

More Lives Saved

More Life Lived

# Investor Day 2023

## Growth Opportunities: Trends, Innovations and Regulations

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*(\*) Non-US GAAP reconciliations are disclosed in our regulatory filings available at [www.sec.gov](http://www.sec.gov) or [www.autoliv.com](http://www.autoliv.com)*

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# Growth Opportunities Trends, Innovations and Regulations

## Autoliv's Real-life Safety Approach

- Autoliv's approach to real-life safety allows us to explore and discover new ways of protecting people

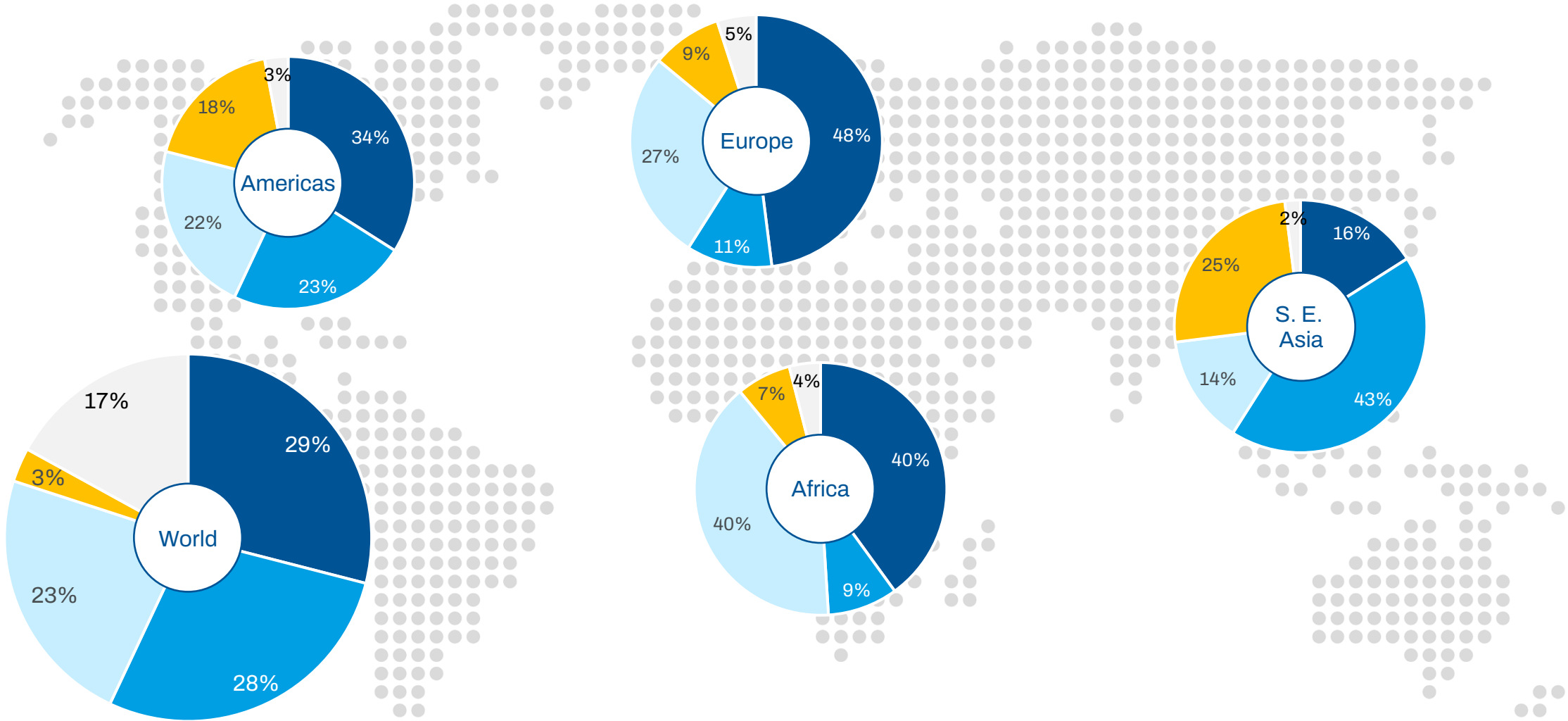
## Autoliv's strong pipeline of Safety Solutions innovations

- Societal, market and customer trends create opportunities for Autoliv
- Safety for new mobility support our vision of Saving More Lives
- Regulations and consumer ratings drive safety content per vehicle

## Autoliv's vision of Saving More Lives

- Our passion to save more lives is the energy behind the realization of Autoliv growth opportunities.

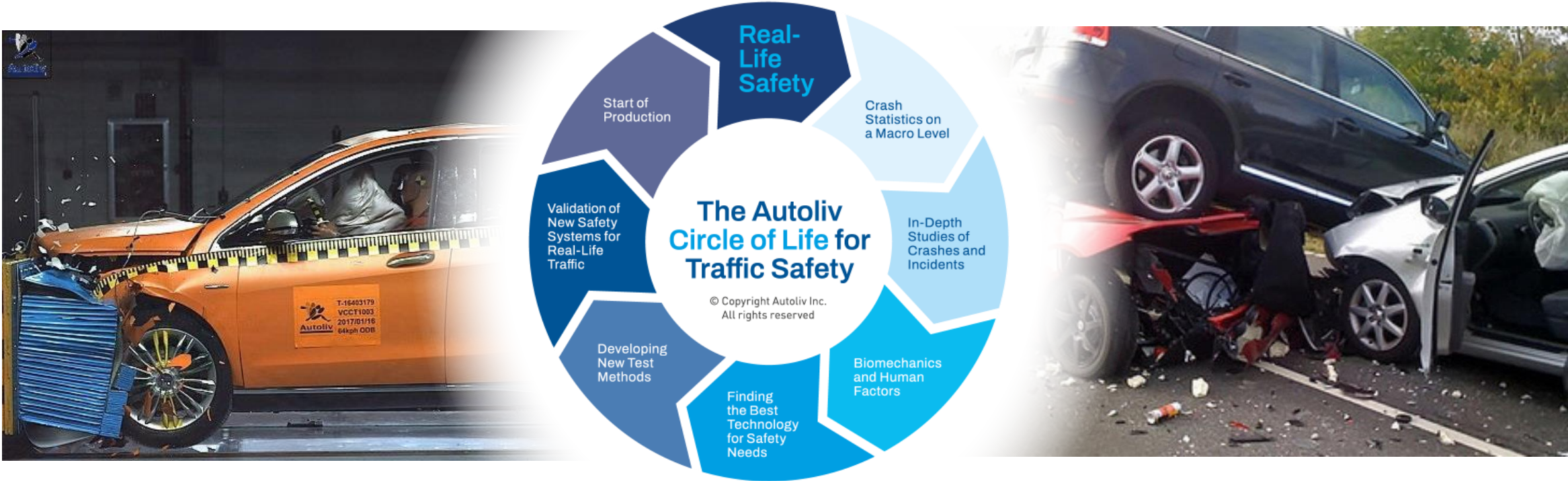
# Real Life ... 1,350,000 Reasons to Do More



Source: WHO Road Safety report 2018

# The Road to Saving More Lives

Going Beyond Standardized Test Scenarios Towards Real Life Situations and Benefits



