21.11.10 SIPadus Workshop, Safety Assurance Plenary Session

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Safety Assurance KUdos for
Reliable Autonomous Vehicles

# A scenario database linked to a virtual platform for automated driving safety development and evaluation purposes

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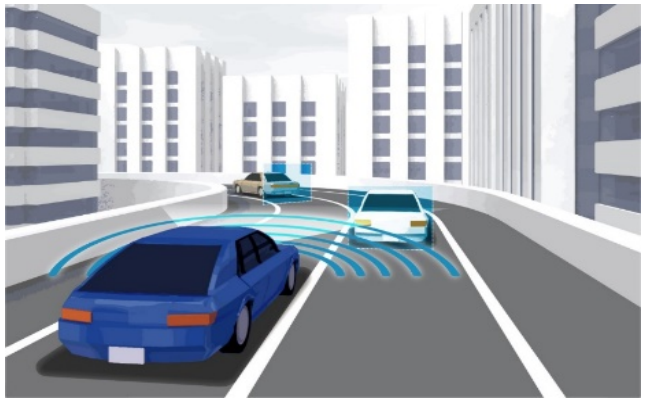
**SAKURA project**

**Japan Automobile Research Institute**

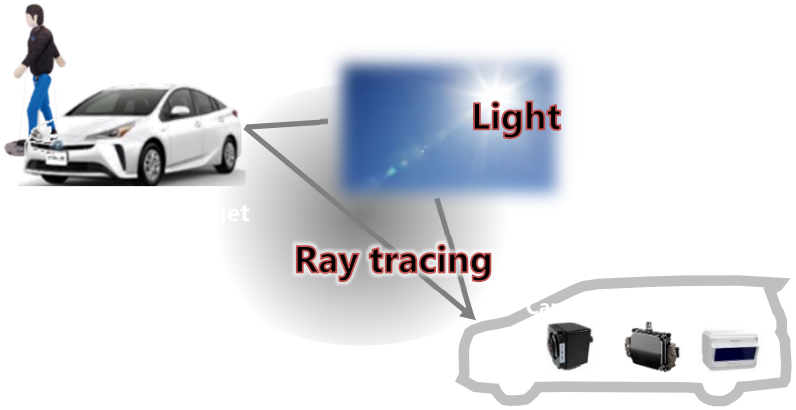
# AD safety assurance major challenges

**AD safety cannot be ensured with long-distance endurance driving tests alone**

**High complexity of traffic enviroment**



**Virtual test environment (including perception)**




**Challenge 1** Safety validation scope

**Challenge 2** Virtual platform consistent with reality

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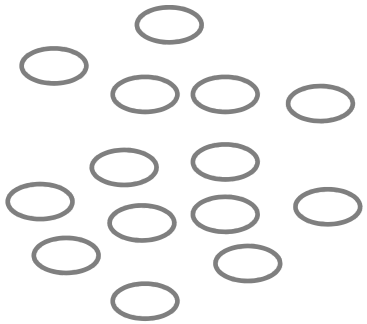
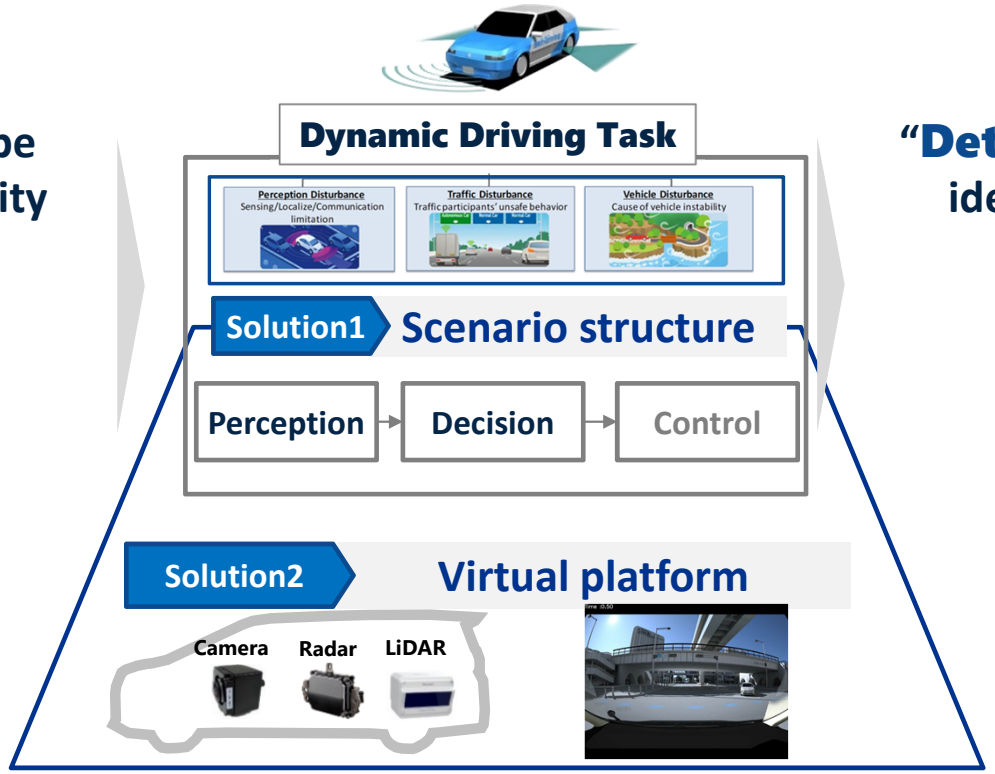
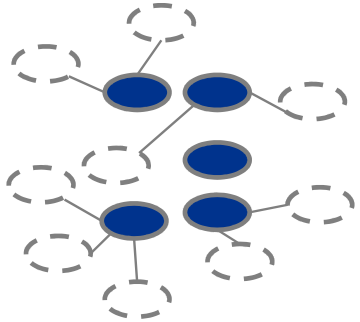
# Our approach to overcome the challenges

