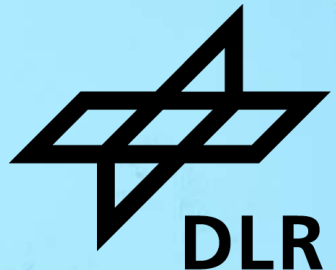


SIMULATION-BASED V&V OF DRIVING FUNCTIONS IN THE GAIA-X DATA ECOSYSTEM

Arne Lamm, Head of Group, German Aerospace Center (DLR e.V.)



Assuring Safety of Highly Automated Driving Functions

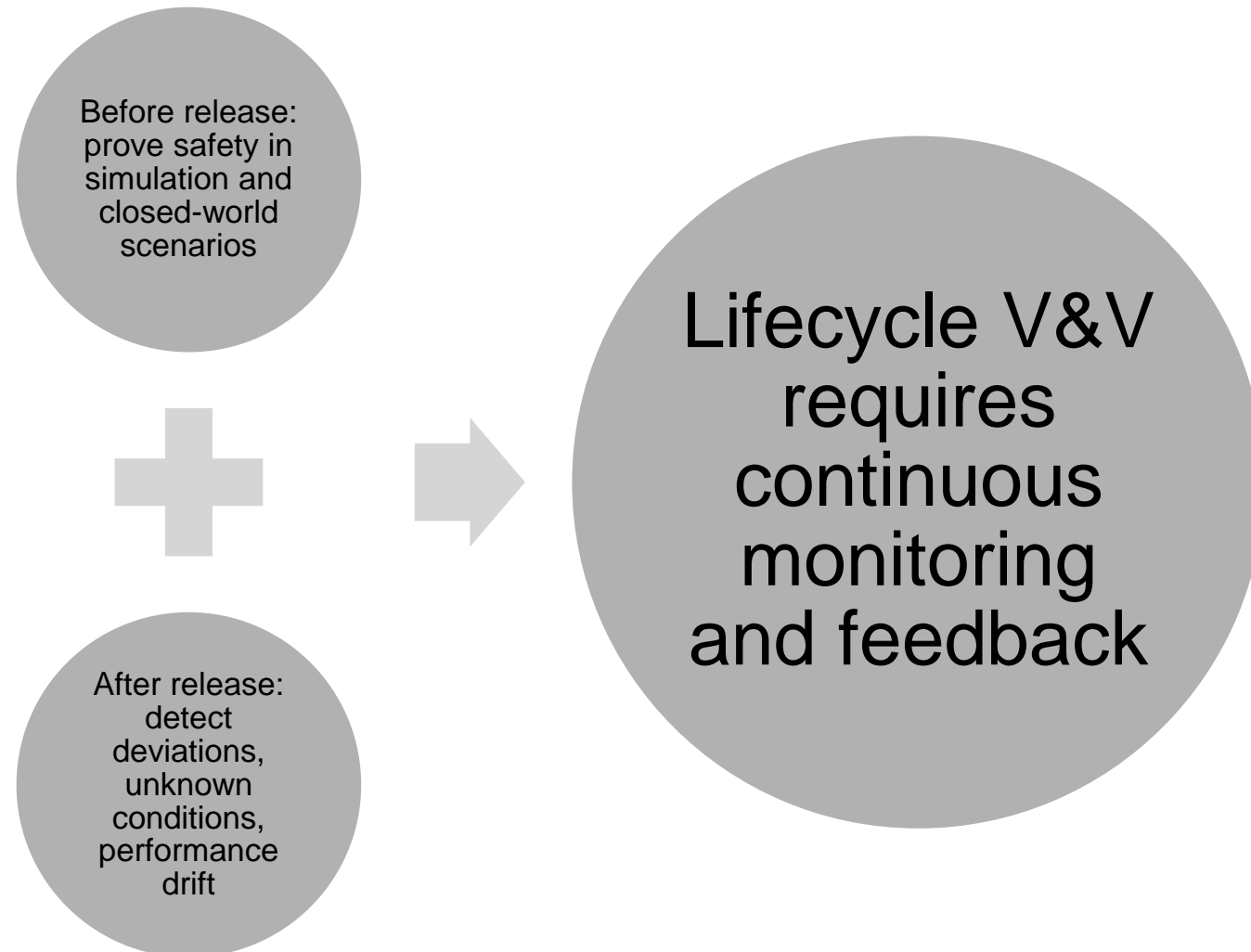