# Growth Opportunities

## Trends, Innovations and Regulations

### Autoliv's strong pipeline of innovation on Safety Solutions

- Societal, market and customer trends create opportunities for Autoliv
- Safety for new mobility support our vision of Saving More Lives
- Regulations and consumer ratings drive safety content per vehicle

# Societal Goals and Enabling Technology



The United Nations Sustainable Development Goals (UN SDGs)

Electrification



Connectivity



Automation



Shared Mobility



# The Automotive Industry Trends ...

... Will Impact Safety Content per Vehicle Over the Coming Decade

## Market Trends

Electrification



Sustainability



Connectivity



Autonomous Drive



## Safety Content Implications

Design Freedom  
Roomy & Flexible Interior

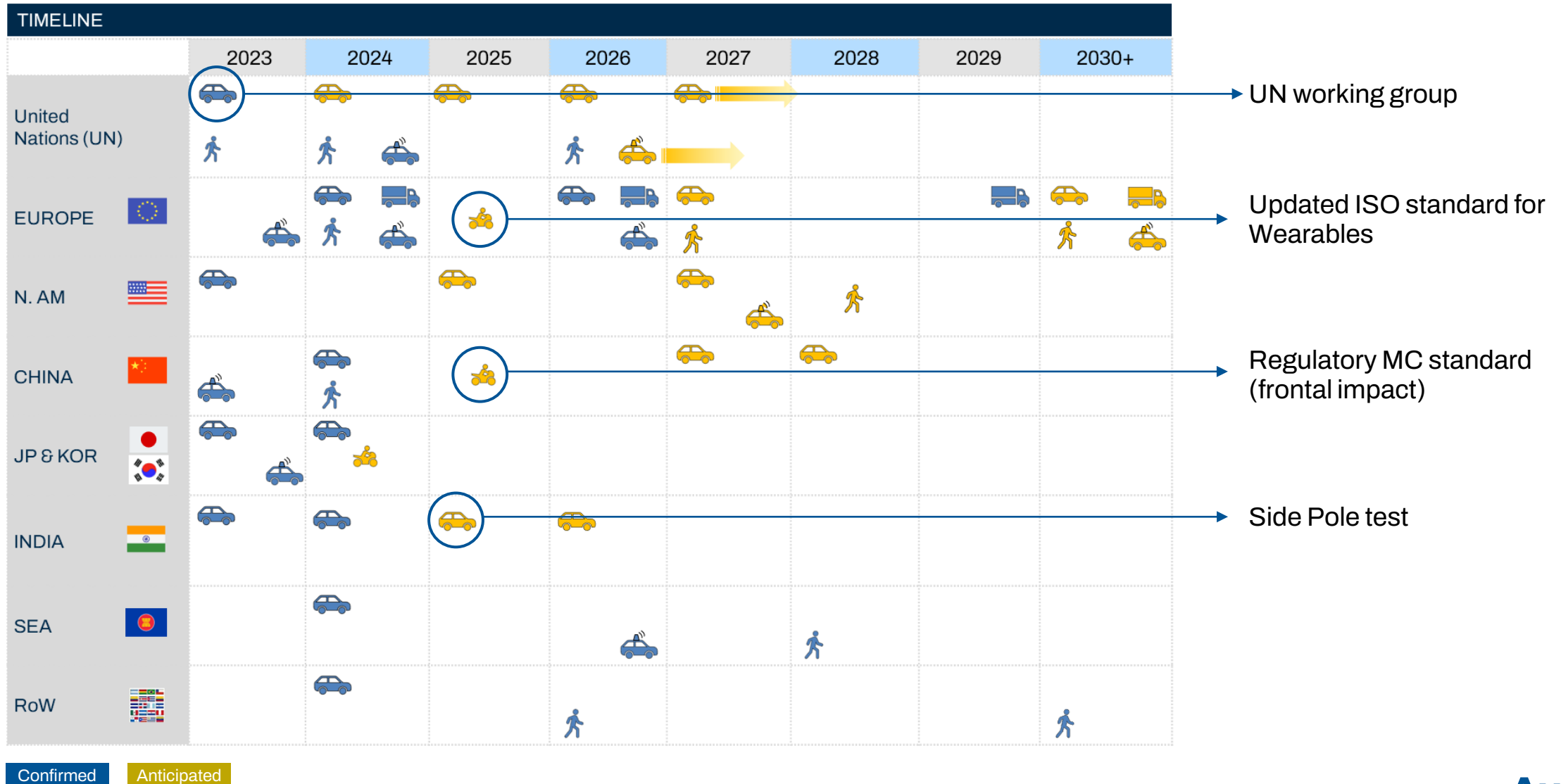
New Material & Designs

Software Features &  
Functions

Consumer Demand for  
Comfort & Convenience



# Regulations and Standards



# Customer Demand

## Features and Functions for Optimal Riding Experience

### Comfortable Seating



### Other tasks than driving



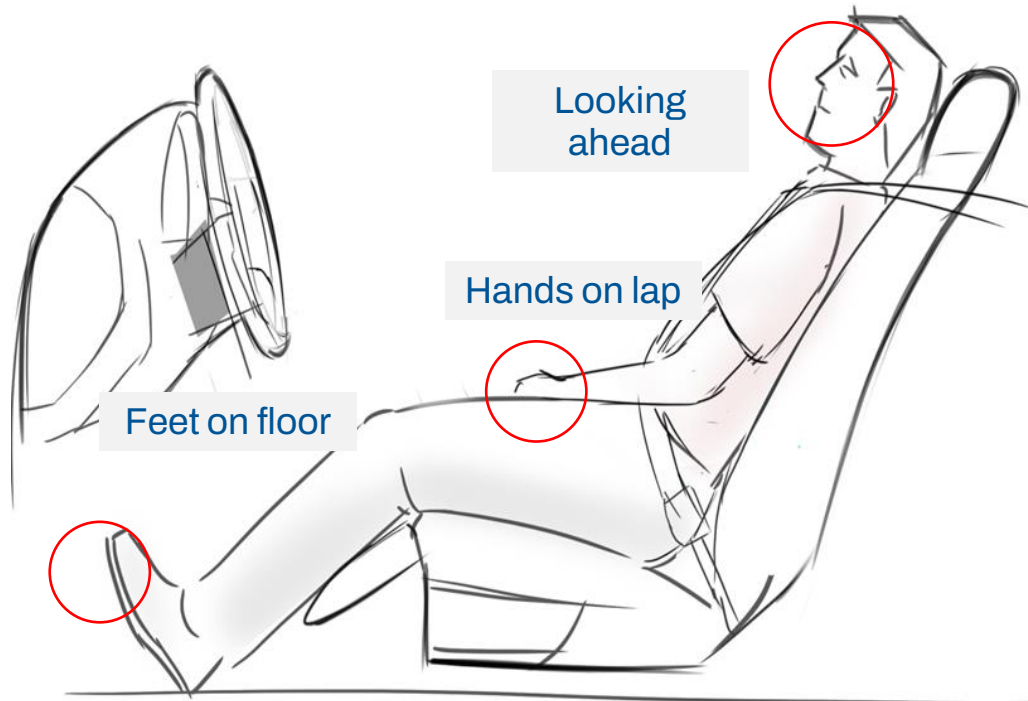
### Steering on demand



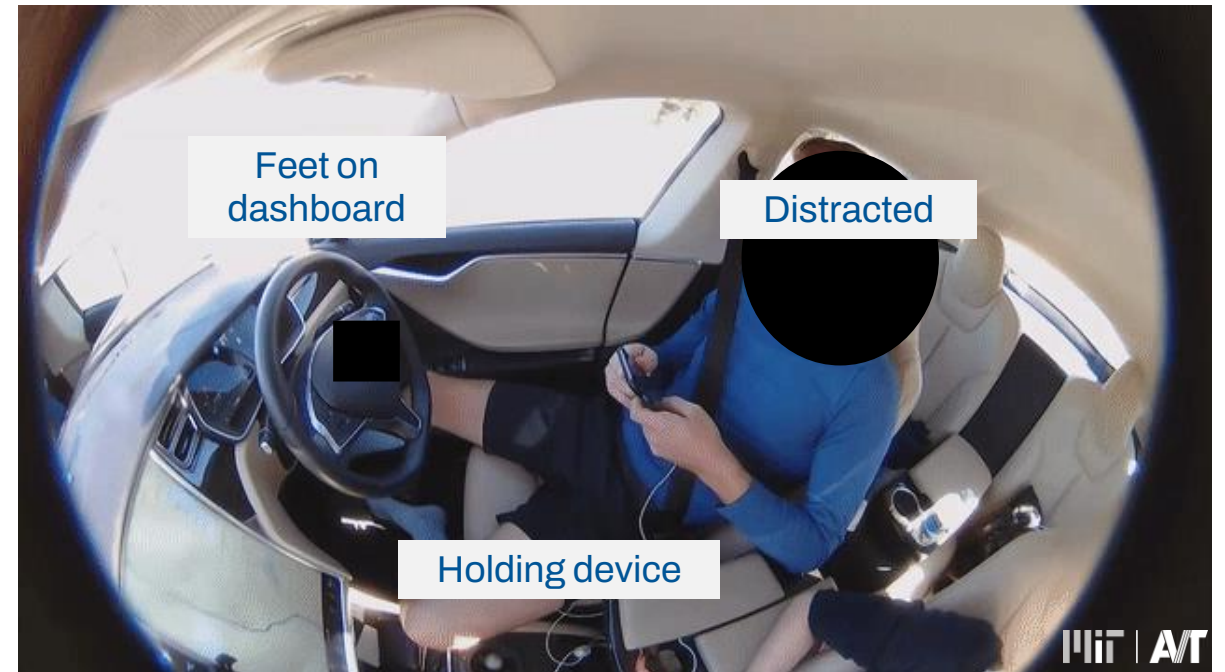
# Real Life Safety

The Need for Keeping Occupants Safe

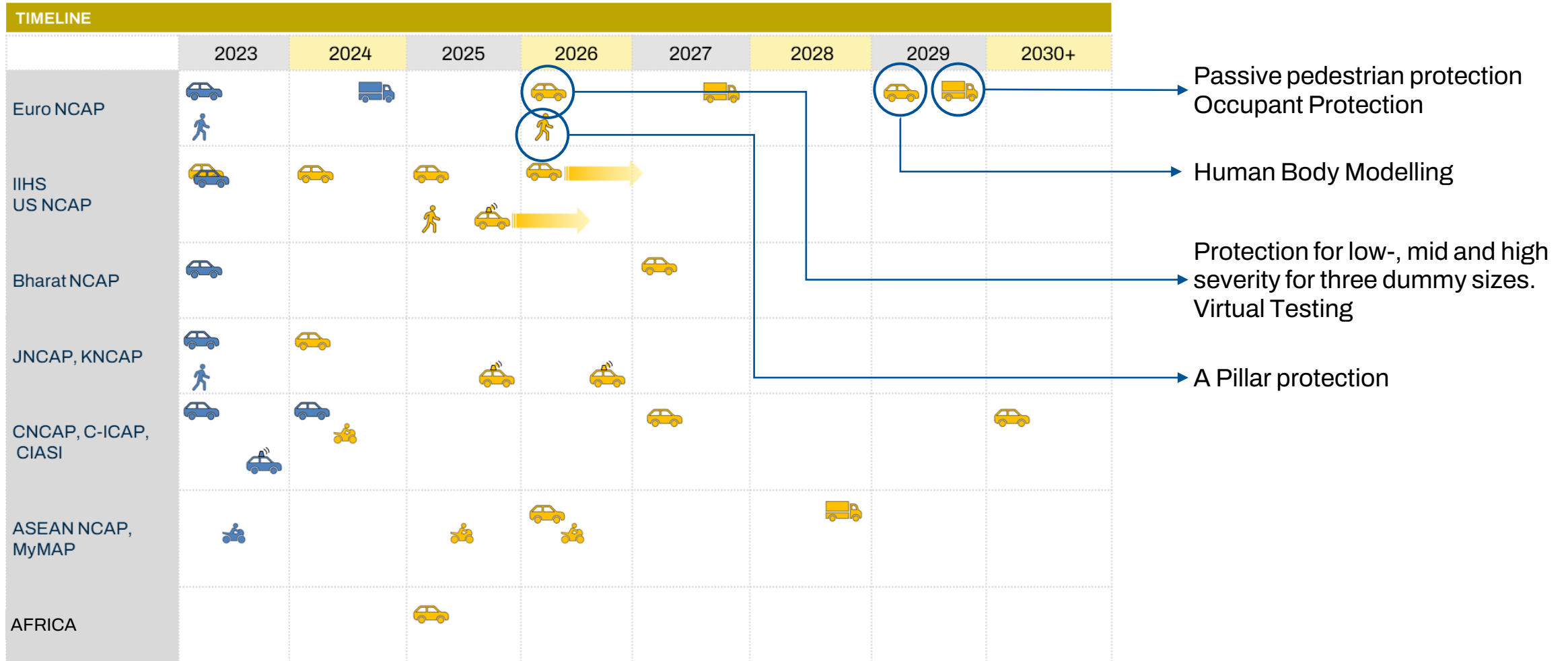
By design  
(In the future)



Violated Assumptions  
(Now!)



