



ASECAP C-ITS MANIFESTO

Cooperative intelligent transport, referred to as “C-ITS” hereafter, refers to the exchange of messages between vehicles, infrastructure and other road users, within a common trust domain set out by the “European C-ITS Security Policy” and the “European C-ITS Security Certificate Policy”. C-ITS encompasses a group of applications and services that allow efficient data exchange through wireless communication technologies between components and actors of the intelligent transport system.

A central element of C-ITS is wireless short-range communication, also known as vehicle-to-everything (V2X) communication, that enables data exchange between vehicles, infrastructure and other road users and infrastructure. ITS-G5 is the only short-range technology that has been developed under the C-ITS standardisation mandate of the EU to the European Standardisation Organisations, in a technologically open environment. The hybrid approach of complementing C-ITS short-range with long-range communication is specified by C-ROADS. It has been harmonised in Europe, successfully piloted and deployed in several Member States. Important services related to road safety and traffic efficiency, such as road works warning, hazardous location notification and in-vehicle signage, have thus become reality. The apparent benefits have demonstrated that C-ITS serves a public goal – road safety, traffic management and sustainable transport.

A cooperative intelligent transport system is essential to further improve road safety on Europe’s roads, through providing instant and low latency communication to prevent accidents. It is an enabler for energy-efficient driving, such as speed recommendations, green light optimal speed advice, electric charging spot notifications etc. It also supports higher levels of vehicle automation, e.g. where a low latency data exchange amongst infrastructure and vehicles is necessary. The existing security framework also ensures all C-ITS actors can trust each other.



ASECAP believes:

- that C-ITS will make a major contribution to Europe's "Vision Zero" reducing Europe's road fatalities to near zero by 2050.
- that C-ITS will contribute to collaborative traffic management, C-ITS based congestion management and energy-efficient driving, which reduces the external cost of roads, fuel consumption and their CO₂ footprint.
- that no charge or operating costs should be paid by users for C-ITS that serves road safety.
- that C-ITS should protect the fundamental right to privacy and comply with Europe's General Data Protection Regulation (GDPR). Compliance is not merely a technical question, but rather a question of governance and accountability.
- that higher levels of automation on Europe's roads can only be achieved with the V2I, I2V and V2V communication C-ITS establishes between vehicles amongst themselves, vulnerable road users and road operators. It is hence an important element for Europe's economic development.
- that C-ITS has to work seamlessly across national borders, across different vehicle brands, across different chip-set manufacturers, across different road operators and across different generations of communication protocols and chip-sets. This is the only way for C-ITS to comply with the principles of "interoperability" and "backward compatibility".
- that C-ITS participants have to trust each other. Europe has a unique security system to establish trust. This is the principle of "security".

- that currently ITS-G5, a variant of the globally very successful WLAN standard, is the only low latency short-range technology that is mature enough and suited for deploying C-ITS in Europe; future technologies need to be evaluated according to their maturity and interoperability as to already deployed systems, as well as according to the cost of introducing the technology, including royalties for standard-essential patents.
- that any short-range technology suitable for C-ITS should be backwards compatible and interoperable with ITS-G5, use the same security and be able to co-exist with European road charging systems, without causing harmful interference.
- that ASECAP Protected Zone Data Base (PZDB) is at the core of mitigation techniques to ensure that Europe's road charging systems can co-exist with C-ITS and other radio applications. ASECAP urges its wider use.
- that a dedicated C-ITS roadside infrastructure including C-ITS equipped trailers and road operator vehicles creates huge benefits for resilience of critical infrastructure while being independent of mobile cellular networks. The investment in such infrastructure, if not covered by road tolls or by the provisions of concession contracts, deserves public funding.
- that EU legislation is necessary to enable C-ITS to unfold its full potential.

EU Legislation

The EU is pursuing a “Vision Zero” as a road safety goal in its transport policy. “Vision Zero” aims at reducing transport fatalities to zero by 2050, it also aims at reducing serious injuries. Part of the strategy to reach that goal is the ‘safe systems’ approach, creating a road safety environment that “forgives” human mistakes. C-ITS establishes the vital direct link between vehicles themselves, road infrastructure and other road users, that is essential to prevent collisions. C-ITS is part of Europe’s strategy to achieve ‘Vision Zero’. Road safety goals can even be achieved with coverage of the vehicle fleet and does not require full coverage of the road infrastructure.

