ASAM OpenODD Concept Project
Motivation for ASAM OpenODD

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Association for Standardization of
Automation and Measuring Systems

Agenda

Agenda

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Motivation

11 Billion miles[1]

To demonstrate with 95% confidence that AVs are 20% better than human drivers

1 N. Kalra and S. M. Paddock, "Driving to safety: How many miles of driving would it take to demonstrate autonomous vehicle reliability?," *Transp. Res. Part A Policy Pract.*, vol. 94, no. December, pp. 182–193, 20163

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Some Challenges for CAVs

11 Billion miles[1]

To demonstrate with 95% confidence that AVs are 20% better than human drivers

100,000 lives[2]

Saved (in the next 30 years) if AVs which are 10% better than human drivers are introduced

1 N. Kalra and S. M. Paddock, "Driving to safety: How many miles of driving would it take to demonstrate autonomous vehicle reliability?," *Transp. Res. Part A Policy Pract.*, vol. 94, no. December, pp. 182–193, 20163
2 N. Kalra and D. G. Groves, The Enemy of Good. 2017
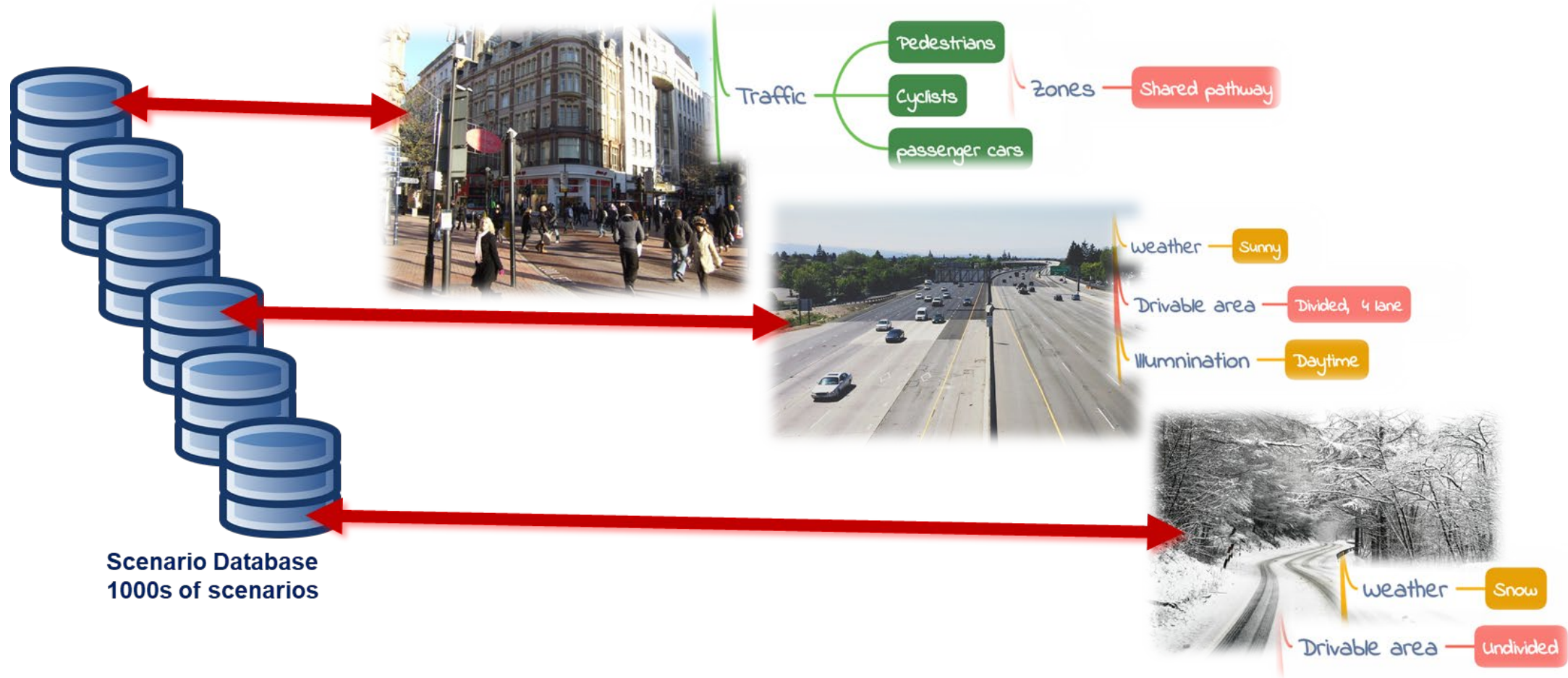
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Why is ODD important?

