

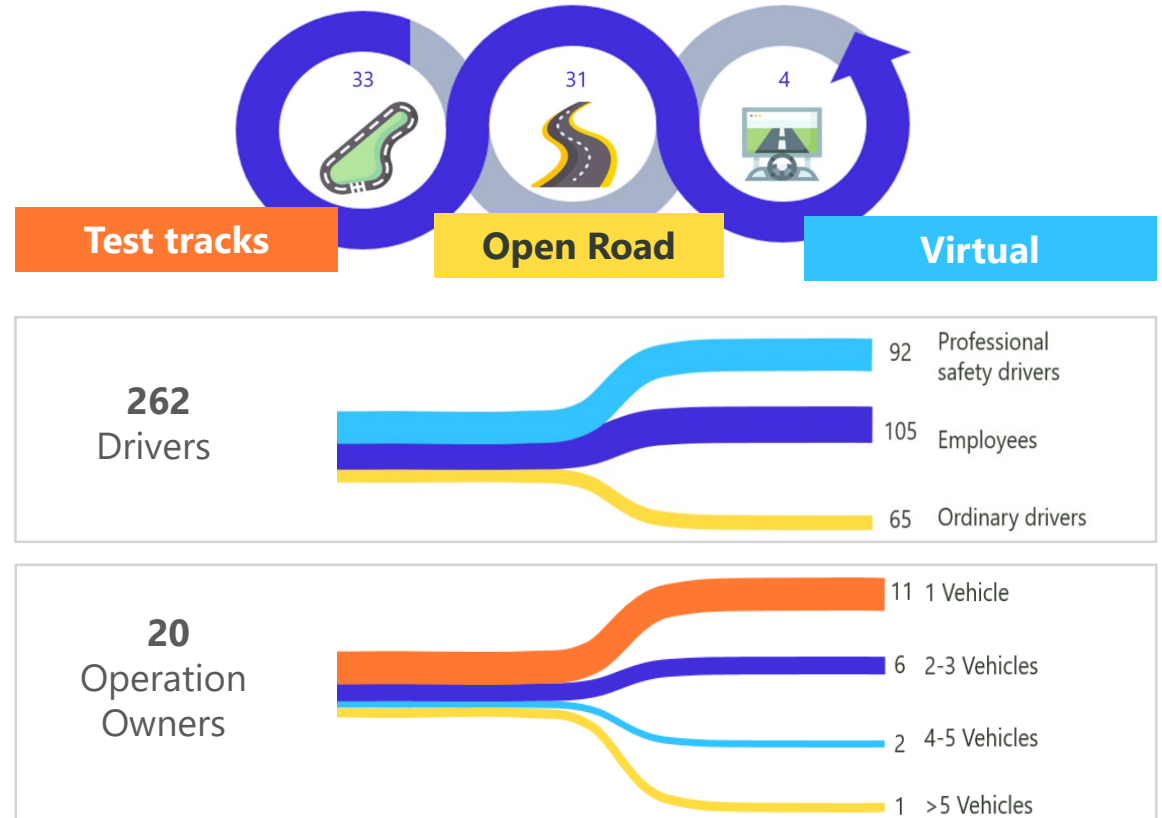
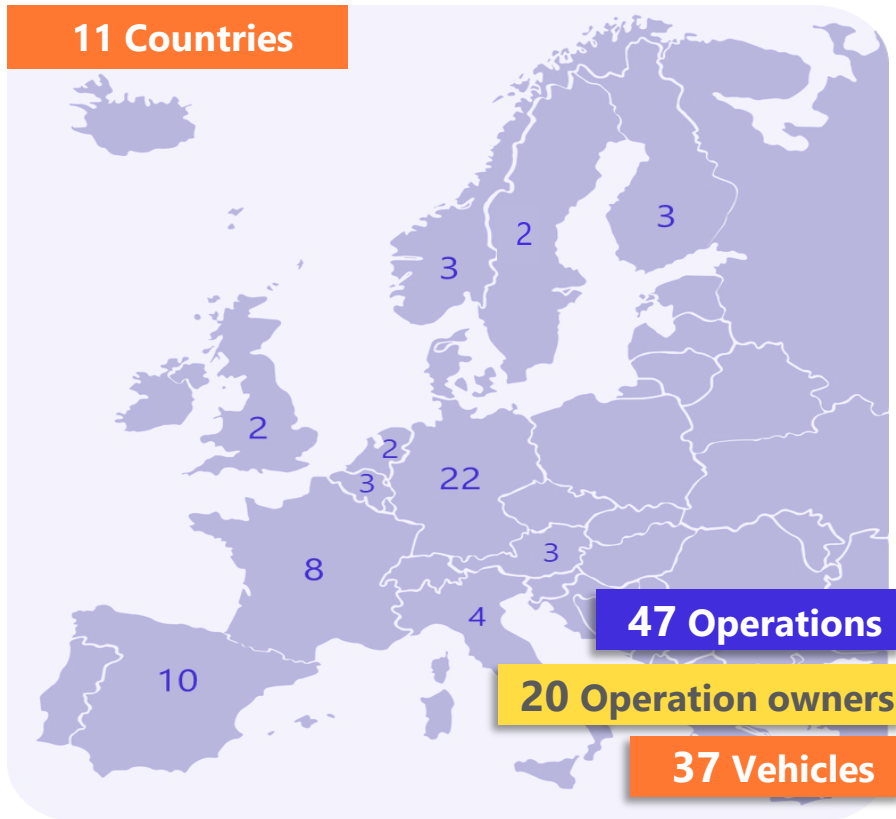
# Testing performance and reliability of ADFs for operation in extended ODDs

