The background is a light blue illustration of a smart city. It includes various buildings, houses, and people. There are icons for Wi-Fi, a car, a bicycle, a person with a shopping cart, and a person with a dog. Text labels like 'CONNECTED CITY', 'CONNECTED HOUSE', 'CONNECTED PEOPLE', 'CONNECTED TRANSPORTATION', and 'CONNECTED HEALTH' are scattered throughout the scene, connected by white lines representing data flow.

The 5G Infrastructure Association

5G Pan-European Trials Roadmap

Dr. Didier Bourse

5G Global Event, 24-25 May 2017, Tokyo

5G Pan-EU Trials Roadmap Version 1.0

Context and Objectives

- 5G Pan-European Trials Roadmap Version 1.0 and related actions towards implementation (May 2017)
- The Trials Roadmap has been worked out by the 5G Infrastructure Association (5G-IA) Trials WG (open membership) expanding the work initiated by the Industry in the context of the 5G Manifesto (July 2016) and by EC in the EC 5G Action Plan (September 2016)
- The Roadmap Version 1.0 implements the Roadmap Strategy introduced in MWC 2017 (February 2017)
- The main objectives of the Roadmap are to:
 - Support global European leadership in 5G technology, 5G networks deployment and profitable 5G business
 - Validate benefits of 5G to vertical sectors, public sector, businesses and consumers
 - Initiate a clear path to successful and timely 5G deployment
 - Expand commercial trials and demonstrations as well as national initiatives

5G Pan-EU Trials Roadmap Version 1.0

5G Manifesto and 5G Action Plan

- Expanding the work initiated by Industry in the context of the 5G Manifesto and by EC in the EC 5G Action Plan (5GAP)

The following 5G use-cases are currently under consideration:

- Demonstration of the concept of 5G network virtualisation (slicing) to accommodate specific needs or business models with enhanced levels of service assurance and guarantees.
- Connected **automotive** scenarios, including ultra-broadband infotainment, safety applications and automated / autonomous driving across motorways in Europe.
- Connected eHealth** scenarios that can spark Healthcare innovation and business transformation across the continuum of care, keeping Healthcare affordable to citizens and government (and tax payers).
- Reliable, high capacity broadband connectivity in connected planes, railway and high-speed transportation across Europe, and **transport and logistic** networks with multimodal cargo (truck, rail, shortsea, barge, plane/drone).
- Public Safety** use-cases providing security, reliability and real-time broadband connectivity for key events involving large audience, for example at European Soccer Championship 2020.
- Smart grids**: ensuring networks stability and coordinating energy distribution from diverse sources (e.g. wind, solar, power-plant) and different regions.
- Smart City** use-cases including connected bus shelters, real-time traffic monitoring and analytics, crowd management, smart homes, ageing population, augmented reality for tourism and advertising.
- Media and entertainment** use-cases, including the integration of satellite and terrestrial network services, demonstrating the power of multicast and caching for delivering a cost-effective and scalable user experience **anywhere in Europe** (e.g. at the Glasgow-Berlin European Championships in 2018 and European Soccer Championship 2020), as well as immersive video scenarios showcasing the benefits of 5G capacity enhancements.

http://ec.europa.eu/newsroom/dae/document.cfm?action=display&doc_id=16579

Action 1 — The Commission will work with Member States and industry stakeholders towards the voluntary establishment of a common timetable for the launch of early 5G networks by the end of 2018, followed by the launch of fully commercial 5G services in Europe by the end of 2020. The common timetable should be developed as quickly as possible. The EU timetable should be driven by the following key objectives:

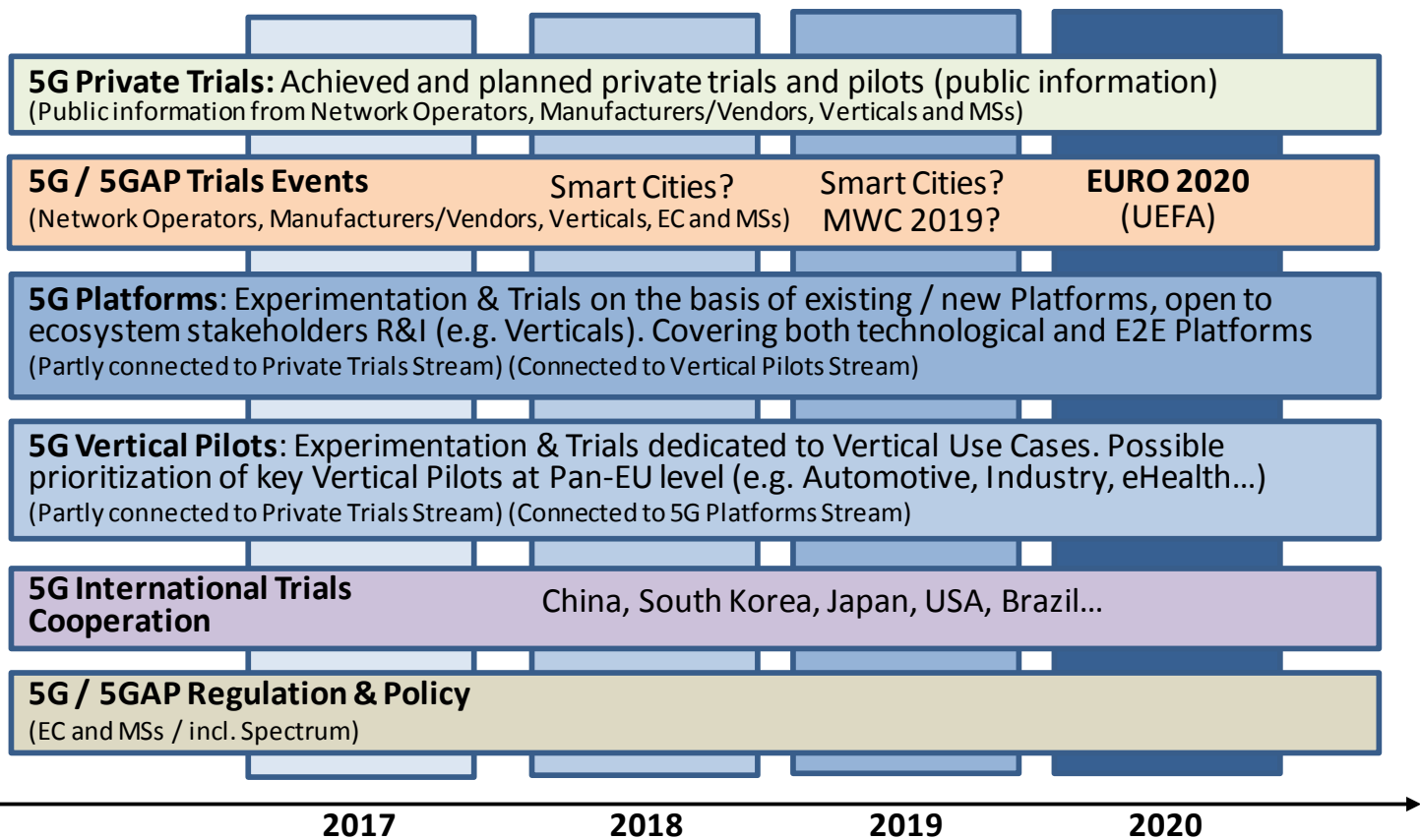
- Promoting **preliminary trials**, under the 5G-PPP arrangement, to take place **from 2017 onwards**, and **pre-commercial trials** with a clear EU cross-border dimension **from 2018**.
- Encouraging Member States to develop, by end 2017, **national 5G deployment roadmaps** as part of the **national broadband plans**¹⁷.
- Ensuring that every Member State will identify at least one major city to be "5G-enabled" by the end of 2020¹⁸ and that all urban areas and major terrestrial transport paths have uninterrupted 5G coverage by 2025¹⁹.

http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=17131

5G Pan-EU Trials Roadmap Version 1.0

Roadmap Strategy (February 2017)

- Pan-European Trials Roadmap 2017-2020 – Strategy and Streams



https://5g-ppp.eu/wp-content/uploads/2017/05/5GInfraPPP-Trials-Roadmap-Strategy_Short_28-February-2017.pdf

5G Pan-EU Trials Roadmap Version 1.0

Four Main Pillars

- Building Europe 5G readiness through 5G Private Trials
- 5G for Vertical Industries - Building the case through Pilots
- 5G for UEFA EURO 2020 - An opportunity for a Pan-European Showcase Event
- 5G Trials Cities