"**Non-deterministic**" scope due to traffic causal complexity






"**Deterministic**" scope through identification of root causes



- Structured scenarios to address root causes affecting the three subtasks of the DDT
- Qualified virtual platform including simulation of sensor weaknesses

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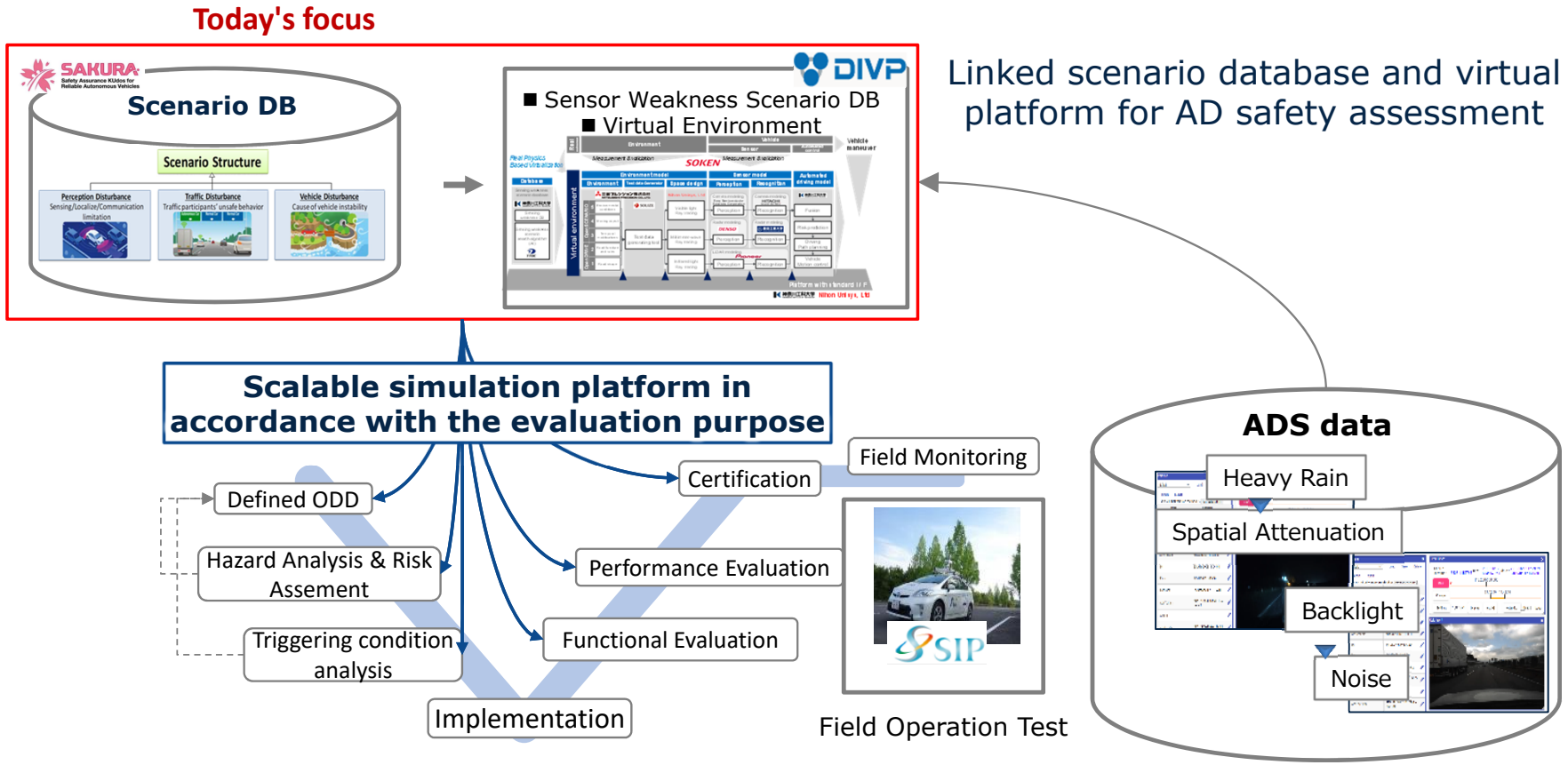
# Safety assurance strategic activities in Japan




