ENabling SafE Multi-Brand Platooning for Europe

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Content

- ENSEMBLE intro and objectives

- Description of the main WP's

- Where are we now?

- What's next?

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ENSEMBLE facts

- Innovation Action number 769115
- **3 year** EU project, start June 2018
- **20 million euro** funding EC
- **20 partners**, including 6 truck manufacturers and CLEPA representing automotive suppliers

The ENSEMBLE project is led by TNO and joined by:

- Six European truck manufacturers: DAF, DAIMLER, IVECO, MAN, SCANIA and VOLVO GROUP (VOLVO TRUCKS & RENAULT TRUCKS).

- CLEPA represents the suppliers of automotive equipment and components.

- Suppliers: NXP, ZF, WABCO, Bosch, Continental, Brembo and Daimler Fleetboard.

- ERTICO – ITS Europe - the crucial link to the European Truck Platooning Community.

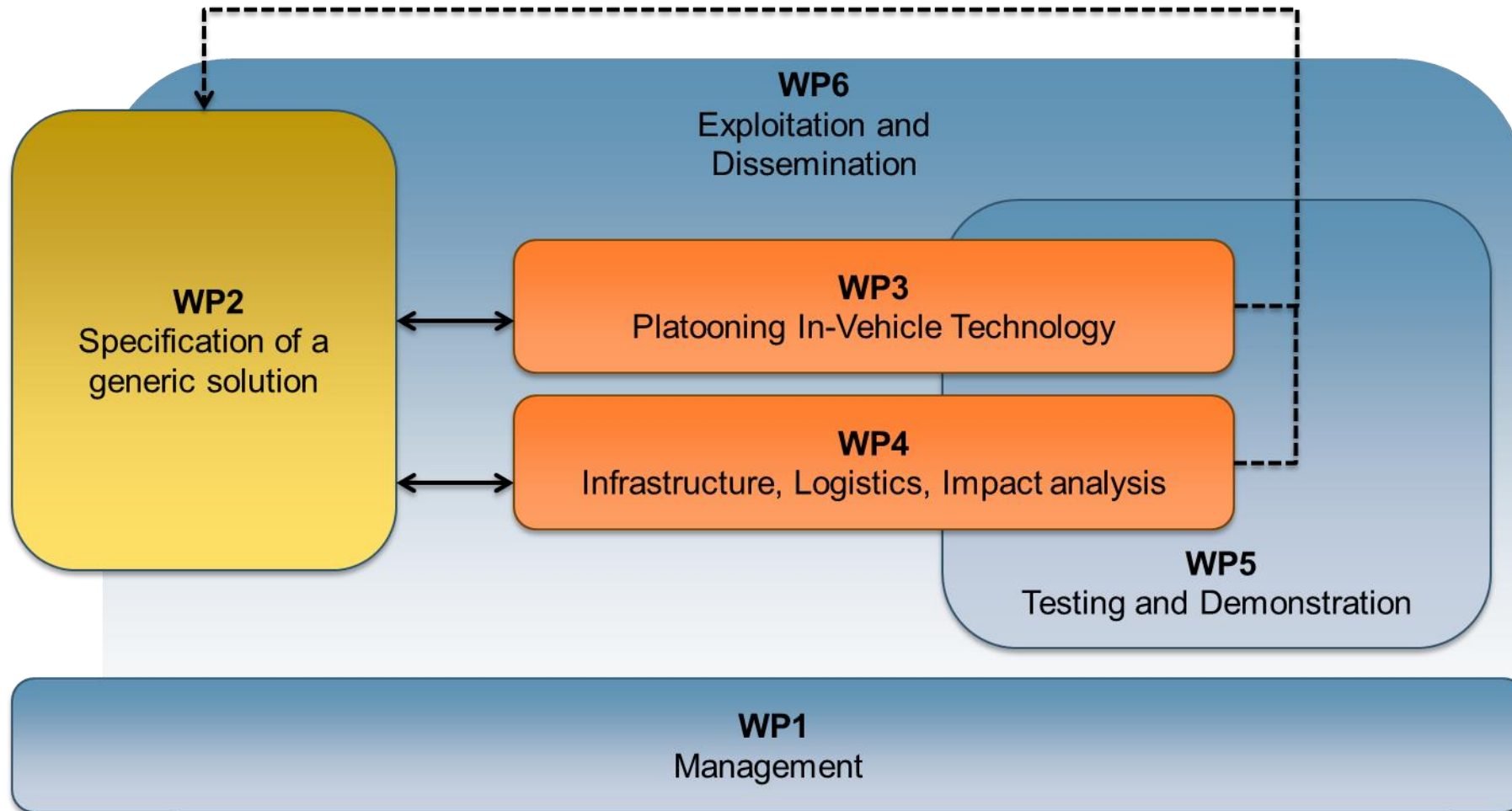- Knowledge partners: IDIADA, IFSTTAR, KTH and VU Brussel.