Trials WG Members organizations contributing to the Trials Roadmap Strategy

ABB, ADVA Optical Networking, Ahlers, Airbus, Altice Labs, Atos, BMW, BT, Deutsche Telekom, DOCOMO Communications Laboratories Europe, Ericsson, Eutelsat, Huawei Technologies, IBM Research, Indra Sistemas, Inmarsat, Intel Mobile Communications, KPN, Leonardo, Mitsubishi Electric R&D Centre Europe, NEC Laboratories Europe, Netaş Telecommunication, Nokia, Orange, Philips, Proximus, QinetiQ, Samsung Electronics Research Institute, SES, Siemens, Telecom Italia, Telefónica I+D, Telenor, Tele2, Telespazio, Telia Company, Thales Alenia Space, Thales Communications & Security, Trenitalia, Turk Telekomünikasyon, Vodafone, ZTE Wistron Telecom, European Broadcasting Union (EBU), ECTA, ETNO, T-REGS, AICO Software, AMBEENT WIRELESS YAZILIM, CityPassenger, Ingeniería y Soluciones Informáticas, Integrasys, InterInnov, M.B.I., Nextworks, Quobis, Sequans Communications, CEA-LETI, Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Consorzio Nazionale Interuniversitario per le Telecomunicazioni (CNIT), DLR (German Aerospace Center), Fundacion IMDEA Networks, IMEC, Institut Mines-Télécom, Instituto de Telecomunicações, TNO, Universidad de Málaga, Universitat Politècnica de Catalunya, University of Bologna, VTT Technical Research Centre of Finland, Universidad Carlos III de Madrid.

5G Pan-EU Trials Roadmap Version 1.0

5G Private Trials (Highlights) (1/3)

- Europe is home of an increasing number of 5G private experimentation and trials (pre-commercial and commercial) involving a multiplicity of stakeholders and notably network operators, manufacturers/vendors and some vertical actors
- Main target of the current trials is to demonstrate key features for 5G technology, focused on enabling technologies
- In 2017 only a few 5G Private trials including vertical stakeholders. When the maturity level of 5G features increases, more direct vertical stakeholders will be included for trials
- Some of the 5G trials announced include joint work on experimentation platforms that could become open to new ecosystems, in order to develop 5G applications and services in the context of the digital transformation of vertical industries

5G Pan-EU Trials Roadmap Version 1.0

5G Private Trials (Highlights) (2/3)

- Before 2018 demonstrations and trials are done to early demonstrate and validate the new 5G capabilities as well as foster an ecosystem around the new 5G capabilities
- The running trials and demonstrations are already today building concrete know-how and readiness of the European industry to benefit from early 5G launch when the standards will be fully stable, by the end of 2019
- The 5G readiness will be further consolidated during and after 2018, when European stakeholders will move to agree on detailed trials specifications valid for Pan-European trials, largely based on standard-compliant systems. These trials will aim to demonstrate wider interoperability and support for vertical use-cases in order to validate new business models

5G Pan-EU Trials Roadmap Version 1.0

5G Private Trials (Highlights) (3/3)

- The 5G-IA Trials WG targets a tight connection with the NGMN 5G Trial & Testing Initiative (TTI), launched in June 2016. TTI enables a global collaboration on testing activities, consolidating contributions and report on industry progress, and testing future 5G use-cases with industry stakeholders (in particular from vertical industries)
- At the international level, multiple standalone 5G network trials will be in progress by 2018. It is hence targeted to run interoperability trials in coordination with other main regions. In order to enforce the coordination with other regions the bi- and multi-lateral agreements with other 5G initiatives in China, Japan, Korea, the United States and Brazil will be leveraged

5G Pan-EU Trials Roadmap Version 1.0

Vertical Pilots (Highlights)

- After 5G technologies have reached a maturity level beyond pure laboratories experiments, trials and pilots will be targeted to validate 5G technologies in multi-vendor and multi-user environments
- 5G-IA Trials WG focusing on 11 different Industry segments (66 use cases) and analyzing the common and various functional characteristics requiring 5G functionalities
- Different verticals have different levels of 5G readiness. In some verticals large industry alliances or consortia exist, e.g. the EATA and 5GAA in the automotive sector or the IIC in the manufacturing industry, which are well positioned to partner with the 5G Industry to establish, drive and shape 5G adoption within their verticals
- Connected Cars is considered as one of the verticals priorities for a strategic 5G European roadmap targeting vertical use cases
- 5G-IA will assure that an umbrella perspective across all verticals will be developed to avoid siloes and a harmful segmentation of the 5G trials

5G Pan-EU Trials Roadmap Version 1.0

5G for UEFA EURO 2020 (Highlights)