**Aim at a scalable simulation platform to support ADS safety development and evaluation**

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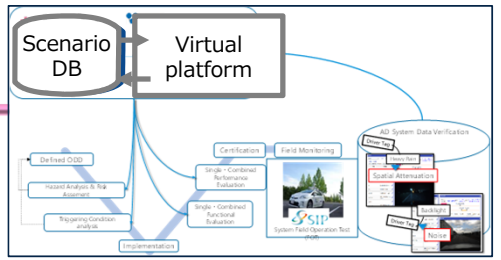
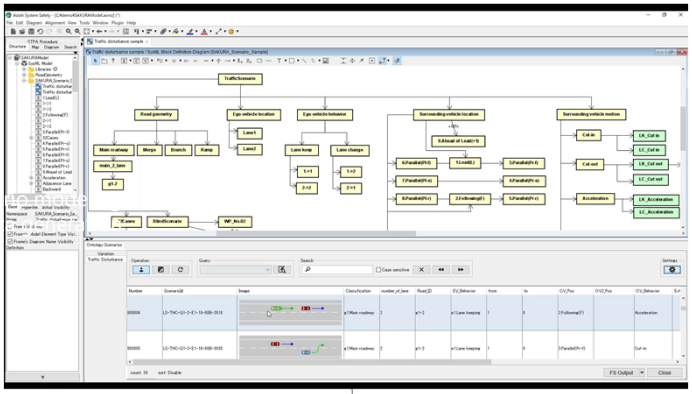
# Linked scenario database & virtual platform



