Stakeholders information day

17th March 2016

5G verticals and services visions, constituency building, results and requirements in key domains, societal impacts

Strategic requirements for 5G in Europe: A social and economic perspective

SMART 2014/0008

www.linkedin.com/groups/8314284

DG CONNECT 5G socio-economic study

Automotive

Healthcare

Transport

Utilities

Smart Cities

Non-urban areas

Smart Homes

Smart Workplaces

Automotive

Automotive is the most cited sector amongst verticals and use cases in 5G studies

There are more than 275 million motor vehicles in use in EU28 Member States

In 2011 31,500 people died and 324,000 were seriously injured[1] in traffic accidents in EU Member States

Numerous studies and use cases have investigated how 5G can enhance the automotive sector and provide safety, convenience, comfort and ecological benefits to users and society. 5G will be introduced alongside 'legacy' systems (ADAS, DSRC, ITC and others) and on-going innovations. This study is examining how 5G utilisation in the automotive sector will create new business models and offer the greatest potential for delivering socio-economic value in Europe.

Introduction

The automotive industry has been one of the early adopters of connectivity technologies[2]. The sector is the most cited in 5G reviews and White Papers and it is expected to be an important driver for any user of 5G. There are many different developments in the industry that could utilise 5G capabilities. It is important to examine current and potential innovations and business models to better understand the role and opportunities offered by 5G.

Advanced Driver Assistance Systems (ADAS) and autonomous vehicles are emerging trends in the automotive sector[2]. ADAS systems are utilising Dedicated Short-Range Communication (DSRC - a short-to-medium range, two-way wireless technology for vehicle communication) and Intelligent Transport Systems (ITS[3]). To provide complete functionality (beyond vehicle to vehicle communications) DSRC and ITS require a dense infrastructure of roadside units to communicate to on-board units. Lack of this infrastructure, which is largely a public function along roadsides, limits adoption of this model. Commentators[5] have suggested this impasse could be resolved if major manufacturers deploy the technology (Toyota anticipates deployment on all its vehicles after 2016) and/or administrations mandated the adoption of systems in the same way that safety-belt regulations were introduced.

5G will obviously not be introduced in vacuum. ADAS, DSRC and ITS demonstrate that systems are being developed which can already provide some of the capabilities put forward as major advantages for 5G in the automotive sector. Nonetheless, the next phase of remotely controlled or even self-driven vehicles[4] will require 5G. Mark Fields, the CEO of Ford, predicts that fully autonomous vehicles will be available within five years[7].

There are numerous benefits that will arise from ADAS and autonomous vehicles innovations. 5G will play a role in enhancing and facilitating many of these. But some of the benefits, widely quoted in 5G studies are already being achieved. The benefits can be presented in four groups[6].

> ***Safety benefits:*** ADAS systems can reduce accidents through sensors that monitor neighbouring vehicle proximity, pedestrians, driver behaviour and adverse weather conditions. 'eCall' systems provide an automated single button reporting system that can call emergency services in an emergency[3]. Advanced diagnostics can provide in-vehicle health monitoring and it may be possible to

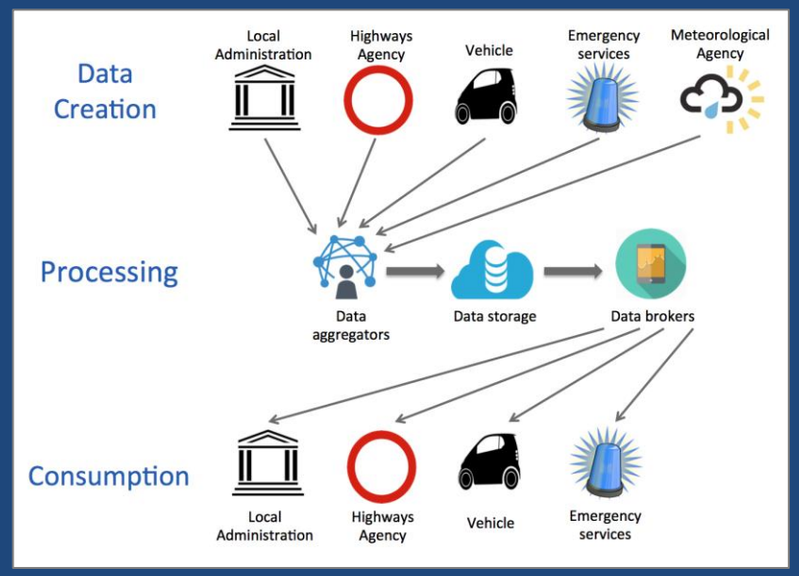
[1] ETSC. 2012. A Challenging Start towards the EU 2020 Road Safety Target. 6th Road Safety PIN Report. The report estimates the monetary value of one road fatality is €1.84 million. Total road deaths amount to €58 billion.
[2] Ericsson. 2014. 5G What is it for?
[3] 4G Americas. 2014. 4G Americas' recommendations on 5G requirements and solutions
[4] EU Directive 2010/40/EU 7th July 2010
[5] Benkler Y. 2012. Open wireless vs. licenced spectrum: Evidence from market adoption. Harvard Journal of Law and Technology. 26, 1. 71 – 163

Constituency building

www.linkedin.com/groups/8314284

Vision and vertical headlines

Verticals Benefits	Automotive (€ mn)	Healthcare (€ mn)	Transport (€ mn)	Utilities (€ mn)	Total (€ mn)
Strategic	Real-time Telematics data	Preventative care	Real-time Telematics data	Peak demand smoothing via smart meters	**32,770**
Operational	Supply chain integration and economies of scale and scope	Wearables and increased operational efficiency	Increased loads and operational efficiency	Operational efficiency from smart meters	**11,850**
Consumer	Infotainment	Reduced health care insurance	Delivery tracking information	Decrease in energy consumption	**24,110**
Third Party	Telematics data	Health data and reduced drug testing costs	Telematics data	Data sharing for Energy as a service	**27,170**
Total	**75,600**	**5,530**	**8,300**	**6,470**	**95,900**



New business models - Pay how you drive, pay where you drive, control groups in medical trials, pay when you drive, energy as a service.

Barriers - Development of key 5G capabilities, spectrum sharing, establishment of standards.

Vision and environment headlines

Environment Benefits	Smart City (€ mn)	Non-urban (€ mn)	Smart Home (€ mn)	Workplace (€ mn)	Total (€ mn)
Economic	Reduced traffic congestion	Enhanced access to broadband	Reduced cost of domestic burglary	Supply chain integration and economies of scale and scope	**21,420**
Social	Reduced road accidents	Online purchase savings	Reduced healthcare costs	Accident reduction	**12,400**
Environmental	Reduced congestion emissions	Reduced congestion emissions	Decrease in energy consumption	Reduced waste production	**16,770**
Total	**8,122**	**10,540**	**1,329**	**30,600**	**50,590**

New business models - Pay when and where you drive, home working, independent living, home systems integration, supply chain integration.

Benefits realisation requires - effective government frameworks and (capability and technical) standards, with strong and clear regulations particularly in relation to data exchange and data privacy.