Driving functions must operate safely under variable real-world conditions

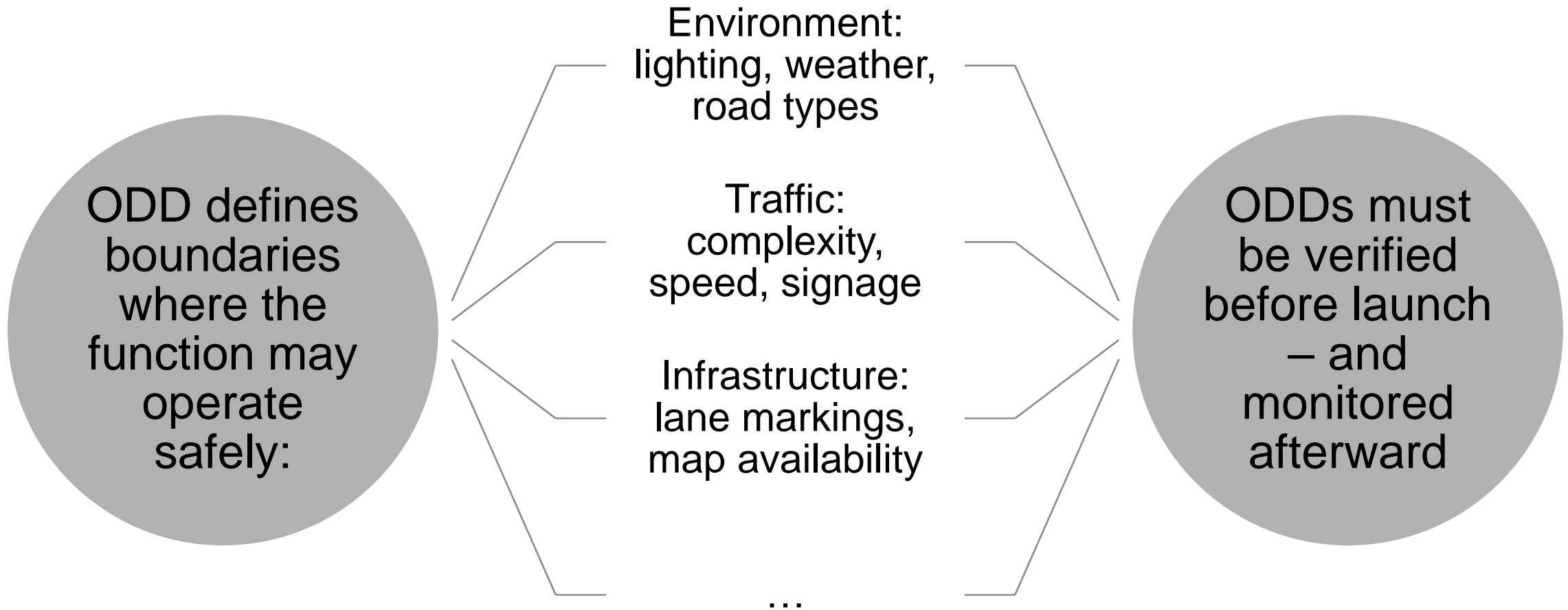
Traditional V&V methods are limited in scope and scalability

Simulation and data-driven methods are essential to bridge the gap

The V&V Lifecycle Challenge



What is an Operational Design Domain (ODD)?



