



TRAFIKVERKET
SWEDISH TRANSPORT ADMINISTRATION

VISION ZERO ACADEMY

STRIVING
FOR EXCELLENCE IN
TRANSPORT
SAFETY



EuroNCAP and
the role of safe
vehicles



EuroNCAP and the role of safe vehicles

Rikard Fredriksson

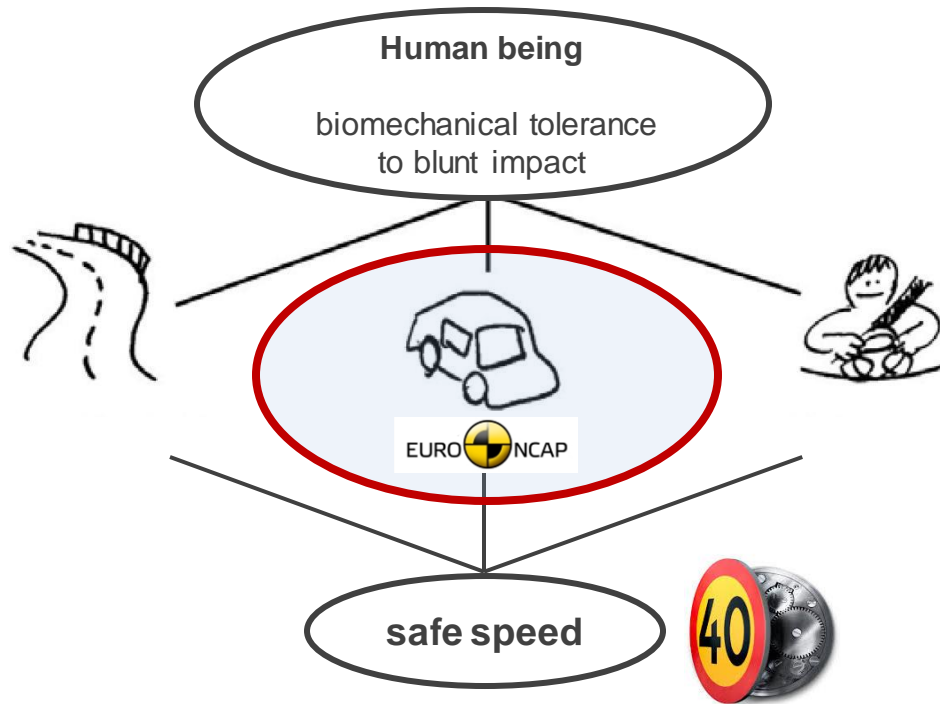
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Vision Zero

A safe system's approach: accept that mistakes can always happen





Old way - Regulations

- Long lead time
 - New crash dummy can be up to 20 years
- Many partners have to agree
 - EU 30+ countries, Car industry
- All vehicles need to be tested
 - All model variants, small volume vehicles
 - Sales stopped

Consumer testing - NCAP

- Fast process
 - 2 years typically
- Voluntary
 - Only benefit if you have high rating
 - Does not stop sales
- Most sold version
- High to medium volume cars
 - Biggest impact on road safety

Consumer testing

- *“... seeks to ensure that consumers can understand what products will do for them and which products are the best value.”*

Consumer testing - NCAP

- New Car Assessment Program
- First NCAP, US 1979
- National Highway Traffic Safety Administration - NHTSA
- *"Encourage manufacturers to build safer vehicles and consumers to buy them"*
- 35 mph (56 km/h) frontal crash test

EuroNCAP

- Founded 1997 by
 - **TRL (UK)**
 - FIA (international car sports organization)
 - STA (Sweden, then SRA)
 - International Consumer Research & Testing