Objectives of the 3 year project

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- Pave the way for **adoption** of multi-brand truck platooning in EU

- Align and work on **standardization**

- **Demonstrate** differently branded trucks in one platoon

  - Under real world traffic conditions

  - Across national borders

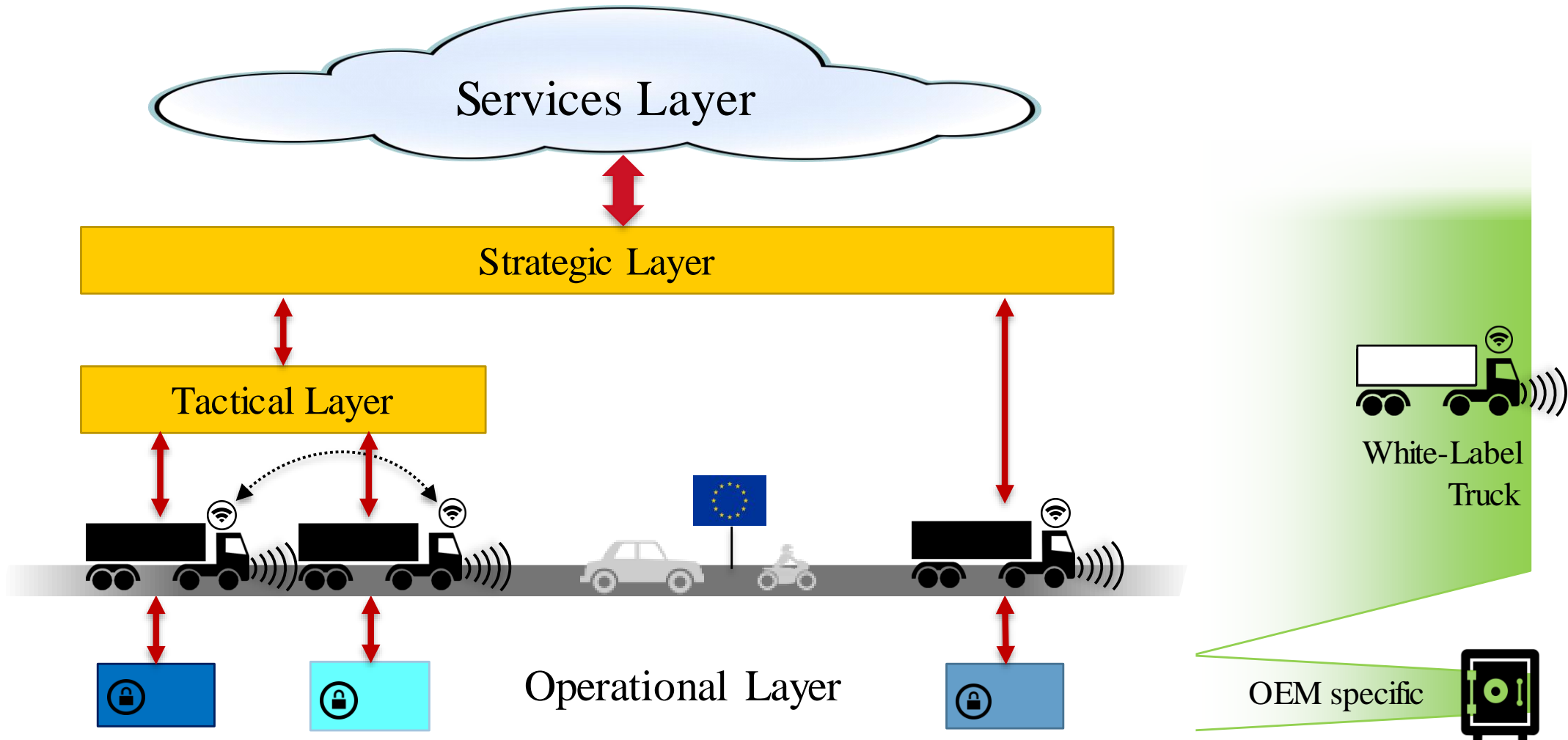- Assess **impacts** on traffic safety, throughput and fuel economy

