SCIENCE
PASSION
TECHNOLOGY

Workshop on Virtual Crash Testing

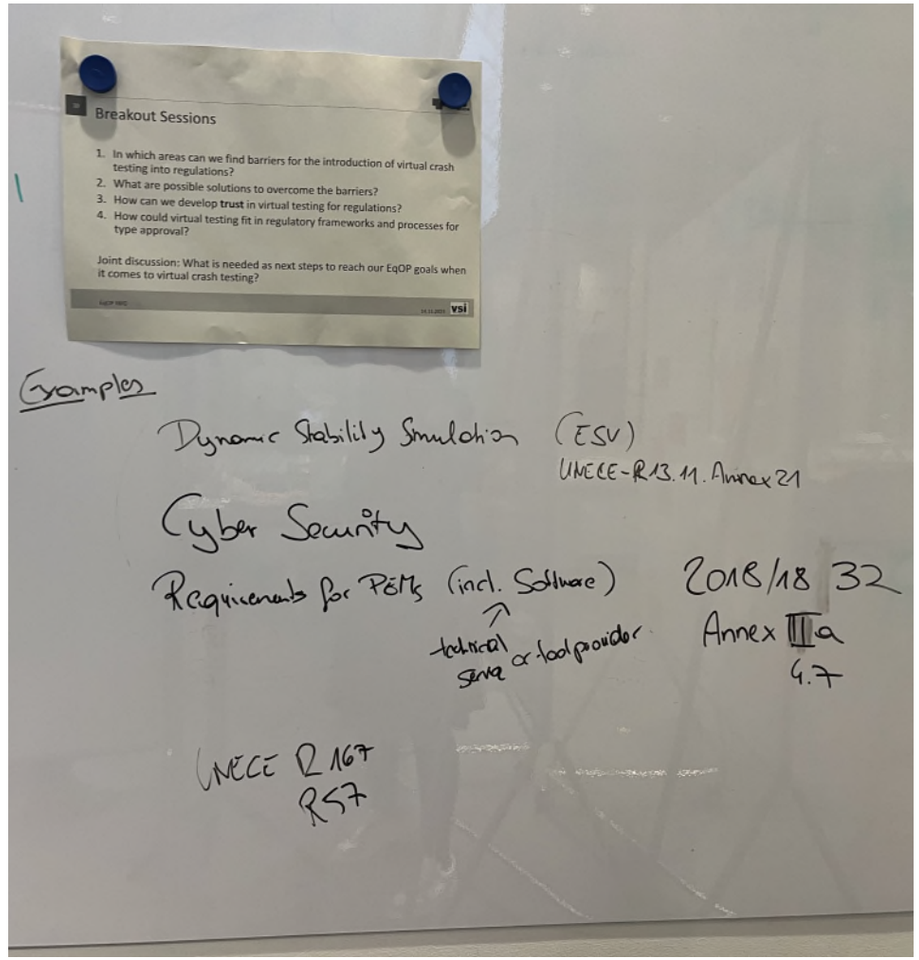
Results of Break-Out Sessions

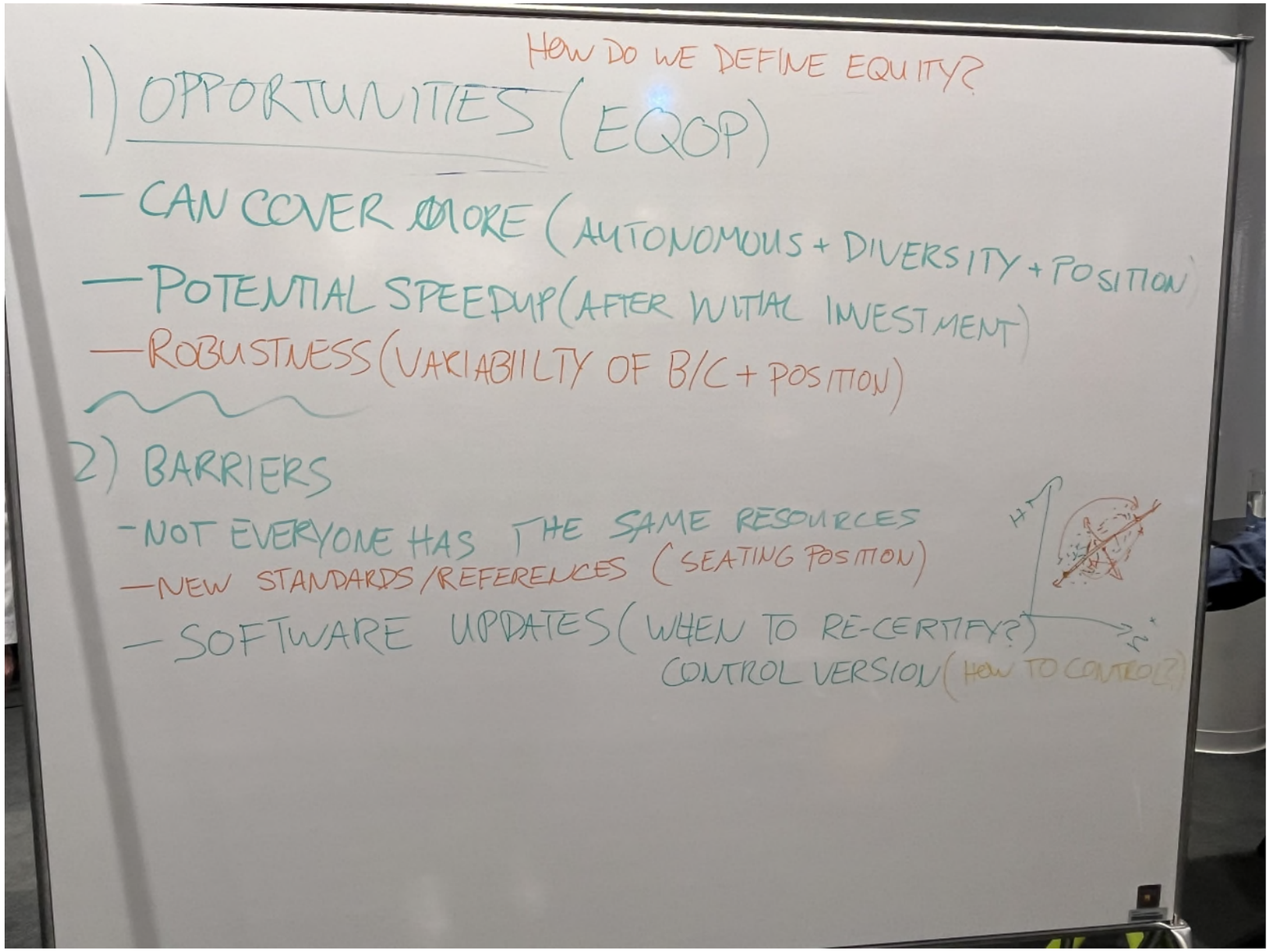
EqOP IWG | 14.11.2023

