



# ENSEMBLE

## EUROPEAN COMMISSION

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### ENSEMBLE

**EN**abling **Safe** Multi-Brand pLatooning for **E**urope

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## Revision history

Version	Date	Author	Summary of changes	Status
0.1	14/01/2020	Odile Arbeit de Chalendar (IUGE)	Final Draft	Prepared
0.2	15/01/2020	Carmela Canonico (ERTICO)		Revised (integration of content)
0.3	16/01/2020	Frank Daems (ERTICO)	Review	Reviewed document
0.4	27/01/2020	Marika Hoedemaeker	Review	Reviewed document
0.5	20/4/2020	Carmela Canonico	Review	Addressed EC comments (first bullet point)
0.6	22/4/2020	Frank Daems	Review	Check and last update

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# 1. EXECUTIVE SUMMARY

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## 1.1. Context and need of a multi brand platooning project

### 1.1.1. Context

Platooning technology has made significant advances in the last decade, but to achieve the next step towards deployment of truck platooning, an integral multi-brand approach is required. Aiming for Europe-wide deployment of platooning, 'multi-brand' solutions are paramount. It is the ambition of ENSEMBLE to realise pre-standards for interoperability between trucks, platoons and logistics solution providers, to speed up actual market pick-up of (sub) system development and implementation and to enable harmonisation of legal frameworks in the member states.

The ENSEMBLE project started in June 2018, as part of the Horizon 2020 framework programme, on multi-brand truck platooning (ART03). The six OEMs are partners in the consortium led by the TNO. The two other research partners are IFSTTAR and IDIADA. ERTICO and CLEPA are among the 17 partners. The project intends to develop standardised interoperable V2V communication, to specify, develop and test on open roads multi-brand truck platoons, to assess the main impacts and to propose mitigation measures against the negative impacts. These two last objectives are led by IFSTTAR in the WP4. The project is planned for 36 months and a total budget of 20 M€.

### 1.1.2. Project scope

The main goal of the ENSEMBLE project is to pave the way for the adoption of multi-brand truck platooning in Europe to improve fuel economy, traffic safety and throughput. This will be demonstrated by driving up to seven differently branded trucks in one (or more) platoon(s) under real world traffic conditions across national borders. During the years, the project goals are:

- Year 1: setting the specifications and developing a reference design with acceptance criteria
- Year 2: implementing this reference design on the OEM own trucks as well as perform impact assessments with several criteria
- Year 3: focus on testing the multi-brand platoons on test tracks and international public roads

The technical results will be evaluated against the initial requirements. Moreover, the impact on fuel consumption, drivers and other road users will be established. In the end, all activities within the project aim to accelerate the deployment of multi-brand truck platooning in Europe.

## 1.2. Abstract of this Deliverable

This deliverable gives an overview of the ETPC activities. It also defines the vision and expectations towards the ENSEMBLE partners from the point of view of ETPC stakeholders. A specific agenda



for the ETPC<sup>1</sup> goes beyond the objectives of the ENSEMBLE project, and defines a roadmap and specification for the deployment of a first version of truck platooning by 2022. This is addressed by the ETPC 'VISION 2022' (see Annex B).

ETPC, as a multi stakeholder platform, acts as a mirror to the ENSEMBLE partners, reviewing the deliverables related to use cases, specifications, requirements and testing for the defined 'platooning levels' and roadmaps, aiming at the implementation of Truck platooning by 2022, expressed in ETPC VISION 2022. (see addendum

In terms of standardisation of the communication, specific considerations have been raised by this stakeholders' group on communication standards, considering not only the V2V standard need for OEMs, but also the necessity of a V2I standard to connect the platoon to the infrastructure and services offered by road operators. The focus of the OEMs is of course to ensure the V2V communication. From the perspectives of road authorities and Member States, the V2I and V2X offers also key services to display messages and services to the platoons concerning, amongst others, events such as roadworks warning, weather and traffic conditions.

Benefits of truck platooning are currently being discussed in coordination with ENSEMBLE WP4 and an implementation roadmap.

As ETPC also links with a vast amount of current platooning initiatives in Europe and beyond, it also points out potentials for co-operation actions between ENSEMBLE and interesting projects. ETPC offers an excellent networking and benchmark opportunity for ENSEMBLE.

ETPC will contribute to the organisation of the ENSEMBLE final event, supporting road authorities' cooperation and Member States' acceptance of the necessary exemptions. Concerning this final event, the criteria discussed so far in the ETPC are the support of truck platooning in the involved Member States and the availability of reliable road infrastructures responding to the needs defined within ENSEMBLE. The final event should be held close to and in cooperation with an existing relevant conference, to maximize the impact. The ETPC has raised the necessary LOI (Letter of Intent) to shortlisted stakeholders to check their commitments on their engagement and support for the final event. The ETPC will take this LOI further in the next months to come to a MOU (Memorandum of Understanding), as a business covenant between stakeholders, to guarantee the deployment of truck platooning.

The ETPC has also pushed forward the concept of "side events", highlighting Member states or cross border initiatives currently ongoing in Europe. Via a communication strategy, the idea would be to orchestrate videos serving the final demo and other platooning initiatives, highlighting the general activities in terms of truck platooning in Europe (see Appendix C).

The ETPC meetings and workshops that have been organised had the following major outcomes:

- Opening up the standard between trucks and including infrastructure connexion (from V2V to V2I);
- Engaging the ETPC Network Stakeholders in discussions:
  - on the benefits,



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<sup>1</sup> European Truck Platooning Challenge (Association)

- on conditions of implementation,
- on the organisation of final event and side events.



## 2. INTRODUCTION

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### 2.1. Background

The European Truck Platooning Challenge Network (ETPC) initiative was launched in early 2016 under the Dutch Presidency of the EU. A large demo was organised in some EU Member States with cross-border trips of six mono-brand platoons converging to Rotterdam in the Netherlands (ETPC, 2016). The ETPC network opened a long-term vision for the management of heavy goods vehicles on major European corridors. It offers a unique opportunity for manufacturers and OEMs to develop autonomous and intelligent heavy vehicles, and for infrastructure managers to experiment the concept on a large scale, to formulate conditions for its safe and acceptable implementation, particularly for other users and transport companies, and to assess potential benefits. The ETPC promotes cooperation between manufacturers and road authorities. The challenge offers a platform for all partners, industrials, OEMs, logisticians, research institutes and public authorities to strengthen their mutual efforts. The objective is now to allow platoons made up of vehicles of different brands to circulate safely in the EU. An Amsterdam Declaration was signed by the EU Transport Ministers to join their efforts developing autonomous and connected vehicles. A high-level group is continuing this work in cooperation with the ETPC.

#### 2.1.1. Who takes part in ETPC?

The ETPC Association has since 2016 consisted of six supporting associations (“ambassadors”/steering members):

1. European Automobile Manufacturers' Association (ACEA), with the six European OEMs (DAF, Daimler, Iveco, MAN, Scania and Volvo)
2. Conference of European Road Directors (CEDR),
3. European Association of Automotive Suppliers (CLEPA),
4. Association of European Vehicle and Driver Registration Authorities (EReg),
5. European Shippers' Council (ESC), and
6. International Road Union (IRU).

In 2018, three more members joined the ETPC Association:

1. Kapsch TrafficCom AG (KAPSCH)
2. GEIE - Traforo del Monte Bianco (GEIE-TMB)



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### 3. Robert Bosch GmbH (Bosch)

Research organizations (TNO, University of Amsterdam, IFSTTAR), as well as governmental bodies, Member States and other stakeholders from the transport sector are members of the broader ETPC Network:

- The network comprises about 150 persons.
- The network is managed by Odile Arbeit de Chalendar (IFSTTAR) and Frank Daems and Carmela Canonico (ERTICO).

The ETPC conducted activities to raise awareness about the benefits of potential truck platooning for the European Parliament in 2017. ETPC is a member of the ENSEMBLE project (section 6.2) supporting the project by contributing its member's expertise. Representatives include public authorities who are given a platform to enter into dialogue with the project's members. This cooperative relationship paves the way to be able to demonstrate the expected results of ENSEMBLE in 2021.

#### 2.1.2. Objectives

The main objectives of the ETPC are further developing its missions and roadmap:

- Promoting truck platooning to provide safer, more efficient freight transport, creating new jobs and economic growth in the traffic and transport sector.
- Fostering cooperation between states, automotive industry, and other related sectors to deploy commercially viable truck platooning services.
- Providing a platform for cross-stakeholder dialogue defining the necessary technical, regulatory and organisational framework.
- Ensuring a coherent, continuous and consistent way forward.

#### 2.1.3. Aim of the ETPC - ENSEMBLE cooperation

The intervention of the ETPC network in the ENSEMBLE project is to interact with some of its Work Packages to provide new, expert perspectives.

ENSEMBLE presents its key results to the ETPC network while ETPC gives inputs to the ENSEMBLE project. This interaction takes mainly place in network meetings, twice a year. The strategy of using the ETPC as a dissemination platform is motivated by the current momentum of the platform (with active Task Forces), as well as the large community already involved. This will allow conducting wider consultations on topics such as (1) validation requirements and specifications; (2) reviewing use cases; (3) discussing evaluation methodology; (4) testing exemption.



