

# 1<sup>st</sup> 5G-MOBIX Webinar

## *Cooperative, Connected and Automated Mobility use cases for initial deployment of 5G technological innovations*

### 5G-MOBIX Use cases overview: description and methodology

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**5GMOBIX**



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# Layout

- Background to use cases and trial activities in 5G-MOBIX
- Methodological approach for use case categorisation
- Description of linkages between use cases and different trial sites

# Background and motivation of 5G-MOBIX use cases and trials



# Background

- 5G-MOBIX evaluates **automotive use cases** leveraging **5G technologies** with a **specific focus on cross-border areas**
- **Cross-border environment** presents a **number of challenging issues**
  - Telecoms, security, regulatory and application perspectives
- 5G-MOBIX will conduct **experimental trials** for solutions to identified cross-border challenging issues
  - Trial sites located in actual cross-border areas (Cross-Border Corridors or CBC)
  - Supporting trial sites (TS) in controlled local environments

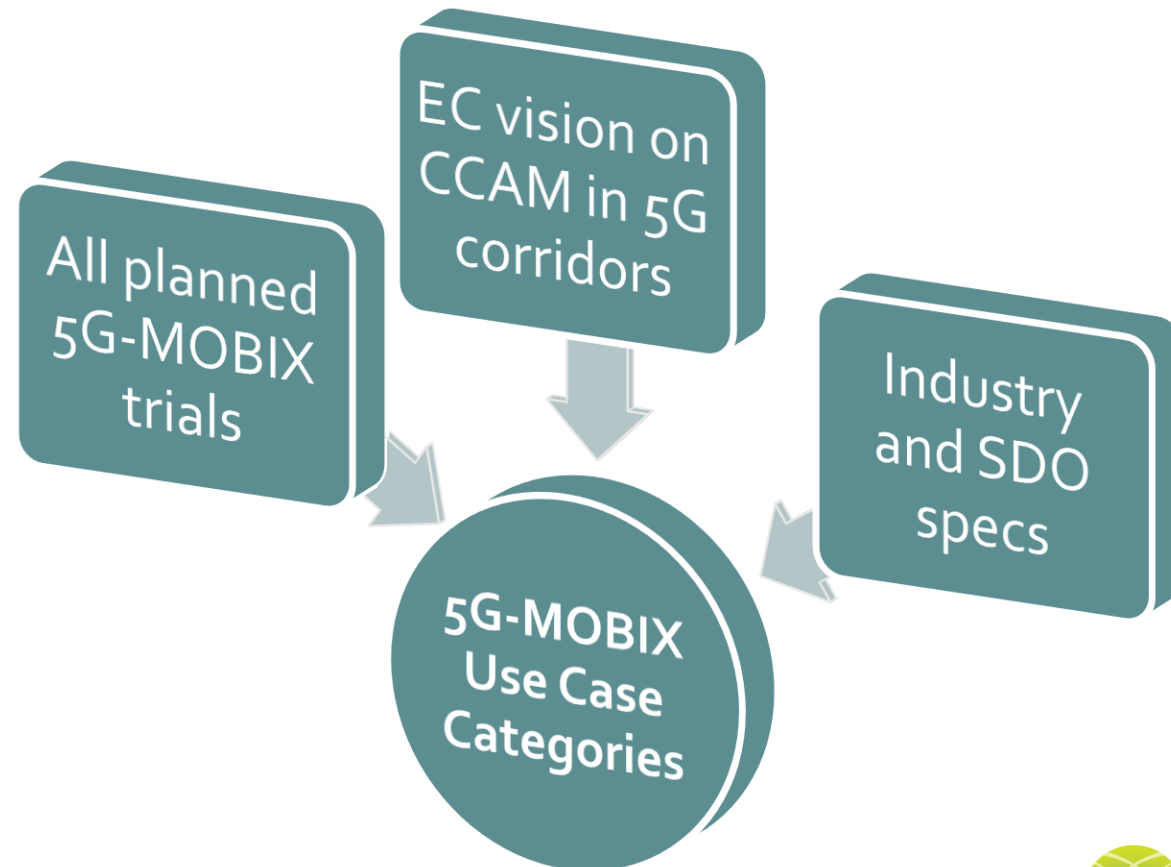


# Methodology for 5G-MOBIX use case categorisation



# Use Case Categorisation

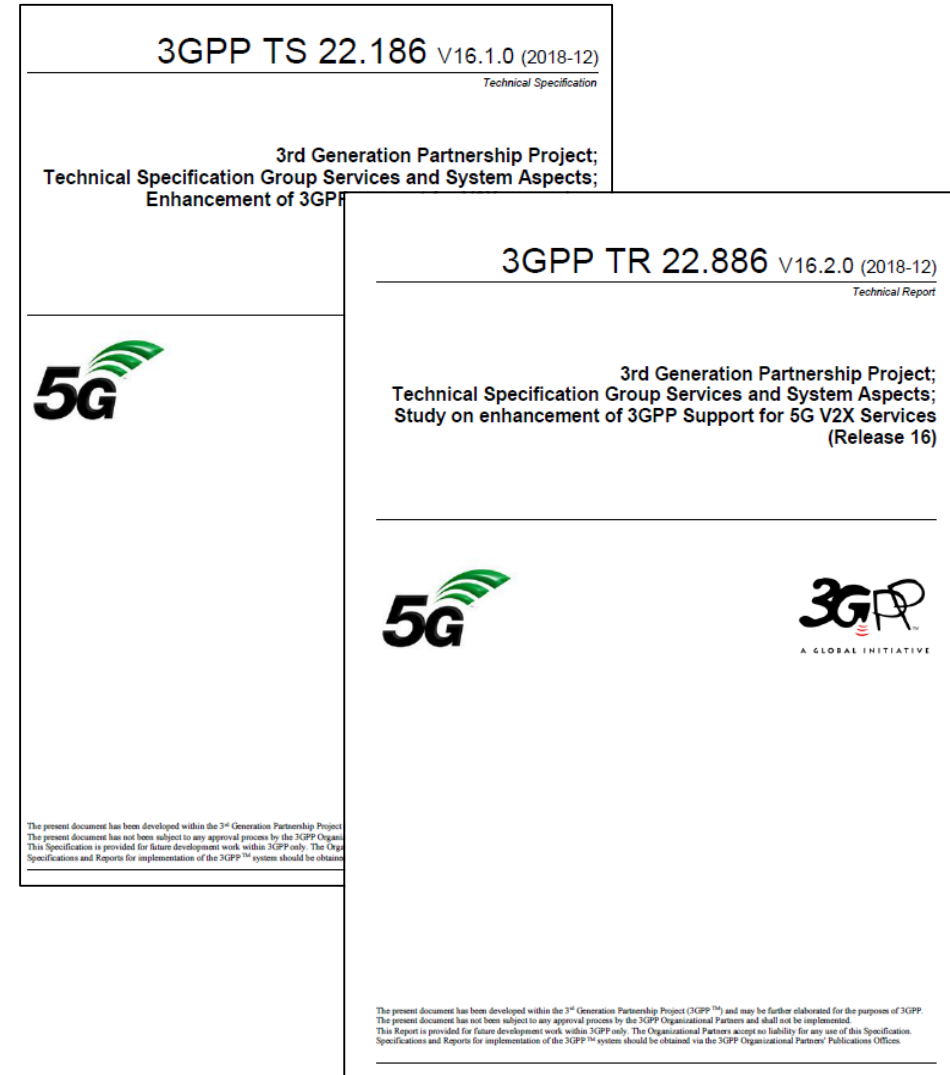
- Use case categorisation essential in 5G-MOBIX to **enhance synergy between CBCs and TSs** experimenting on common automotive use cases



CBC: Cross-Border Corridor  
CCAM: Cooperative, Connected and Automated Mobility  
TS: (Local) Trial Site

