

ASSURED **CAV**

Increasing system
complexity



Increasing operational
complexity

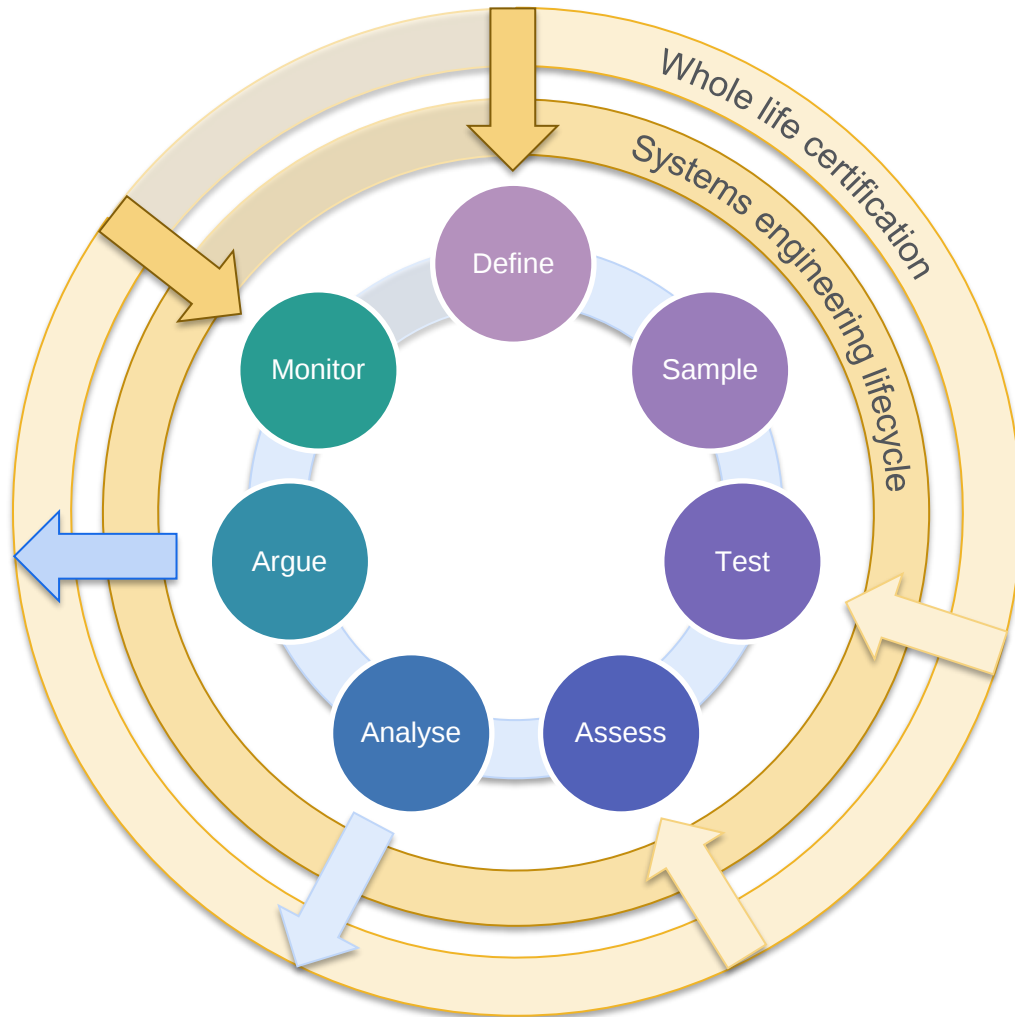
What to
test?

How to
test?

When to
stop?