The following figure provides a general picture of this interaction.

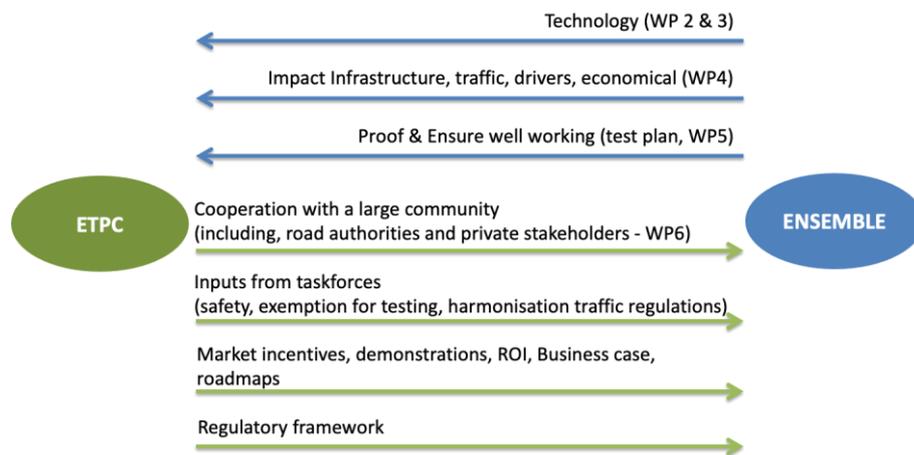


Figure 1: Interaction between ETPC and ENSEMBLE

A mapping of the workgroups, established in ETPC are mapped to the work packages, tasks and deliverables, as they are defined in ENSEMBLE project. The following picture gives a detailed

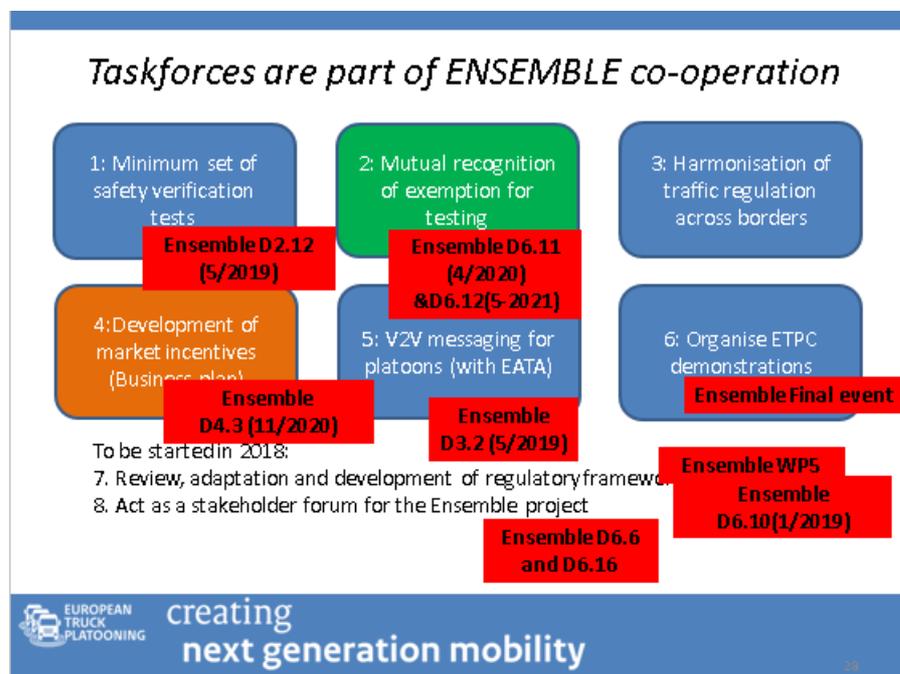


Figure 2: ETPC-ENSEMBLE cooperation on deliverables

ETPC and ENSEMBLE share common objectives as shown in the next picture

Address Common Concerns	
<b>Impact on:</b> Business case, Driver, Infrastructure, Road safety, Congestion, Capacity, Fuel and CO2 economics,...	
<b>Applications:</b> Logistics, Transport legislation changes,	
ETPC	Ensemble
DEPLOYMENT	TECHNOLOGY
Implementation, early ROI	Pave the way for the adoption of multi-brand truck platooning
Foster a European cooperation between stakeholders and member states	Tests and demonstrations of pan-European platooning technology
Develop the necessary technical, regulatory and organisational framework.	Interoperable, safe, real life, embed platooning by cloud based services
Ensure a coherent, continuous and consistent way forward	Ensure industrial readiness for implementation Impact on driver, infrastructure, trucks, safety,...

Figure 3: ETPC and ENSEMBLE common objectives

## 2.2. Structure of this report

This deliverable is formed of the concrete topics that are discussed within ETPC. It provides the minutes of the ETPC network meetings that have been held so far.

The main topics discussed are:

1. Communication Standards;
2. Final event;
3. Vision of Truck platooning from V2V to V2X (Appendix B – ETPC Vision 2022);
4. Support from the ETPC:
  - a. Letter of Intention-Lol,
  - b. Interviews of Ambassadors,
  - c. Interview of EC officials.



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## 3. ETPC COOPERATION WITH THE ENSEMBLE PROJECT

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Concretely, the ETPC association and its members provide their contributions to the ENSEMBLE project mainly on the topics and via the activities listed below.

### 3.1. Support on the communication standard

One important topic of the ETPC cooperation with ENSEMBLE is the interaction with work package 2, task 5 concerning the standard of communication.

The focus of the OEMs is of course to ensure the V2V communication. From the perspectives of road authorities and Member States, the V2I and V2X offers also key services to display messages and services to the platoons concerning, amongst others, events such as roadworks warning, weather and traffic conditions.

### 3.2. Support on the Final event

The Criteria for the final event discussed so far in the ETPC are the support of truck platooning in the involved Member States and the availability of reliable road infrastructures responding to the needs defined within ENSEMBLE. The final event should be held close to and in cooperation with an existing relevant conference, to maximize the impact.

The ETPC has also pushed forward the concept of “side events”, highlighting Member States or cross-border truck platooning-related initiatives currently ongoing in Europe. Via a communication strategy, the idea would be to orchestrate videos serving the final demo and other platooning initiatives, highlighting the general activities in terms of truck platooning in Europe (see Appendix C).

The final destinations for the final demo that have currently been taken into consideration are the following:

- Antwerp (BE) –Rotterdam (NL) (as described in ENSEMBLE initial proposal);
- DE: A9 corridor as a potential extension;
- DE BE FR LUX (adapting to NL also): Governmental official autonomous corridor as a potential extension.
- The Mont Blanc Tunnel between Italy and France. Mont Blanc Tunnel, part of ETPC, has made an official offer to ETPC members and to the coordinator of ENSEMBLE. This can be an additional demo case that fulfils a particular business case for successful platooning deployment in tunnels.



### 3.3. Support on creating a common vision for Truck platooning deployment (VISION 2022)

Within the ETPC platform and network, there are different visions when it comes to the best way to implement truck platooning in Europe. All the stakeholders involved in the ETPC network add their inputs to the discussion, and within the platform, the different approaches are all assessed and taken into account, before agreeing on the benefits and best approach. The ETPC is working hard on building up a bigger momentum for truck platooning in 2020 through:

- Awareness raising;
- Finalisation of the LOI and MOU from stakeholders;
- Supporting the preparation of the final event.

Especially the establishment of the VISION 2022 (See addendum) is a proof of a joint creation of a vision on how platooning can hit the market in 2022.

### 3.4. Supporting activities by ETPC

#### 3.4.1. ETPC Network Meetings

The ETPC Network Meetings are workshops held bi-annually that bring together relevant stakeholders and the ETPC community together to discuss state of the art solutions and activities around truck platooning in Europe and beyond, whilst also disseminating ENSEMBLE's achievements and findings. More information is provided in the next chapters, with the minutes of the meetings held in the period from June 2018 to December 2019. The presentations for each meeting are available upon request, by contacting Frank Daems, the ENSEMBLE WP6 Leader, via email at the address: [f.daems@mail.ertico.com](mailto:f.daems@mail.ertico.com).

#### 3.4.2. LOI survey

A discussion has been led to fostering the involvement of ETPC stakeholders towards truck platooning.

A Letter of Intent has been issued (Appendix A) to shortlisted stakeholders, and a survey was sent to the ETPC members and the ENSEMBLE partners, to collect their inputs. The responses to the survey were presented during the ETPC General Assembly on the 13<sup>th</sup> of November 2019.

#### 3.4.3. Interviews of Ambassadors

A series of interviews has been held to align the expectations of the ambassadors with those of the management team. Their perspective of the ETPC and their support has also been updated and confirmed. The result is the renewed support from all the Ambassadors to the ETPC platform, and their confidence in the fact that the benefits of truck platooning are recognised, albeit still to be



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documented in ENSEMBLE.