# Insights from 3GPP

- Use case categorisation adopted from 3<sup>rd</sup> Generation Partnership Project (3GPP) and based on service requirements
  - *3GPP TS 22.186 (2018-12). Enhancement of 3GPP support for V2X scenarios; Stage 1*
- Additional description of 5G-enabled automotive use cases and their potential requirements
  - *3GPP TR 22.886 (2018-12). Study on enhancement of 3GPP Support for 5G V2X Services*



# 3GPP TS 22.186 Use Case Categories

3GPP TS 22.186 Use Case Categories	Brief description
Advanced driving	Vehicles (and/or RSU) in proximity <b>share driving intentions and local sensor data obtained</b> , thus allowing <b>vehicles to coordinate their trajectories or maneuvers</b> .
Vehicles platooning	Enables the vehicles to <b>dynamically form a group</b> travelling together.
Extended sensors	The <b>exchange of raw or processed data gathered through local sensors or live video data</b> among vehicles, RSUs, devices of pedestrians and V2X application servers.
Remote driving	A <b>remote driver or a V2X application is able to operate a remote vehicle</b> .
Vehicle QoS Support	A <b>V2X application is timely notified of expected or estimated change of QoS</b> before actual change occurs and/or mobile network able to <b>modify the QoS in line with V2X application's QoS needs</b> .

QoS: Quality of Service

RSU: Roadside Unit

V2X: Vehicle to Everything



# Linking activities within 5G-MOBIX use case categories



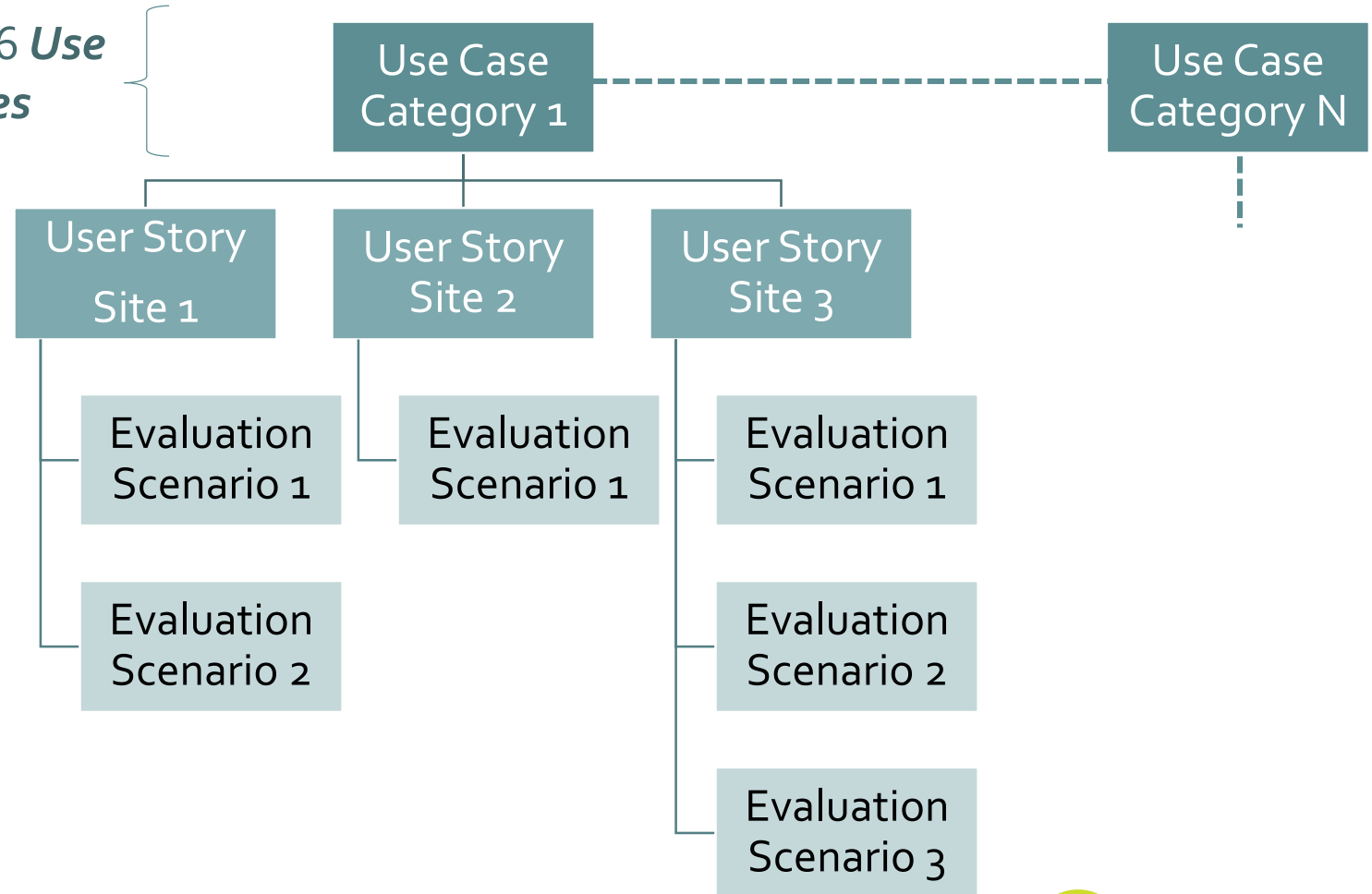
# Hierarchy of 5G-MOBIX Trial Activities