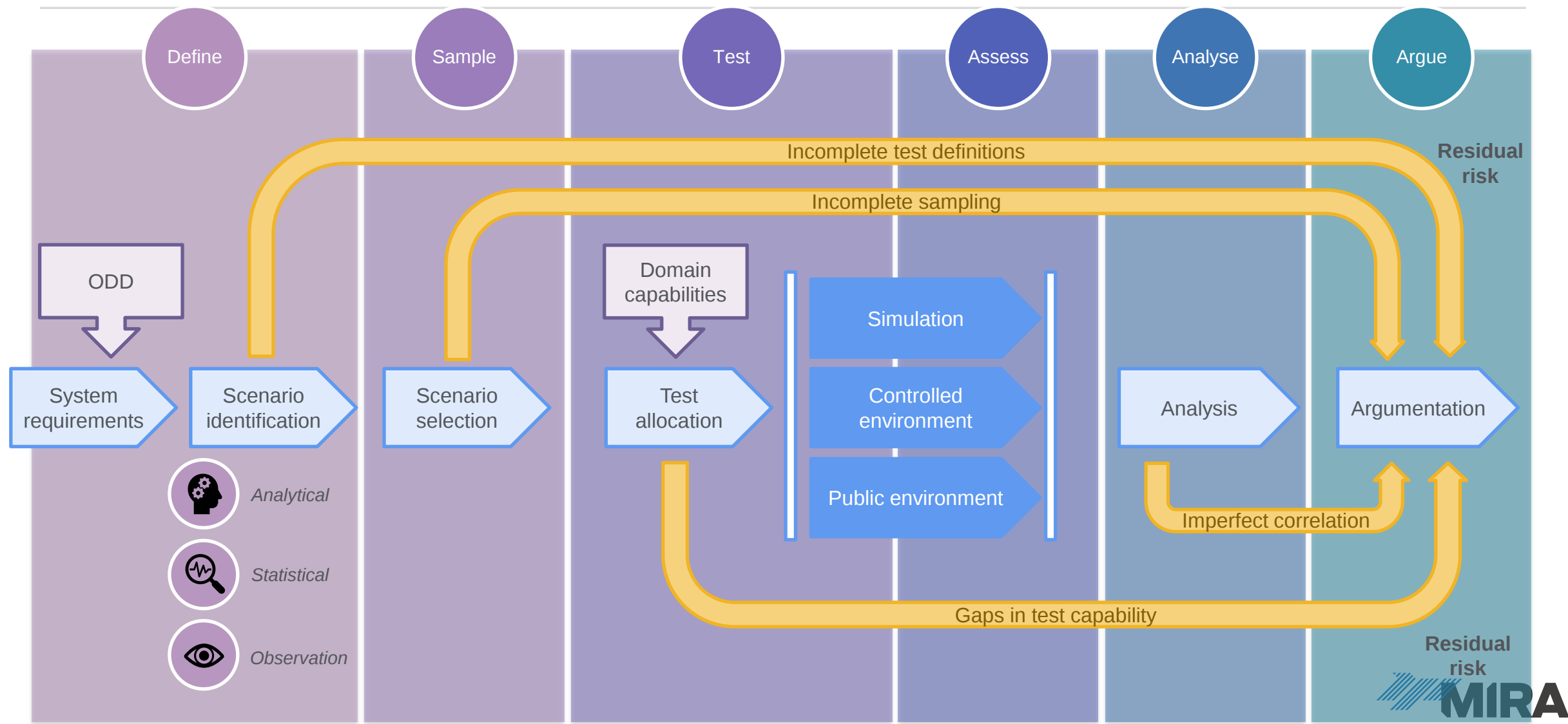
Applies as much, if not more, to Advanced Driver Assistance Systems (ADAS)

- Hard production deadlines
- Expensive programme inefficiencies
- Product risk and liability