#### 3.4.4. Interview of EC officials

Informal interviews with EC officials are being organised to deliver an update about their view on the status of ENSEMBLE. Discussions will also be led about the European Commission's expectation and possible regulation issues that could facilitate the uptake of truck platooning in Europe in the coming years.

#### 3.4.5. Communication strategy:

Based on the previous communication strategy organised for the 2016 European Truck Platooning Challenge, an updated communication strategy has been presented to ETPC members leading to the definition of a team (see Annex III.)

### 3.5. Formalisation of the cooperation between ETPC and ENSEMBLE

The link between ETPC and Ensemble is clearly established and unanimously confirmed by the ETPC G.A (WP6.2 Stakeholder forum) dd.31-7-2019. The network itself is based on an association 'de fait' and not a formal agreement between members. Therefore, there cannot be any legal agreement.

During the kick off meeting of ENSEMBLE the role of the stakeholder forum was stated clearly and accepted unanimously by all participants:

- Involve ETPC community on targeted themes
- Be a reference platform for European truck platooning
- Contribute to the ETPC roadmap

During the ETPC general assembly (02/2018) the Lol was discussed. The basis was a survey allowing every partner to reaffirm its commitment to bring truck platooning technological solutions to the market in a short time horizon. The signatories agreed to the following intentions stated, aiming to enable the final ENSEMBLE live demonstration event.



## 4. ETPC NETWORK MEETINGS MINUTES

### 4.1. ETPC Network event - 2019/03/26

#### 4.1.1. Introduction

This chapter is a report on the ETPC network meeting of November 2018. It contains the report on the interactive and workshop sessions of the network event (see Agenda). It proposes conclusions to the Ensemble project and to the ETPC management. An action list to follow up is published. These will be discussed with the Steering Committee for acceptance.

#### 4.1.2. Agenda

*Tuesday, 20<sup>th</sup> November 2018 - h12:00-17:00*

Time	Topic
12:00-13:00	<b>Registrations and Lunch</b>
13:00-14:30	<p><b>Current deployment status in the member states and market evolution</b></p> <p>An overview will be given of the status of current projects throughout Europe, including the different views on possible barriers, opportunities, next steps to take, and market evolutions.</p> <ul style="list-style-type: none"> <li>• The Netherlands: NL Experience week, Michiel Jak</li> <li>• Austria: Walter Aigner, HITEC</li> <li>• Sweden: Hamid Zarghampour, Trafikverket</li> <li>• Germany: Christhard Gelau, BMVI</li> <li>• France: Bernard Jacob, IFSTTAR</li> <li>• Market evolution: Godfried Smit, ESC</li> </ul>
14:30-15:00	<p><b>Discussion</b></p> <p>A broad discussion will follow the previous session, addressing the elements that are relevant to the truck platooning uptake and possible case studies to be tackled on day 2. A few suggestion on inputs to be discussed:</p> <ul style="list-style-type: none"> <li>• Deployment enablers</li> <li>• Physical and logical infrastructure</li> <li>• Data sharing and cyber security concerns</li> </ul>
15:00-15:30	<b>Coffee Break</b>



<b>15:30-16:30</b>	<p style="text-align: center;"><b>Current Innovation status</b></p> <p>A presentation will be given on the status and intermediate deliverables of the ENSEMBLE project. Speakers:</p> <ul style="list-style-type: none"> <li>• Marika Hoedemaeker, coordinator of Ensemble, TNO</li> <li>• Bernard Jacob, WP4 (Infrastructure &amp; logistics ) leader, IFSTTAR</li> </ul> <p>Developing the service layer:</p> <ul style="list-style-type: none"> <li>• Radu-Florian Atanasiu, HERE</li> <li>• Kärblane Kalmer, Kapsch</li> </ul>
<b>16:30-17:00</b>	<p style="text-align: center;"><b>Conclusions</b></p> <p>Odile Arbeit-de-Chalendar and Frank Daems (ETPC management team)</p>
<b>17:00</b>	<b>End of day 1</b>

### Wednesday, 21<sup>st</sup> November 2018 - h9:00-14:00

Two concrete case studies will be identified following the discussion on day 1 and discussed in interactive sessions.

Time	Topic
<b>9:00-9:30</b>	<b>Welcome Coffee</b>
<b>9:30-10:45</b>	Case study 1
<b>10:45-11:15</b>	<b>Coffee break</b>
<b>11:15-12:30</b>	Case study 2
<b>12:30-13:00</b>	Conclusions
<b>13:00-14:00</b>	<b>Lunch – End of day 2</b>

#### 4.1.3. Discussion session (Tuesday 20th-14h30)

A discussion session was held on the presentations regarding the status and projects in the Member States and the market evolutions.

We determined in an interactive session the top 3 items for each of the following topics:

##### Platooning deployment enablers

The top 3 identified topics to handle are:

1. Proof the safety being number 1 feature of interest
2. Educate stakeholders (authorities, drivers, other road users), also leaving them finding their own answers and solutions, without pushing them top-down



3. Define clearer and more precise benefits, quantifiable numbers and specific topics

#### The physical and logical infrastructure in relation to Platooning

The top 3 identified topics to handle are:

1. Implement services to the drivers:
  - a. App to tell the driver where and with whom to platoon
  - b. Digital ADAS type support service
  - c. Platooning navigation
2. Physical infrastructure to be taken in account when platooning: bridges, number of lanes in motorways, restricted areas, etc.
3. Interaction between digital and physical infrastructure (green wave at the traffic lights, weather condition of the roads etc.)

#### Data sharing and cyber security concerns

The top 3 identified topics to handle are:

1. Secure data exchange amongst stakeholders involved without Google taking over (tools for data sharing)
2. Cyber security to be tackled
3. Start small, then grow

#### 4.1.4. Workshop on case studies

##### Process of the workshop

The network members were divided in groups of 4 to 5 people, each discussing the following topics and questions:

***Identify and comment on how your team thinks that Ensemble and Services can strengthen the 'business case' of this Platooning CASE in 2022***

*Consider the following:*

- SAE level;
- ADAS;
- Logistics and services;
- Drivers;
- Infrastructure (road operators).

***Describe your initial real implementation and deployment of platooning technology in 2022 related to this CASE:***

The 2 cases were selected at the end of the previous day. The choice was made to study the case of Sweden and of the Netherlands.

Both cases were handled at the same time, as the audience felt that for both cases, most of the items would be the same, only small differences will need to be made clear.

The individual contributions of each group can be retrieved on the shared network drive.

At the end of the sessions we gathered the conclusion from all groups in joint interactive session.



## Results and conclusions from the workshop

The text below is an improved edited version

### Envisioned SAE level in 2022:

- **It should be an EU approach**
- We go for the **'assisted level'** only: the driver remains responsible
- **SAE2**-no problem but level 1 is most appropriate
  - Each country is open for exemptions for a higher level
  - Type A platoon level-> SAE is for automation (applies to a single vehicle)
    - Challenges: following distance  $\geq 0.8s$
    - Defined already defined by existing laws, probably no exemptions needed
  - Platoon levels are defined by Ensemble (=coordinated level between vehicles) It remains to be seen how these 'platoon levels' will be taken up in the legislation. This is an action for the ENSEMBLE project to consult.)
- Allowing Platooning should be **under traffic management control**: e.g. only allowed when the right conditions are met e.g. Weather related
- There is a need for a feedback loop to the Service level to confirm?
- Decision if ' platooning is allowed' is a combination of the ODD (Operational Design domain) and the level of service the TM (traffic management) centre offer. This decision is fed back by the cloud level to the driver as a recommendation. The driver, both for the activation and the de-activation, takes the decision.
- In 2022, platooning should be possible on all  **$\geq 2$  lanes in one direction e.g. highways**
- The number of **trucks allowed in a platoon is 3** in 2022. Allowing more trucks in a platoon is a Step by step approach, Local exemption can allow more.  
The Spec of **Ensemble keeps 7** in order to allow the technology development to cope with the maximum envisioned number of trucks in a platoon
- In 2022 the platoon **only longitudinal control** should be implemented
- The truck **should be able to report its platoon level capability** e.g. to allow it to join a platoon or not e.g. on Different slopes-taking into account the braking-part of the assessment process in Ensemble
- EU should understand the concept for Platooning levels

### ADAS support in 2022

- Direct ADAS support (integrated with the functionality in the trucks on the 'tactical level' should only be for B and C platoon levels-> taking into account lessons learned from Level A. So, the real ADAS is envisioned beyond 2022.
- ADAS gets the driver more out of the loop  
The Driver can be helped in a traffic jam: e.g. by a specific application like 'Connected acceleration and deceleration' This type of feature can bring less



Connected Platooning starts now only on 40km/h speed-> this should change to 0-30 as the main topic.

In this use case there is the opportunity to shorten the gap and increase capacity  
Shortening the gap would probably impact the actual sensors. They should work for close systems driving. Advanced emerging braking system needs to be tweaked for the short distance.