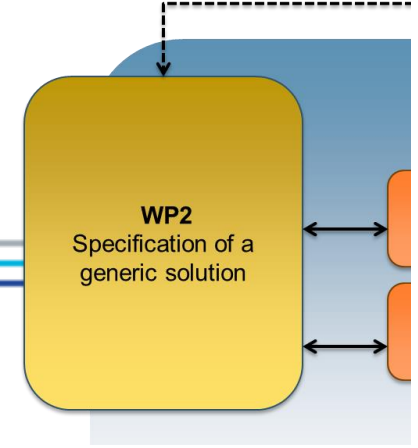And in this way ensure **acceptance** and **deployment** of platooning

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Project structure

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Platooning layers

Services Layer

Strategic Layer

Tactical Layer

Operational Layer

White-Label Truck

OEM specific

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WP2 Specification of a generic solution

WP2
Specification of a generic solution

Objective:

- Definition of the *specifications* of layers and their interfaces to be implemented in trucks of the 6 OEMs for testing and demonstration

- *Iteration process* to validate and modify the specifications during project life-cycle is essential part of the work

- Important input for *standardisation*

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WP3 Platooning Technology
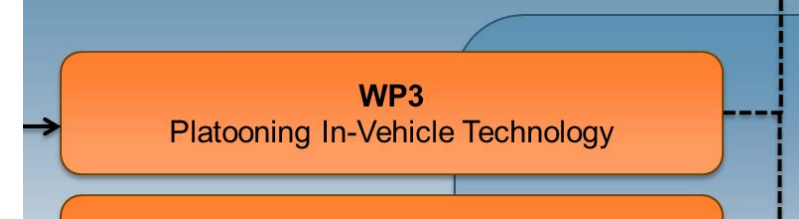
- **Design** and **implementation** of platooning system according to specifications of WP2

- Develop common functionality required for multi-brand platooning:
  - Platoon coordinator functionality
  - Mechanism to check consistency of the messages
  - Functionality to guarantee safe behaviour of platoon

- At least Platooning Level A implemented: **longitudinal automation**

- Implementations will be verified in WP5

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WP4 Impacts of platooning
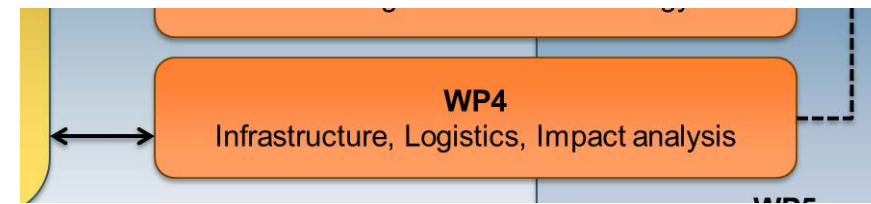
Assessment of impact of multi-brand platooning on:

- Road infrastructure (pavement, bridges, tunnels)

- Economic and environmental benefits,
  i.e. fuel savings and emissions for different time gaps and positions in the platoon

- Truck drivers & other road users
  i.e. how is their behavioral response and how can we support their interactions with truck platoons

- Traffic conditions and traffic flow

- Assessment of variability

  Variability in loads and dimensions

  Formation of platoons on the fly

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WP4 Strategic and service layers
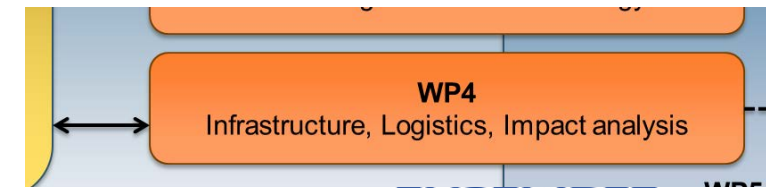
- Individual trucks need to **find each other** to form platoons

- During platoon driving, **dissolve** and continue independently

ENSEMBLE provides:

- Assessment of multi-brand **specific issues to form platoons** on Strategic and Service Layers

- Description of the **interaction** and **information exchange** between the Tactical and Strategic Layer and Service Layer

- (Cyber)security prerequisites for **data exchange** and management for Strategic and Service Layer, and interaction with Tactical layer

- Proof concept of **platoon coordination** in multi-brand pilot case

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WP5 Testing and Demonstration

- Definition of **methodology** and **test plan**; incl. data acquisition plan and KPI's

