
FOR SAFER CARS
EURO NCAP
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DE LA TRANSITION
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THE GOVERNMENT
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Ministry of the Economy
ICRT
INTERNATIONAL CONSUMER RESEARCH & TESTING
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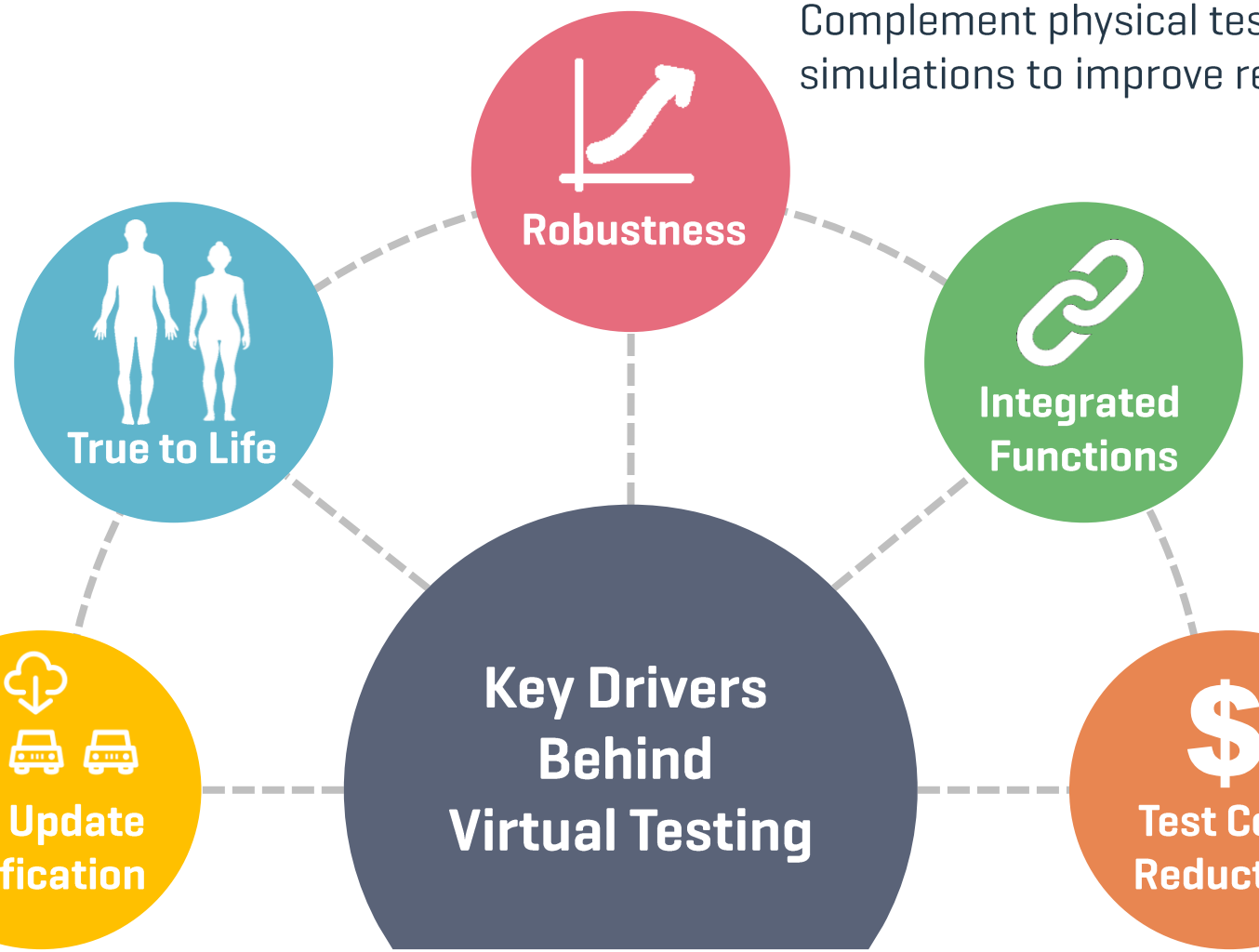
Contents

Why Virtual Testing?



