

DRIVE



Accelerate cooperative mobility

## Deliverable D11.5

**Deployment strategies for cooperative driving including standards and business models (IP-Deliverable)**

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## Executive Summary

The implementation of C2X communication requires considerable investments from various stakeholders. OEMs need to equip their vehicles with communication modules, infrastructure operators, private or public, have to set up communication beacons along the roads and traffic management centers need to be updated, so that they can cope with the huge amount of data provided by the new system. Those investments are usually only made, if they can be reimbursed in a foreseeable timeframe. This is the case for private investors, who expect a certain revenue stream that pays off for the initial investment at least in mid-term, but also for public authorities, whereas "revenue" does not mean money flow for them but reduced number of accidents and of people injured or killed in road traffic, improved traffic flow and reduced traffic related emissions.

In order to decide on an investment, private investors expect a viable business case. Public authorities on the other hand usually decide on investments on the basis of a benefit/cost analysis, where benefits such as accident reduction or improved traffic flow are valued in monetary terms and put in relationship to the expected costs of the planned investment. Thus, the document is looking on the implementation of C2X communication technology on European roadways from two points of view: from the political economics side and from the side of business economics. First it introduces the various assessment methods available for system evaluation under political economics and business economics aspects and describes those that have finally been selected for application in the project. The document then explains in detail the application process and its results and describes business models and deployment strategies derived from these.

In order to get there more than 50 interviews with representatives from all relevant stakeholders in C2X communication were accomplished. In these interviews different approaches could be identified, how to refinance the needed investments in infrastructure and on-board equipment. Depending on the stakeholders talked to the interviews indicated diverse philosophies when it comes to implementation of C2X communication or using this technology as a means to implement services based on the data generated by C2X communication. The various approaches can be regarded as complementary and a viable business model for C2X communication should be a combination of these approaches in order to be successful and leverage a promising market potential.

### *Infrastructure refinancing*

The interviews with representatives from road operator side showed that for public road operators the socio economic benefits of an implementation of C2X communication would be enough to justify an investment in communication infrastructure. As it is the case for all public investments in the road network, they expect a positive benefit/cost ratio, which should be above 2. With a benefit/cost ratio between 2 and 6.8 depending on the market penetration rate and the level of infrastructure equipment the calculations done for Europe-wide implementation of the DRIVE C2X reference system show, that the requirements for a public investment in C2X communication technology are clearly fulfilled. Road operators, public and private ones, expect also resources savings through C2X communication for instance through optimized use of the existing road infrastructure, that compensate at least partly the investment in communication infrastructure. Could this infrastructure be used for

road charging the resulting “synergetic effects” are expected to pay off quickly for the investment, but this applies of course only for toll roads. Significant potential for investment in infrastructure is also seen, if this is shared with private investors in a public private partnership. Those investors can be for instance OEMs, telecommunication companies or providers of automotive related services such as fleet management. Through the communication infrastructure at the roadside they can better access the vehicles with their services. Compensation for the use of the communication infrastructure can either be through a fixed or variable fee or by sharing the cost for infrastructure set up and maintenance.

### *Vehicle equipment*

Regarding the refinancing of the costs for the vehicle equipment a number of the interviewed stakeholders expressed the opinion that C2X onboard units could be sold by OEMs as special equipment. Others thought that onboard-units should become standard equipment of all new vehicles in order to offer an open platform solution for all kinds of telematics services. This approach generates revenue for the OEMs as platform holders on the one hand side by making the system available to external service providers, who are supposed to pay for the use of the platform and the availability of vehicle centric data, and on the other hand by offering to the OEMs new possibilities for customer retention especially in the aftermarket segment through improved customer relationship management. This approach works particularly well, if the OEMs agree on a synchronized market launch, and builds on the assumption that vehicle and driving related data is of high value for third parties.

Evidence for economic viability could be identified for all philosophies. But their relevance is often regionally diverse depending on country specific framework conditions. The two business models discussed in this document consider this. Business Case 1 looks at implementation of C2X communication from the point of view of public institutions and road operators. It describes how cost savings that can be achieved through C2X communication can pay the investments in infrastructure off. Thus business case 1 looks on C2X communication primarily from a political economics point of view. The second business case elaborates on the various opportunities for OEM driven revenue streams that arise from the obvious value of the data generated by C2X communication. This business case focuses on the business economics side of vehicular communication.

The last part of the document describes deployment strategies derived from the two business cases. These strategies consider lessons learned from other technologies such as eCall or airbags as well as potential barriers for market introduction. However, no matter, which way of deployment is chosen, crucial for a successful implementation of a C2X communication system on European roads is a synchronised market launch of this technology by all OEMs with C2X onboard-units becoming standard equipment of all new vehicles. These onboard-units need to be designed as open platforms to raise system attractiveness for third parties and to generate the needed revenue streams to become economically viable. Equally crucial is the willingness at all stakeholders to enter into public/private partnerships on the one hand side and into collaboration with new partners from different areas, because of the very nature of the system no stakeholder will be able to implement C2X communication only by its own means.