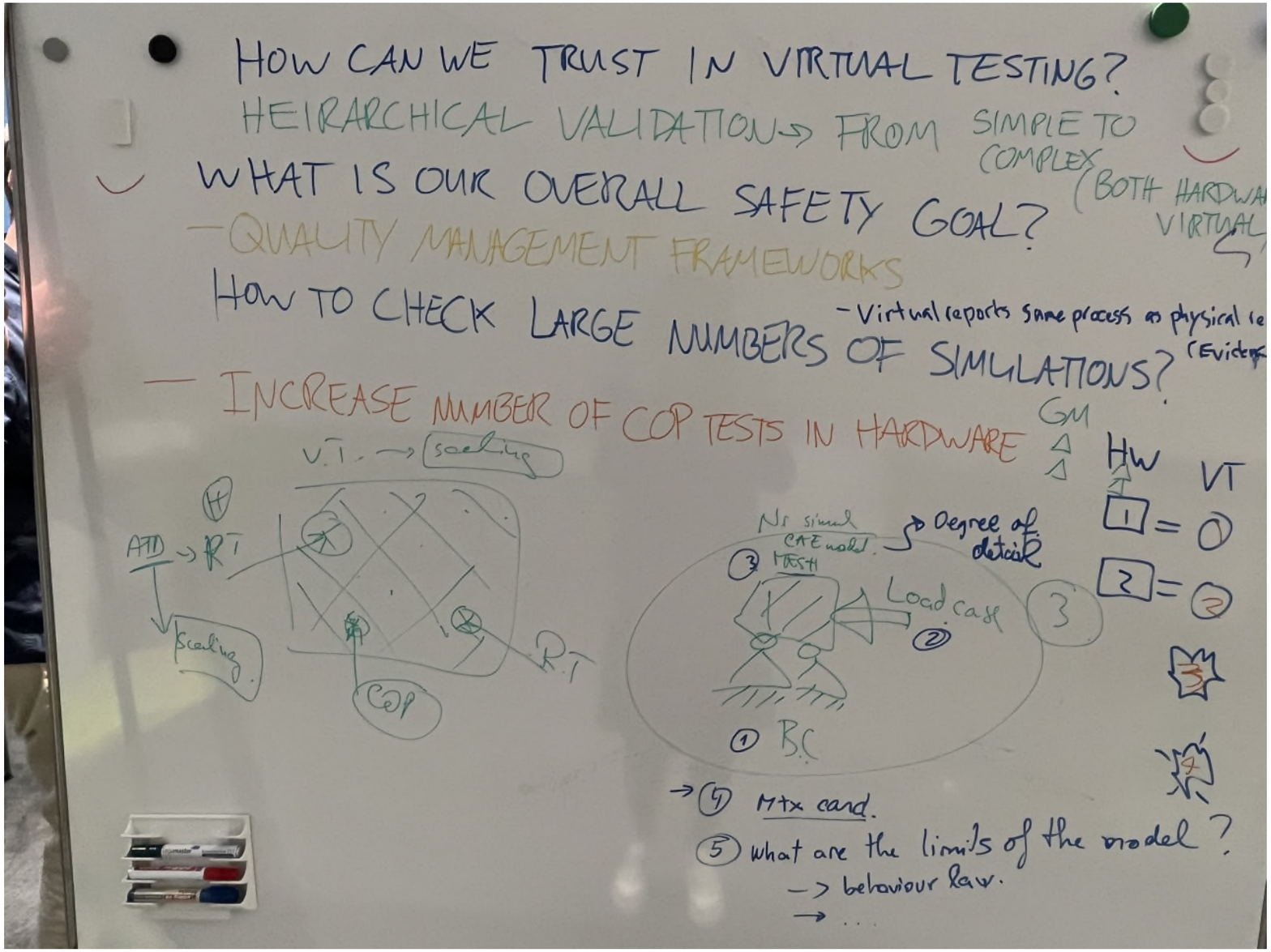
Breakout Sessions

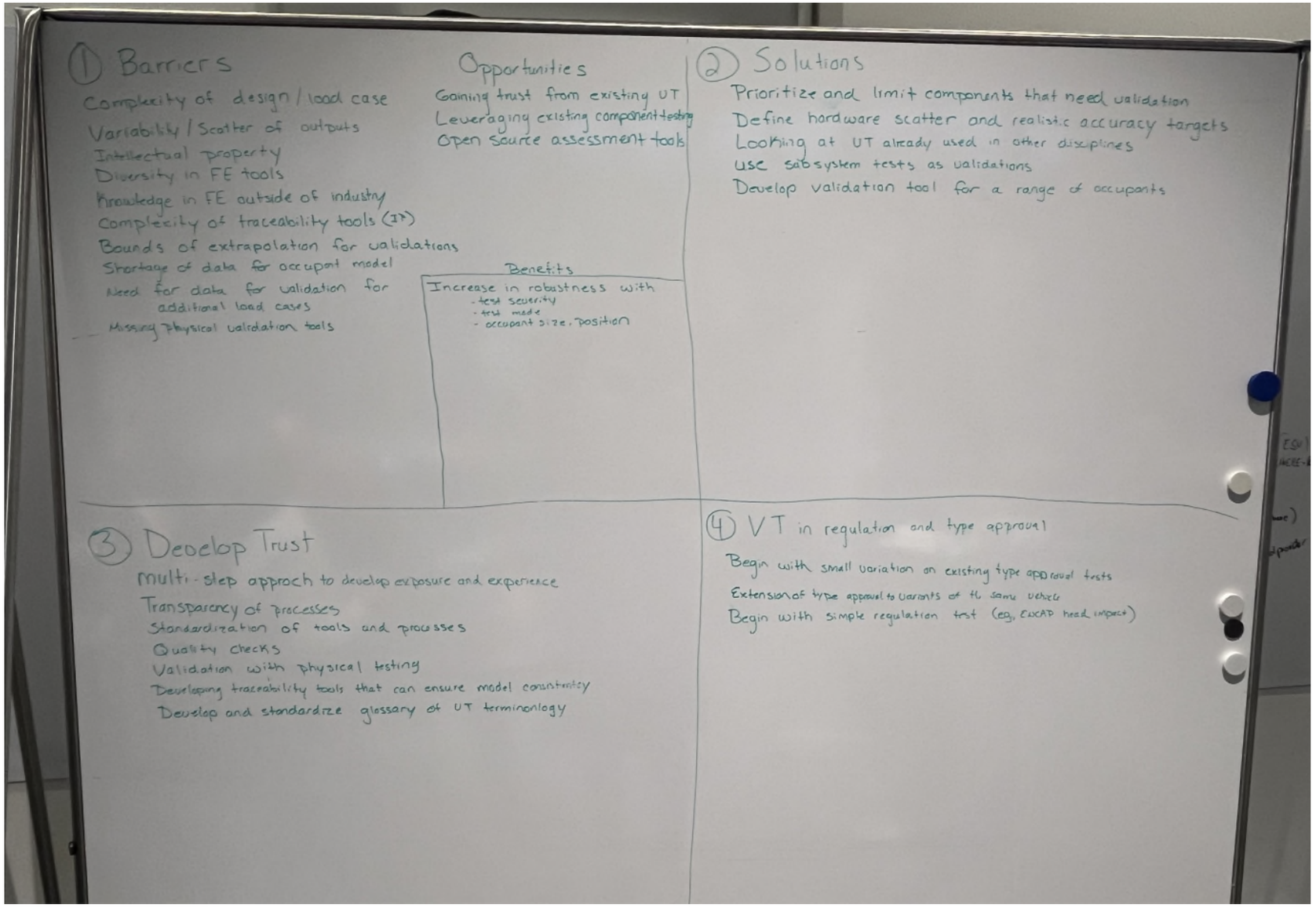
1. In which areas can we find barriers and opportunities for the introduction of virtual crash testing into regulations?
2. What are possible solutions to overcome the barriers?
3. How can we develop **trust** in virtual testing for regulations?
4. How could virtual testing fit in regulatory frameworks and processes for type approval?