- This feature is only possible with the connectivity  
V2V is mandatory and V2I(infra) can help-optional  
It remains unclear if V2I IS it mandatory?
- Open data: is necessary to feed the Operational design domain
- ADAS features:
  - See through capability-
  - Steering guidance for road works, traffic jams-up hill driving,...
  - Intercom communications channels between the driver

These features are nice to have

- Safety enhancing features  
Platooning linked to ADAS automated breaking systems, Nice to have , not a necessity in 2022, Incentive if you buy this from the government  Adated  
emerging system is already in law for new truck , but drivers can switch it off
- Other incentives for the drivers: Priority for parking
- Services are an Area of additional research.

### Logistics and services in 2022

- First logistics application swill be in Mono (one big operator company) fleet and multi brand
- Platooning requires cooperation: the industry needs to make a step to cooperation.
  - Platform launched by Commission on exchange of logistics data
  - [AEOLIX](#) is a Data Exchange European platform
- Logistics applications can monetize the value of data
- Governments and service providers should encourage platooning by looking to the cloud service and look to the presence of platooning.
  - Tax reduction?? (Because of less CO2, ...
  - Less Insurance fee if ADAS is correctly used.
  - Toll reduction?
  - eCMR? Potential
- IMAGINE project: expand the protocol
- Dangerous goods stuff handling: A platooning protocol is existing in the spec
- Look for the opportunity to create a separate complementary project to ENSEMBLE for the service layers,



Drivers

- Drivers influence the boss and hence they have buying power
  - Marketing should therefore address the drivers.
  - Drivers getting more involved to see the big picture of the logistics chain
- ADAS needs experience and knowledge
  - Is there a need for an extra qualification?
    - We should avoid the need for an extra driver's license, as the needed process of acceptance and deployment such a license in the member states will slow down the introduction of platooning.
    - Drivers older than 35 will not accept:->It will take a generation
- Address the general public for solving the driver shortage

Infrastructure (road operators)**Digital infra:**

- Test co-operative messaging-weather, dynamic info, traffic information,...-  
Dynamic condition
  - Already a lot of Data is available,
  - V2X based
- Road operator should give info if road is “platoonable”
- Control tower TM tool can give priority to
  - Green wave – booking can be done in a cloud service
  - Corridor management
  - Green flow-
  - Dedicated lane for platooning...

**Physical infrastructure:**

- Cope with the impact on e.g. Parking lots

#### 4.1.5. Inputs to the ENSEMBLE Project

This event is part of Task 6.2 in the Ensemble project: “Stakeholders forum-ETPC”

We can identify the specific and project inputs:

Platooning specification 2022

The following information is important for a check on the specifications for deployment of platooning in Europe in 2022.

- SAE level 1 compliant
- Platooning should be able to cope with dedicated platoon areas in geo-fenced environment. We aim for platooning on 2 lanes one direction (e.g. highways)
- Longitudinal control



- Gap >0.8 s
- Assisted level only-driver remains responsible
- Traffic mgt. control interface to be identified
- Number of truck in a platoon <=3
- Trucks need to be able to communicate their 'platoon capability –level' (tbd in detail)
- Verify the compliance of applied sensor specs in relation to this specification
- Be able to implement the first version of ADAS services
  - Look through capability
  - Steering guidance e.g. for roadworks, traffic jams, uphill or downhill driving (joint acceleration and deceleration)
  - Intercom possibility for the drivers
  - Service interface capability (e.g. to allow services for parking and traffic light priority etc.)
  - Any support in the spec to a better 'Handling dangerous goods'?
  - The specification should describe how interaction with Traffic Management services can be done, what is needed and how it is implemented. Care has to be taken that whatever is necessary, can be implemented and is ready in 2022.
  - Specification should cope with cybersecurity
  - Specification should enable data exchange (see further)
  
- Avoid the need for an extra 'driver license level' for truck drivers dealing with platoons.

#### ENSEMBLE Project process

The ENSEMBLE project should take up the following action:

- Create an insight and a proposal how to integrate Platoon levels into SAE frame.

#### 4.1.6. Derived actions for ETPC

From the event we identify the following actions

- ETPC (in co-operation with ENSEMBLE dissemination activity) to set up a communication program to clearly market the benefits (as we have defined them in this network event), especially also focussing on the safety aspect and potentials.
- ETPC to start an 'educational program and activity' towards road operators and Member States on platoon technology and deployment in 2022. This can be a part of the ENSEMBLE project deliverables.
- Look into the feasibility to create a 'platoon service' project, as a complementary project to ENSEMBLE. This project should also deal with identification, market and usage research on the identified first generation services.
- Logistics services: this can be a dedicated and a 'specific' vertical in the previous proposal.
- Data exchange possibility: ERTICO is actually proposing a project on data sharing management facilities.
- ETPC should identify the 'low hanging fruit' and enable the first 'focussed small platoon deployments'. Then platooning deployment can grow in a second phase. A dedicated implementation plan has to be made and agreed with the stakeholders and target platoon customers.

#### 4.1.7. Conclusions

This network event was a very successful combination of exchanging information about the status and expectations from the market, and the status and progress in the ENSEMBLE project.

The interactive sessions led to a shared and a unanimous view of the network members on the



needs and priorities to be taken care of to introduce platooning in 2022 onto the market.

Derived from these insights, we issued a number of dedicated inputs for the process and the specifications of Platooning in ENSEMBLE. ETPC will further take up additional actions to support the deployment in 2022.

## 4.2. ETPC Network event - 2019/03/26

### 4.2.1. Introduction

This document is a report on the ETPC network meeting, related to the agenda points

- ETPC workgroups;
- LOI;
- Business covenant.

### 4.2.2. Agenda

Time	Topic	Presenter
9:30	<b>Welcome Coffee</b>	
9:50	Introduction: Aim of the network meeting	ERTICO, Frank Daems
10:00	Country update: UK	TRL, Matthias Seidl
10:15	Country update: France	IFSTTAR, Bernard Jacob
10:30	Country update: the Netherlands (Truck Platooning, the Experience Week)	MINIENW, Arjan Van Vliet
10:45	Outcome of the previous meeting: VISION 202	ERTICO, Frank Daems
11:00	Ensemble General Status	TNO, Marika Hoedemaeker
11:15	Ensemble WP2 Spec	CLEPA, Lina Konstantinopoulou
11:45	Ensemble WP4 Impact	IFSTTAR, Bernard Jacob
12:15	Ensemble WP6 Communication	ERTICO, Iuliia Skorykova
12:45	<b>Lunch</b>	
13:30	ETPC workgroups	ERTICO, Frank Daems
14:00	LOI	ERTICO, Frank Daems
14:15	Business Covenant : Intro and discussion	ERTICO, Frank Daems



<b>15:00</b>	<b>Coffee break</b>	
<b>15:30</b>	Communication objectives: <ul style="list-style-type: none"> <li>• Discussion</li> <li>• Core messages and target groups for ETPC</li> </ul>	ERTICO Cordelia Wilson
<b>16:30</b>	1700 Conclusions (all)	ERTICO, Frank Daems
<b>17:00</b>	<b>End of Meeting</b>	

#### 4.2.3. Registered Attendees

1. Virginie Etienne, IFSTTAR
2. Michael Menzel, Bosch
3. Steve Phillips, CEDR
4. Ryad Joondan, GEIE-TMB
5. Matthias Seidl, TRL
6. Jocelyn Delatre, ACEA
7. Rauno Heikkilä, University of Oulu
8. Tom Alkim, EC
9. Dimitrios Vartis, EC
10. Arjan Van Vliet, Ministry of Infrastructure and Water Management
11. Iuliia Skorykova, ERTICO
12. Arnaud Massart, SPW
13. Carlo Giro, IRU
14. Dalila Coviello, ERTICO
15. Carmela Canonico, ERTICO
16. Christhard Gelau, BMVI
17. Marika Hoedemaeker, TNO
18. Frank Daems, ERTICO
19. Alessandro Coda, CLEPA
20. Veikko Pekkala, University of Oulu
21. Lina Konstantinopoulou, CLEPA
22. Giulia Catini, CNH Ind.

#### 4.2.4. ETPC Workgroups

A short presentation was made about the established ETPC workgroups and their role in the co-operation with ENSEMBLE, as agreed in the KoM of ENSEMBLE in May 2018 and during the GA of the ETPC in 2018.

There is the opportunity that the ETPC workgroups review and give inputs to a number of deliverables of the ENSEMBLE project. A potential list of deliverables related to the workgroups has been presented. (See presentations)

ETPC workgroups have today no clear workgroup leader. The meeting asked if the founding members of ETPC could take up leadership for the workgroups. The meeting did not conclude on assignments.

#### 4.2.5. LOI



The proposed LOI is a deliverable of the ENSEMBBLE project. The meeting presented the main topics of the LOI. The meeting also discussed the different intentions that are drafted in the LOI. It is clear that a stakeholder can probably not agree on all mentioned intentions TOGETHER. However, a stakeholder could agree with some of the intentions. The idea was presented to use the LOI draft and reform it to a survey, to be sent to the entire network. Each network partner can indicate the

particular intentions that they can support.