- Number of miles driven?
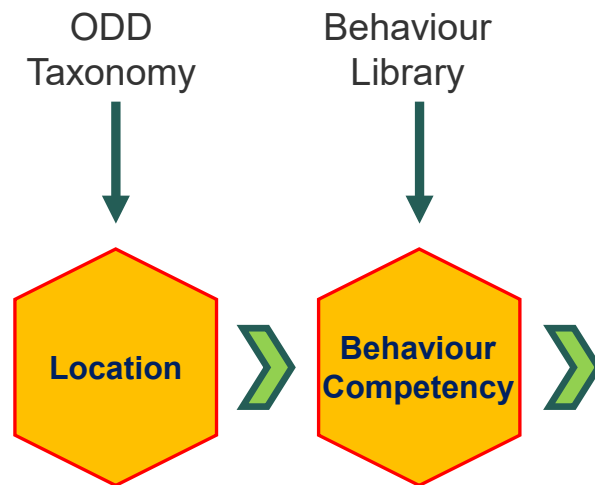- Types of scenarios experienced?
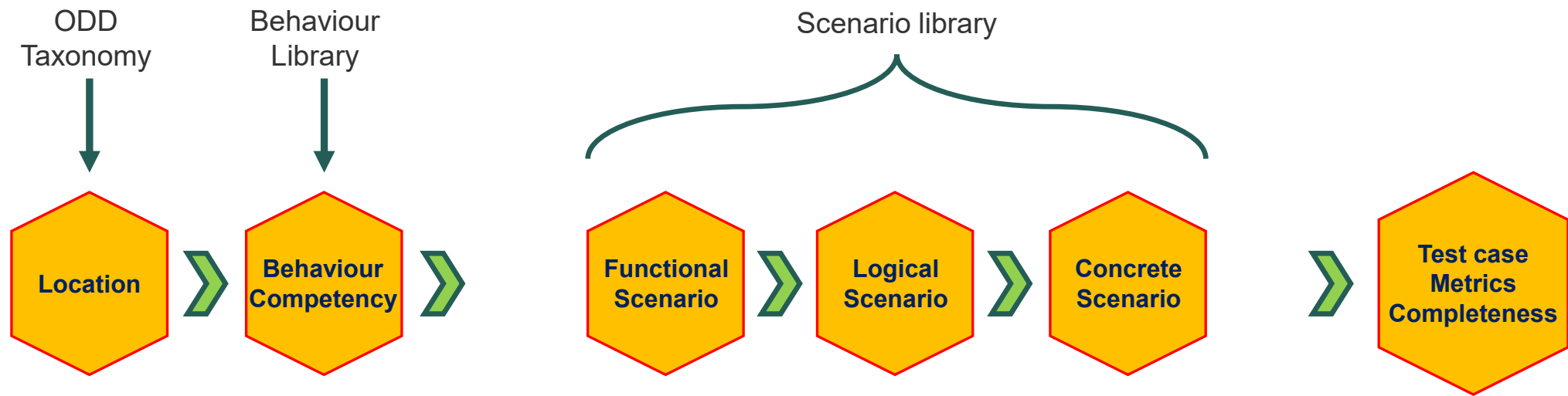
Why is ODD important?

Scenario mapping to ODD

Scenario Database
1000s of scenarios

Traffic
- Pedestrians
- Cyclists
- passenger cars

Zones — Shared pathway

weather — Sunny
Drivable area — Divided, 4 lane
Illumination — Daytime

weather — Snow
Drivable area — Undivided

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Why is ODD important?

ODD Taxonomy

Behaviour Library

Location

Behaviour Competency

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Why is ODD important?