ITS European Congress Lisbon, 24 May 2023 | SIS72

Anastasia Bolovinou – ICCS



# Location & test environment Vehicles & Drivers



\* Status of July 2022

# Testing

## Enabler technology tests

Tests in closed / controlled environments.

 + **Hi-Drive Enabler**

- Connectivity (V2X)
- High-precision positioning
- Context learning via ML
- Cybersecurity

=   
**Advanced AD functions**

## Pilot studies

### Test on public road

incl. manual driving, automated driving with enabler on/off



## User focused studies

### Different user oriented studies

Simulator, test track, public roads, etc.

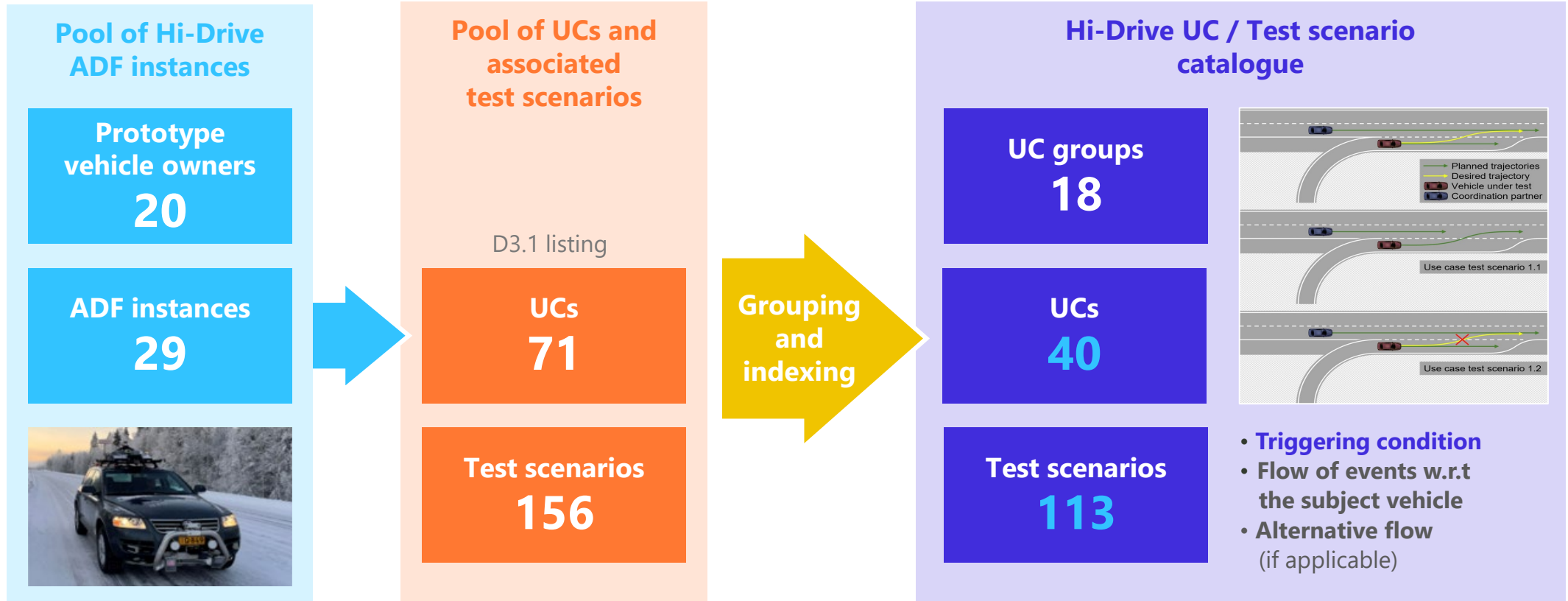


## Simulation

Impact Assessment studies and Simulation based enabler tests.



# UC/Test scenarios catalogue (publicly available)



# UC catalogue

| ADF type                              | UC clusters   | Number of UCs generated | Number of TS generated | Supported by 'x' ADF instances |
|---------------------------------------|---|-------------------------|------------------------|--------------------------------|
| Motorway<br>(and peri-urban Motorway) | Cooperative overtaking  | 1                       | 2                      | 1                              |
|                                       | Cooperative lane management in merging or diverging areas                 | 6                       | 12                     | 5                              |
|                                       | Cooperative hazard/dynamic signage awareness                              | 2                       | 9                      | 4                              |
|                                       | Special or temporary road infra crossing (tunnel, road construction site) | 2                       | 6                      | 3                              |
|                                       | Lane management under nominal ODD conditions                              | 2                       | 6                      | 6                              |
|                                       | Lane Keeping under challenging ODD conditions                             | 3                       | 7                      | 4                              |
|                                       | Lane merging/diverging (non-cooperative)                                  | 3                       | 9                      | 5                              |
|                                       | <b>Motorway-Total</b>   | <b>19</b>               | <b>51</b>              |                                |