- **Validation** of the generic solution via physical tests on test tracks

- Multi-brand platooning **testing** on *public roads*

- Technical evaluation of the generic multi-brand platooning solution

- **Demonstration** of the multi-brand platoon solution on *public roads*

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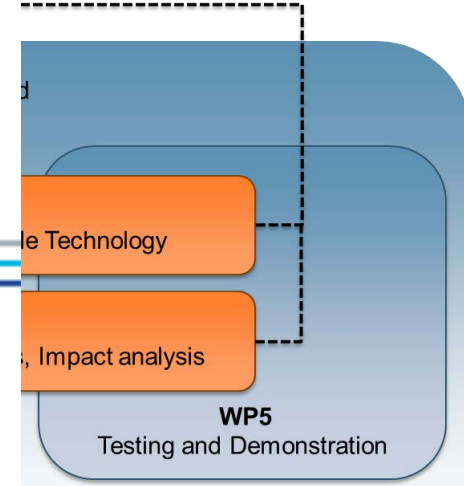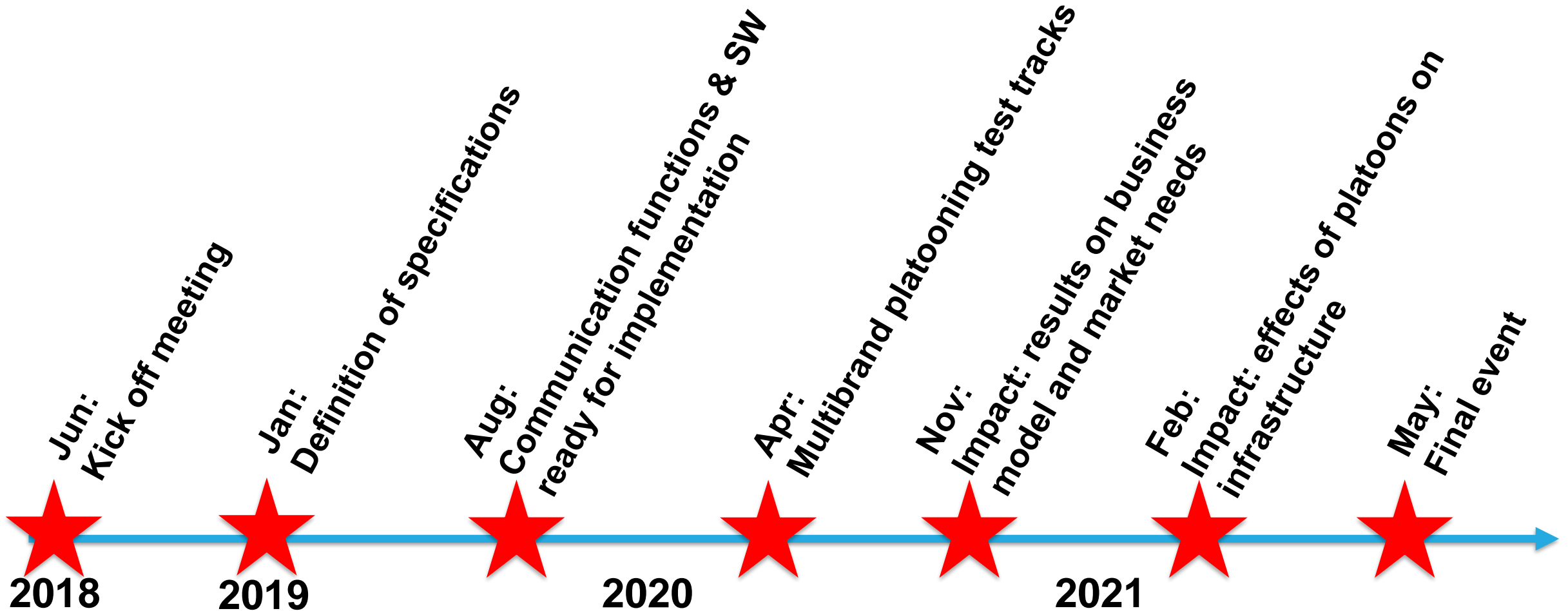
Where are we now?

- Focus on WP2 and WP3: **specifications and platooning tech**

- State of the art finished

- Cooperate to come to jointly agreed specifications (end of 2018)

- Related to platooning levels A, B and C

  – Level A = minimum requirements (e.g. **no lateral control**, following distance ≥ 0,8 s, disengage platoon when intruder appears, etc.)

  – Level B and C will be jointly agreed upon, but **not demonstrated** in final demonstration

- Results will be in **public deliverables** since we aim for *standardization* and *broad implementation*

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What will be the focus next year?

- *Design* and *implementation* of platooning system

- Develop common functionality required for multi-brand platooning:

  – Platoon coordinator functionality

  – V2X communication aspects

- Set up of test plan

- License exemption process

- Market analysis and business models

- Arrange for official cooperation/twinning with US

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Main dates

Jun: Kick off meeting

Jan: Definition of specifications

Aug: Communication functions & SW ready for implementation

Apr: Multibrand platooning test tracks

Nov: Impact: results on business model and market needs

Feb: Impact: effects of platoons on infrastructure

May: Final event

2018   **2019**   **2020**   **2021**

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Thank you for your attention!

Spring 2021

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