Development history

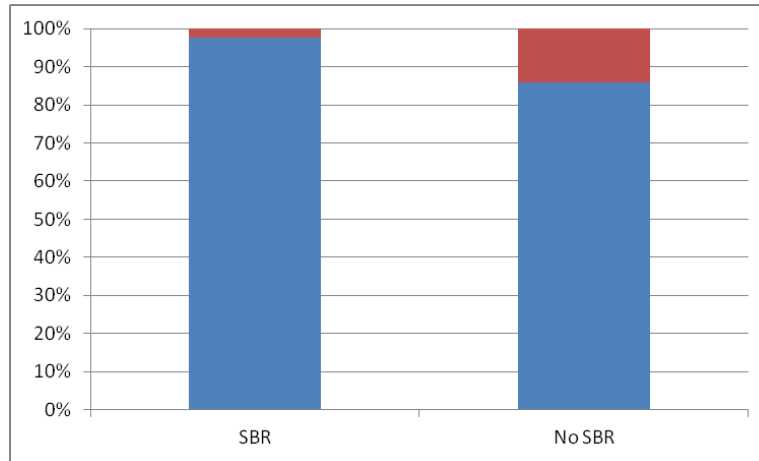
- 2001 first 5 star car
- 2002 seat belt reminder
- 2003 child protection
- 2008 whiplash
- 2011 stability control (ESC) included in rating
- 2012 pedestrian in overall rating
- 2014 auto-brake (AEB) car-to-car
- 2016 auto-brake pedestrian
- 2018 auto-brake cyclist

Improved Structures & Restraints

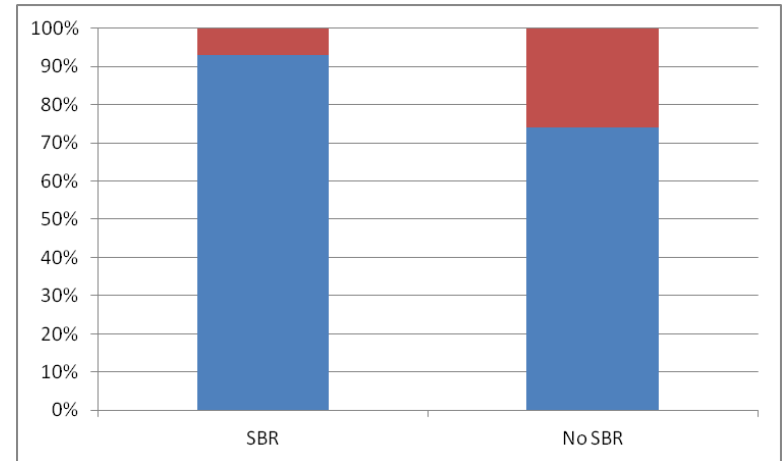


Seat belt reminder

Road side observations, Europe



Fatal crashes, Sweden



Effects of ESC

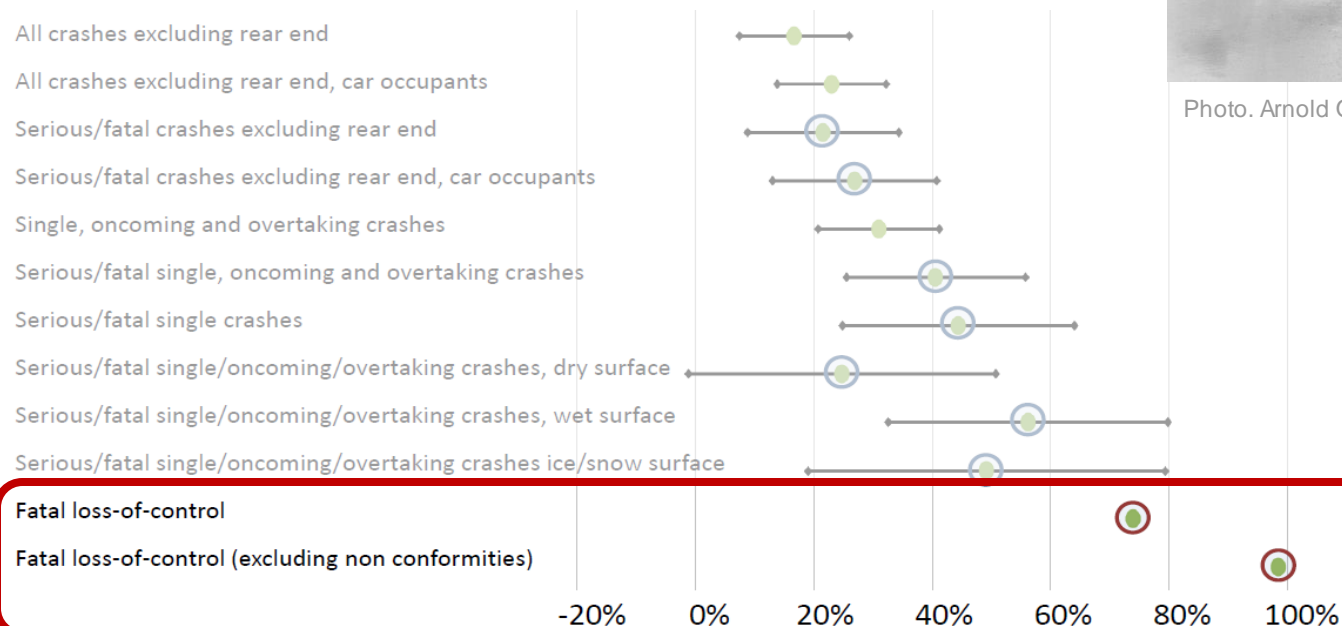
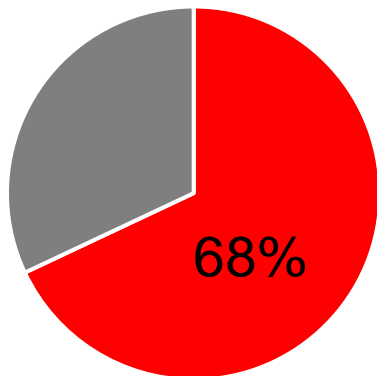