Break-Out Session: Group 1




HOW DO WE DEFINE EQUITY?
1) OPPORTUNITIES (EQOP)
- CAN COVER MORE (AUTONOMOUS + DIVERSITY + POSITION)
- POTENTIAL SPEEDUP (AFTER INITIAL INVESTMENT)
- ROBUSTNESS (VARIABILITY OF B/C + POSITION)
2) BARRIERS
- NOT EVERYONE HAS THE SAME RESOURCES
- NEW STANDARDS/REFERENCES (SEATING POSITION)
- SOFTWARE UPDATES (WHEN TO RE-CERTIFY?)
CONTROL VERSION (HOW TO CONTROL?)


HOW CAN WE TRUST IN VIRTUAL TESTING?
HEIRARCHICAL VALIDATION → FROM SIMPLE TO COMPLEX
WHAT IS OUR OVERALL SAFETY GOAL?
- QUALITY MANAGEMENT FRAMEWORKS
HOW TO CHECK LARGE NUMBERS OF SIMULATIONS?
- INCREASE NUMBER OF COP TESTS IN HARDWARE
V.T. → scaling
ATD → RT
scaling
COP
RT
Load case
BC
Degree of detail
GM
Hw
VT
Mtx card.
what are the limits of the model?
→ behaviour law.


1 Barriers
Complexity of design / load case
Variability / Scatter of outputs
Intellectual property
Diversity in FE tools
Knowledge in FE outside of industry
Complexity of traceability tools (IT)
Bounds of extrapolation for validations
Shortage of data for occupant model
Need for data for validation for additional load cases
Missing physical validation tools
Opportunities
Gaining trust from existing UT
Leveraging existing component testing
Open source assessment tools
Benefits
Increase in robustness with
- test severity
- test mode
- occupant size, position
2 Solutions
Prioritize and limit components that need validation
Define hardware scatter and realistic accuracy targets
Looking at UT already used in other disciplines
use subsystem tests as validations
Develop validation tool for a range of occupants
3 Develop Trust
multi-step approach to develop exposure and experience
Transparency of processes
Standardization of tools and processes
Quality checks
Validation with physical testing
Developing traceability tools that can ensure model consistency
Develop and standardize glossary of UT terminology
4 VT in regulation and type approval
Begin with small variation on existing type approval tests
Extension of type approval to variants of the same vehicle
Begin with simple regulation test (eg, EuroNCAP head impact)