The ITS Directive, plays a key role for C-ITS to reach its potential. C-ITS is already deployed by major automobile manufacturers and road operators. The regulatory framework to access the market and to broadcast ITS messages is already in place. However, there is currently no legal guarantee ensuring “interoperability”, “backward compatibility” and “security”. This creates uncertainty and the risk of system fragmentation. The ITS Directive provides for the adoption of a delegated act which would guarantee “interoperability”, “backward compatibility” and “security”. A C-ITS delegated act was drafted by the European Commission in 2019 on the legal basis of the ITS Directive and eventually not adopted.

ASECAP notes that market forces have driven towards ITS-G5 deployment, but observes with regret that there is no legally binding framework to ensure interoperability.

ASECAP believes the revision of ITS Directive constitutes a great opportunity to improve this situation by taking appropriate EU legislative measures to move Europe closer to ‘Vision Zero’, and prepare Europe for higher levels of automation.

Road Safety

C-ITS already plays a key role in reducing the impact of accidents and will significantly contribute in the future in preventing accidents and reducing their severity. C-ITS has the ability to “see” around corners and hence ideally complements optical vehicle sensors. The US National Transportation Safety Board (NTSB) recommends connecting all vehicles

to each-other through a cooperative radio technology that complements vehicle sensors. The European voluntary car safety performance assessment programme (Euro NCAP) is an independent body that assesses vehicle safety and endorsed the road safety benefits of C-ITS.

C-ITS aims at improving the safety of road workers on motorways. In 2019, more than 360 accidents involving motorway service personnel and collided materials happened on ASECAP concession motorways in Austria, Denmark, France, Greece, Portugal and Turkey. Complementing existing work safety measures and specialised personal devices could be deployed to deliver warnings to workers and vehicles and complement the safety benefits of C-ITS equipped safety trailers, which are already available today. New C-ITS equipped vehicles can immediately be alerted by those trailers.

The Weights & Dimensions Directive, amongst other goals, aims at improving road safety by easing weight control enforcement. Overloaded heavy goods vehicles constitute a serious risk to other road users, due to longer stopping distances and wear on brakes, as well as roads and bridges. Heavy goods vehicles that are equipped with on-board weighing equipment can be controlled remotely. C-ITS is used to ensure interoperable communication between trucks and trailers.

ASECAP members see great potential in C-ITS to further improve the health and safety for road users and workers on road works sites.

The European standardised ITS-G5 communication is currently the only technology that meets the road safety requirements of C-ITS. C-ITS operates in an open technological environment where technologies need to be interoperable and backward compatible to ensure continuity with existing systems, as long as they fall within the C-ITS trust environment and prove non-interference with the EU's electronic road charging systems.

De-carbonisation

A variety of studies indicates that reducing congestion and creating a smooth traffic flow reduces fuel consumption and hence reduces CO₂ emissions and air pollution. The methodologies and accordingly the projections of these studies vary so far, they all indicate varying degrees of improvement. C-ITS allows road operators to monitor traffic and keep its flow and hence to improve safety, as well as to reduce carbon emissions and external costs, such as air pollution, on motorways. Traffic management has an impact independently of vehicle category and yields immediate effects. It complements electronic road charging systems in the quest to make Europe's road transport more sustainable.

ASECAP is convinced of the de-carbonisation potential of C-ITS and of its positive impact on the reduction of external costs of road transport. Furthermore, C-ITS has an instant impact and foster decarbonisation achievements on the medium-term, via measures such as new propulsion of cleaner vehicles.

Road Maintenance

C-ITS can be used for sustainable road maintenance. The goal is that road damage prediction system, based on ITS and C-ITS data, which calculates and displays probabilities of road damages and their prioritisation based on the pre-recorded data using novel algorithms and machine learning methods increase the life-time for roads. The latter are also used to identify objects automatically and to classify them according to the degree of damage and save them in a database. C-ITS recommendation messages can then lead to distribute vehicles based on the road status. The data can also be used to control repairs and document actual/target analysis comparisons and serve as evidence for road damage. The data platform serves as the basis for future research and measures and enable sustainable, efficient, resource-saving preservation of the road infrastructure.

ASECAP believes that C-ITS improves road maintenance and allows to maintain it at a lower cost thanks to its predictive capacities. Europe's motorway network is mature. Maintenance and efficiency improvements will in most regions take priority over infrastructure expansion. C-ITS will give motorway operators the analytical instruments necessary to improve efficiency in terms of traffic flow and sustainability.

