# SINGAPORE 2019

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21–25 October

# Smart Mobility, Empowering Cities

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# EU project ENSEMBLE
# ENabling SafE Multi-Brand pLatooning for Europe

## Transforming Freight Movements through ITS – Part II (SIS30)

**Alessandro Coda**

CLEPA

ENSEMBLE is co-funded by the European Union
under the Framework for R&I Horizon 2020 (GA 769115)

# ENSEMBLE facts

The ENSEMBLE project is coordinated by TNO in collaboration with:

- **The European truck manufacturers:**
  DAF, DAIMLER, IVECO, MAN, SCANIA, VOLVO Group (Volvo trucks and Renault trucks)
- **CLEPA** represents the European suppliers of automotive equipment and components.
- **Suppliers:**
  Bosch, Brembo, Continental, NXP, WABCO, ZF
- **ERTICO:**
  Link to the European Truck Platooning Community
- **Knowledge partners:**
  IDIADA, IFSTTAR, KTH, VU Brussel.

- Innovation Action no. 769115
- 3-year EU project, started June 1st 2018
- 20 million euro EC funding
- 20 partners, representing the full value chain of the automotive sector

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Chief Technology Officer
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# Truck platooning and ENSEMBLE

## Truck platooning

- ACEA: Truck platooning is the linking of two or more trucks in convoy, using connectivity technology and automated driving support systems.

## Societal impact

- Truck platooning holds a potential to improve road safety, reduce emissions and increase transport efficiency.
- To achieve the next step towards deployment, an integral *multi-brand* approach is required.

## Ambition ENSEMBLE

- The harmonisation of multi-brand specifications, realising a Multi-brand V2V communication protocol supporting both platooning levels, leading to standards for *multi-brand* truck interoperability.

## Platooning Levels

- The project has defined two principally different ways of platooning of which one will be implemented and demonstrated in the project.

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# ENSEMBLE objectives

ENSEMBLE

## To pave the way for the adoption of multi-brand truck platooning in Europe, by

- Aligning and working on standardization
- Implementing Platooning as a support system
- Demonstrating differently branded trucks in one platoon
  - Under real world traffic conditions
  - Across (national) borders
- Assessing impacts on traffic safety, throughput and fuel economy

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# ENSEMBLE main benefits

- Ensemble paves the way towards autonomous platooning (SAE L4) by providing the important corner stones for the required technologies:
  - communication technology
  - brake performance estimation
  - architecture for strategic and service layer (platoon matching)
- Ensemble defines platooning technology for standardization across Europe as a necessary step towards autonomous platooning
- Both supporting and autonomous platooning functions support future services for logistical service providers

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# Support vs Autonomous function

- Current technology does not fulfill all the safety requirements that are needed for short-gap platooning deployment
- Ensemble concludes there are two levels relevant for specifying platooning functions:
  - platooning as a **support function** (including longitudinal control)
  - platooning as an **autonomous function** (both longitudinal and lateral control, system responsible, ODD still to be defined)
- The benefits of platooning (i.e. fuel economy, safety, traffic flow, driver workload) will be shown for both support and autonomous platooning as shared understanding of the ENSEMBLE partners.
- ENSEMBLE will provide the specifications at the tactical layer for both levels.
- For the Ensemble final demonstration we will show the support function.

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# ENSEMBLE deliverables

- Functional specifications for both support and autonomous levels of multi-brand platooning
- Inputs for standardisation
- Implementation of a reference design for the communication layer
- Development, verification and validation of multi-brand platooning
- Assessment of the economic and environmental impact
- Demonstration of multi-brand platooning on public roads

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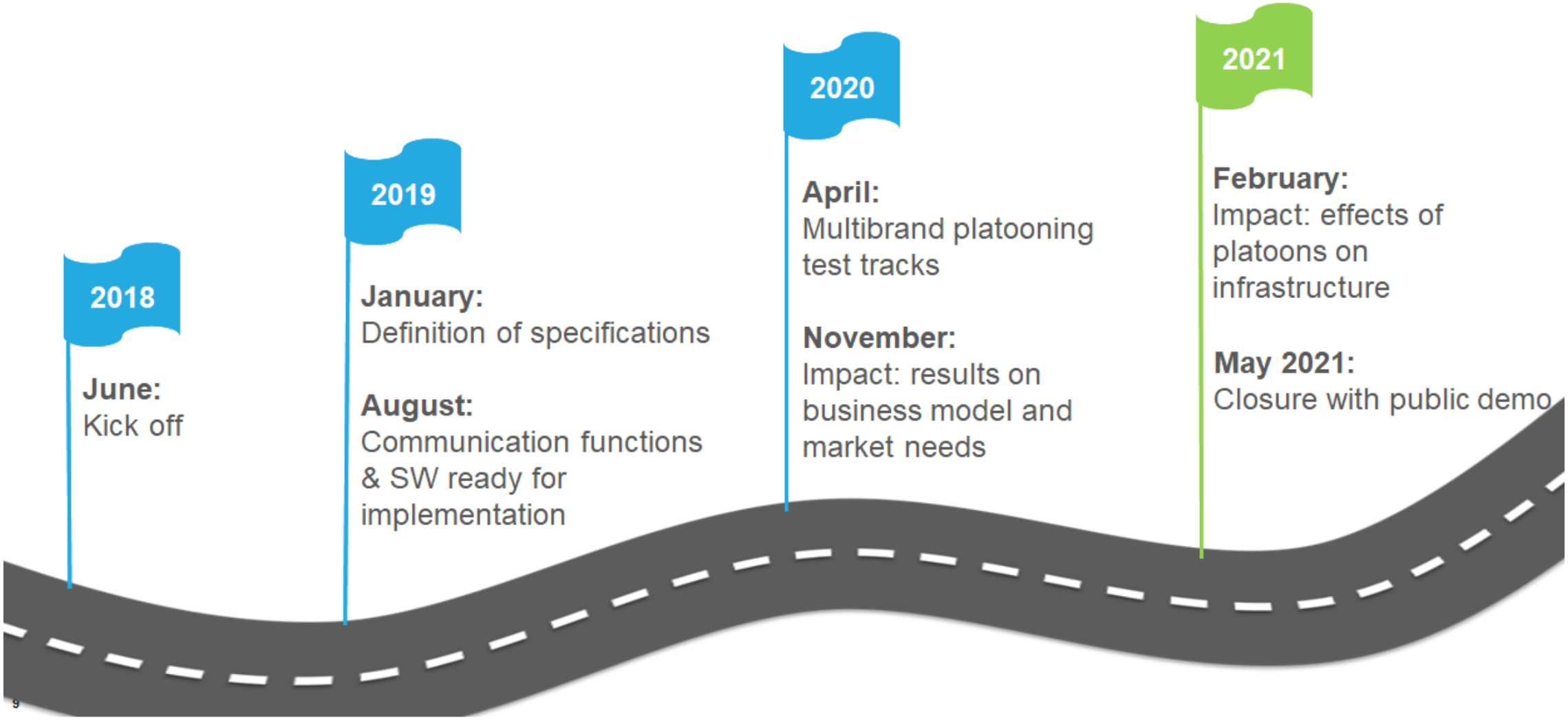
# ENSEMBLE Milestones



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