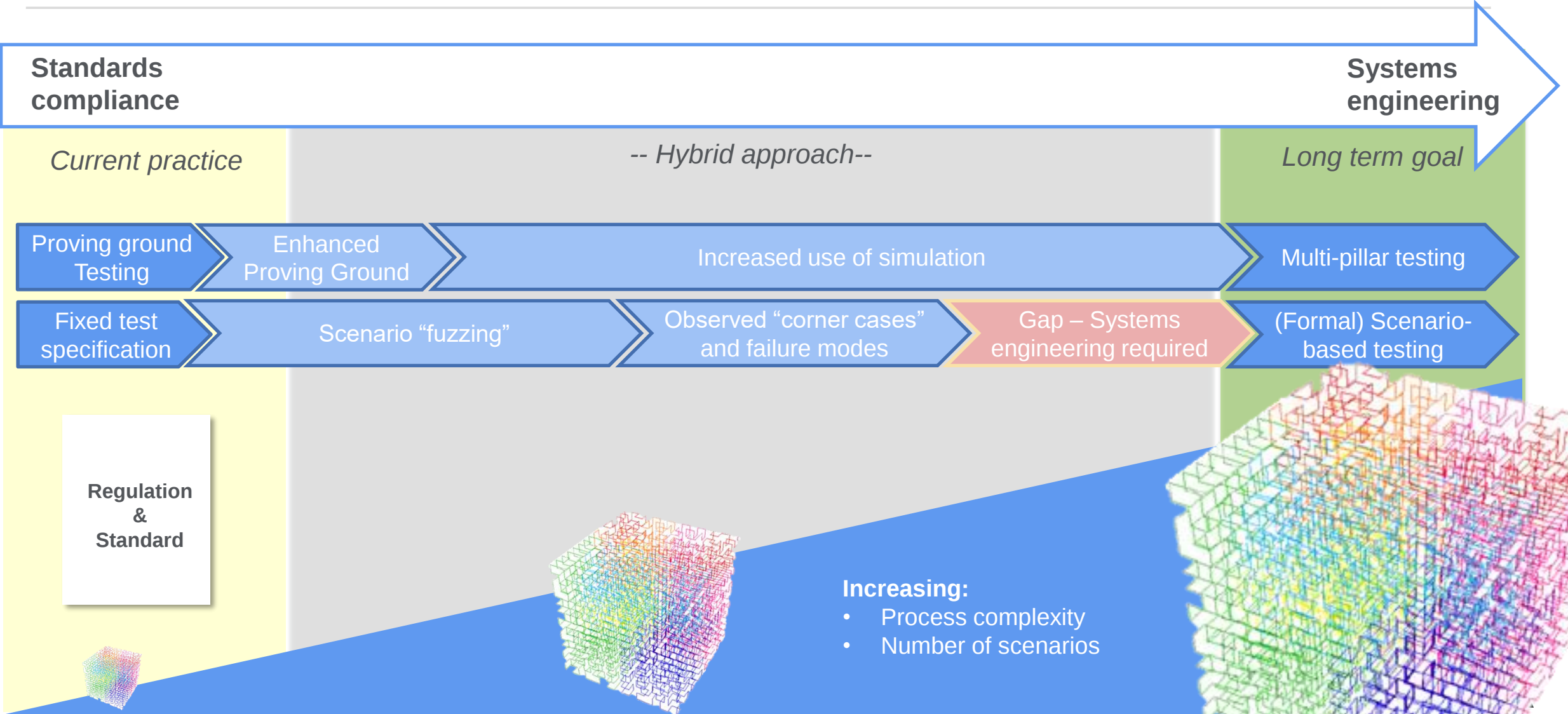


- Systematic and structured approach to tackle the challenge of scale.
- Ensuring sufficient coverage is achieved by selecting a range of scenarios.
- Benefits over range based methods which rely on 'observed' experiences.
- Question becomes:
 - What performance are we comparing against and how do we know its acceptable?

How do we know when performance is acceptable?



What performance can we achieve?