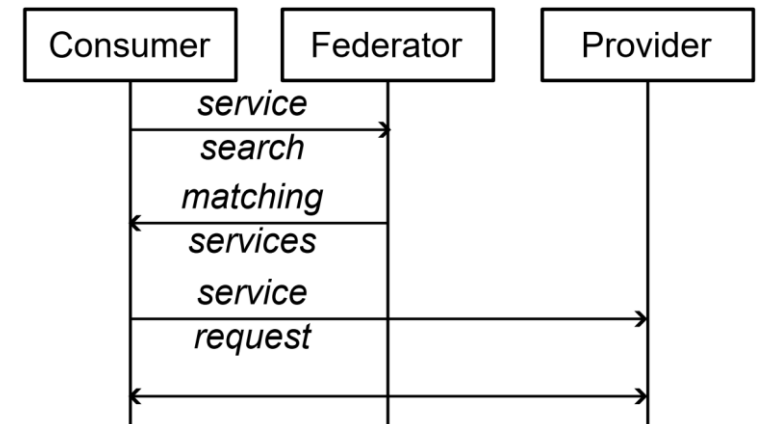
What is GAIA-X? A Federated Data Infrastructure



European initiative for sovereign and interoperable data sharing

Supports trust, access control, and certification across stakeholders

Not a platform, but a set of architecture and governance rules



Why GAIA-X Can Support Simulation-based V&V



Access to diverse, standardized datasets across partners

Seamless integration of simulation, sensor models, test services

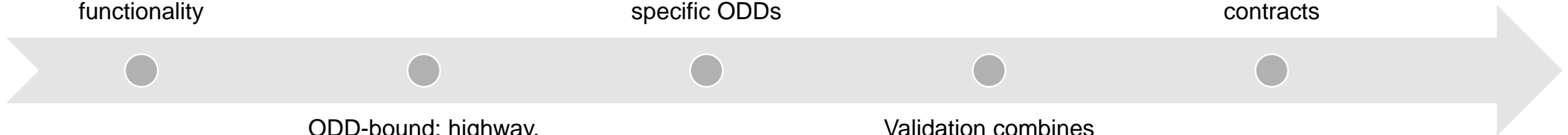
Supports transparency, explainability, and contract-based data use

Example: Online ODD Monitoring for ALKS

Automated Lane Keeping System (ALKS) – Level 3 functionality

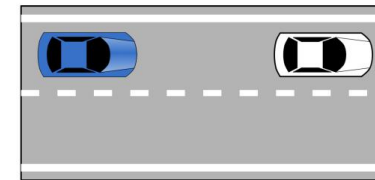
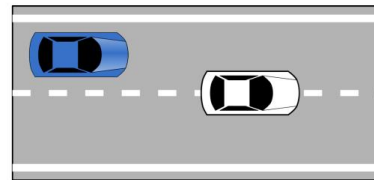
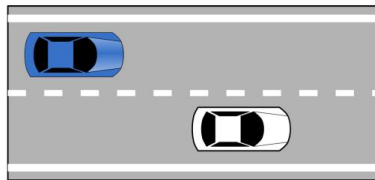
Sensor models and ALKS must meet requirements under specific ODDs

