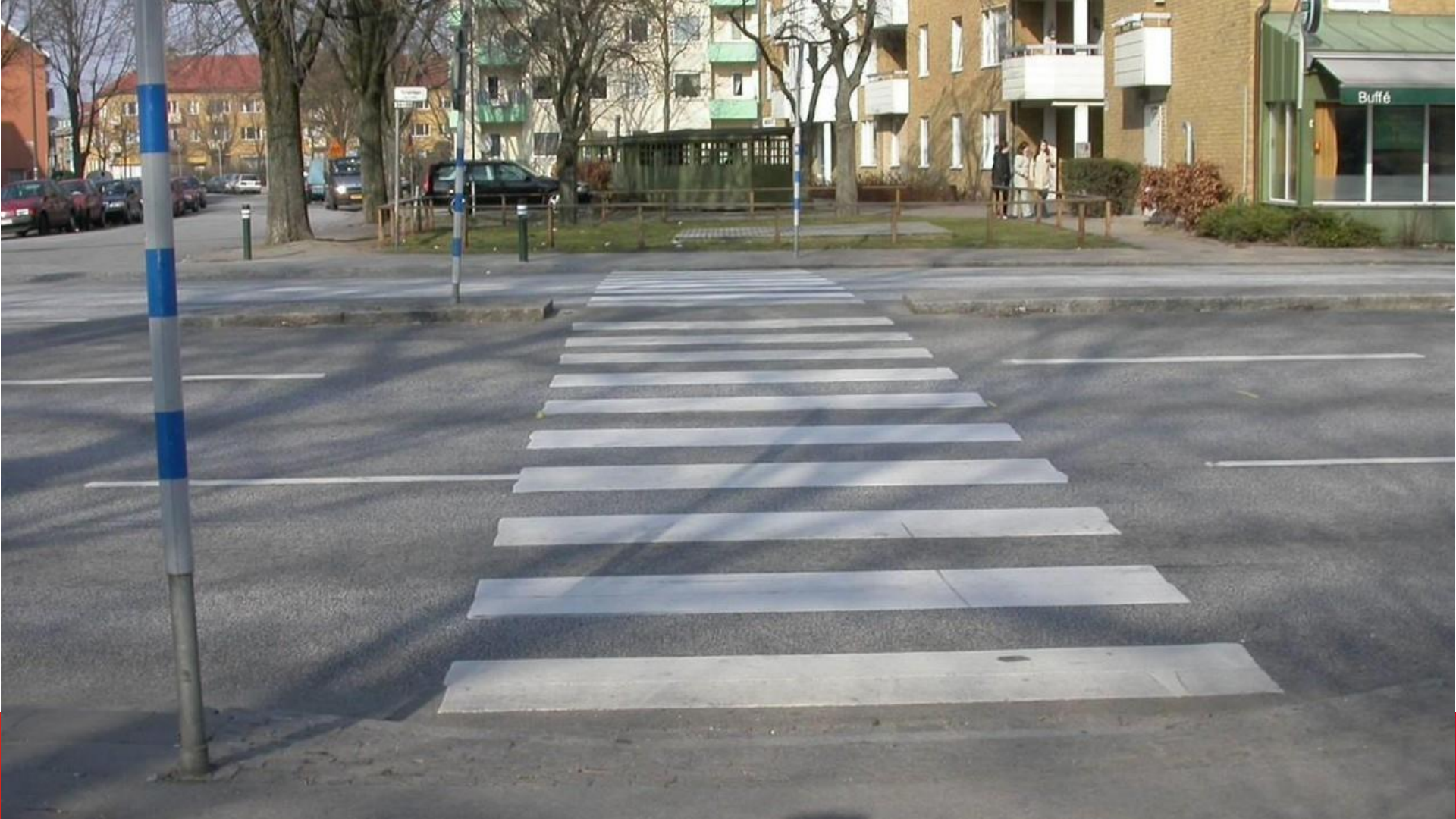




<https://goo.gl/maps/1ijGRpgVz9Zxuyij7>









[Google](#)





VISION ZERO
TOGETHER WE
SAVE LIVES

Thanks

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