ODD Taxonomy → **Location** → **Behaviour Competency**

Behaviour Library

Scenario library

Functional Scenario → **Logical Scenario** → **Concrete Scenario** → **Test case Metrics Completeness**
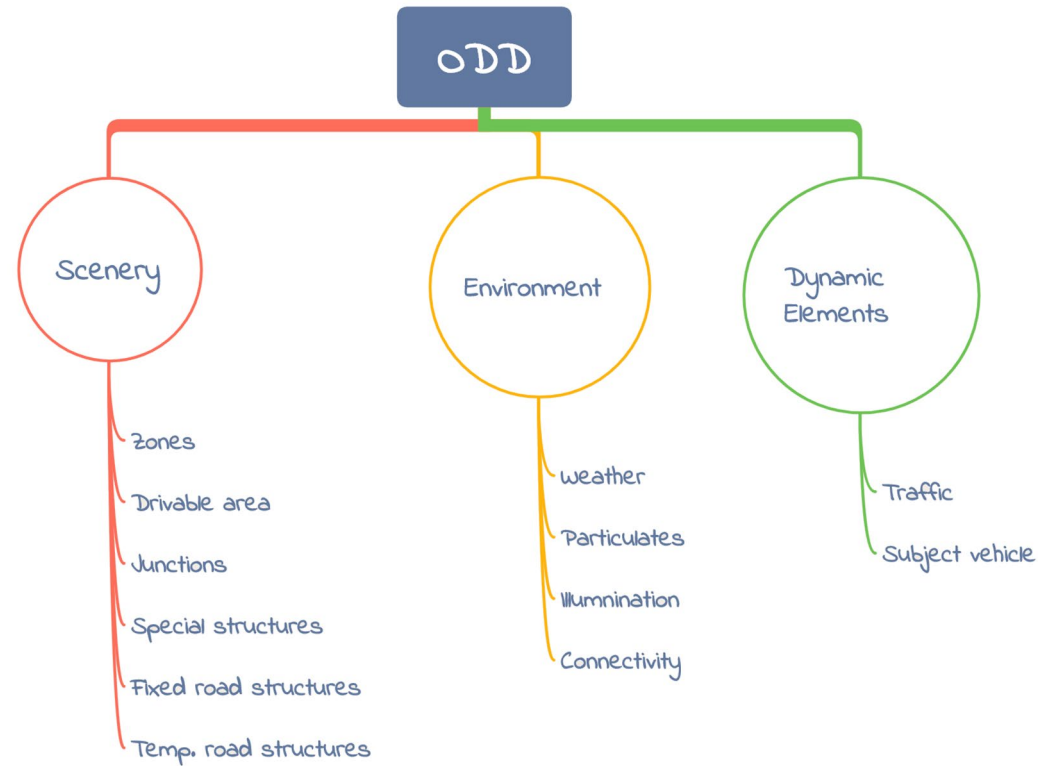
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ODD considerations

What is an ODD?

"Operating conditions under which a given driving automation system or feature thereof is specifically designed to function, including, but not limited to, environmental, geographical, and time-of-day restrictions, and/or the requisite presence or absence of certain traffic or roadway characteristics."

- SAE J3016 (2021)

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What is an ODD?

ODD Taxonomy as per BSI PAS 1883

ODD attributes awareness - Rainfall

- What does rainfall rate mean?

- How do we measure rainfall rate?

- Can the CAV measure it via on-board sensing only?

- How do we address local variability issues?

For more on Curious case of ODD: https://bit.ly/CuriousCaseODD

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Other standardization activities