| Urban                                 | Cooperative non-signalized intersection transit                           | 2                       | 6                      | 5                              |
|                                       | Cooperative signalized intersection transit                               | 3                       | 10                     | 6                              |
|                                       | Cooperative traffic/hazard awareness                                      | 2                       | 5                      | 2                              |
|                                       | Lane Keeping under nominal ODD conditions                                 | 3                       | 9                      | 3                              |
|                                       | Lane Keeping under challenging ODD conditions                             | 2                       | 6                      | 5                              |
|                                       | Non-signalized intersection crossing                                      | 2                       | 10                     | 5                              |
|                                       | VRU interaction zone (eHMI)   | 2                       | 2                      | 1                              |
|                                       | <b>Urban-Total</b>  | <b>16</b>               | <b>48</b>              |                                |
| Rural                                 | Urban to rural transition   | 1                       | 3                      | 1                              |
|                                       | Cooperative overtaking via V2V  | 1                       | 2                      | 1                              |
|                                       | Arctic uninterrupted driving against specific conditions                  | 1                       | 5                      | 1                              |
|                                       | <b>Rural-Total</b>  | <b>3</b>                | <b>10</b>              |                                |
| Parking                               | Automated Valet Parking   | 2                       | 4                      | 3                              |
|                                       |   | <b>Parking-Total</b>    | <b>2</b>               | <b>4</b>                       |
|                                       | <b>Total</b>  | <b>40</b>               | <b>113</b>             |                                |