# Rating and Consumer Test



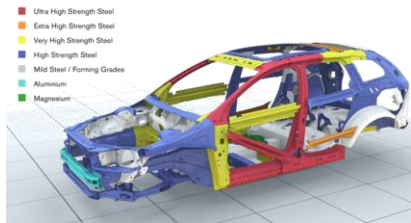
Confirmed

Anticipated

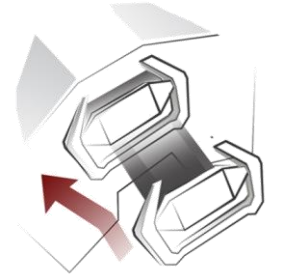
# Safety Requirements Drives a System Approach

It Starts With The Human

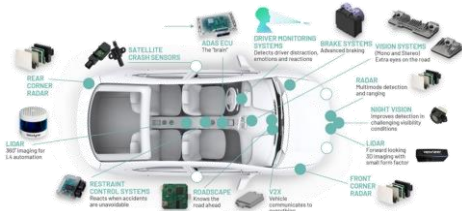
## Vehicle structure



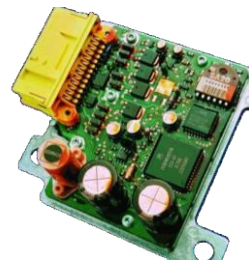
## Steering



## Assisting subsystem



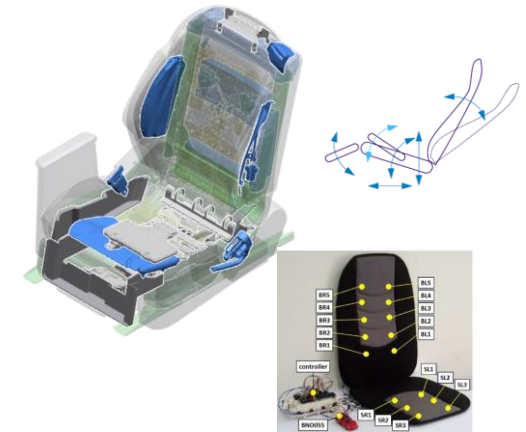
## RCU & Software



## Restraints



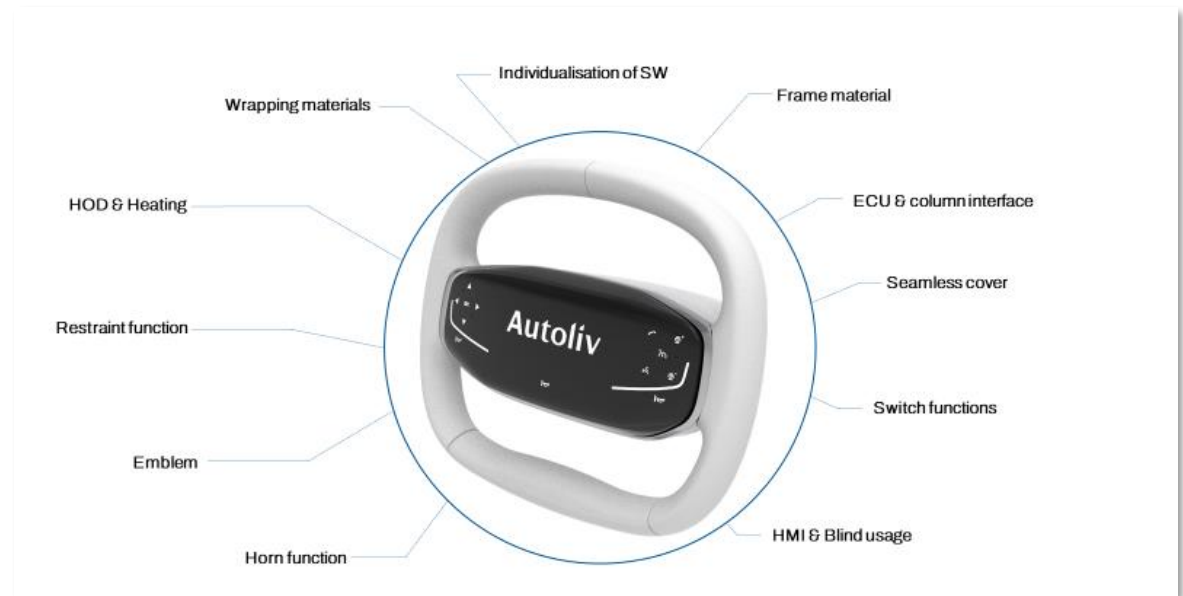
## Seats



# High Complex Steering Wheels Will Stay

- Customer trend is to concentrate in level 2 and 2+
- Many projects in L4 and L5 are canceled or delayed
- Level 2 and 2+ require many features in the wheel:
  - HOD systems(1, 2, 3 zones)
  - Light bars, illuminated emblems
  - Vibration modules
  - HMI features
  - ...

High Complex Driver Unit to stay since market is trending towards Levels 2 and 2+



# High Complex Steering Wheels Will Stay

## Driver Monitoring, Detection & Classification

Equal or better DMS function than the cluster camera

- In total 50% less occlusion compared to the cluster position
- Provides the same gaze accuracy on viewing targets (i.e. on road, mirror)

### Driver Monitoring Camera in the Steering Wheel

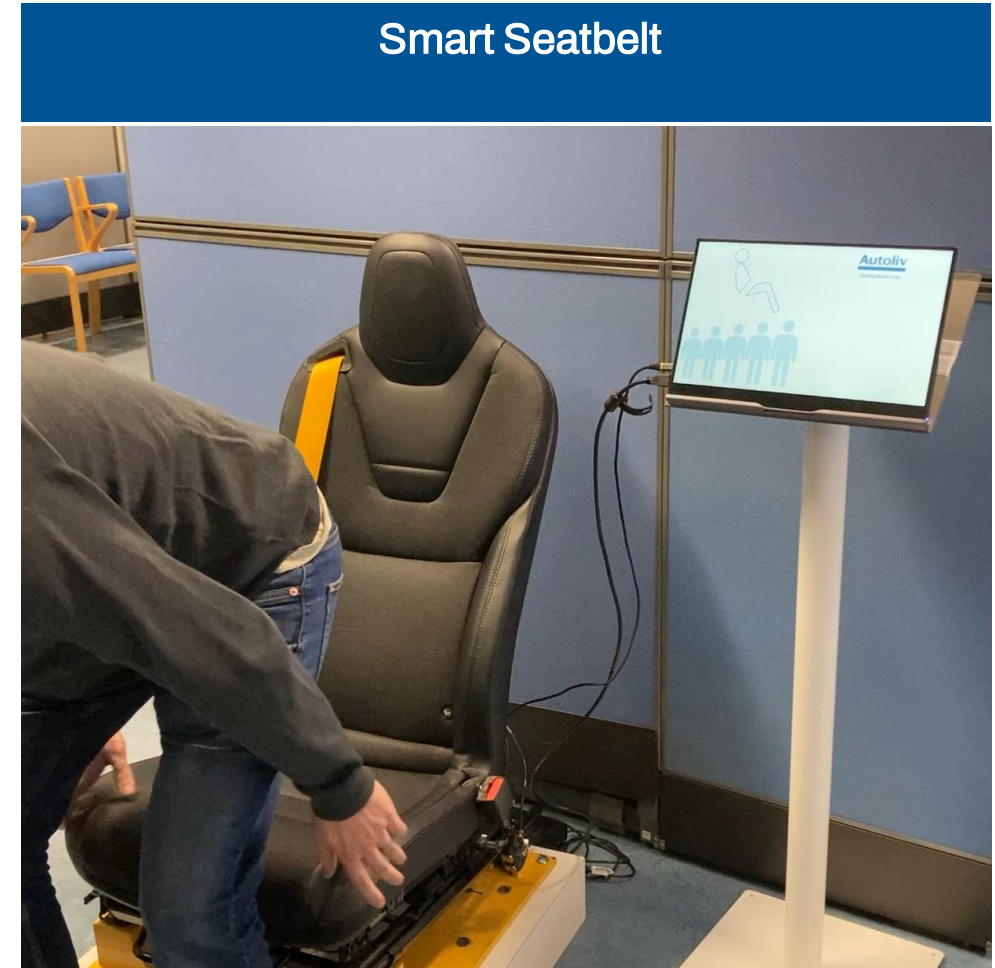


# Occupant Monitoring, Detection & Classification

Detecting Fitness to Drive, Correct Buckling State, Posture and Position

Adding sensors and software to detect:

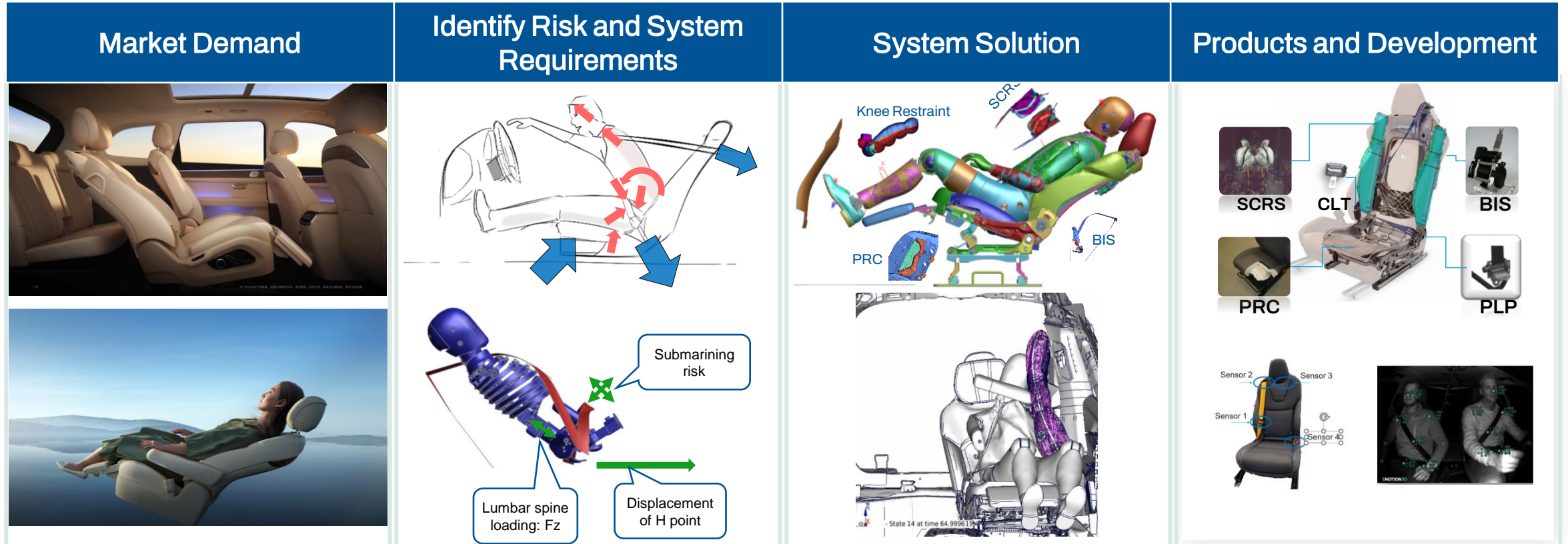
- Correct buckling state
- Vital signs
- Occupant classification





# Zero Gravity Package Solution

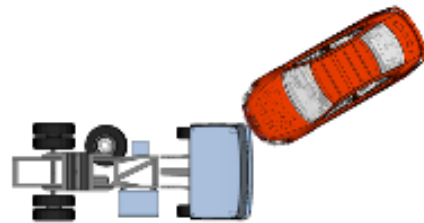
## An Example of System Solution Approach



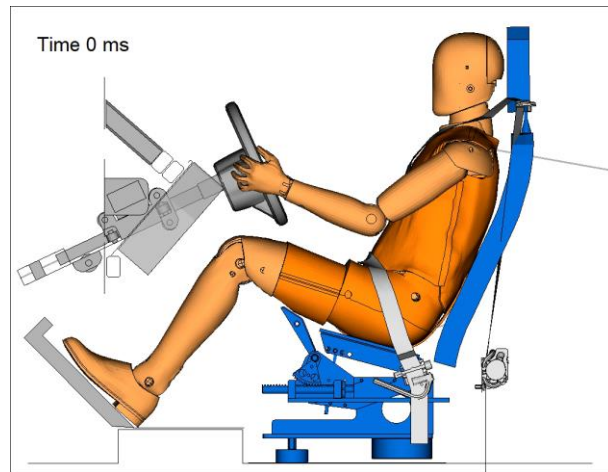
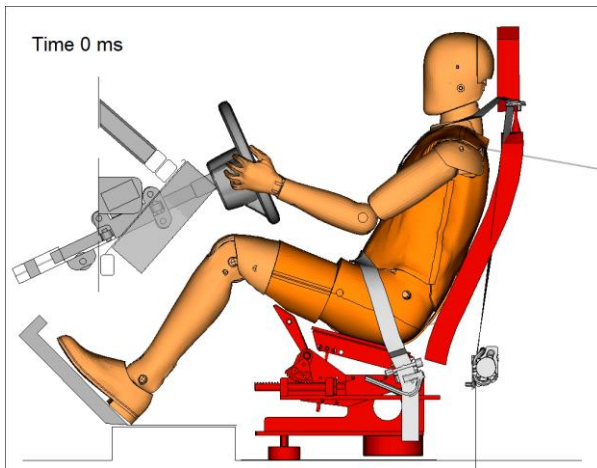
# Protecting Occupants in High Severity Crashes

## Truck Safety – High Severity Crashes

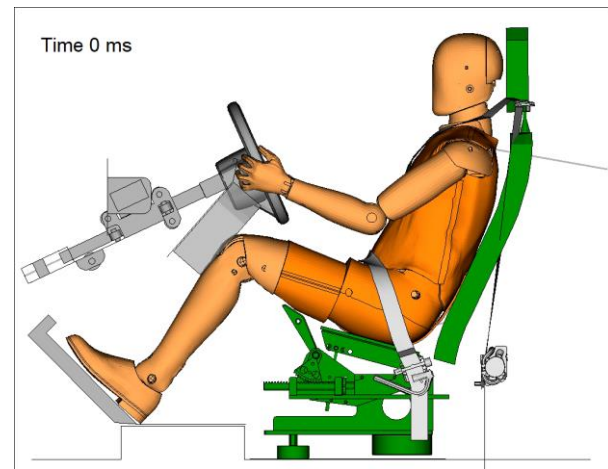
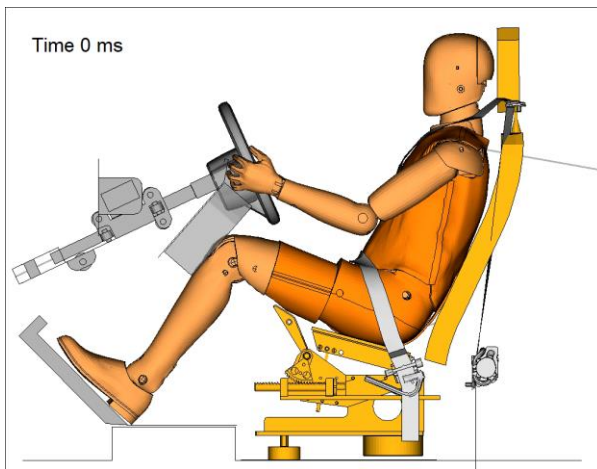