Photo. Arnold Odermatt

The effect of Lane Departure Warning

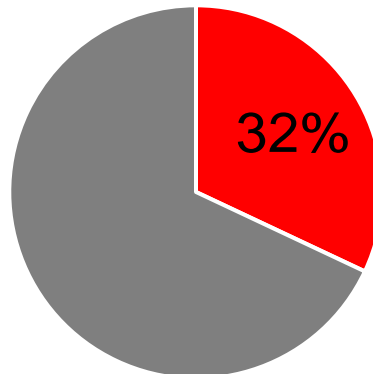
Without LDW



Head-on
and single

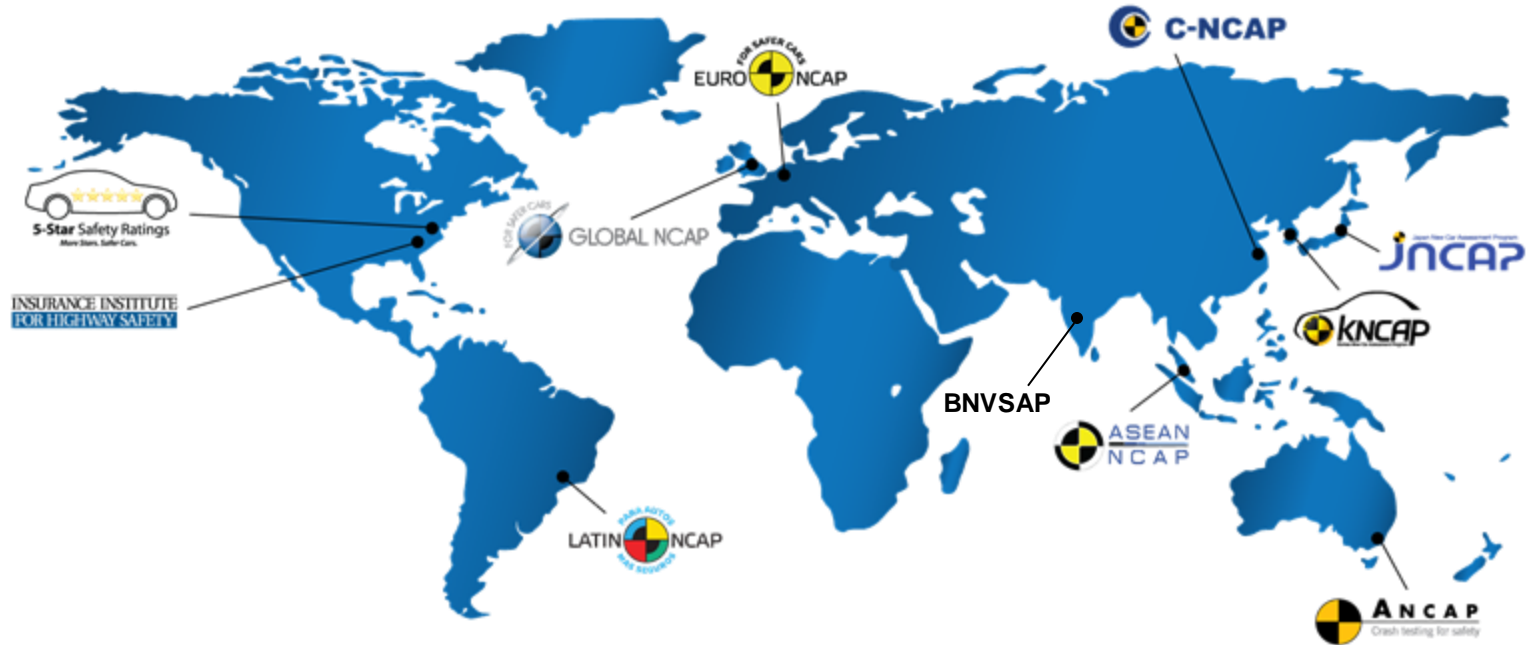
Rear-end

With LDW



53% reduction of single-vehicle and head-on crashes in
speed areas 70-120 km/h - no snow or ice

NCAP's around the world



EuroNCAP 2020

- 11 partners in 8 countries
- 9 test labs in 7 countries
- 2019:
 - 55 tested cars
 - 75% 5 stars
 - 16% 4 stars
 - 9% 3 stars