Results shared with OEMs and authorities via data space contracts



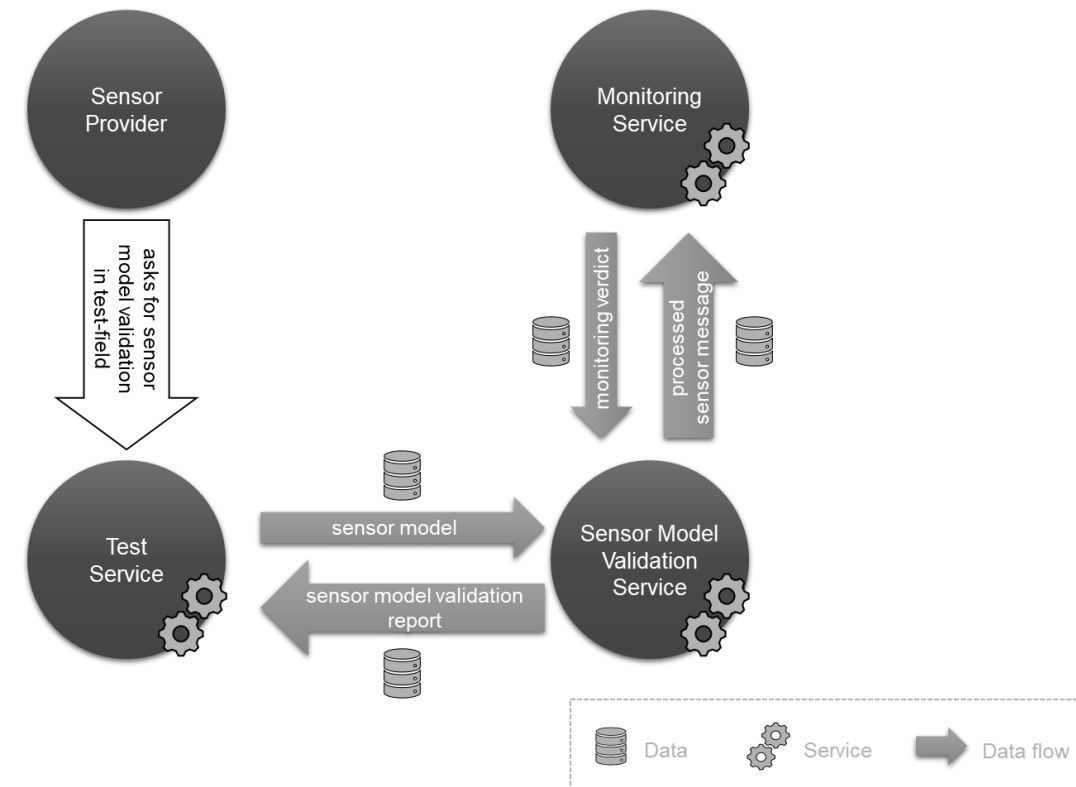
ODD-bound: highway, good visibility, clear lane markings