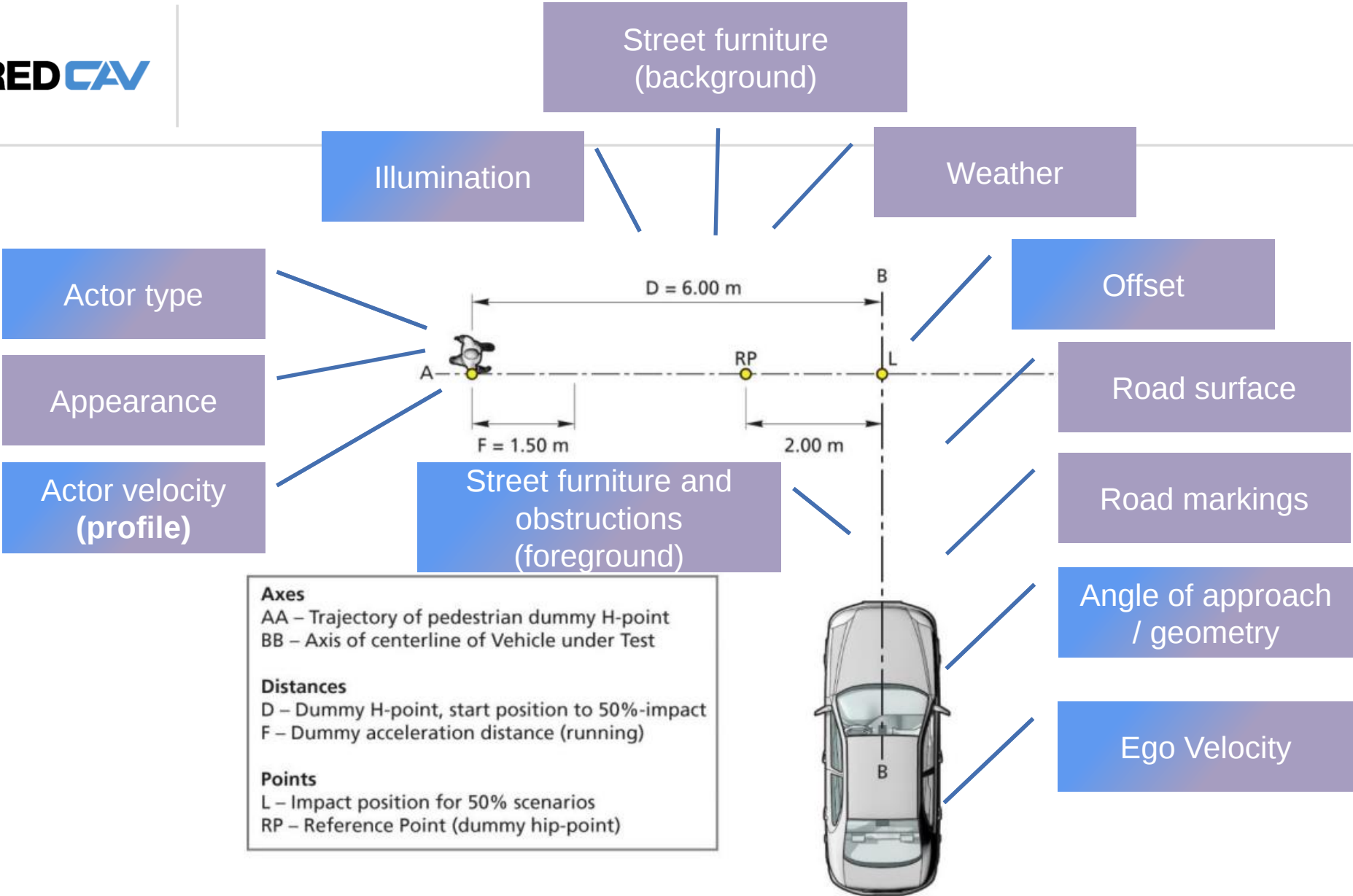