# Challenging OD conditions targeted by the UCs

## Motorway



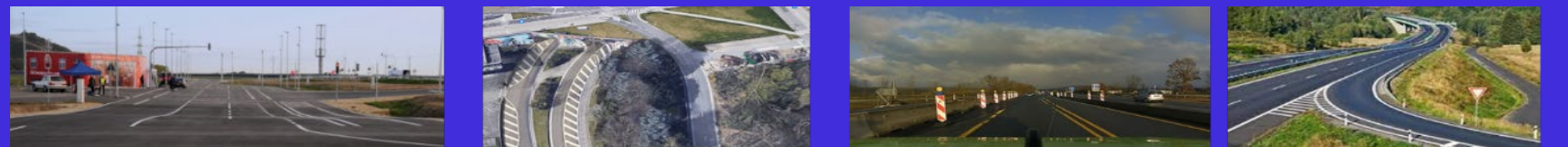
## Urban



## Parking

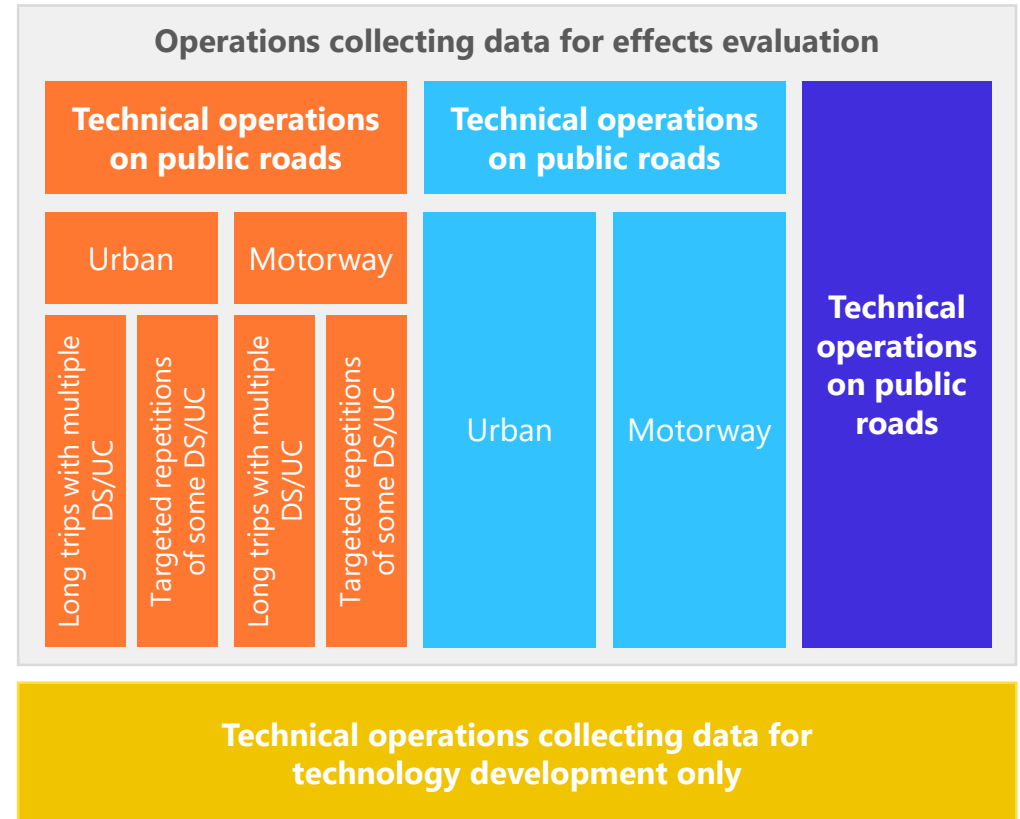


## Test-track

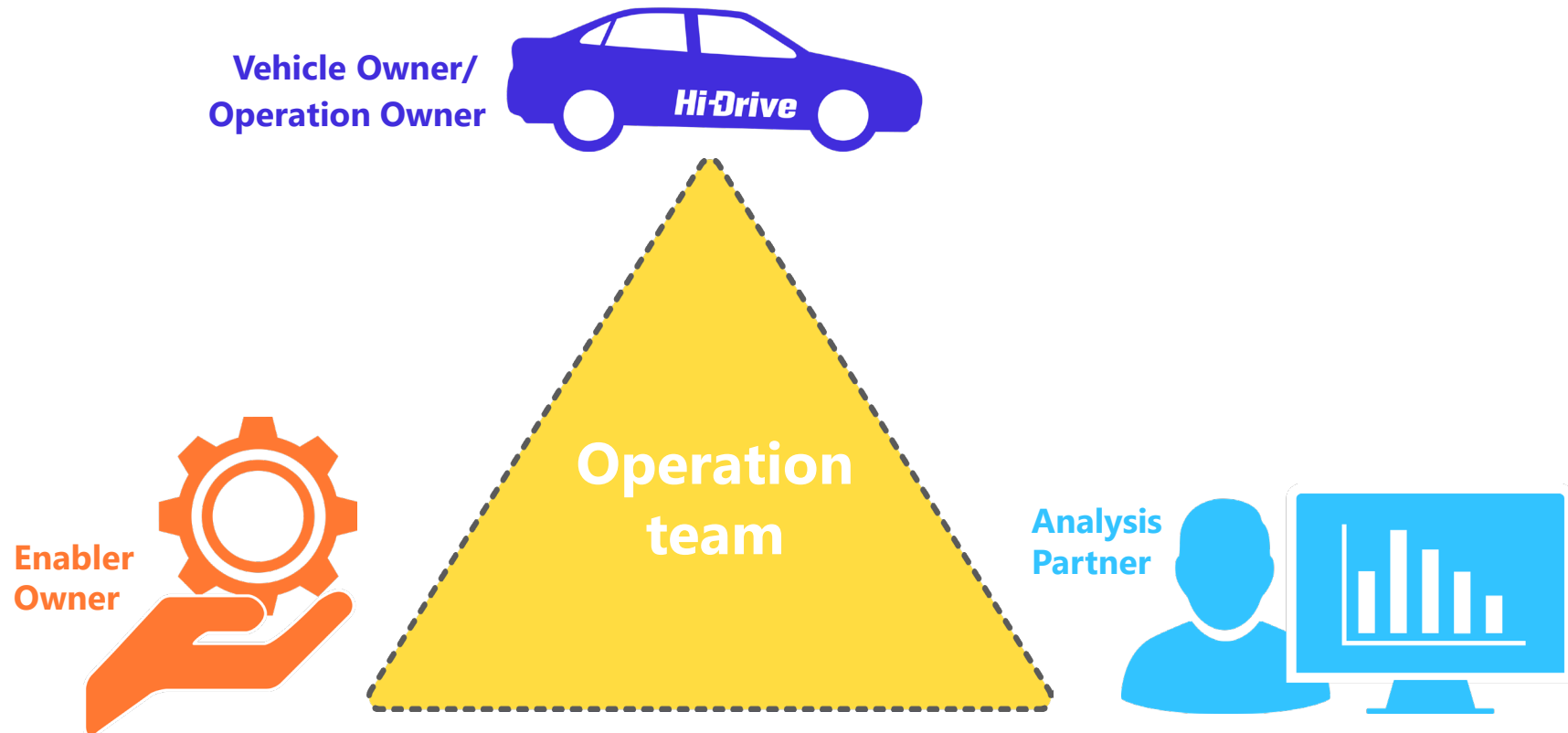


# Steps towards Hi-Drive Operations & Grouping

- Enablers' integration
- Vehicle testing and data logging tools design
- Design **data engineering tools** and **database structures** to manage and process data from the experiments.
- Test preparation activities according to Experimental guidelines
  - Test environment considerations
  - Baseline/Treatment
  - Desired quantity of data + repetitions
  - Drivers selection / questionnaires
- Collect data during the tests and make this data available to analysis teams
- Each vehicle owner deploys a set of prototype vehicles and covers specific technology enablers, use cases, test environments contributing to a set of validation objectives as determined by the RQs of the project.

