

S N O W B O X

S N O W B O X

ARCTIC AUTONOMOUS DRIVING

ISO 34500 serie: Test scenarios for ADS
Operational Design Domain, ODD



SNOWBOX – test area for connected automated vehicles (CAV)

Snowbox provides winter and cold testing environment and facilities for CAV technologies. It combines public roads, cross-border corridors as well as independent proving grounds with its partners. The facilities are completed with professional snow-how knowledge, engineering and information services, and digital infrastructure to contribute self-driving vehicle industry to obtain weather-proof technological and worldwide scalable solutions.



ISO 34500 – TEST SCENARIOS FOR ADS

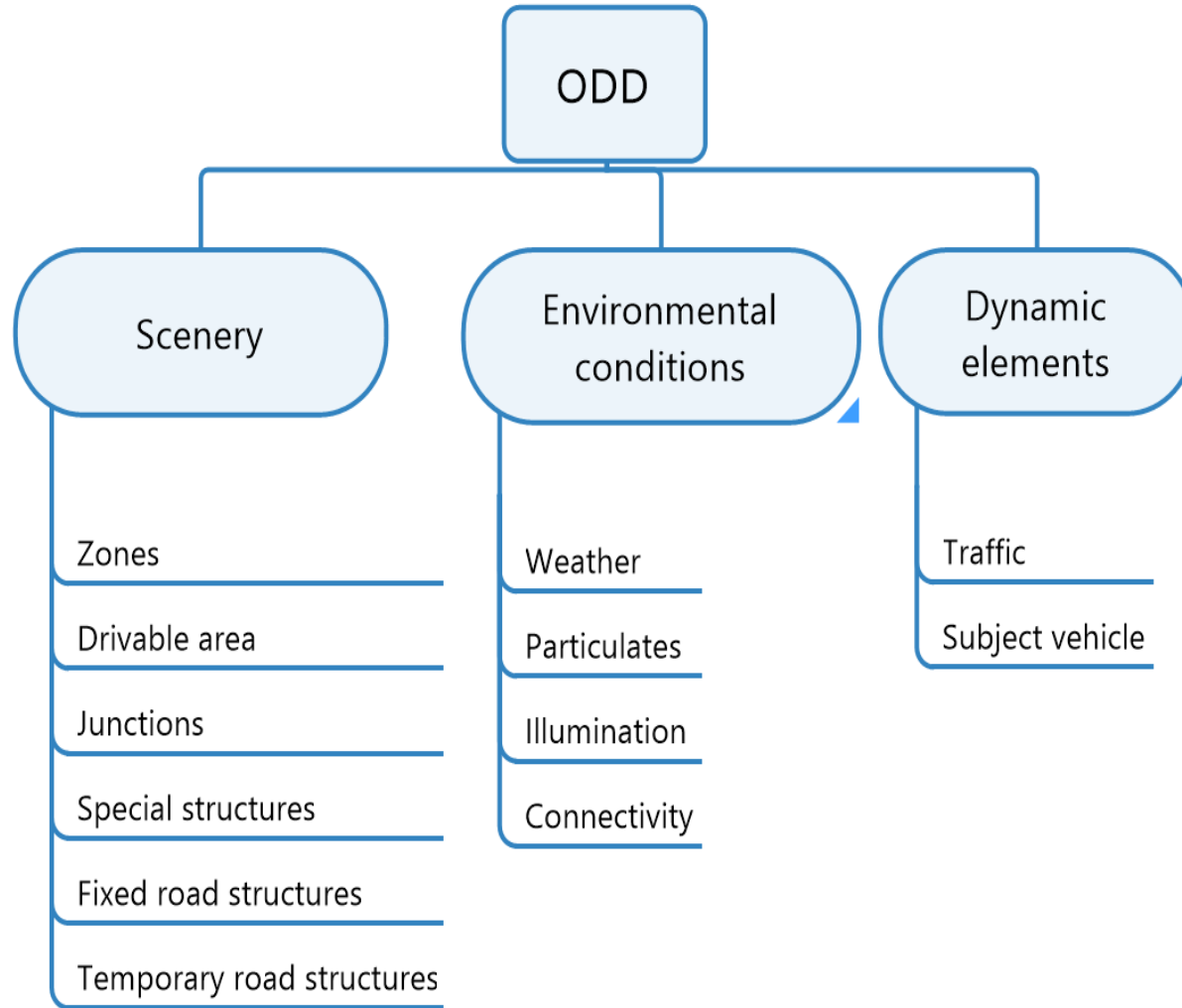
- Simulation
- Proving ground
- Open environment testing
- Terms and definitions
- Structure and processes
- Taxonomy
- Test scenarios
- Standardisointiin vaikuttaminen
- Standardien hyödyntäminen omassa toiminnassa
 - > Snowbox strategia
 - > liiketoiminta
- Verkostoituminen



Operational Design Domain, 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.
- Defining the limitations is more important than capabilities
- ODD is especially for higher levels of automation – SAE level 3 and 4

A TOP-LEVEL TAXONOMY OF THE ODD ATTRIBUTES



- **Scenery:** non-movable elements of the operating environment
- **Environment:** weather and other atmospheric conditions
- **Dynamic elements:** all movable objects and actors in the operating environment

The list of ODD attributes produced in 2017-2019 by EU EIP and MANTRA		
ODD attribute	Physical / Digital infrastructure	Static / Dynamic
Road	Physical	Static
Speed range	Physical	Static
Shoulder or kerb	Physical	Static
Road markings	Physical	Static
Traffic signs	Physical	Static
Road furniture	Physical	Static
Traffic	-	Dynamic
Time	-	Dynamic
Weather conditions	-	Dynamic
HD map	Digital	Static
Satellite positioning	Digital	Static
Communication	Digital	Static
Information system	Digital	Static
Traffic management	Digital	Dynamic
Infrastructure maintenance	Physical/Digital	Dynamic
Fleet supervision	Digital	Dynamic
Digital twin of road network	Digital	Dynamic

...	...
Roadway Surfaces - Surface de la route	
Asphalt Asphalte	Yes
Concrete Béton	Yes
Mixed= Asphalt + concrete	Yes
Grating Grille (e.g. grille d'égout)	No
Brick Pavés	No
Dirt Poussières, Saletés sur la route	No
Gravel Graviers	No
Scraped road Route grattée	No
Speed bumps Ralentisseurs	No
Potholes Trous / Nids de Poule	No
Grass Herbe	No
Roadway Edges & Markings	
Bords de route & Signalisation horizontale & Bords de route	
Lane markers Signalisation horizontale	Yes = Clear markers Oui = marquages détectables

Belgian brick road (Routes pavées Belges)



ISO 34503 Taxonomy for ODD

2 layers of Finnish ODD: Slush and Snowbox



S N O W B O X

END-USERS / STAKEHOLDERS POINT OF VIEW

- It may also be seen from **the perspective of the end-user** as the operating environment in which a system should be able to operate safely
- Allow end users (e.g. insurers, regulators, service providers, national, local and regional government), operators and regulators to reference a minimum set of ODD attributes and performance requirements in their procurements.