The outcome of the survey exposes the total support that exists in the market place for the deployment of platooning, as expressed in the Vision 2022 of ETPC and in the Platooning level A definition of ENSEMBLE.

As a preparation, a matching analysis has to be made between platoon level A definition and VISION 2022 spec (as presented in the previous ETPC network report) **Action : ETPC management.**

The meeting also discussed the general process that is needed to deploy the final event of the ENSEMBLE into the market. The outcome of the survey is a good tool to make the right recommendations for a realistic decision-making by the Steering Committee of ENSEMBLE, to appoint the final locations and involved road networks for the final event(s) demonstrations in May 2021.

The outcome of the survey will also reveal the support in Europe for Platooning deployment.

#### 4.2.6. Business Covenant -MOU Ensemble

A draft idea for a business covenant was presented, on the basis of the MOU deliverable in the ENSEMBLE project, with the following characteristics discussed:

- An agreement between all stakeholders (associations and their majority of members).
- A win-win business case for each stakeholder as a basis for the covenant.
- The covenant should represent the mutual understanding of each stakeholder's benefits and efforts.
- It should be a joint and coordinated deployment action towards the market.
- It should be a business development process for Vision 2022 platooning.

The meeting did not reveal a practical methodology to get this idea forward.

The idea is that the ETPC management will contact each of the ETPC founding members to discuss how we should organise this process.

#### 4.2.7. ACTIONS gathered from the meeting

Action	Description	When	By:
LOI	Transfer LOI into a survey to be sent to the ETPC network partners	April 2019	Frank Daems and Kujtesa Hajredini, ERTICO
Covenant	Pre discuss the covenant with each ETPC founding member	Q2 2019	Frank Daems, ERTICO Odile Arbeit de Chalendar, IFSTTAR



## 4.3 ETPC Network Workshop – 14 November 2019

### 4.3.1. Agenda

Tuesday, 14<sup>th</sup> November 2019– h10:00-16:00

Venue: ERTICO – ITS Europe, Avenue Louise 326, 1050 Brussels (Ground floor)

Time	Topic	Presenter
<b>10:00</b>	<b>Welcome Coffee</b>	
	Part 1 - Market perspective	
<b>10:15</b>	Update from projects: <ul style="list-style-type: none"> <li>• Turkey</li> <li>• France</li> <li>• CONCORDA Truck Platooning of Bosch</li> </ul>	Sercan Karaağaç, Ford TK Bernard Jacob, IFSTTAR Michael Menzel, Bosch
<b>11:00</b>	Truck Platooning test plan in the Mont Blanc Tunnel	Ryad Joondan, GEIE - MBT
<b>11:15</b>	Role of secure parking in Truck Platooning	Dirk Penasse, ESPORG
<b>11:30</b>	Enabling multi-fleet, on-the-fly platooning through predictive analytics	Valentin Rudloff, TRACKS
<b>11:45</b>	European High Capacity Transport Network	Loes Aarts, Aeroflex / RWS
<b>12:00</b>	Best practice from the Falcon project	Karel Kural , Han university
<b>12:45</b>	Discussion on potential role of dynamic exemptions	Frank Daems, ERTICO
<b>12:30</b>	<b>Lunch</b>	
	Part 2 – updates from ENSEMBLE	
<b>13:30</b>	General project status	Marika Hoedemaker, TNO
<b>13:45</b>	Recognised benefits of platooning as defined by ENSEMBLE	Marika Hoedemaker, TNO
<b>14:00</b>	Communication strategy	Odile Arbeit de Chalendar, IFSTTAR



<b>14 :15</b>	Discussion- Q/A	-
<b>14:30</b>	<b>Coffee break</b>	
	Part 3 - Building the vision 2022 (interactive session)	
<b>15:00</b>	Match of the ETPC Vision 2022 and ENSEMBLE intermediate results – Interactive discussion	-
<b>16:00</b>	<b>End of Meeting</b>	

#### 4.3.2. Participants

<b>Name</b>	<b>Family name</b>	<b>Organisation</b>
Loes	Aarts	Rijkswaterstaat
Tom	Antonissen	AKKA
Odile	Arbeit de Chalendar	IFSTTAR
Angelica	Armstrong	Nordic Logistics Association
Radu-Florian	Atanasiu	HERE
Marion	Auzolle	HERE
Jerome	Buquet	SEE TELECOM
Carmela	Canonico	ERTICO
Dalila	Coviello	ERTICO
Jocelyn	Delatre	ACEA
Christhard	Gelau	BMVI
Marika	Hoedemaeker	TNO
Bernard	Jacob	IFSTTAR
Daniel	Jeegers	SEE Telecom
Ryad	Joondan	GEIE-TMB
Sercan	Karaağaç	Ford TK
Koosha	Kaveh	FleetSpark

Kiss	Kiss	ECG
Karel	Kural	Han University
Arnaud	Lambinon	Service public de Wallonie
Thijs	Meijer	TLN
Michael	Menzel	Bosch
Hans	Nordin	SCANIA
Navid	Nourani Vatani	FleetSpark
Piero	Onofri	
Eric	Patron	See Telecom
Dirk	Penasse	Esporg
Kristof	Rombaut	MOW
Valentin	Rudloff	Tracks GmbH



Tahir	Sarı	Ford TK
Ernst	Thierry	YoGoKo
Onno	Tool	Rijkswaterstaat
Nikolaos	Tsampieris	ERTICO
Valerio	Turri	KTH

### 4.3.3.Part 1 - Update from projects

#### **Turkey, 5G-MOBIX – FORD TK**

Sercan Karaağaç, Ford TK, illustrates the 5G-MOBIX challenges and solutions on its truck platooning use case, implemented on the cross-border corridor between Greece and Turkey. Detailed information can be found in the presentation.

Q/A with the audience:

- It is unclear how Truck Platooning makes the border crossing easier?  
Border between Turkey and Greece has strict control points. Hence, vehicles have to stop on certain points to pass the border. In 5G-Mobix, platoon will arrive to border gate and will be dissolved. After that, we will route vehicles autonomously through 5G with the help of sensors that are located on the facility and on the vehicles by processing sensor data on the cloud.
- You use DSRC instead of C-V2X, how are you getting to that part?  
On our current platooning project (seen on the videos) we have worked on ITS-G5 V2V communication. Our current goal on 5G-Mobix project is, about using 5G-V2N connection as main and PC5-V2V connection for redundancy where there is no network connection.
- Is it V2X communication?  
Yes, please see our answer on 2<sup>nd</sup> question.
- What is the safe option if the signal fails in platooning?  
Our idea to have redundant connectivity using “ITS-G5 or PC5” and “cellular network” enabling seamless connectivity even if one of the connectivity channels fails, e.g. when cellular is gone, or short range communication fails. Additionally, if connection is completely lost, since driver is still on the seat, and responsible for a take-over, an HMI warning is issued to indicate that. When this happens, vehicle automatically decelerates to increase the time gap to 1.5 second where a safe following distance, and takeover can take place.
- What’s the link between V2V(ITS-G5) and 5G? More reliable?  
According to current studies, 5G will have 99.999% reliability. We will take advantage of its URLLC (Ultra reliable low latency communication) and high throughput capability to perform more advanced use cases in 5G-Mobix project, such as see through and autonomous truck routing on customs area.



## CONCORDA Truck Platooning of Bosch

Michael Menzel, Bosch, illustrates the CONCORDA truck platooning use case; more information can be found in the presentation.

Q/A with the audience:

- Which was the biggest challenge with the multi-brand platooning?

The integration of the components into the different architectures of the trucks. Ensuring performance for deceleration manoeuvres without V2V communication.

- Is it your Bosch solution providing the platooning support?

BOSCH solution works within L2-architecture of the trucks (driver is always responsible).

## Truck Platooning test plan in the Mont Blanc Tunnel

Ryad Joondan, GEIE – MBT presents PPT, and formally asks to the ENSEMBLE coordinator, Marika Hoedemaeker if the MBT could be used as a test case for ENSEMBLE.

Mr. Daniel Jeegers from SEE TELECOM joins the presentation to detail the technical sides of the foreseen tests.

Q/A with the audience:

- For enabling Platooning in a tunnel, will the distance and communication technology be the same that outside or not?

The objective is to have the same protocol outside and inside the Tunnel. That's why the EEIG -MBT want to be a test area for Platooning.

- In terms of risk management, how do you balance the increase of the risk coming from driving closer and augmenting the throughput?

The EEIG-MBT will NEVER reduce the safety condition inside the MBT. Actually, the minimum distance between vehicles is 150m, so as to have at least 100m between them when they are stopped. So, 50 m are dedicated to the reaction time of the driver from the following truck.

That's why we are looking to a high level of platooning that allows an electronic reaction time, and not a human's one. In this case, EEIG-TMB could reduce the minimum distance between trucks when driving from 150 to 100 meters.

- With which OEMs are you doing the tests? We are still looking for OEMs.