- 5G-MOBIX experimental trial activities inspired by cross-border issues

3GPP TS 22.186 *Use Case Categories*

Each 5G-MOBIX trial site may contribute one *User Story* for given *Use Case Category*

Each *User Story* must address at least one cross-border issue and have a corresponding *evaluation scenario* for a solution to the issue



# 5G-MOBIX CBCs / TSs – Linking User Stories

- Different architecture / technology may be used at different sites evaluating their performance
- Focus on cross-border operation at the two CBC
  - Spain-Portugal (ES-PT)
  - Greece-Turkey (GR-TR)
- Local TS have been selected to **contribute and enable** the CBC trials (providing SW, components, alternatives, etc.)
- Extended evaluations requiring controlled environments also performed at the TS

Trial site	Advanced Driving	Vehicles Platooning	Extended Sensors	Remote Driving	Vehicle QoS Support
ES-PT	Complex manoeuvres (merging, overtaking, etc.) in cross border settings			Automated shuttle remote driving across borders	Public transport support in cross border operation
GR-TR		With "see what I see" functionality in cross border settings	For assisted border crossing ('zero-touch' inspection)		
DE		With surround view and eRSU	Dynamic maps with surround view		
FI			With dual handover	In a bonding / redundant network environment	
FR	Satellite assisted				For security applications
NL	Collision avoidance		Creating and sharing Collective Perception Messages.	Remote operation using 5G localization and positioning	
CN	C-V2X (PC5) based AD	V2I and V2V based platooning		5G - CV2X hybrid approach	
KR				mmW enabled Remote Driving	mmW Tethering via Vehicle