Complement physical testing with simulations to improve real-world benefit

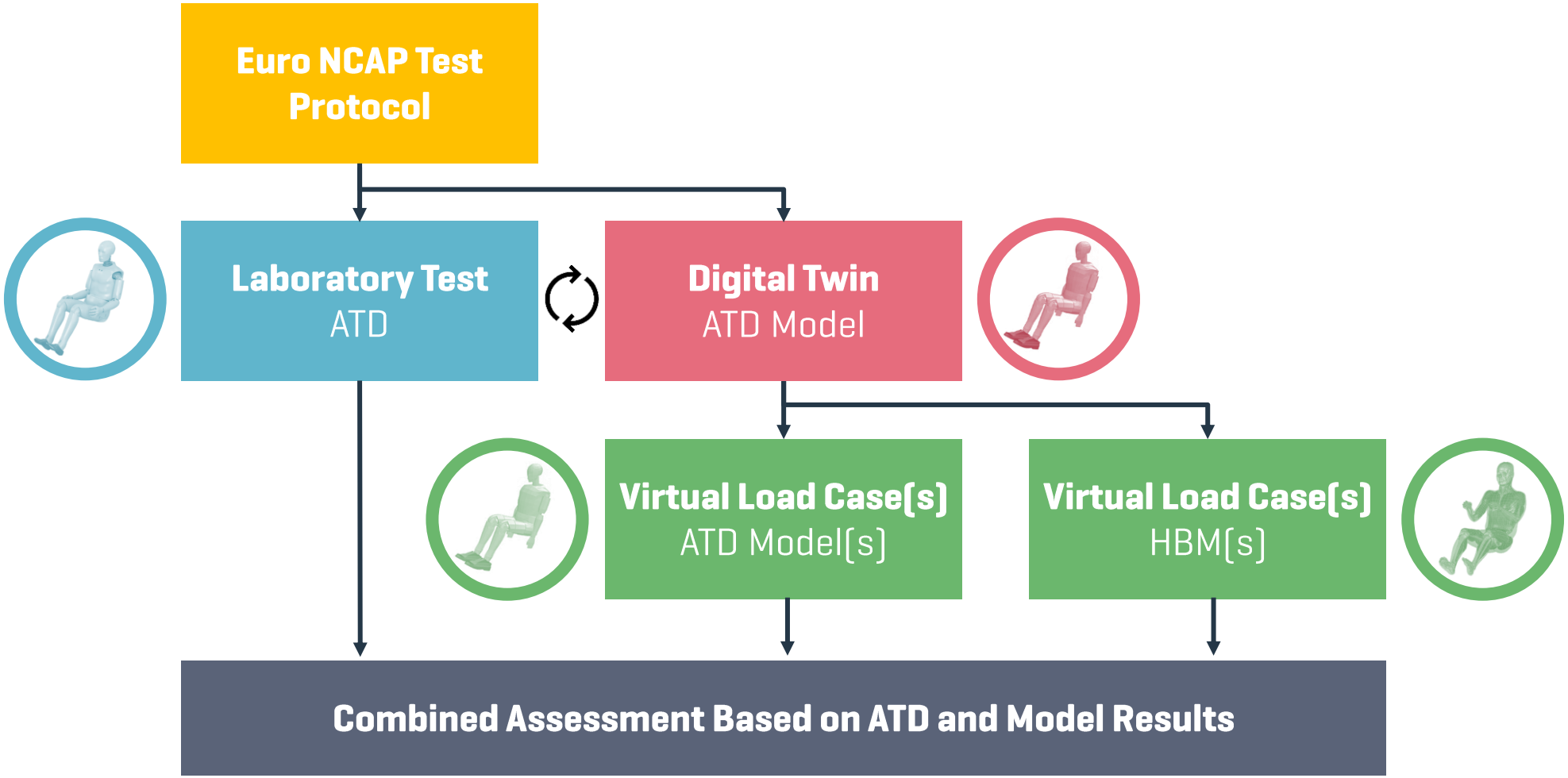
Use highly realistic models, remove hardware limitations & add diversity

Allow a more holistic assessment of safety, e.g. PRESAFE©

Verify performance after software updates

Improve test efficiency

Virtual Testing Principle



Aims of Euro NCAP VTC WG

- Develop “Far-side impact” pilot case
  - Task 1: Vehicle Model Control
  - Task 2: Validation Testing
  - Task 3: Virtual Load Case(s) Definition
  - Task 4: Data Handling & Management, Communication
  - Task 5: Scoring and Rating Process
  - Task 6: Virtual Occupant Specification & Certification

- Scope limitations
  - Passive safety countermeasures only, no integrated systems
  - No HBM development or new biomechanical research

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Far-Side Impact Pilot

Far Side Test and Assessment Protocol v2

- Acceleration based sled rig with BIW (mounted at 75°)
- WorldSID mid-sized male ATD (sleeveless suit)
- AE-MDB and Pole impact pulse

