The Challenge – Assuring the Safety of Connected & Autonomous Vehicles

• The driving task requires: Perception > Decision Making > Control in an extensive range of complicated scenarios

• Automation of the driving task brings a step change in the complexity of software deployed on road vehicles.

• The human driver is very good at this, the vast majority of the time.

• Traditional methods are insufficient to test so many possible scenarios
What is a Scenario?

Ego vehicle performs emergency braking
What is a Scenario?

Ego vehicle

Actor vehicle

performs emergency braking
What is a Scenario?

Defines:
- Initial conditions of actors
- Behaviour of actors
- Environmental and geographical factors
- Expected outcomes
Vision: The Scenario Based Certification Process

- **MUSICC Scenario Database**
- **Curator**
- **Incoming scenarios**

**OEM & Technical Service**
- **Regulatory testing**
  - Simulated tests
  - Physical tests

**Other Processes** (audit, test drives, manufacturers’ declarations, …)

**Type Approval Authority**
- Certification

**Export parameterised scenarios**
Objectives and Approach

Objectives:
• Implement a language to describe scenarios, aligned with industry standards
• Build an open and expandable library for CAV certification scenarios

Approach:
• Proof-of-concept project, Apr 2018 – Mar 2020
• Close collaboration with vehicle manufacturers, ADS developers, organisations with expertise in CAV validation, and regulators
• Focus on simulation testing environments
Scenario Description Language

MUSICC Scenario Record
- Metadata
- Parameterisation
- Ego goal

• The Scenario Description Language (SDL) defines a consistent format for representing scenarios

• Stakeholders will be more likely to engage if a standardised or widely compatible format is used
# The MUSICC Roadmap

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<td>Engage stakeholders, map existing work and gaps</td>
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Multi-User Scenario Catalogue for CAVs (MUSICCC)