CBC: Cross-Border Corridor  
 TS: (Local) Trial Site

# 5G-MOBIX CBCs / TSs – Illustrating Synergies

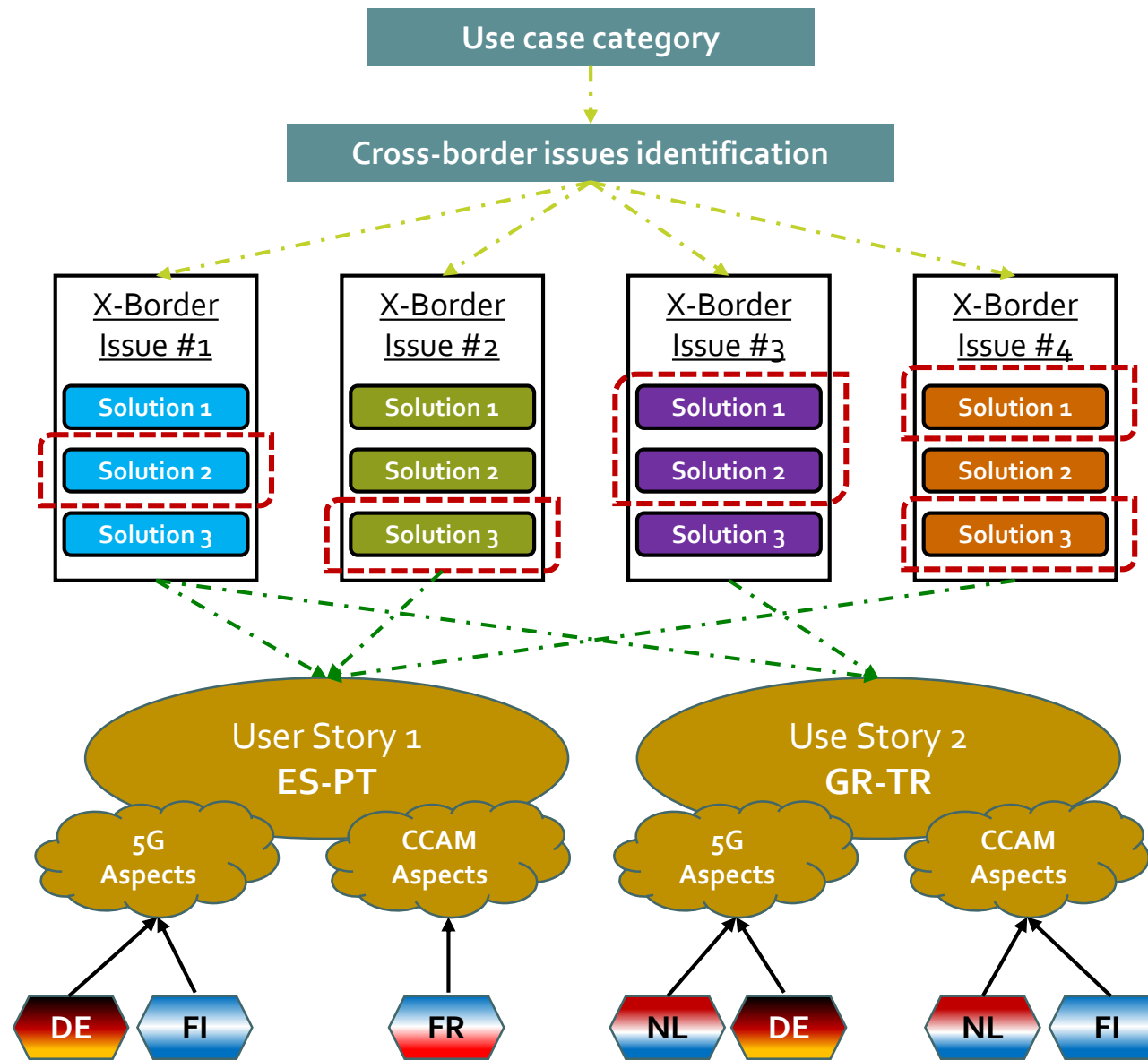
→ Identify the specific x-border issues of this use case category

→ For each cross-border issue identify the potential solutions

→ Test and evaluate the progressed solutions using specific user stories belonging to this use case category

→ Evaluation scenarios on 5G and CCAM aspects

→ Different TSs evaluate specific solutions to cross-border issues



CCAM: Cooperative, Connected and Automated Mobility  
 ES-PT: Spain-Portugal corridor  
 DE: Germany trial site  
 FI: Finland trial site  
 FR: France trial  
 GR-TR: Greece-Turkey corridor  
 NL: Netherland trial site  
 X-border: Cross-border

# Thank you



[www.5g-mobix.com](http://www.5g-mobix.com)



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