Validation combines simulation, scenario replay, physical test data

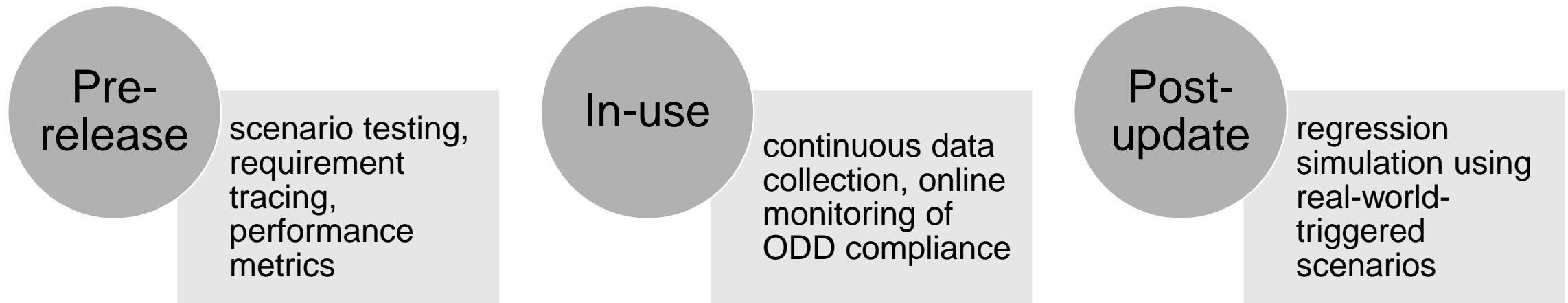


Example: Online ODD Monitoring for ALKS

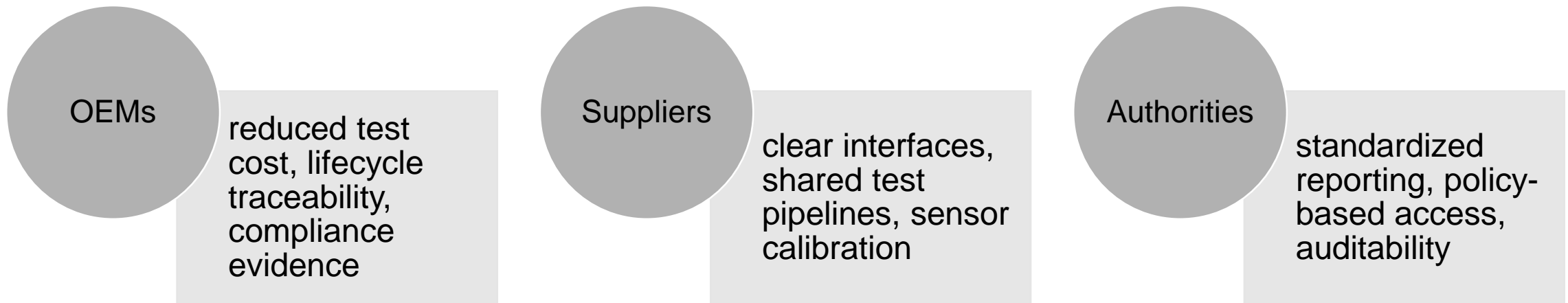
- Vehicle detects heavy rain and poor lane markings – borderline ODD
- Event is logged and shared in data space for analysis
- Helps OEM assess if system needs update or ODD must be adjusted



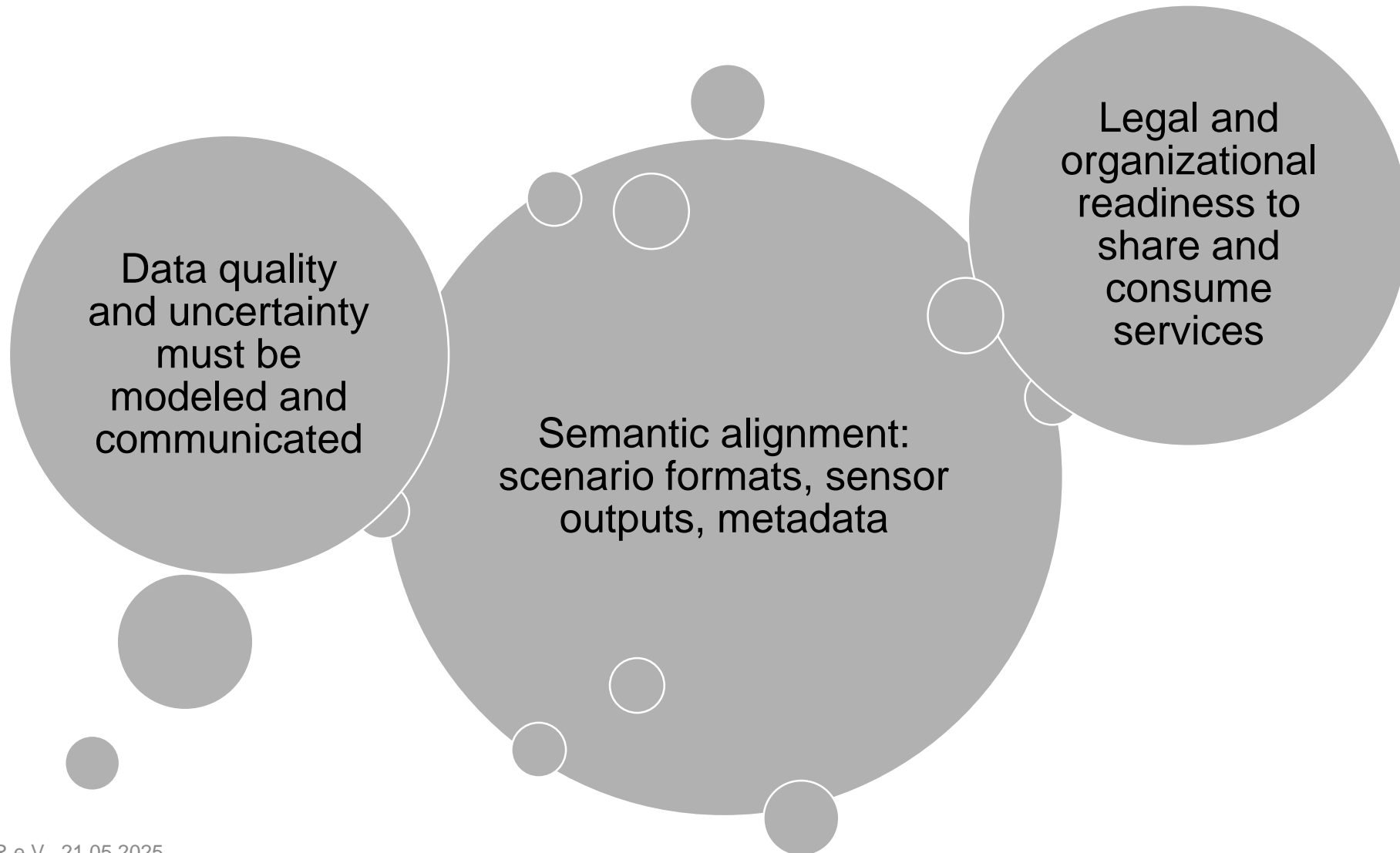
Federated V&V Workflow: A Lifecycle View