A Market for Safety



4 areas – 18 tests



Adult occupant



Child occupant



Vulnerable Road User

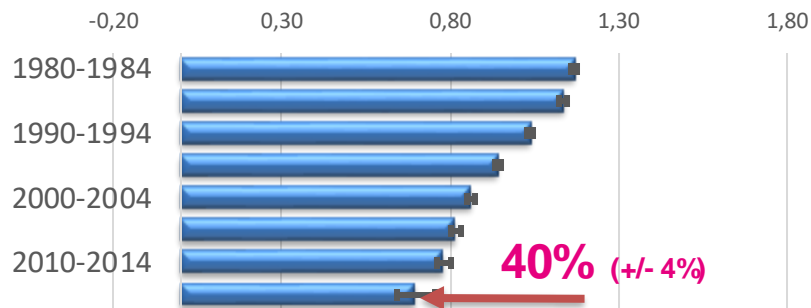


Safety assist

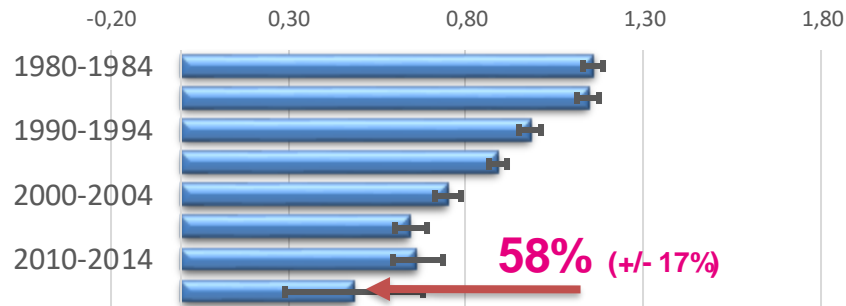


Development in crash safety

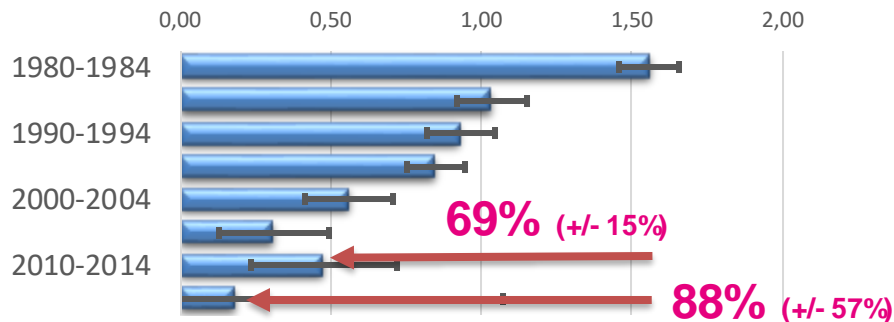
Risk of any injury



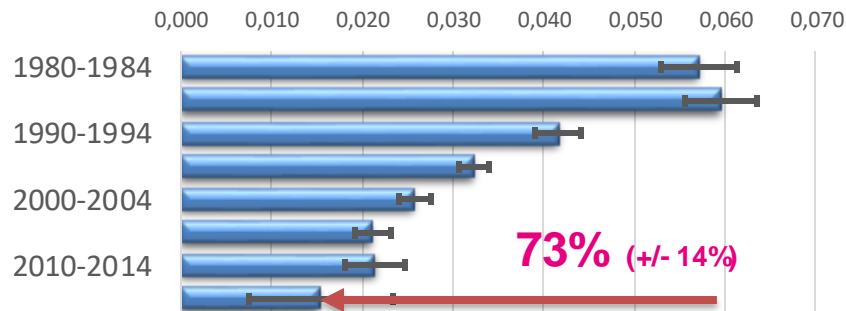
Fatal and serious



Fatal

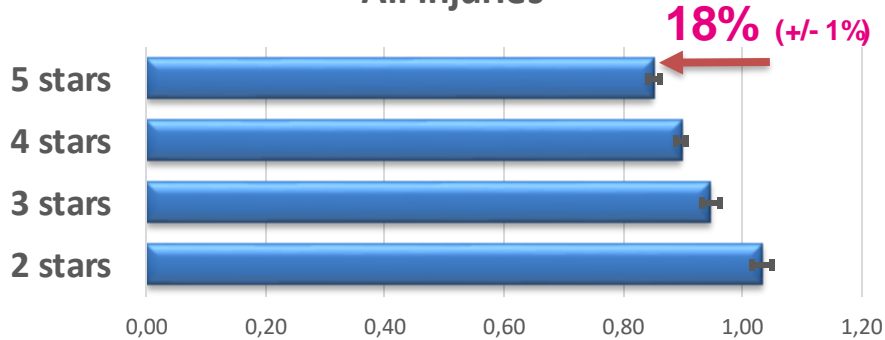


Permanent medical impairment

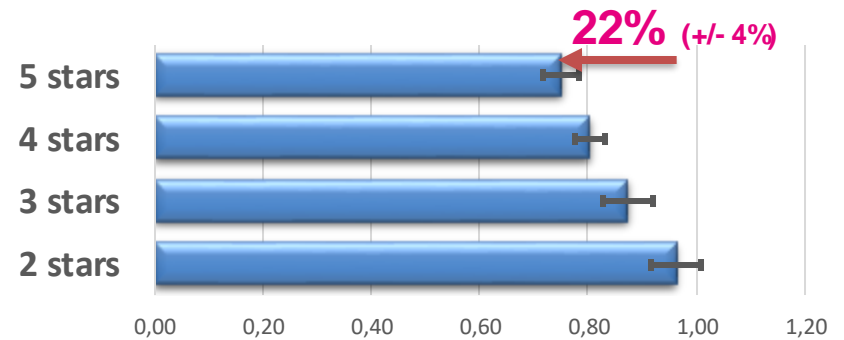


Correlation to Euro NCAP - injury risk for star bands

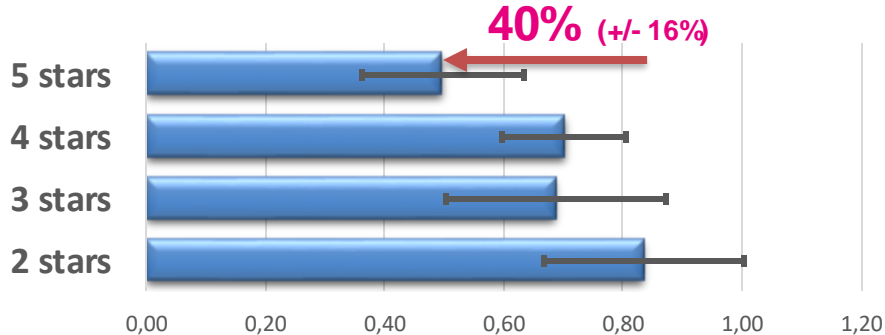
All injuries



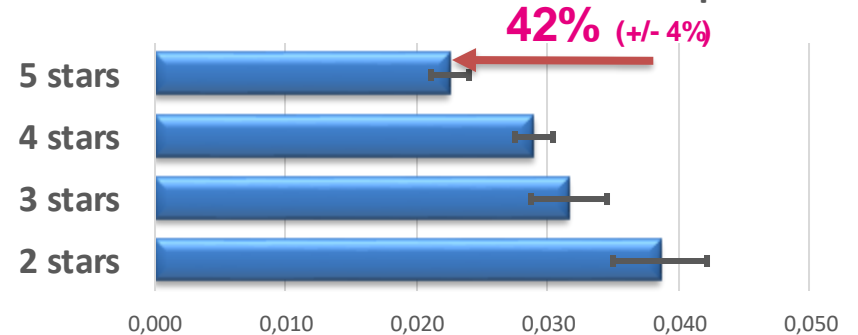
Fatal and serious



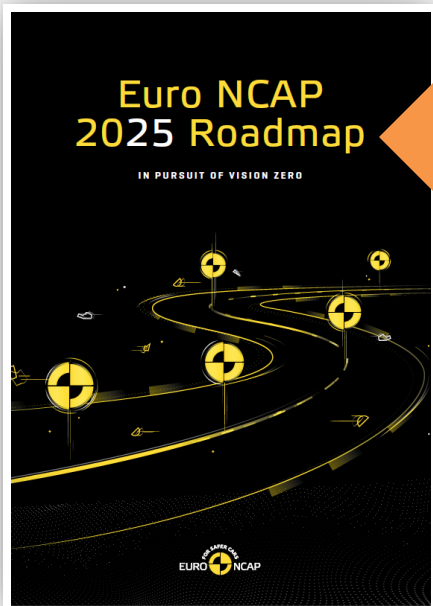
Fatal



Permanent medical impairment



Roadmap 2025



Overall Safety Rating

Primary, secondary and tertiary safety of cars and vans: protecting car occupants of all ages, gender, and sizes as well as vulnerable road users

Highlights:

- Automatic Braking and Steering