Relevant Virtual Load Case Variations*

- Delta v
- Vehicle variants (mass, EV, vehicle body): crash pulse
- Anthropometry: occupant sizes, gender & posture
- Seating position

**Based on review of accident data*

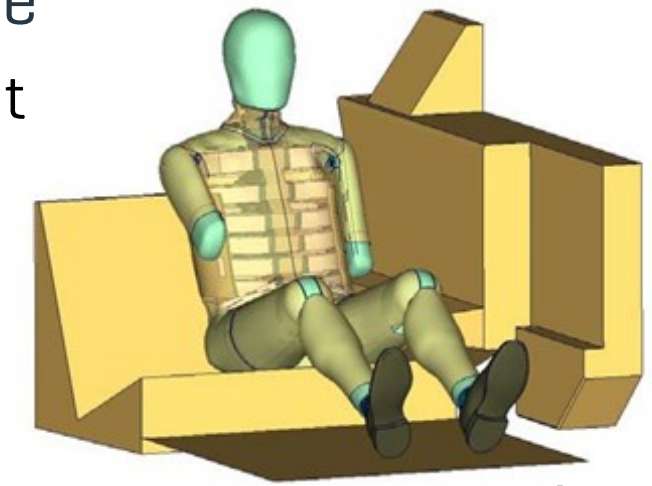
Added Measurements for Validation

- Pre-test: reference points of seat, belt anchorages, WorldSID position scan, etc.
- During test: Dummy (head) position, seat back position over time, relative airbag position (additional stills and video)

Human Test Tool Definition – ATD Model

- Variation in ATD model response
  - Different code and code version
  - Different model supplier (commercially available, in-house developed)
  - Different model version (often linked to vehicle programme)

- Model “certification” catalogue for quality assurance
  - Includes near and far-side load cases, simplified restraint interaction
  - Model acceptance based on correlation requirements
  - Declared by manufacturer and/or supplier



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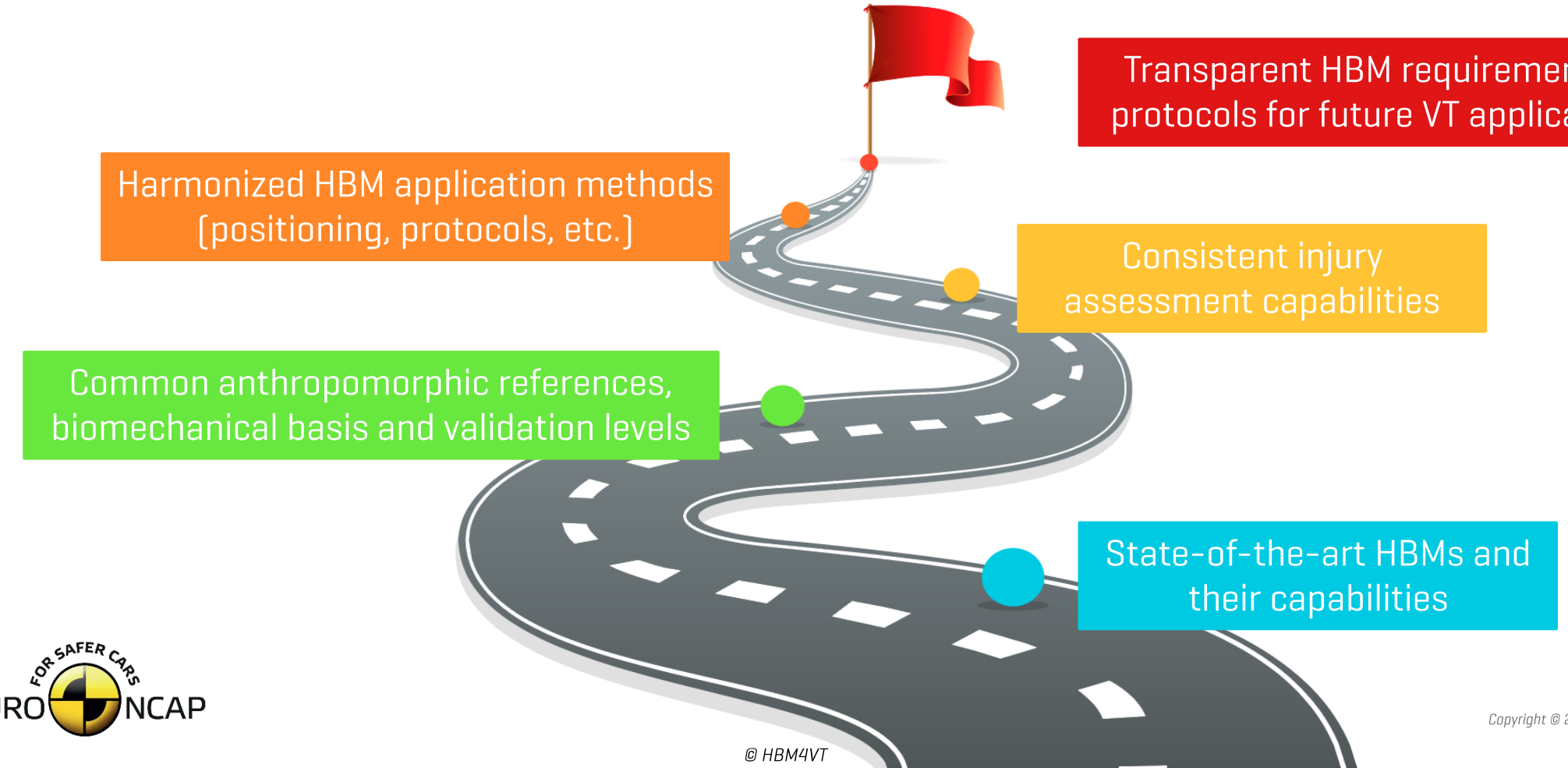
Human Test Tool Definition - HBM