- Need for common understanding
- Need for collaboration
- Crowded landscape

Major activities
- BSI (UK): PAS 1883: ODD Taxonomy
- SAE: ORAD, AVSC: ODD Lexicon
- ISO: ISO 34503: ODD Taxonomy and definition format
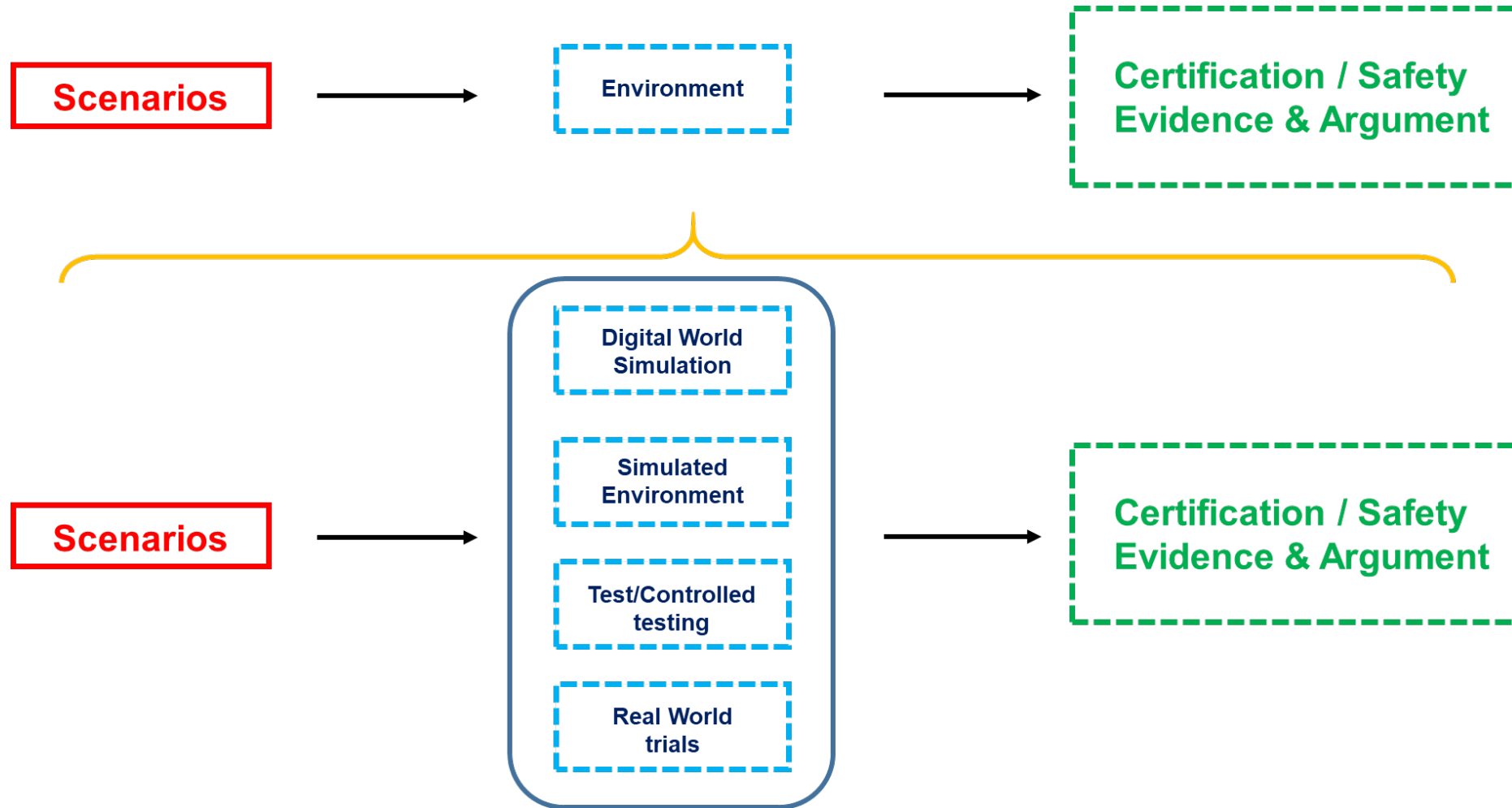- ASAM: OpenODD: simulation level ODD definition

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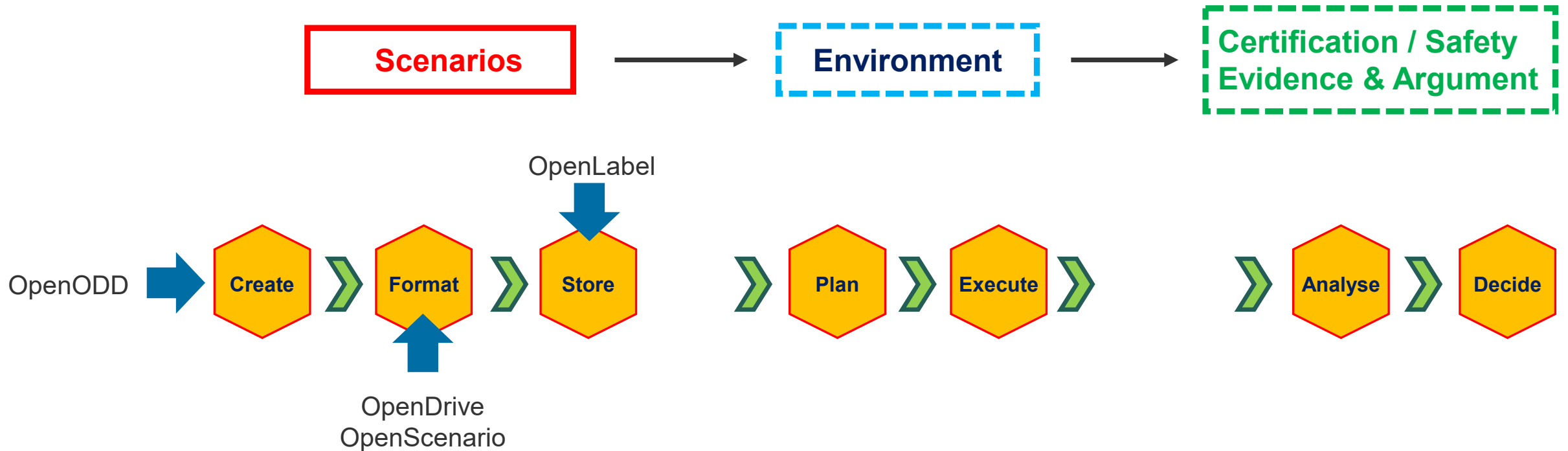# ASAM OpenODD
Objective and Work packages