Scenario database

Virtual platform

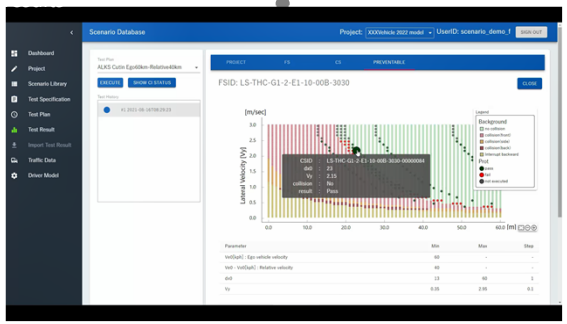
Use case Knowledge Data

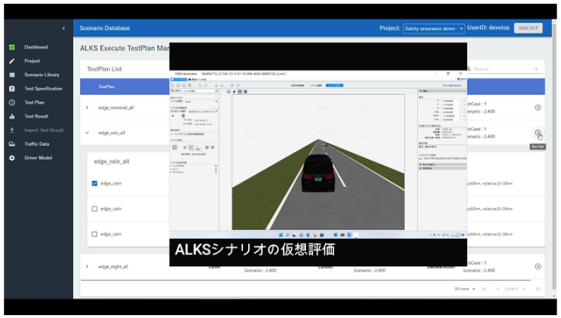
Test scenario

Real world data

Simulation test data

Simulation



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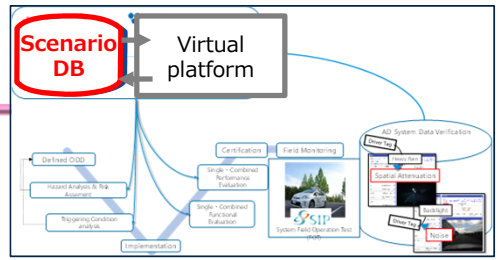
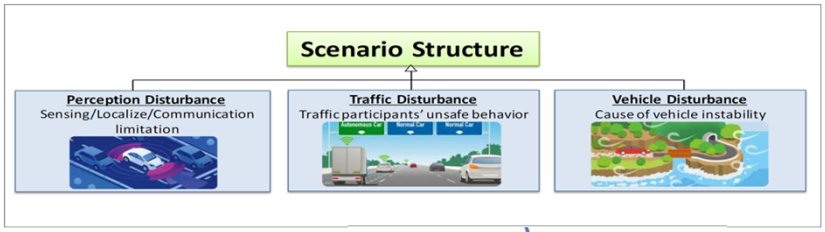
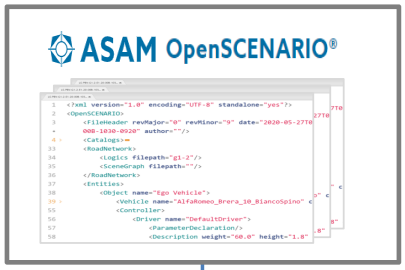
# Scenario database