- "HBM4VT" - A framework of international experts to develop a roadmap for HBM application in virtual testing



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Quality Control & Checks

Occupant Model

Supplier/OEM runs simulations
Euro NCAP verifies

"Certification Acceptance Criteria"

Vehicle Environment Model

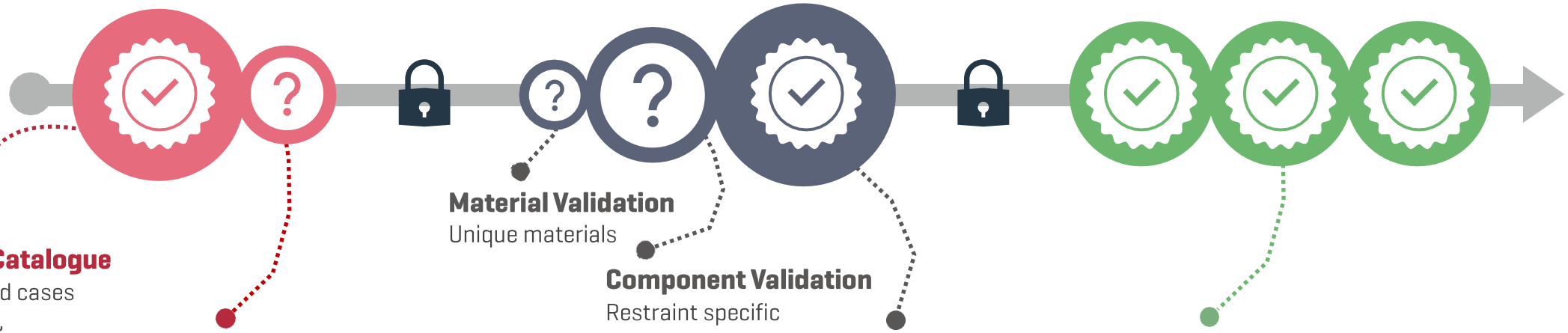
OEM/systems integrator runs simulations
Euro NCAP verifies

"Validation Acceptance Criteria"

Assessment Model(s)

OEM/systems integrator runs simulations
Euro NCAP verifies & rates

"Assessment Criteria"



Certification Catalogue
Standardized load cases near and far side, simplified restraint loading

Additional Certification
Manufacturer-specific certification load case(s) (if needed)

Material Validation
Unique materials

Component Validation
Restraint specific

System Validation
Vehicle specific geometry, restraint and materials

Prescribed Load Cases
Variations in boundary conditions, pulse, seating position, etc.

FUTURE OCCUPANT SAFETY FOR CRASHES IN CARS

Closing Remarks

- Virtual testing offers many opportunities for enhanced safety assessment, but there are important challenges to overcome
- Industry, academia and Euro NCAP have joined forces to develop a feasible methodology, applicable to the evaluation of crash protection systems
- First application and test case is far-side impact – if successful, other applications like frontal impact and pedestrian safety will be considered
- Model (quality) control is fundamental in achieving trust in the process and has been the focus of the WG so far