ASAM OpenODD and the Testing Continuum
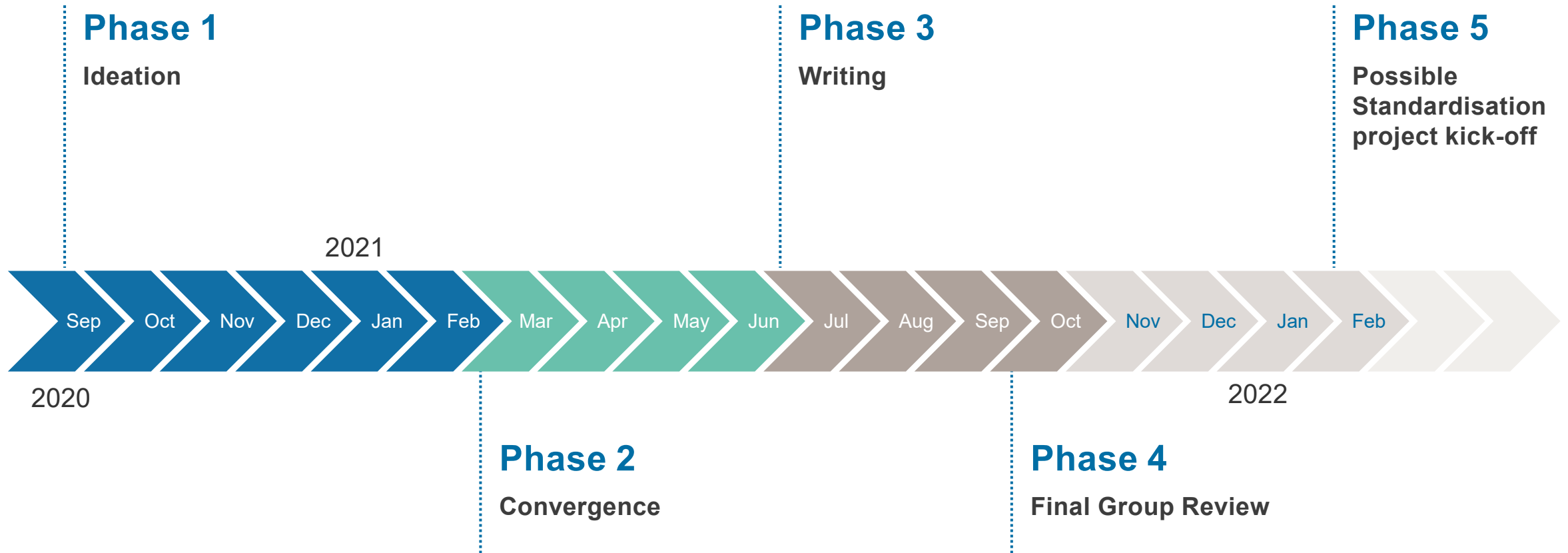
ASAM OpenODD and the Testing Continuum

ASAM OpenODD and the Testing Continuum

ASAM OpenODD
Timeline

ASAM OpenODD Project Timeline

Phase 1
Ideation

Phase 3
Writing

Phase 5
Possible Standardisation project kick-off

2021

| Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb |

2020

2022

Phase 2
Convergence

Phase 4
Final Group Review

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Thank you for your attention!

Questions…

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