**ISO DIS34502 Scenario based safety evaluation (Annex A to D)**




**Standard format**



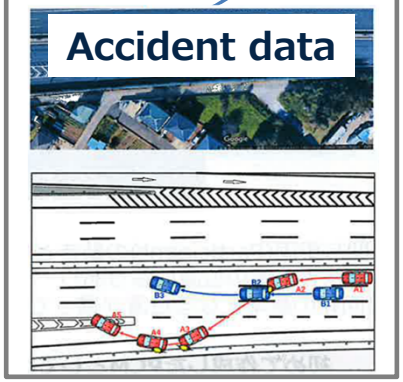

**Scenario database**

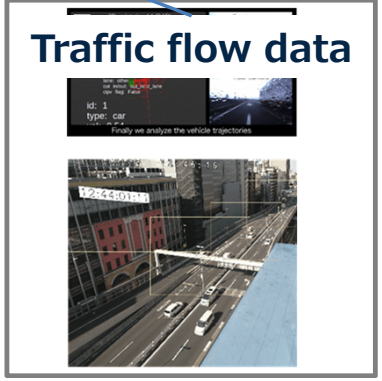
- Test scenario
- Real world data

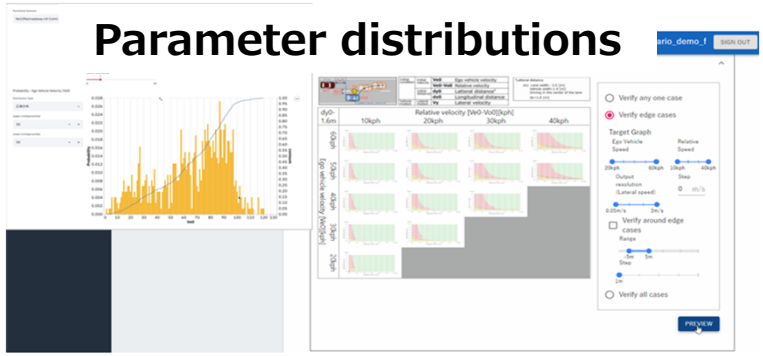
→ Simulation test data

**Virtual platform**

→ Simulation

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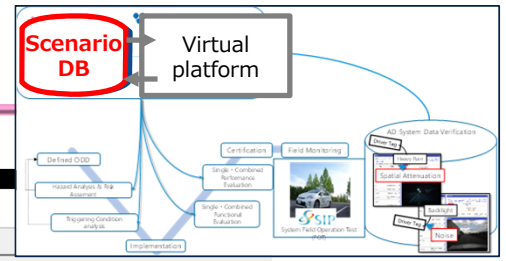
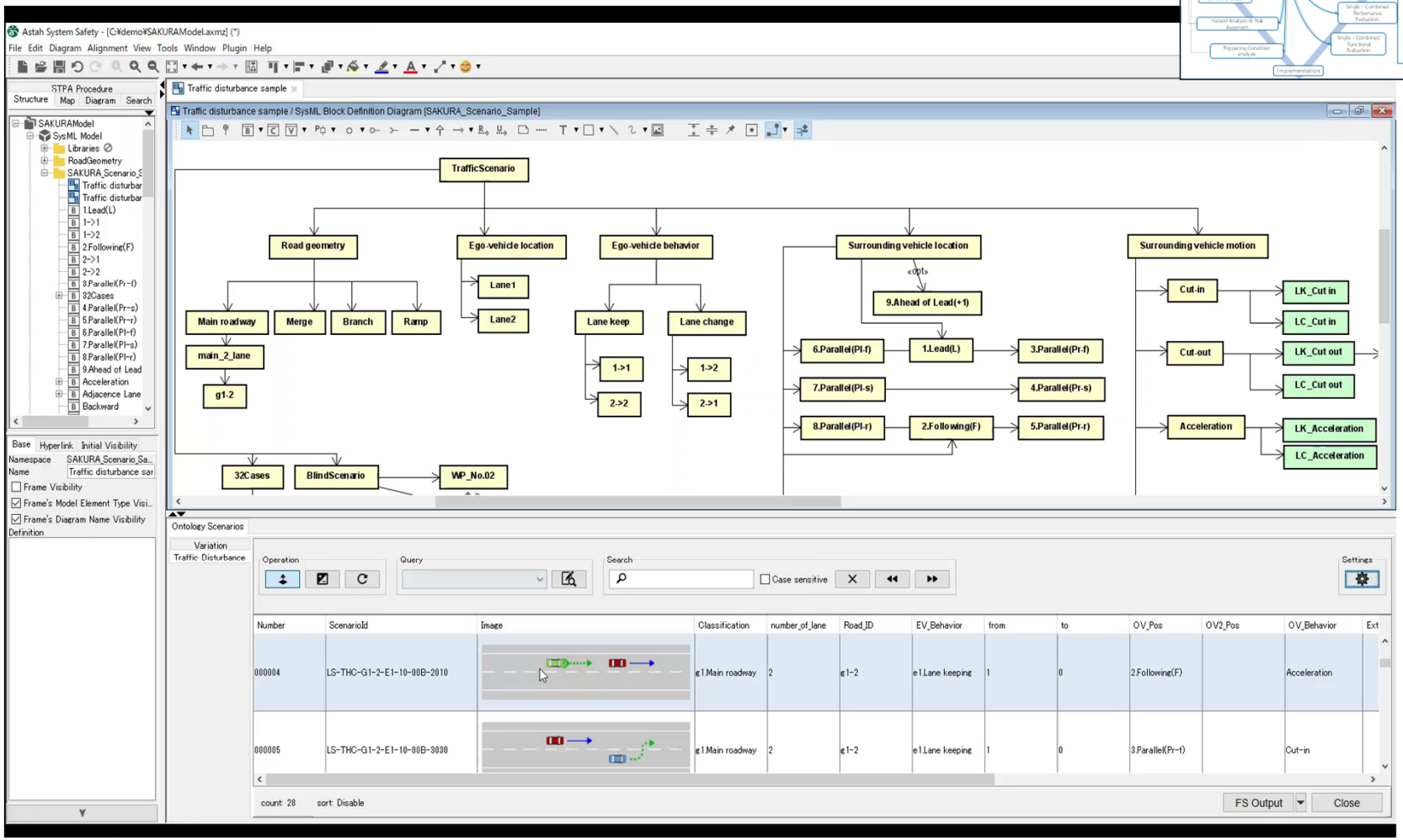
# Scenario database