## Enabling multi-fleet, on-the-fly platooning through predictive analytics

Valentin Rudloff, TRACKS, introduced the work.

He also introduces a report on the economic feasibility of Platooning that is not free to share due to confidentiality limitations. If interested in knowing more about the report, please contact Valentin Rudloff at the email: [valentin.rudloff@tracksfortrucks.com](mailto:valentin.rudloff@tracksfortrucks.com).

After the presentation, a round of questions are answered:

- Where do you get your data from? How do you manage it?

To date, we already receive granular rFMS-data (<http://www.fms-standard.com/Truck/index.htm>)



from more than 9.000 European trucks which include data points on fuel consumption, speed and position. We furthermore established API-keys to include open source weather and infrastructure data. Beyond this we are seeking to include more data sources such as data from Fleet Management Systems or on road surfaces. We combine these data with Machine Learning Algorithms.

- What kind of data are you working with? Every OEM has to provide their own solution? How are you sharing the data to the outside world?

All major European OEMs have agreed on the new rFMS standard in 2017 which means that they share granular vehicle data from their on-board telematics with third parties over a cloud. We have to make an agreement with carriers to access the cloud-data of their fleets. Thereby we do not need to install any additional hardware in vehicles and we can be used across OEMs and fleets.

### **Best practice from the Falcon project**

Karel Kural , Han University

Q/A with the audience:

- What is the follow up with this project? Will the conclusion be taken to the legislator as insights and suggestion to update the legislation to enable truck platoon to actually be on the streets?

At first, the findings and outputs from the FALCON project will be directly adopted by the H2020|AEROFLEX project. Next, according to my information ACEA is trying to establish an expert group with DG MOVE to adopt the findings. In NL, there is now an initiative to start piloting so called 'Super Eco Combi' vehicle combinations (tractor with two semitrailers linked by dolly), where HAN is also involved and we are promoting the Performance Based Standards (PBS) principles for further implementation to ensure the safe operation on selected infrastructure segments. In all the mentioned cases the FALCON results will be applied in relation to High Capacity vehicles not a platoon, although the principles of PBS understood as dynamical exception mechanism may generally be applied to platooning while using different performance measures. I think to set the platoon on the streets is for this moment perhaps too ambitious, I see the main impact of the platooning on the highways and corridors.

- Truck platooning approach in FALCON is different here when compared to other projects, as it opened the door for PDS to prove the safety of platooning and the actual ability of the involved trucks to platoon. This project was initiated by CEDR, but are you having any talk with the EC to implement this approach? And are the OEMs able to demonstrate they can provide what showed in the project?

I am not sure if I understand well the question. In FALCON it did not go directly over the platooning but High Capacity Vehicles as I commented above. Nevertheless, the 'talks with EC' should be done at the first instance through the expert group which ACEA is setting up (which represents also all the truck OEM's per definition).

- Flanders transport ministry is currently working on a very strong concept of infrastructure support layer for CAD. Automotive is more and more looking to infrastructure to provide support. How are you addressing this infrastructure input from a digital infrastructure point of view?

The smart infrastructure can ensure and enforce that correct vehicles, which were suitable for a



particular job on a specific infrastructure segment (i.e. the vehicle received a dynamical exception from the established legislation) really operate as they should.

### Discussion on potential role of dynamic exemptions

Frank Daems, ERTICO, introduced the concept of dynamic exemption, as following:

“Real time exemption on a certain existing regulation by means of issuing a digital certificate to allow a certain transport on a certain trajectory”

After the presentation on how to proceed in the implementation of the dynamic exemption, and the main benefits of it, a discussion follows.

The audience understood the principle and sees benefits. A reaction from the road authorities was explicitly asked for. MOW reacted that, currently their procedure is a two-stage procedure of studying the exemption request and then issuing the exemption. It remains to be seen how ‘dynamic exemptions concept’ can be introduced and adopted by the road authority.

#### 4.3.4. Part 2 - updates from ENSEMBLE

Marika Hoedemaker, TNO, presents a general overview on the project’s activities and achievements so far.

One of the highlights is the definition of two relevant levels of platooning defined by ENSEMBLE (more details in the presentation):

- Platooning as a support function;
- Platooning as an autonomous function.

**ENSEMBLE** partners will share the benefits of platooning (i.e. Safety, driver workload, traffic flow, potentially fuel economy) for both support and autonomous platooning, will provide the specifications at the tactical layer for both levels. The final demonstration will show the Support function.

(as current technology does not fulfil all the safety requirements that are needed for short-gap deployment).

Next steps for ENSEMBLE:

- Hazard Analysis and Risk Assessment (HARA)
  - Identify malfunctions in the system that might lead to hazards
- Safety of the Intended Function (SOTIF)
  - Identify performance limitations or insufficiencies in the function that might lead to hazards
- Mono / Dual/ Three / Multi brand testing
  - will provide inputs for updating the specifications
- Final demo
  - 7 trucks platoon in different formations

#### 4.3.5. Part 3 - Building the vision 2022 (interactive session)



## Match of the ETPC Vision 2022 and ENSEMBLE intermediate results – Interactive discussion

Three working groups are set up and are asked to discuss and fill in the tables below, where the different answers are reported.

### Working group 1

VISION 2022	ENSEMBLE support level	Remark
Number of truck in a platoon <=3	No	It is unnecessary limiting the use case. There is enough gap between the vehicles
Trucks need to be able to communicate their 'platoon capability –level'	Not necessary	Human in the loop to make judgement
Verify the compliance of applied sensor specs in relation to this specification	<input checked="" type="checkbox"/>	
Look through capability	No, we don't know if it is beneficial. Platoon status  no important	<input type="checkbox"/> Gap <input type="checkbox"/> Gap <input type="checkbox"/> _Space
Steering guidance e.g. for roadworks, traffic jams, uphill or downhill driving (joint acceleration and deceleration)	<input checked="" type="checkbox"/>	
Intercom possibility for the drivers	No	
Service interface capability (e.g. to allow services for parking and traffic light priority etc.)	See below	
A better 'Handling dangerous goods'	Not at this stage	
Avoid the need for an extra 'driver license level' for truck drivers dealing with platoons.	Yes, avoid it	
Interaction with Traffic Management services		



Specification should cope with cybersecurity	Yes	
Enable data exchange	Yes	
Service interface capability (e.g. to allow services for parking and traffic light priority etc.)	Yes	

## Working group 2

VISION 2022	ENSEMBLE support level	Remarks
Gap >0.8 s	<input checked="" type="checkbox"/>	
Assisted level only-driver remains responsible	<input checked="" type="checkbox"/>	Include training in driver licence test
Traffic mgt. control interface to be identified	<ul style="list-style-type: none"> <li>Needs to be identified</li> <li>Services to cloud via API are foreseen</li> <li>Traffic mgmt. control from API requires development</li> </ul>	Part of specifications for cloud communications
Number of truck in a platoon $\leq 3$	To date, no technical limit	Road specific limits are needed
Trucks need to be able to communicate their 'platoon capability -level'	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> <li>Important for optimal matching</li> <li>Remaining driving time not available</li> </ul>
Verify the compliance of applied sensor specs in relation to this specification		
Look through capability		
Steering guidance e.g. for roadworks, traffic jams, uphill or downhill driving (joint acceleration and deceleration)	OEM	OEM feature
Intercom possibility for the drivers		
Service interface capability (e.g. to allow services for parking and	<ul style="list-style-type: none"> <li>Missing relevant information</li> <li>Driving time</li> </ul>	



traffic light priority etc.)		
A better 'Handling dangerous goods'	?	<ul style="list-style-type: none"> <li>• EU standardisation needed</li> <li>• Evaluate impact on tunnel safety miles</li> </ul>
Avoid the need for an extra 'driver license level' for truck drivers dealing with platoons.	<input checked="" type="checkbox"/>	
<b>ADDED by the group:</b> Inclusion of IRV	?	
Interaction with Traffic Management services	<input checked="" type="checkbox"/>	
Specification should cope with cybersecurity	<input checked="" type="checkbox"/>	
Enable data exchange	V2I for traffic management	V2V given
Service interface capability (e.g. to allow services for parking and traffic light priority etc.)	No	

## Working group 3

VISION 2022	ENSEMBLE support level	Remarks
Gap >0.8 s	Yes for 1,45	Dynamic, for short time T > 0,8 allowed (breaking) Yes 0,8 with modification on L2-safety level
Assisted level only-driver remains responsible	Yes	
Traffic mgt. control interface to be identified	Yes No	For receiving information Sending from truck to infrastructure
Number of truck in a platoon <=3	To date, no technical limit	Road specific limits are needed
Trucks need to be able to communicate their 'platoon capability -level'	More than 2 trucks	



Verify the compliance of applied sensor specs in relation to this specification		
Look through capability	No	
Steering guidance e.g. for roadworks, traffic jams, uphill or downhill driving (joint acceleration and deceleration)	Yes	OEM related
<b>VISION 2022</b>	<b>ENSEMBLE support level</b>	<b>Remark</b>
Intercom possibility for the drivers	No	
Service interface capability (e.g. to allow services for parking and traffic light priority etc.)	Yes	
A better 'Handling dangerous goods'	No	
Avoid the need for an extra 'driver license level' for truck drivers dealing with platoons.	Yes	
Interaction with Traffic Management services		
Specification should cope with cybersecurity		
Enable data exchange		
Service interface capability (e.g. to allow services for parking and traffic light priority etc.)	Interface in open can be feasible	





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## 5. SUMMARY AND CONCLUSION

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This deliverable illustrates the role of the ETPC network in relation to the ENSEMBLE project . The ETPC represents the platform that will support the implementation of truck platoon in Europe. Therefore, the interaction between the ETPC and ENSEMBLE is considered as a key point for the project.