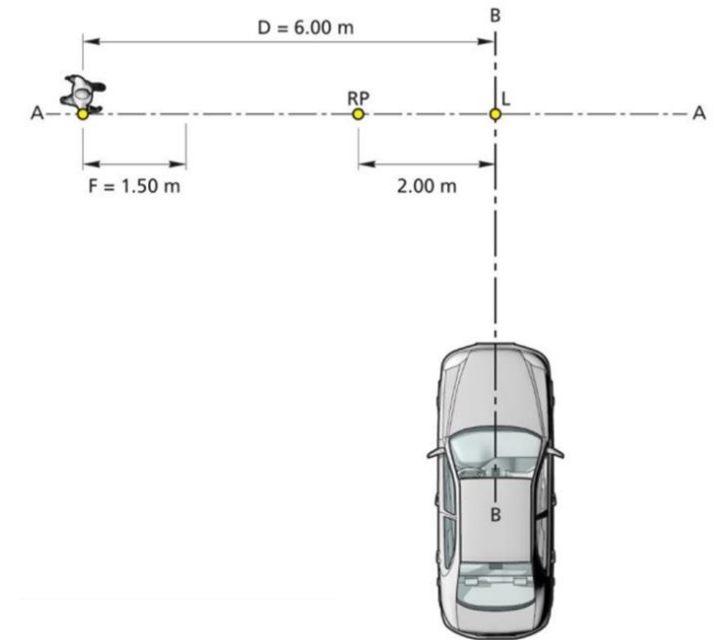
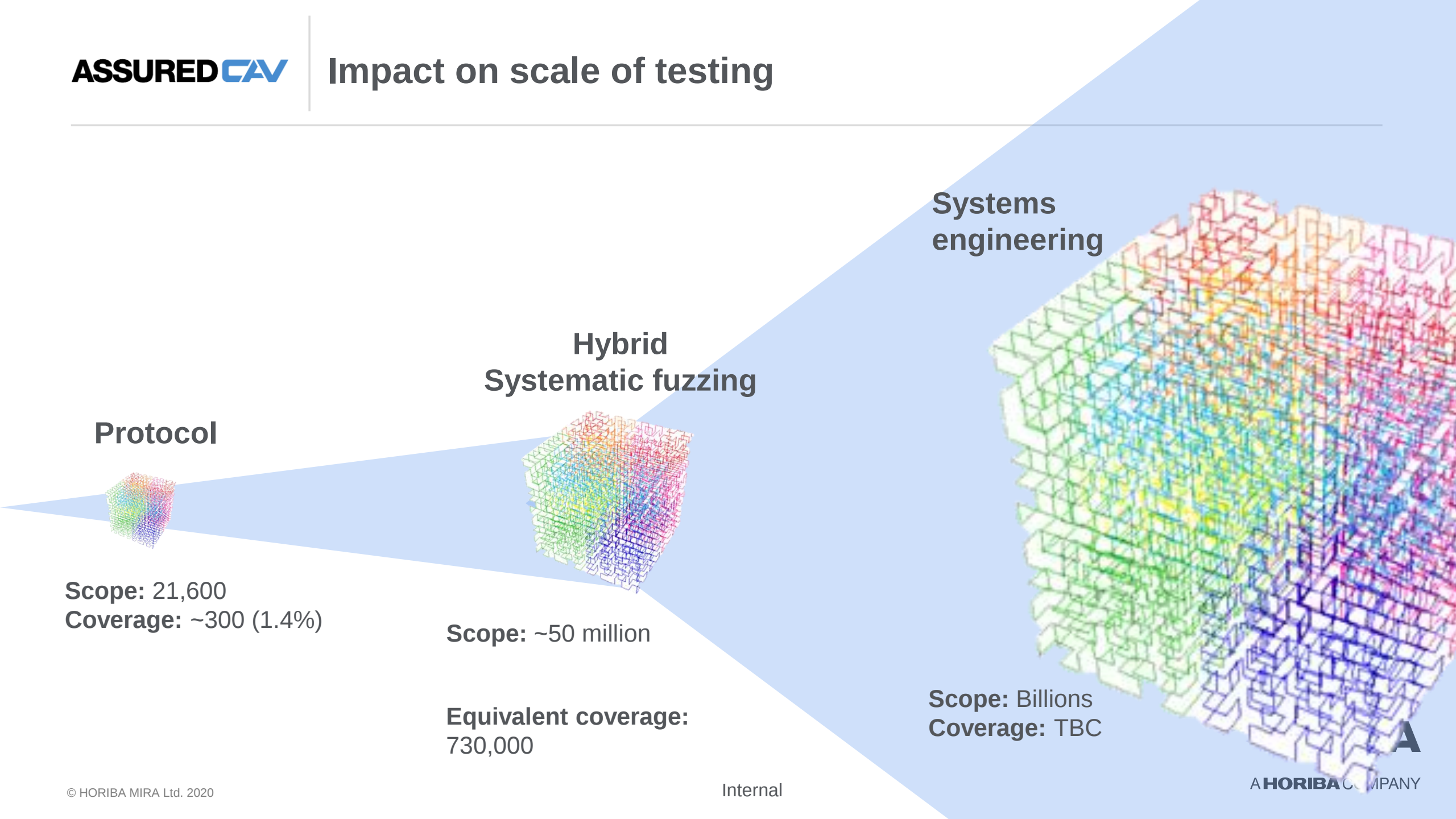