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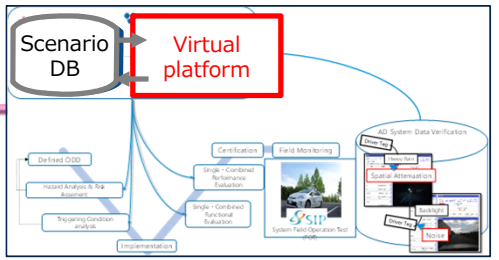
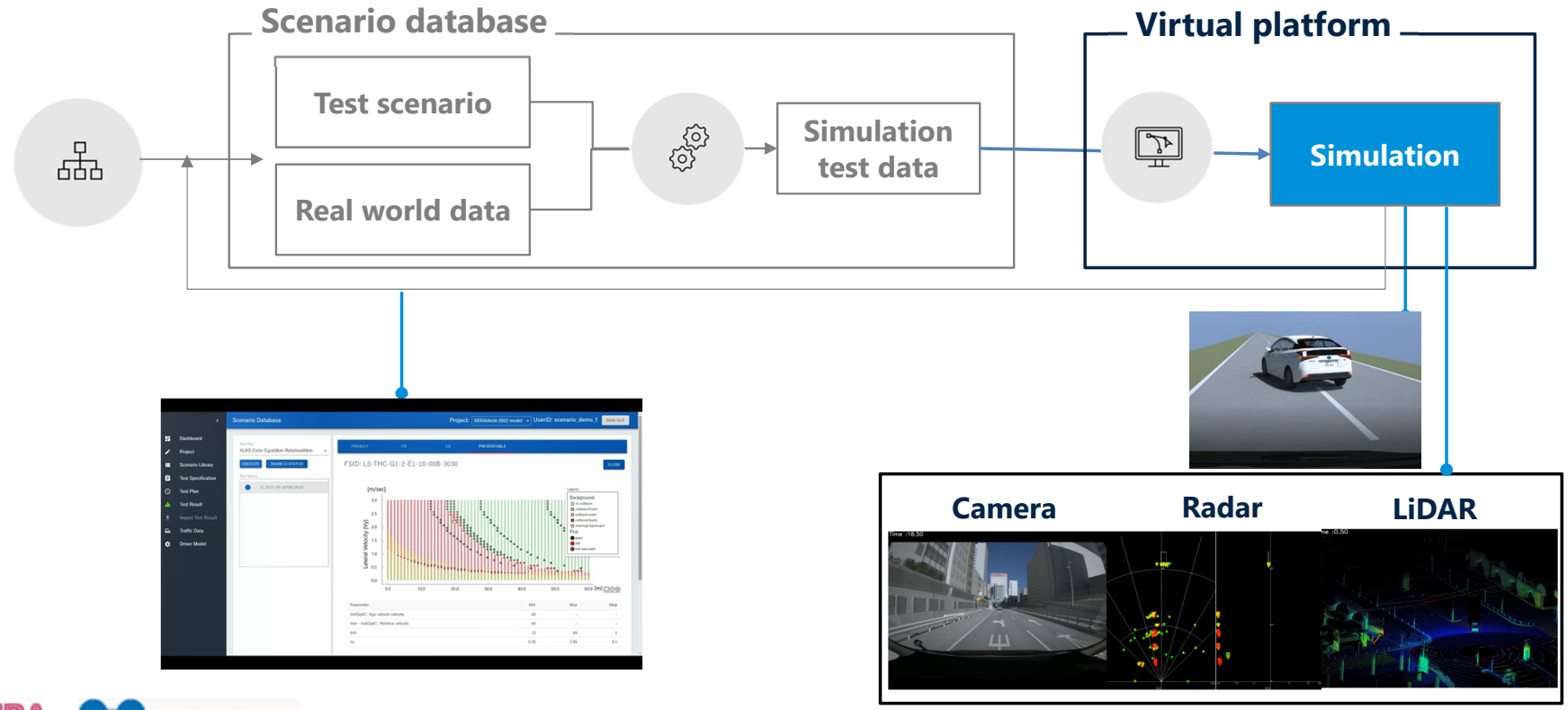
# Virtual platform and results management