The ETPC Members are providing their feedback, their support, and their engagement to make truck platooning happen with a midterm vision that goes beyond the delivering of Multi-brand Truck Platooning of ENSEMBLE.

The ETPC, throughout its meetings has produced a set of topics – already presented in the ETPC minutes that are included in this document – that are summarised below:

- Support to ENSEMBLE:
  - Letter of Intent discussion;
  - Ambassador interviews;
  - Commission interviews.
- Future perspectives for Truckplatooning:
  - Vision and Interviews of Ambassadors;
  - Interview of EC officials. Status ongoing.
- Standardisation needs for ENSEMBLE MultiBrand Truckplatooning: from V2V to V2X
- Communication: Discussion of a communication strategy and Logo
- Final event: Discussion on the criteria's for the choice of the location for the final event

The ETPC also has an important role in the organisation of the final event, in order to connect the project with road operators and to facilitate the involved Member States in allowing the relevant exemptions.

## ADENDUM A - LOI

Note: this draft will be made official soon after a check for the legal language by a legal expert.

To whom it may concern:

Stakeholders: All ENSEMBLE Partners,  
ETPC members (Road authorities included)  
EU-EIP Network

The main goal of the ENSEMBLE project is to pave the way for the adoption of multi-brand truck platooning in Europe to improve fuel economy, traffic safety and throughput.

ENSEMBLE project aims that in its final event being a live demonstration of multi brand platooning of seven trucks electronically coupled and driving across several Members States.

This Lol formulates the intention and commitment of automotive industry, road authorities and other related stakeholders to bring truck platooning technological solutions to the market in a short time horizon.

The signatories agree to the following four intentions stated, aiming to enable the final ENSEMBLE live demonstration event:

**1 Enabling the live demonstration:** In the case the ENSEMBLE final event is proposed to be executed in our involved road network and we are an involved related authority, or if it relates to our activity, our organisation intends to positively contribute and to cooperate with ENSEMBLE project partners to enable the final ENSEMBLE live demonstration event.

**2 Providing the necessary resources:** This contribution and cooperation includes but is not limited to providing the necessary resources in the preparation of the workshops for organising this final event under coordination of the WP6 ENSEMBLE leader.

**3 Support the final event:** Based on the results of these workshops, our organisation intends to create and execute an operational plan to ensure the physical and digital infrastructure support and availability, or technical implementation and testing support to the platooning final event.

**4 Contribute to the acceptance of the exemption:** Our organisation intends to accept the final exemptions as defined by these workshops to guarantee that the final event is in accordance with the local applicable law.

The signatories agree to the following aiming at bringing truck platooning technological solutions to the market in a short time horizon.

**5 Identify necessary actions for further deployment:** Our organisation intends to take the ENSEMBLE project results and identify our necessary actions to contribute in further deployment of truck platooning.

**6 Coordinate actions under the ETPC:** Our organisation intends to align those actions with



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other involved stakeholders in a coordinated way governed by ETPC.

The signatories agree to marketing and communication of ENSEMBLE project related topics:

- 7 Disseminate Ensemble results:** Our organisation intends to adhere to the Code of Conduct of Communication and Dissemination as defined by ENSEMBLE Work Package 6

The duration of this LOI lasts at least project time of ENSEMBLE.

Afterwards this LOI can be terminated with a three months' notification to the ETPC management.

Signatures



# ADDENDUM B – ETPC VISION 2022

## Introduction

This document describes the VISION 2022 expressed by the ETPC platform (European Truck Platooning Challenge platform)<sup>2</sup>. The Vision 2022 was the result of the ETPC event and workshop dd. 20-11-2018. Since then it evolved in the subsequent network events of the platform. VISION 2022 phrases the common insights and requirements, expressed by all related stakeholders and founders of the platform on how Platooning should be made possible to be actively deployed in the EU market from 2022 onwards. VISION 2022 can be used to challenge related deliverables from ENSEMBLE H2020 project on establishing multi brand, cross border and ad hoc platooning.

These deliverables include ENSEMBLE requirement and specification deliverables (WP2). Also deliverables related on the Impact (WP4) can be of interest. ETPC as a platform activity is in itself part of the ENSEMBLE project (Task 6.2) of the communication and dissemination Work Package (WP6)

VISION 2022 can be used as a basis for the LOI (Letter of Intent) (D6.7) and MOU (Memo of understanding) (D6.8) deliverables of ENSEMBLE.

Within ETPC the MOU can lead to a business covenant expressing the agreement between all stakeholders (Associations and their majority of members). The covenant should express the win-win business case for each stakeholder and business relation between them. It is a mutual understanding of each stakeholder's benefits and efforts. It is an agreement for a joint undertaking and a coordinated deployment and action towards the market.

## VISION 2022 content items

The Vision 2022 addresses all related platooning elements:

- What is the SAE automation level that is envisioned in 2022 for platooning?
- What is the ADAS support (Advanced Driver Assistance Support) in 2022 for platooning?
- What type of services (especially ) logistics will be deployed on platooning in 2022?
- What is the impact on drivers in 2022?
- What is the impact on infrastructure in 2022?

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<sup>2</sup> For more information on ETPC platform and its history, please refer to the ETPC website. (In transition at the date of publishing)



## The 20-11-2018 workshop results

Are described below (copy form the minutes):

### Envisioned SAE level in 2022:

- **It should be an EU approach**
- We go for the ‘**assisted level**’ only: the driver remains responsible
- **SAE2**-no problem  but level 1 is most appropriate
  - Each country is open for exemptions for a higher level
  - Type A platoon level-> SAE is for automation (applies to a single vehicle)
    - Challenges: following distance  $\geq 0.8s$
    - Defined already defined by existing laws, probably no exemptions needed
  - Platoon levels are defined by Ensemble (=coordinated level between vehicles) It remains to be seen how these ‘platoon levels’ will be taken up in the legislation. This is an action for the ENSEMBLE project to consult.)
- Allowing Platooning should be **under traffic management control**: e.g. only allowed when the right conditions are met e.g. Weather related
- There is a need for a feedback loop to the Service level to confirm?
- Decision if ‘platooning is allowed’ is a combination of the ODD (Operational Design domain) and the level of service the TM (traffic management) centre offer. This decision is fed back by the cloud level to the driver as a recommendation. The driver, both for the activation and the de-activation, takes the decision.
- In 2022, platooning should be possible on all  **$\geq 2$  lanes in one direction e.g. highways**
- The number of **trucks allowed in a platoon is 3** in 2022. Allowing more trucks in a platoon is a Step by step approach,

Local exemption can allow more.

The Spec of **Ensemble keeps 7** in order to allow the technology development to cope with the maximum envisioned number of trucks in a platoon

- In 2022 the platoon **only longitudinal control** should be implemented
- The truck **should be able to report its platoon level capability** e.g. to allow it to join a platoon or not e.g. on Different slopes-taking into account the braking-part of the assessment process in Ensemble



- EU should understand the concept for Platooning levels

### ADAS support in 2022

- Direct ADAS support (integrated with the functionality in the trucks on the 'tactical level' should only be for B and C platoon levels -> taking into account lessons learned from Level A. So, the real ADAS is envisioned beyond 2022.
- ADAS gets the driver more out of the loop

The Driver can be helped in a traffic jam: e.g. by a specific application like 'Connected acceleration and deceleration'. This type of feature can bring less stress to the driver. Connected Platooning starts now only on 40km/h speed -> this should change to 0-30 as the main topic.

In this use case there is the opportunity to shorten the gap and increase capacity. Shortening the gap would probably impact the actual sensors. They should work for close systems driving. Advanced emerging braking system needs to be tweaked for the short distance.

- This feature is only possible with the connectivity

V2V is mandatory and V2I(infra) can help- optional. It remains unclear if V2I is mandatory?

- Open data: is necessary to feed the Operational design domain
- ADAS features:
  - See through capability-
  - Steering guidance for road works, traffic jams-up hill driving,...
  - Intercom communications channels between the driver

These features are nice to have

- Safety enhancing features

Platooning linked to ADAS automated braking systems, Nice to have, not a necessity in 2022, Incentive if you buy this from the government (7) Advanced emerging system is already in law on new truck, but drivers can switch it off

- Other incentives for the drivers: Priority for parking
- Services are an Area of additional research.