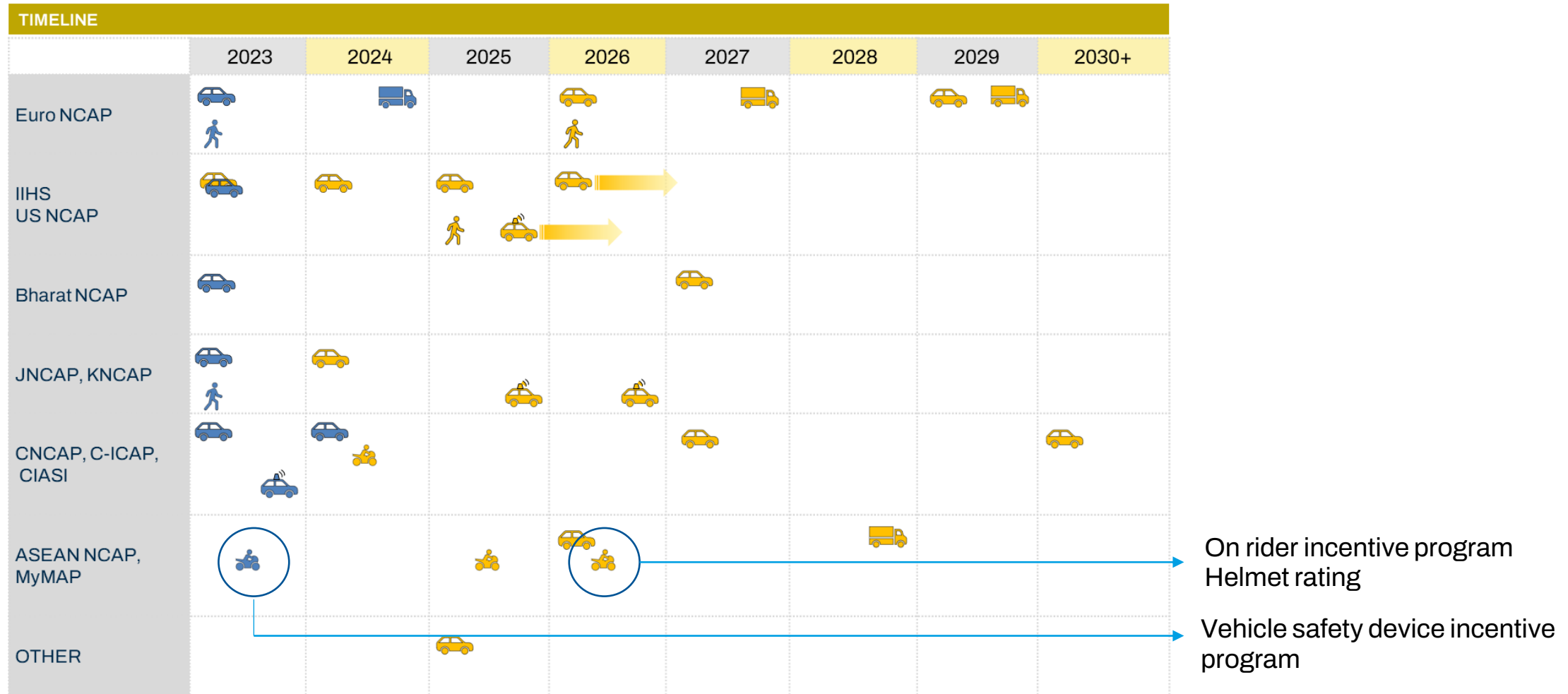
High Severity Crashes with Standard Safety Systems



High Severity Crashes with Improved Safety Systems



# Rating and Consumer Tests



Confirmed

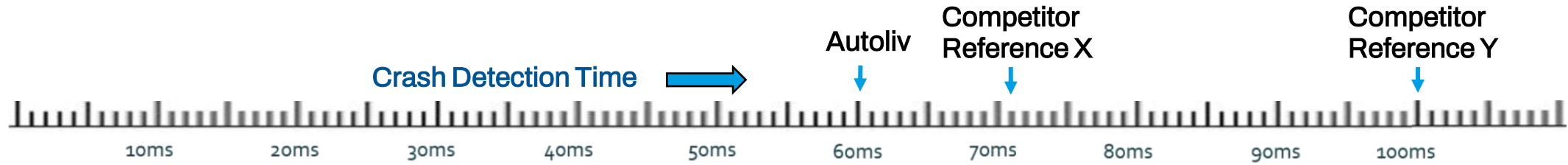
Anticipated

# Motorcycle Safety in Consumer Rating

Driven by Malaysian Motorcycle Assessment Program (MyMAP)