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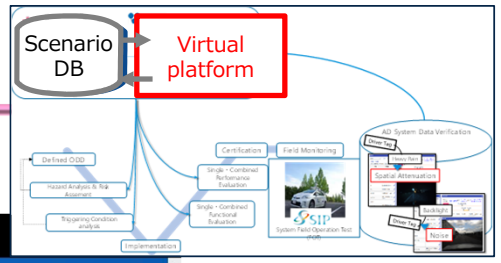
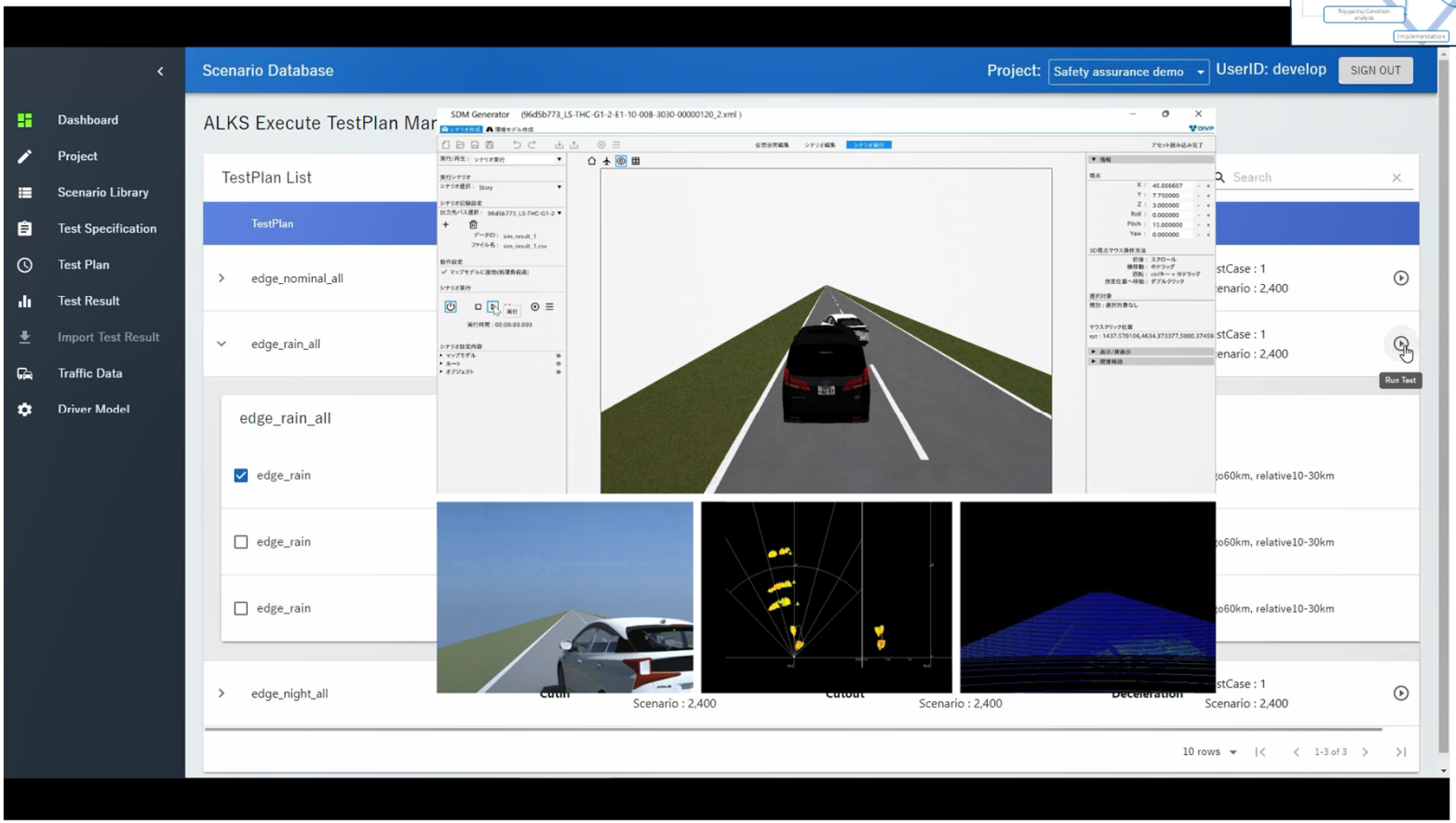
# Virtual platform and results management

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# Summary

- SAKURA scenario database linked to the DIVP virtual platform for AD safety development and evaluation purposes
  - Conversion from a non-deterministic (infinite) traffic system into a deterministic (finite) problem by focusing on subtasks and root causes of the AD system
  - Compatible with simulation platforms and results management tools
  - Gradually incorporating perception scenarios including sensor weaknesses
  - Adaptable to international regulatory, standard, and consumer testing

**Thank you!**

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