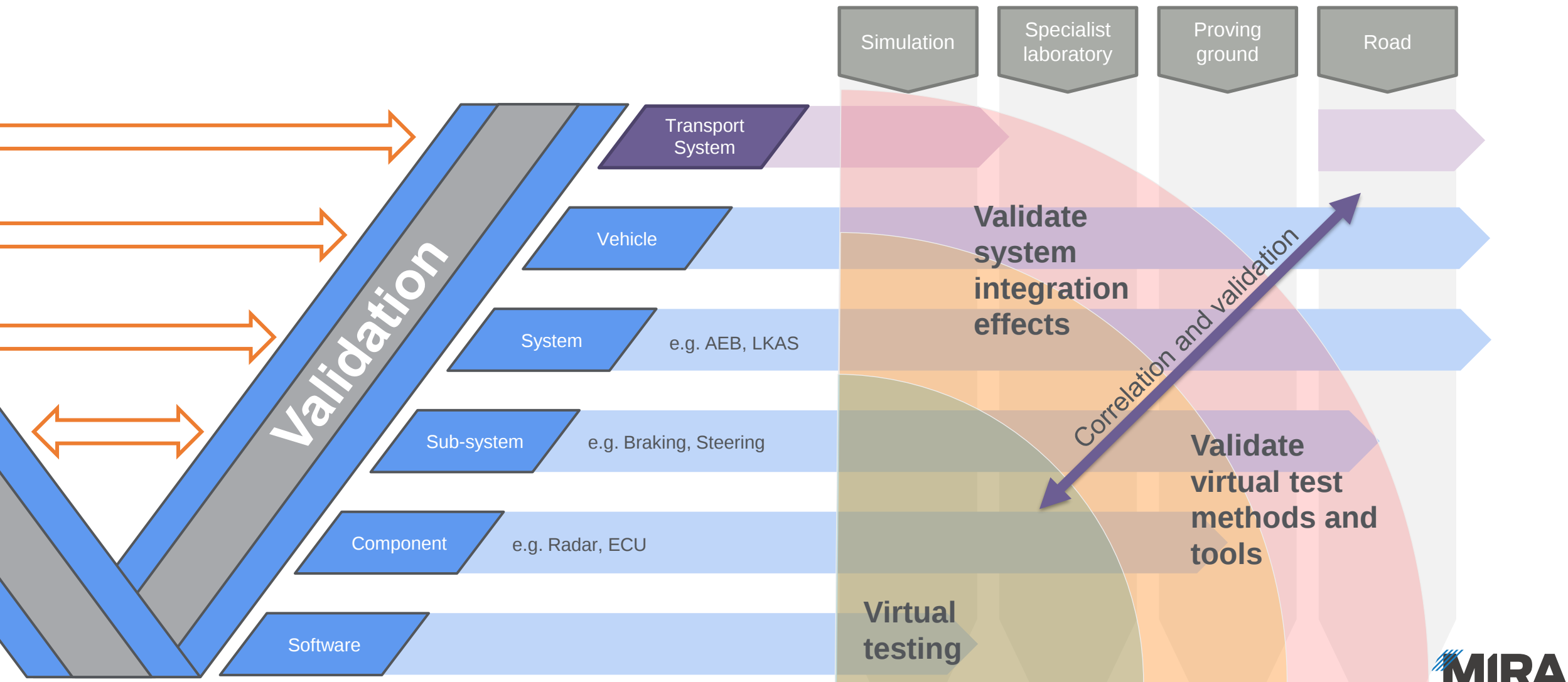