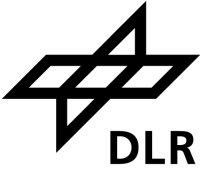
Benefits for Stakeholders



Challenges and Considerations



Take Home Message

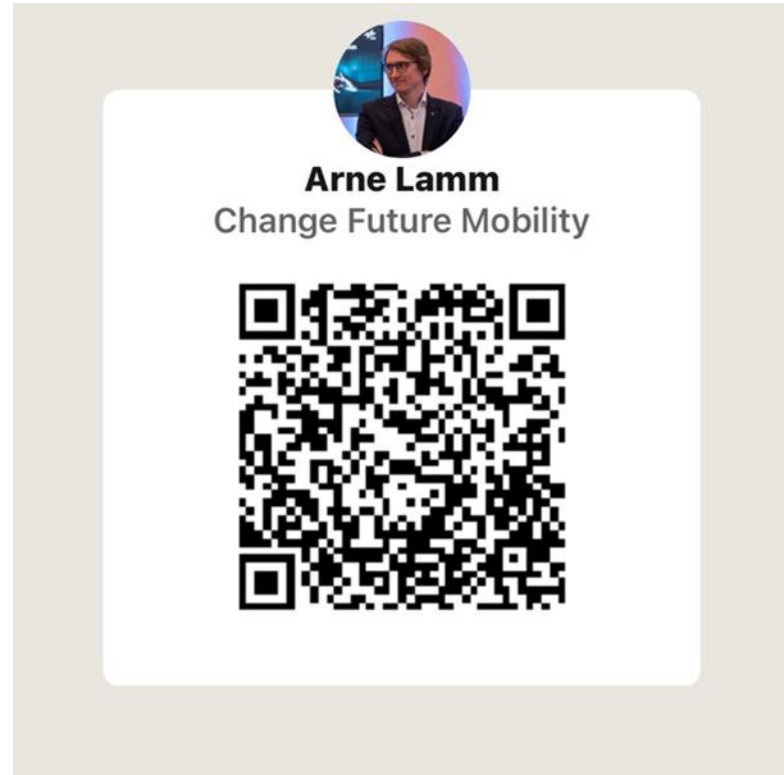


Simulation-based V&V is essential for scalable and trustworthy automation

GAIA-X enables federated, transparent collaboration across the V&V lifecycle

From data to deployment, safe driving functions need a shared ecosystem

Get in touch



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DLR e.V. – Institute of Systems Engineering for Future Mobility

Topic: **Simulation-based V&V of Driving Functions in the GAIA-X Data Ecosystem**

Date: 2025-05-21 (YYYY-MM-DD)

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Institute: Systems Engineering for Future Mobility

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