- Target flagship event to get widespread media attention and serve as a milestone for industry, governments and the general public that 5G is coming now and is beneficial for individuals and society
- The UEFA EURO 2020 football championships will be played in 13 different cities in Europe (Glasgow, Dublin, Copenhagen, Budapest, Bucharest, Brussels, Bilbao, Amsterdam, Saint Petersburg, Rome, Munich, Baku and London)
- EURO 2020 acting as the “launching event” for 5G in Europe with a number of 5G services that will be trialed, incl. (among others) 5G Augmented and virtual reality applications, Automated transportation and Advanced public safety services
- In each of the cities a consortium is needed of local governments, playing stadiums, operators, infrastructure vendors and application providers
- A Pan-European steering committee will ensure a consistent coordination of trial objectives and implementation

5G Pan-EU Trials Roadmap Version 1.0

5G Trials Cities (Highlights)

- In complement to the 5G private trials and the 5G for UEFA EURO 2020 flagship event, specific cities in Europe already announced their plans to become 5G Trials Cities
- In addition 5G Research & Innovation Programs running in several Members States, include the development of specific labs and platforms, generally anchored in specific cities
- In addition, Members States should communicate before end 2017, in the context of the 5GAP, the information on their 5G Pioneering city (or multiple cities) where 5G will be deployed in 2020
- These different actions clearly create a strong momentum on 5G from cities and countries perspectives
- Under the 5G Infrastructure PPP initiative, a "5G City Challenge" will be organized as a call for interest towards interested cities prepared to sign a 5G charter and aiming at supporting cooperation among the cities involved in 5G experimentation and trials

5G Pan-EU Trials Roadmap Version 1.0 PPP Website

- PPP Webpage - Roadmap Strategy and Roadmap Version 1.0

The screenshot shows the website for the 5G Infrastructure Public Private Partnership (PPP). The header includes the contact email 'info@5g-ppp.eu' and a search bar. The main navigation menu contains links for 'About us', 'Getting Involved', 'Plans & Papers', 'Events', 'European 5G Action', 'Global 5G Actions', 'Media & News', and 'Contact'. The current page is titled '5G TRIALS ROADMAP'. The main content area contains the following text:

The 5G Infrastructure Association has launched an activity in 2016 to first, generate a strategy for developing a Pan-European 5G Trials Roadmap, and then, second, to prepare the comprehensive Trials Roadmap.

To generate these documents and roadmaps the 5G Infrastructure Association initiated and coordinates a 5G Trials Working Group expanding the work initiated by the Industry and EC in the context of respectively the [5G Manifesto of industry in Europe](#) and the [5G Action Plan of the EU Commission](#).

Trials Roadmap Strategy Document

This document was made available ahead of MWC 2017, focusing on the Trials Roadmap strategy, with a view to inform the community of the approach being taken and to invite more contributions.


The [Trials Roadmap Strategy Document](#) may be [Downloaded here](#).

Trials Roadmap

The Trials WG is elaborating a solid and comprehensive strategy to develop the Pan-EU coordinated trials as well as international trials with non-EU partner countries. The 5G Pan-EU Trials Roadmap is addressing several of the 5G Action Plan (5GAP) key elements and targets to develop the necessary synergies between these elements. The main objectives of the Roadmap are to:

- Support global European leadership in 5G technology, 5G networks deployment and profitable 5G business.
- Validate benefits of 5G to vertical sectors, public sector, businesses and consumers.
- Initiate a clear path to successful and timely 5G deployment.
- Expand commercial trials and demonstrations as well as national initiatives.

The comprehensive Trials Roadmap document (with detailed content) will be released (public document) in version 1.0 before the 3rd 5G Global Event to be organized on 24-25.05.17 in Tokyo.

The Trials Roadmap may be downloaded here:  [5G PPP Trials Roadmap Version-1, May 2017](#)

5G Pan European Trials Working Group

The Trials Working Group was launched by 5G Infrastructure Association in September 2016 after the publication of the [5G Manifesto of industry in Europe](#) and in the context of the [5G Action Plan of the EU Commission](#). According to the 5G Manifesto industry in Europe will develop by beginning of 2017 a European trial roadmap on technology trials and Pan-European trials with vertical sector use cases.

5G Infrastructure Association is hosting this Working Group in order to provide a neutral place for such discussions. The Working Group is open for

<https://5g-ppp.eu/5g-trials-roadmap/>