Figure 7-1: CPFA-50 scenario, Adult running from Farside

Layer	Item	Parameter	Range	Resolution	Value
Ego	Ego dynamics	Ego velocity	[10..80] km/h	10km/h	30km/h
L1: Street level	Road surface	Road condition	[Dry; Wet]	-	Dry
		Road Markings	[None; Dashed lane markings]	-	None
	Road geometry	Angle of approach	[Straight; Curve 22.5/Radius 30; Curve 30/Radius 30; Curve 22.5/Radius 50; Curve 30/Radius 50; Turn into left side-road; Turn into right side road]	-	Straight
L2: Infrastructure	Foreground	Obstruction	[None; Parked vehicle; Façade]	-	None
	Background	Scenery	[Open field; Complex City Environment]	-	Open field
L3: Temporary modifications	N/A				
L4: Movable objects	Quantity	Number of actors	[0..2]	1	1
	Location	Actor initial location	[Nearside; Farside]	-	Nearside
	Actor characteristics	Type	[Adult; Child; Infant; Cyclist; E-Scooter; Bobby Car]	-	Adult
		Clothing	[Standard; Hi-Vis; Dark]		Standard
		Actor velocity	[3; 5; 8; 15] km/h		5km/h
		Offset	[None (false positive); 25%; 50%; 75%]	-	50%
L5: Environmental Conditions	Illumination	Illumination	[Day-Bright; Day-Overcast; Night-Unlit; Night-1 light; Night-5 lights]	-	Day-Overcast
	Weather	Precipitation	[Clear; Light rain; Heavy rain]	-	Clear