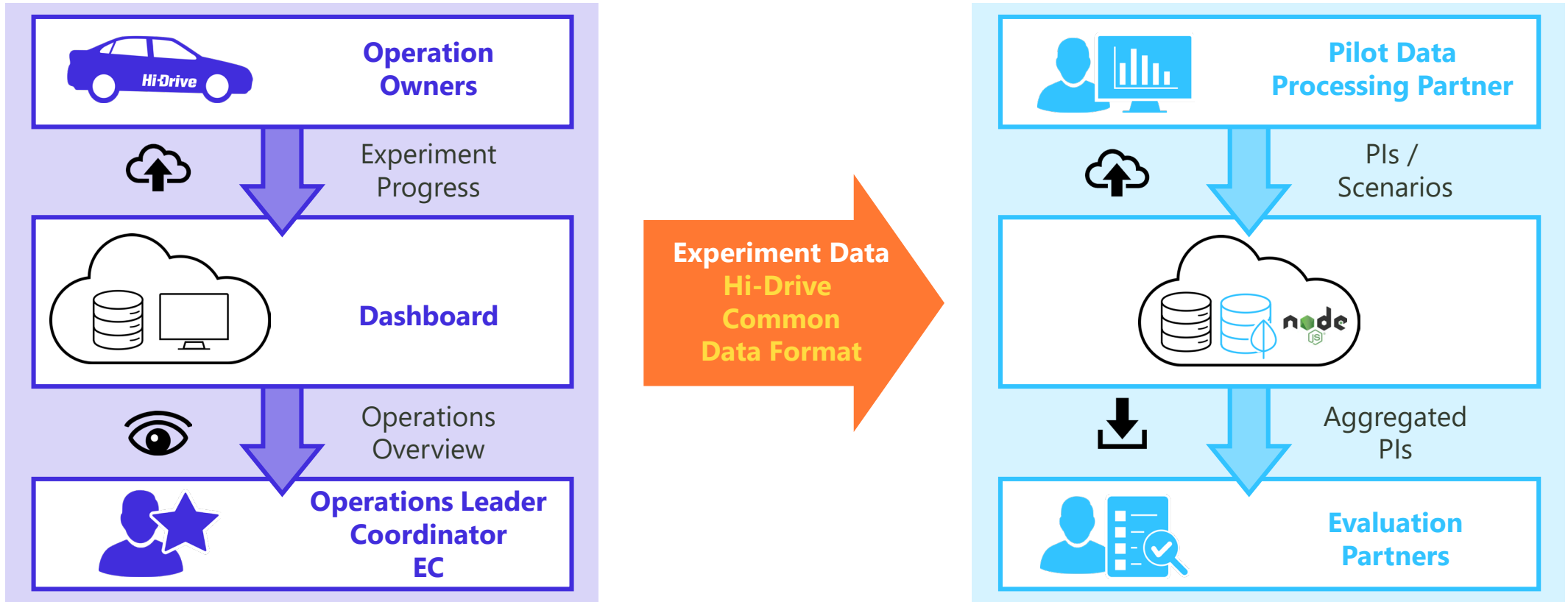


# Operations triangular teams

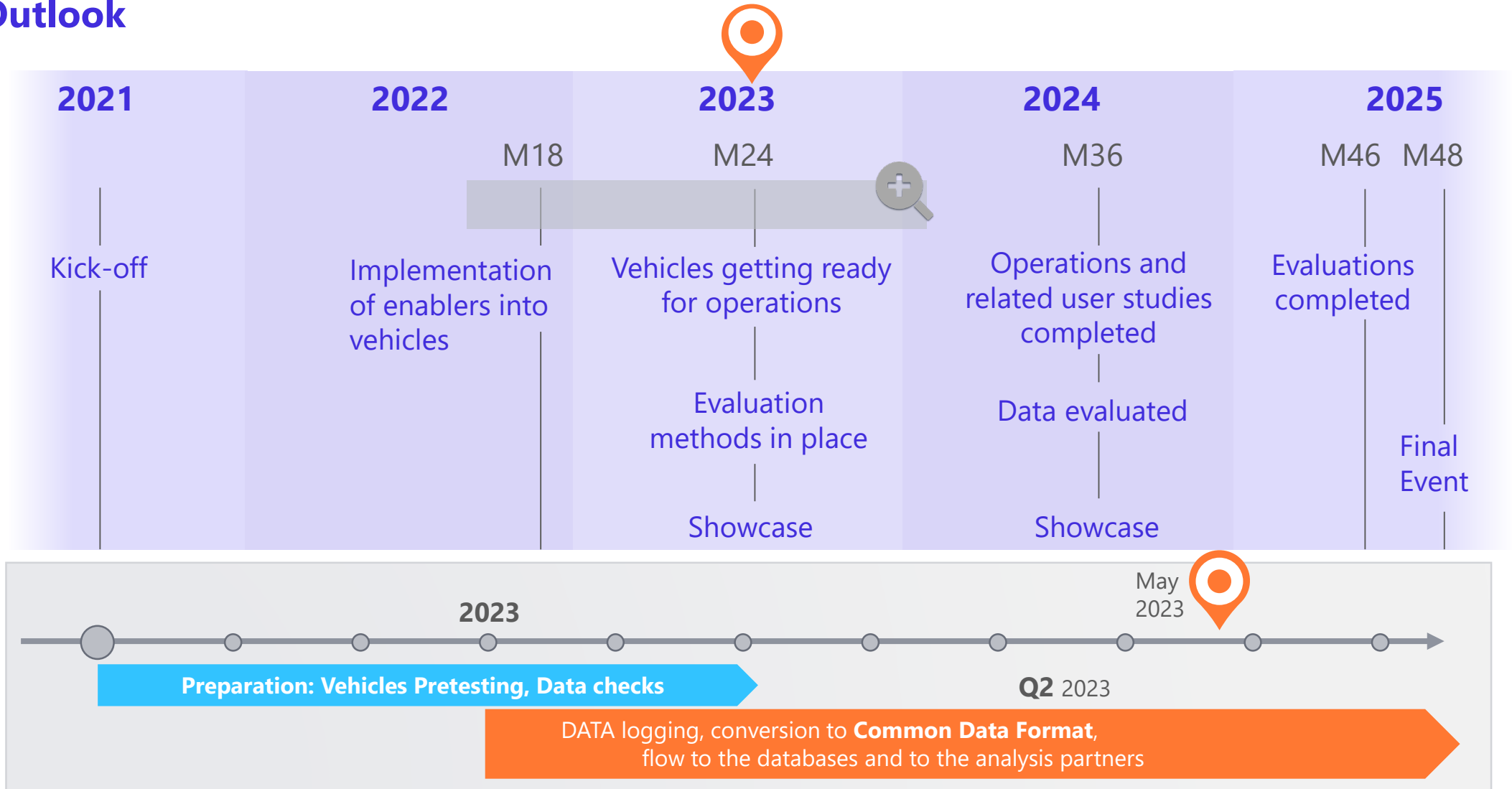












# Multi-teams Hi-Drive Data Process



# Outlook



## Find our work publicly released

| Project Information  | Deliverables  | Presentations | Papers | Links   |
|--|---|---------------|--------|---|
| <b>Publicly available project results and abstracts of non-public Deliverables will be available for download:</b> |   |               |        |   |
|  | Hi-Drive Deliverable D3.1 Use Cases Definition and Description (Draft)            | 28.03.2023    |        |  4.73 MB   |
|  | Hi-Drive Deliverable D3.2 Logging Tools Recommendations (Draft)                   | 28.03.2023    |        |  3.90 MB   |
|  | Hi-Drive Deliverable D3.3 Description of Vehicles (Draft)                         | 28.03.2023    |        |  3.00 MB   |
|  | Hi-Drive Deliverable D4.1 Research Questions (Draft)                              |               |        |  1.81 MB   |
|  | Hi-Drive Deliverable D4.2 Data for Evaluation (Draft)                             |               |        |  2.05 MB   |
|  | Hi-Drive Deliverable D4.3 Experimental Procedure (Draft)                          | 28.03.2023    |        |  2.19 MB   |
|  | Hi-Drive Deliverable D5.1 Description of Operations (Draft)                       | 23.01.2023    |        |  3.11 MB  |
|  | Hi-Drive Deliverable D8.4 Minimum Set of Standards Applicable to Hi-Drive (Draft) | 01.02.2023    |        |  2.78 MB |

[www.hi-drive.eu/downloads](http://www.hi-drive.eu/downloads)



THANK YOU FOR  
YOUR KIND ATTENTION.

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**Hi-Drive**

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