- Occupant State Monitoring
- Improved Frontal Crash Protection
- Far-side Crash Protection
- Rescue, Extrication & Safety
- Child Vehicular Heatstroke
- Revised Subsystem Test for Pedestrian & Cyclist

Far-side Crash Protection

BIW Sled Test: Driver Only



Full-scale Pole Test: Dual Occupancy*



*Required only when occupant-to-occupant protection countermeasure is available.

Automatic Braking and Steering

- Improved intervention capabilities enabled by new sensors



Turn-across-path
(car, pedestrian, cyclist)



Longitudinal (motorcycle)

Crossing traffic (car, motorcycle)



Reverse (pedestrian)



Highway Assist Testing



Slower Moving Car (ACC)

Cut-in (ACC)

Cut-out (ACC)



Assessment Matrix =

HMI assessment +

- System Name
- Official Media
- System Features
- User Manual

Longitudinal (ACC) tests +

- Stationary Car
- Slower Moving Car
- Braking Car
- Cut-in & Cut-out

Lateral (Lane Centring) tests

- Obstacle Avoidance
- Steering In S-curve

Occupant State Monitoring

- Encourage monitoring systems that effectively detect impaired driving

Impaired Driving	Warning / Intervention
Fatigue	Impaired Driving warning
Distraction	High Sensitivity Mode
Driving Under Influence	Limp Home Mode
Sudden Sickness	Safe Stop manoeuvre

- Attention Assist

Attention Assist

- Indirect, mainly fatigue/distraction
 - Time-on-Task
 - Steering Wheel input
 - Lane position
- Direct Monitoring
 - PSA infrared camera



Virtual testing and Human Modelling



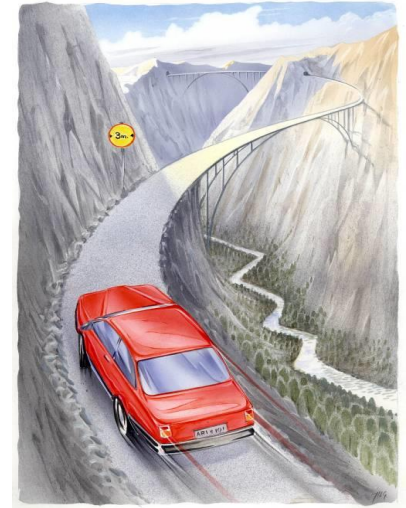
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A paradigm shift ... enables

- 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)

New Car Assessment Program

- Puts safety on the market, over and beyond regulation
- Promotes best practice
- Focuses vehicle industry
- Gives credit to best performance and discourage poor performance
- Works on a global market



Thank you!

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