# Safety for Motorcycle Riders



Competitor X

Competitor Y

Autoliv Concept



# Digital Solutions

Autoliv

Sensing, analyzing and coaching



Post Crash Reporting



Crash Detection & On-Bike Analysis

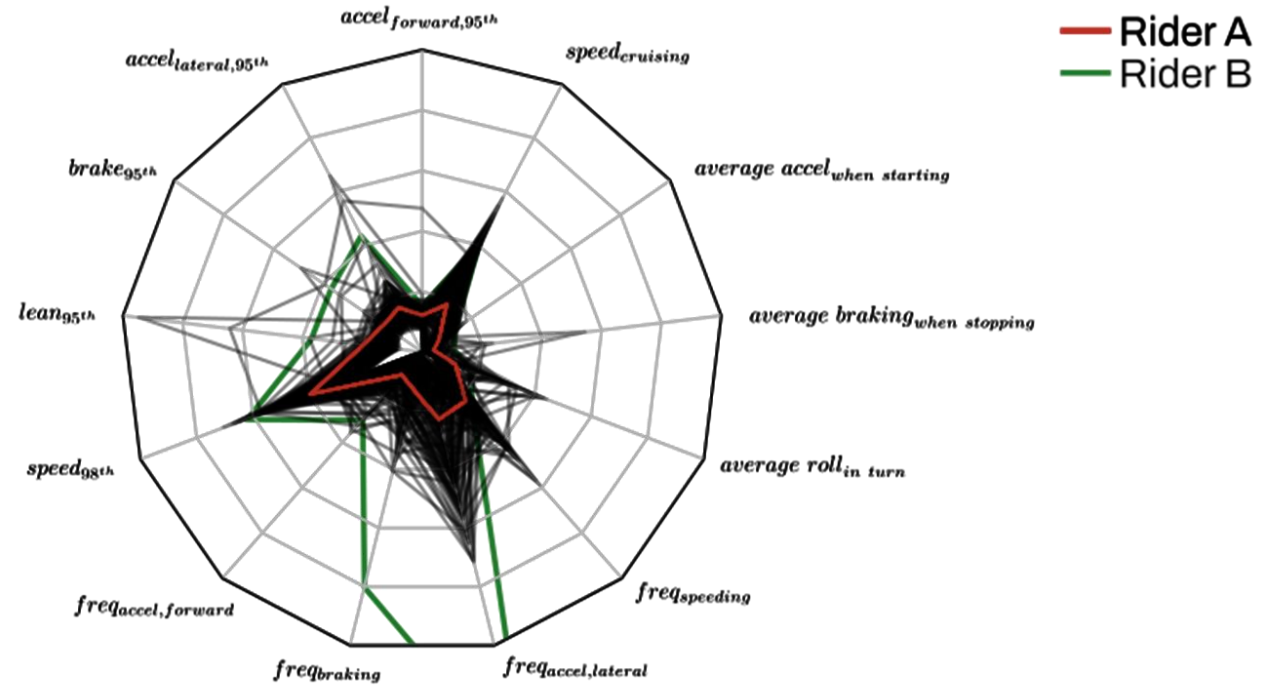


Rider Modelling & Behavior Analysis



Autoliv Safety Cloud

# Our Portfolio Within Digital Solutions for Powered Two Wheelers





# Growth Opportunities

## Trends, Innovations and Regulations

### Autoliv's vision of Saving More Lives

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# Autoliv's Real-life Safety Approach

Allows Us to Explore and Discover New Ways of Protecting People

## Test Methods / Validation



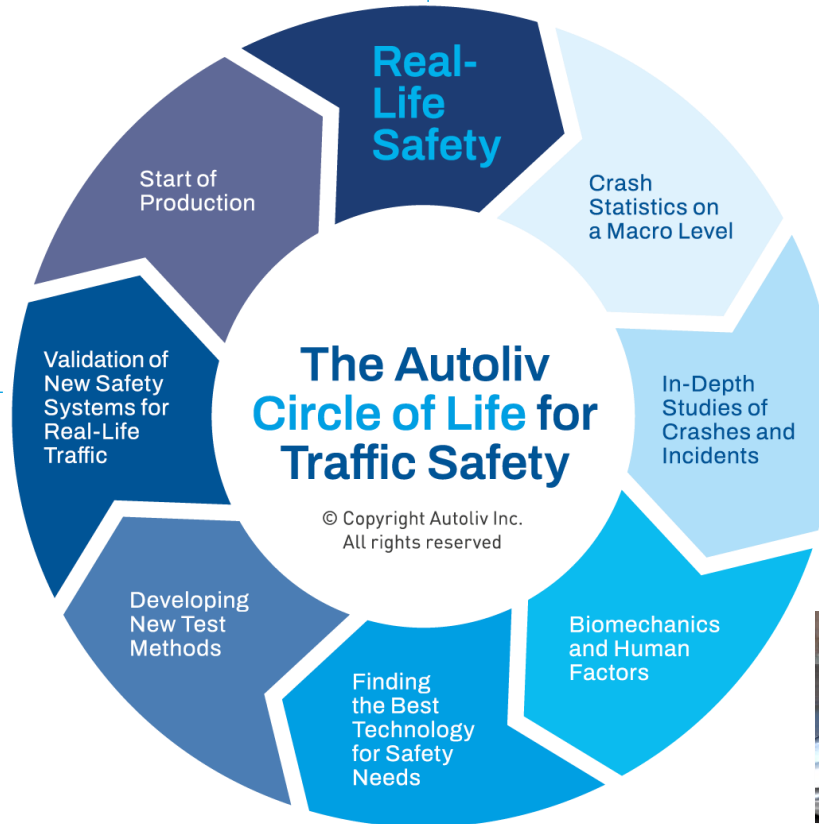
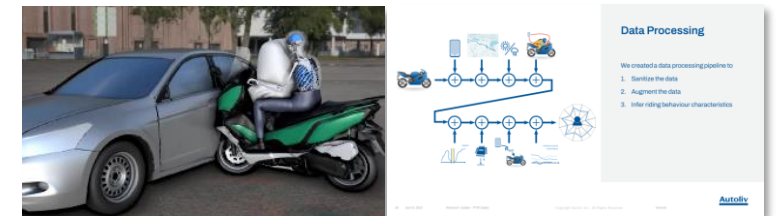
## Developing Solutions On-vehicle | On-rider | Digital



## Real life data analysis



## Injury and behavior assessment



# Highlights on Upcoming Market Firsts

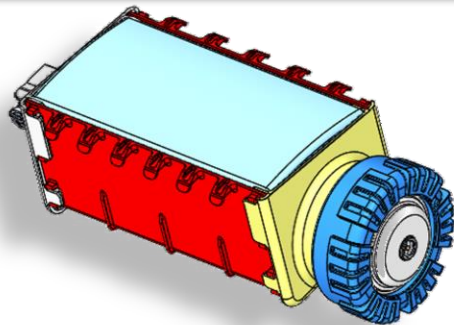
## Airbags

Demand for smaller, lighter, cost-efficient airbag solutions with higher adaptability

**Passenger Airbag with Aspiration**  
Self adaptivity for wider range of passenger seat positions

**Objectives** Self-adaptive passenger restraint, weight and cost reduction

Benefits	Concept	Focus Area
<ul style="list-style-type: none"> <li><b>Self-adaptive</b> <ul style="list-style-type: none"> <li>Single Stage</li> </ul> </li> <li><b>Pass FMVSS208 LRD</b> <ul style="list-style-type: none"> <li>No LRD cushion features                             <ul style="list-style-type: none"> <li>No Safety Vents No Long Flaps</li> <li>Self-Adaptive or Passive-Adaptive</li> </ul> </li> </ul> </li> <li><b>Lower Temperature Gases</b> <ul style="list-style-type: none"> <li>Less cushion heat shield and rebar comments                             <ul style="list-style-type: none"> <li>Weight, Cost, Package Size</li> <li>+58g weight savings</li> </ul> </li> </ul> </li> <li><b>Single Stage System for US Market</b> <ul style="list-style-type: none"> <li>Customer development testing reduced by L10</li> <li>Elimination of one firing line in OEM harness</li> </ul> </li> <li><b>Scalability</b> <ul style="list-style-type: none"> <li>Can fit larger cushions (up to 160L) with Single Stage inflators</li> <li>Reduced Effluent Risk (USCAR)</li> </ul> </li> <li><b>Cost</b> <ul style="list-style-type: none"> <li>Savings about 6 USA (20%) in BCM</li> </ul> </li> </ul>	<p>New PAB concept utilizes in-cabin airflow to help fill passenger airbag during deployment</p> <p>Meeting non-US for single-stage / US for dual-stage by improving energy management</p> <ul style="list-style-type: none"> <li>Cushion: 205L, 3D shape (PAB-E and/or PET)</li> <li>Place: Activation function "closed" → open → closed</li> <li>Inflator: with 1.2 Single stage low output inflator</li> </ul>	<ul style="list-style-type: none"> <li>Adaptivity</li> <li>Product Improvement</li> <li>Safety Improvement</li> <li>Weight Improvement</li> </ul> <p><b>Development Status</b></p> <ul style="list-style-type: none"> <li>GM Concept Phase</li> <li>FM Concept Phase</li> </ul> <p><b>Autoliv</b></p>