### Logistics and services in 2022

- First logistics application will be in Mono (one big operator company) fleet and multi brand
- Platooning requires cooperation: the industry needs to make a step to cooperation.



- Platform launched by Commission on exchange of logistics data
- [AEOLIX](#) is a Data Exchange European platform
- Logistics applications can monetize the value of data
- Governments and service providers should encourage platooning by looking to the cloud service and look to the presence of platooning.
  - Tax reduction?? (Because of less CO2, ...
  - Less Insurance fee if ADAS is correctly used.
  - Toll reduction?
  - eCMR? Potential
- IMAGINE project: expand the protocol
- Dangerous goods stuff handling: A platooning protocol is existing in the spec
- Look for the opportunity to create a separate complementary project to ENSEMBLE for the service layers,

## Drivers

- Drivers influence the boss and hence they have buying power
  - Marketing should therefore address the drivers.
  - Drivers getting more involved to see the big picture of the logistics chain
- ADAS needs experience and knowledge
  - Is there a need for an extra qualification?
    - We should avoid the need for an extra driver's license, as the needed process of acceptance and deployment such a license in the member states will slow down the introduction of platooning.
    - Drivers older than 35 will not accept:->It will take a generation
- Address the general public for solving the driver shortage

## Infrastructure (road operators)

### Digital infra:

- Test co-operative messaging-weather, dynamic info, traffic information,... - Dynamic condition
  - Already a lot of Data is available,



- V2X based
    - Road operator should give info if road is “platoonable”
    - Control tower TM tool can give priority to
      - Green wave – booking can be done in a cloud service
      - Corridor management
      - Green flow-
      - Dedicated lane for platooning
- Physical infrastructure:**
- Cope with the impact on e.g. Parking lots



## ADDENDUM C - VISION 2022: Platooning specification 2022

Derived from this vision the following information is important for a check on the specifications for deployment of platooning in Europe in 2022.

- SAE level 1 compliant
- Platooning should be able to cope with dedicated platoon areas in geo-fenced environment. We aim for platooning on 2 lanes one direction (e.g. highways)
- Longitudinal control
- Gap >0.8 s
- Assisted level only-driver remains responsible
- Traffic mgt. control interface to be identified
- Number of truck in a platoon  $\leq 3$
- Trucks need to be able to communicate their 'platoon capability –level' (tbd. in detail)
- Verify the compliance of applied sensor specs in relation to this specification
- Be able to implement the first version of ADAS services
  - Look through capability
  - Steering guidance e.g. for roadworks, traffic jams, uphill or downhill driving (joint acceleration and deceleration)
  - Intercom possibility for the drivers
  - Service interface capability (e.g. to allow services for parking and traffic light priority etc.)
  - Any support in the spec to a better 'Handling dangerous goThe specification should describe how interaction with Traffic Management services can be done, what is needed and how it is implemented. Care has to be taken that whatever is necessary, can be implemented and is ready in 2022.
  - Specification should cope with cybersecurity
- Specification should enable data exchange (see further)
- Avoid the need for an extra 'driver license level' for truck drivers dealing with platoons.



# ADDENDUM D - ETPC COMMUNICATION STRATEGY



## How did we realise communication objectives?



### Dialogue

- Motivation to participate
- Share new insights/experiences
- Personal
- Start momentum
- Co-creation



### Ambassadors

- Together
- Sharing insights
- Commitment
- Visibility EU TPC
- Use network
- Partnership



### Storytelling

- Emotion, not facts
- Credibility
- Authentic
- Inspiring
- All channels
- same story
- Also in media

## Contact persons communications

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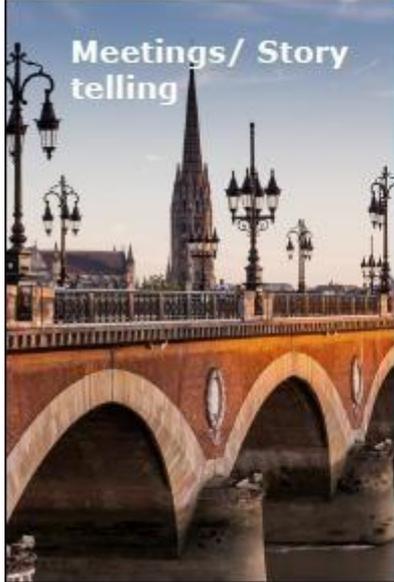
### Policy and communication objectives

<b>2020</b>	EU Truck Platooning becomes routine in Europe in the near future	<b>Communication Objectives</b>	Facilitate European cooperation between EU member states, truck manufacturers and key stakeholders.
<b>2016</b>	During the Dutch EU Presidency we want to realise European Truck Platooning Challenge in April 2016		Facilitate cooperation European level between parties  Visibility EU TP Europe / Netherlands takes role initiator,
<b>2016</b>	After the Challenge ensure that knowledge and experience acquired are shared and are input for successive steps in Europe		Share experiences and lessons learned around EU TPC with all parties involved and interested parties in Europe.

### Three target groups

<b>Primary</b>	<ol style="list-style-type: none"> <li>1. European truck manufacturers (DAF Trucks, Daimler, Iveco, MAN Truck &amp; Bus, Scania, Volvo Group (ACEA))</li> <li>2. Cooperating European countries: Sweden, Denmark, Belgium, Germany, Netherlands.             <ol style="list-style-type: none"> <li>a. Political and senior civil service top</li> <li>b. These countries' road authorities (CEDR)</li> </ol> </li> <li>3. European Vehicle- and Road approval Authorities (Ereg)</li> </ol>
<b>Secondary</b>	<p><b>European parties</b> seeking cooperation and knowledge.</p> <ol style="list-style-type: none"> <li>1. Countries; FR, AT, UK, FI, SP, e.g.             <ol style="list-style-type: none"> <li>a. EU member states (political top, road authorities)</li> <li>b. European Vehicle- and Road approval Authorities</li> </ol> </li> <li>2. European R&amp;D institutes e.g. TNO</li> <li>3. Tier one + Service providers</li> <li>4. Umbrella organisations, common interest groupings (automobile clubs e.g. ANWB, AutomotiveNL, Safety institutes, CLEPA, IRU, ESC, Milieu-organisations)</li> </ol>
<b>Tertiaire</b>	<ol style="list-style-type: none"> <li>1. General public / citizens</li> <li>2. Other road users</li> </ol> <p>NB Press and media continually criss-cross preparations</p>





### Meetings/ Story telling

- **Bordeaux:**
  - 7 October 2015
  - Commitment truck manufacturers
- **Rotterdam:**
  - 30 November 2015
  - Visit to the landing location & network dinner
  - 1 December 2015
  - Defining objectives on:
    - routes,
    - exemption,
    - scientific information
    - communication
- **Brussels:**
  - Bringing the last bits together
  - EU Truck Platooning Conference

## Main core message

About the concept of Truck Platooning (not promoting individual brands):

- Logo: European Truck Platooning
- General umbrella concept: Creating Next Generation Mobility



creating  
next generation mobility

EUROPEAN  
TRUCK  
PLATOONING





- One message for Europe
- Purpose branding trucks for media
- Can be used with or without the letters.
- Can be used on trucks as well on correspondence paper of gadgets

### Communication Channels



#### Online:

- Website: [www.eutruckplatooning.com](http://www.eutruckplatooning.com)
- Website – Workspace
- Monthly newsletter
- Blog

#### Social media:

- Twitteraccount @EU\_TPC
- Youtube Channel EU Truck platooning





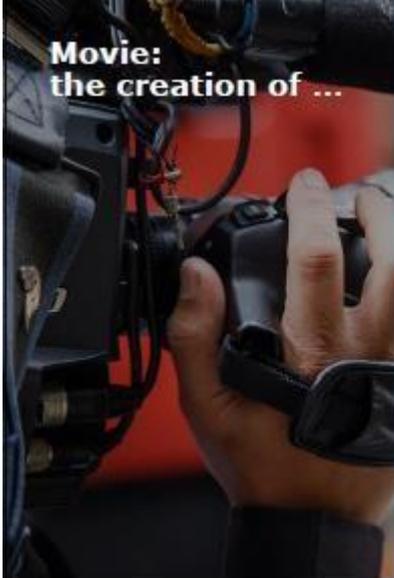
**ENSEMBLE**



### Communication toolkit

Several aspects are introduced centrally in a c-toolkit free to use like:

- Communication strategy
- Social Media strategy with ready to use messages
- Different core messages for different stakeholders
- Image library: images from platooning trucks, free of rights, photo's and video's (ongoing)
- Banners for websites, logo, branding
- Factsheets and infographics
- Guidelines for delivering film footage
- Guidelines for press releases, FAQ
- Guidelines for delivering content for the website



### Movie: the creation of ...

The idea was to grasp the creation of the Challenge in a film. In order to show the 28 EU ministers this process and the unique European cooperation in a short film during the informal council.

What did we film:

- Film of the 3 network meetings
- Film of the routes and the event
- Filming the testing facilities at the RDW
- Arrival of the trucks in Rotterdam incl. Helicopter