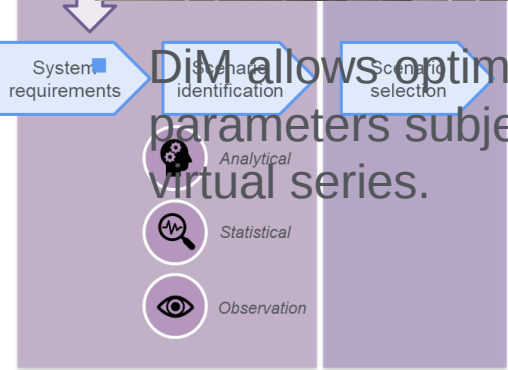




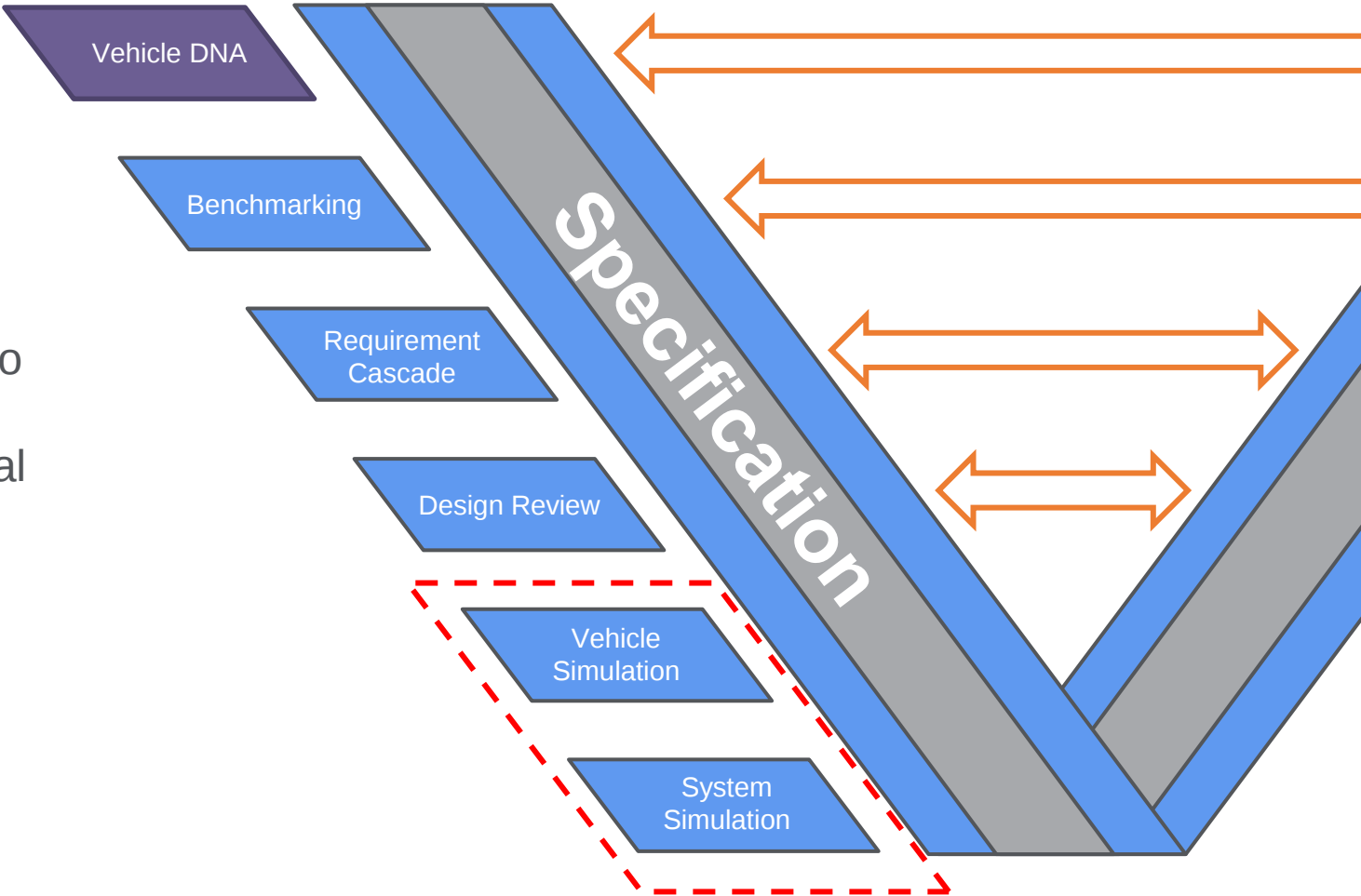
- Interest in not only the ADAS system but performance when coupled to a vehicle model.



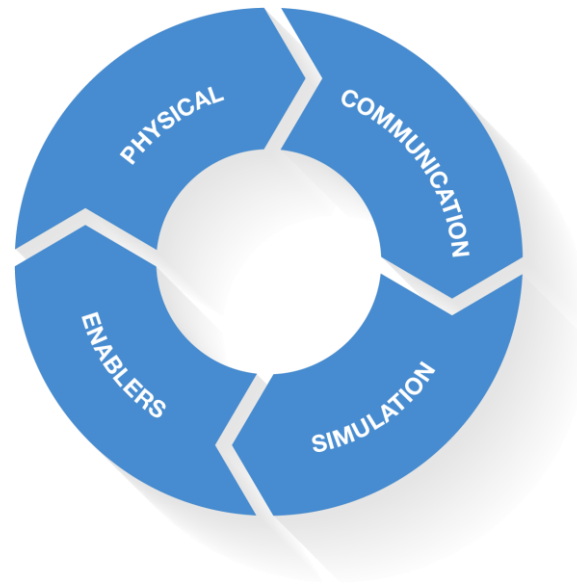
Engineering data to support scenario selection & physical validation stage.



DiM allows optimising ADAS parameters subjectively during the virtual series.



A complete ecosystem made up of key components required in the validation and verification of connected automated technology











Internal

<https://www.horiba-mira.com/assured-cav>