Bernoulli™ Airbag

## New Functionalities

Tiltable steering wheel with small Airbag and HMI sensing e.g., Hands On Detection

**Tiltable / Foldable Integrated Steering Wheel**  
Adaption for steering wheel storing

**Objectives** Interior design and space options / HAD level 4+ requirements

Benefits	Concept	Focus Area
<p><b>Interior Design Options</b></p> <ul style="list-style-type: none"> <li>Enables interior as working, waiting or relaxing space</li> <li>Offers higher design flexibility for steering and cockpit</li> <li>Autonomous driving vehicle feature up to level 4+</li> </ul> <p><b>Steering Wheel Design Option</b></p> <ul style="list-style-type: none"> <li>The driver unit design using small airbag and HMI steering wheel sensing, Like hand-detection etc.</li> </ul>	<p>Manual and/or automatic rotation system with belt or electrical motor</p> <ul style="list-style-type: none"> <li>Full interior roll-in folding rotation</li> <li>Integrated glassing and locking design for reduced packaging</li> <li>Full rim or half rim folding rotation</li> <li>Overall mechanism packaging compatible with driver airbag and steering shaft/frame</li> <li>Control enables cooperation and partnership for stowable and steer-by-wire actuator interfaces</li> </ul>	<ul style="list-style-type: none"> <li>Drive Unit (Electric/Manual)</li> <li>Steering Wheel</li> <li>Interior Design Option</li> <li>Design Option</li> </ul> <p><b>Development Status</b></p> <ul style="list-style-type: none"> <li>In development</li> </ul> <p><b>Autoliv</b></p>



Tiltable / Foldable Integrated Steering Wheel

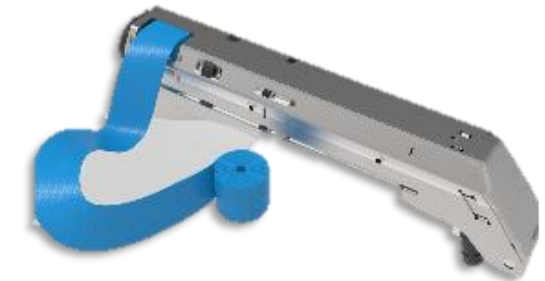
## New Interiors

Seat Belt integrated in seat to support comfort positions

**Belt-in-Seat BIS2025**  
Retractor integrated with upper crossmember

**Objectives** HAD with reclined position require a Belt-in-Seat solution

Benefits	Concept	Focus Area
<p><b>Product Improvement</b></p> <ul style="list-style-type: none"> <li>Fully integrated in slim backrest</li> <li>No intrusion of space in the backrest Optimized package for e.g. ventilation, heating, etc.</li> <li>Improved seating/riding for comfort</li> <li>Best comfort due to direct pull</li> <li>Best comfort PP (SIP, tactile warning, ...) due to direct coupled e-motor</li> </ul> <p><b>Safety Improvement</b></p> <ul style="list-style-type: none"> <li>Improved restraint performance in reclined position</li> </ul> <p><b>Modularity</b></p> <ul style="list-style-type: none"> <li>Retractor function modularity</li> </ul>	<p>Retractor integrated with upper crossmember. No retractor or webbing between side beam.</p> <p>Function:</p> <ul style="list-style-type: none"> <li>Best crash removal / belt parking</li> <li>Heating warning</li> <li>Preheating/warming, High force</li> <li>Preheating</li> <li>Load limiting LL/LLA</li> </ul>	<ul style="list-style-type: none"> <li>New Seating</li> <li>Seat Integration</li> <li>Product Improvement</li> <li>Safety Improvement</li> <li>Modularity</li> <li>Cost In Market</li> </ul> <p><b>Development Status</b></p> <ul style="list-style-type: none"> <li>Concept phase</li> </ul> <p><b>Autoliv</b></p>

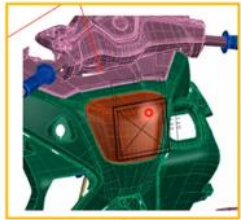


Belt-in-seat solution

# Highlights on Upcoming Market Firsts

## On-Vehicle Safety

First SOP planned for Q1 2025



Airbag for scooter

## On-Rider Safety Systems

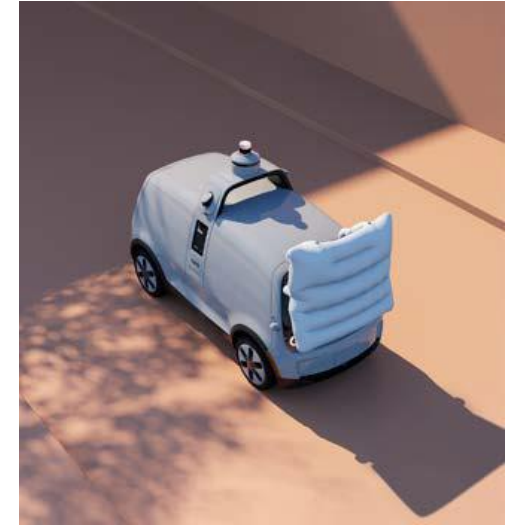
Autoliv Vest ECU and algorithm for on the rider safety



On the rider protection

## Autonomous Delivery Vehicles

Pedestrian protection for autonomous vehicles that are around people

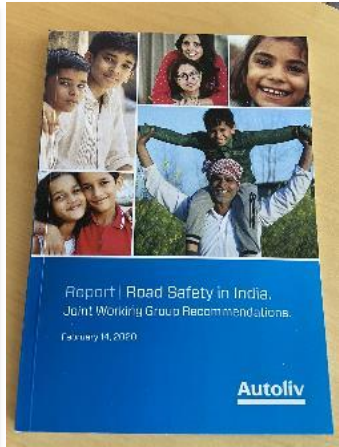


Nuro delivery vehicle

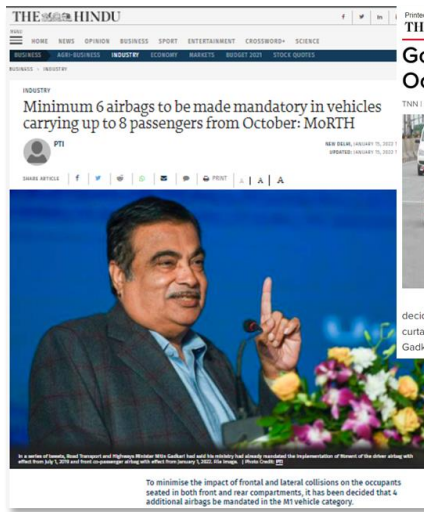
# Autoliv's Strong Collaboration With Regulators and Consumer Ratings

## An Example of a Successful Story: 6-Airbag Mandate in India

2019



2022





# Growth Opportunities

## Final comments

- **Autoliv's Real-life Safety Approach**

- Autoliv's approach to real-life safety allows us to explore and discover new ways of protecting people

- **Autoliv's strong pipeline of Safety Solutions innovation**

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# Saving More Lives