Autonomous driving

C-ITS will play a role of paramount importance for the deployment of autonomous driving. The US National Transportation Safety Board (NTSB) issued in 2017 its highway accident report of a collision between a car with automated control systems and a trailer truck in Florida. In this report, the NTSB analysed an accident in which a vehicle was using SAE category 2 traffic aware cruise control and a lane keeping system. The systems were using data that the vehicle gathered using its own sensors. The NTSB recommended that vehicles should be able to communicate directly with each other to complement data gathered by the individual vehicles.

ASECAP agrees with the NTSB and believes that autonomous driving requires C-ITS. C-ITS further is essential for progressing into higher levels of vehicle automation and hence plays a role for road safety and is key from an industry policy perspective. ASECAP believes that infrastructure plays an essential role in the I2V and V2I environment.

European Electronic Tolling protection

Europe is currently operating microwave technology to implement European transport policy: the European applicable DSRC standards that run on the 5.8 GHz frequency band. This technology is used most notably for the electronic collection of road charges, the enforcement of drive and rest times for drivers of heavy goods vehicles and for protecting motorists from overloaded heavy good vehicles. Around 90 000 km of roads are being charged electronically. They use microwave technology either to determine the toll sections a vehicle has passed by or to check and enforce tolling in satellite-based tolling systems. There are over 30 million pieces of on-board equipment in circulation. The DSRC

standards are used to implement the Interoperability Directive and the European Electronic Toll Service.

DSRC technology is also used within the digital tachograph. The respective regulation provides that the digital tachograph that is used to protect motorists from tired or drowsy truck drivers and that it will need to be enforced remotely. This remote screening of the tachograph is done using microwave technology as foreseen in this regulation. Furthermore, the Weights & Dimensions Directive also enables the remote enforcement of vehicle weight control via a DSRC microwave link.

Any communication service deployed on Europe's roads has to prove its compatibility with applicable DSRC standards to ensure the implementation of the "user pays" and the "polluter pays" principles and to protect the lives of European motorists and the rights of the drivers of trucks and buses.

ASECAP believes that 5.8 GHz DSRC standards for road tolling, smart tachograph, weight and dimensions ensure the implementation of EU transport policy and urges EU institutions and EU Member States to protect the 5.8 GHz frequency band from radio interference and so protect the safety and quality of Europe's motorways in the framework of the Interoperability Directive and the EETS Decision.

C-ITS has to co-exist with road charging, enforcing drive and rest time or vehicle weight. Any connectivity deployed along Europe's motorways has to prove, via specific tests, that it is able to co-exist with for road tolling, smart tachograph, weight and dimensions.

Technology environment

ITS-G5 will become part of the wider digital communication environment that includes 5G and future WLAN or cellular communication systems. Communication technologies will provide a hybrid environment combining short-range communication environment and cellular long-range communication. A technological evolution will be developed and it will consider the life cycles of vehicles and roads and has to be interoperable and backward compatible with technologies already in place, in order to ensure the

continuous functioning of C-ITS and work under the same security policy. As regards the use of direct short-range communication technologies, the upper part of the harmonised 5.9 GHz ITS band (5915-5925 MHz) is recommended for early implementation over the corridor in order to avoid co-channel and adjacent channel interference to and from other ITS technologies. In any case, road tolling, smart tachograph, weight and dimensions applications must be protected. Any technology that meets these requirements and is compatible with Europe's electronic road charging systems can become part of C-ITS. C-ITS fits into connectivity environments, such as 5G and future cellular and WLAN generations.

ASECAP members have proven to be able to make C-ITS work. We have examples of systems thriving ITS-G5 and long-range cellular communication together.

ITS-G5 is geared towards automotive OEM and road operators: the long product cycles are fully accounted for and the system is enabled to slowly phase in new use cases and services, in step with the gradual renewal of the vehicle fleet or road networks. The technology comes without any additional costs for vehicles equipped with the chip sets. It is a successful technology export.

C-ITS has to match the requirements of road operators, this includes the business model as well as the technical requirements. Road operators focus on services for road users. ASECAP expects that the communication environment will evolve, and it should always be able to transport C-ITS messages in-line with the requirements mentioned above.

ASECAP calls for future C-ITS technologies taking into account incumbent technology deployed by Europe's road operators and automotive OEM. ASECAP believes that the interoperable C-ITS system is a unique opportunity for European industry and the European Digital Single Market.

Security

Europe has a Security Policy and a Certificate Policy for deployment and operation of C-ITS. The European Commission, in close consultation with EU Member State security experts and the automotive industry and road operators, elaborated both documents. They are implemented under the auspices of the European Commission's Joint Research Centre. The C-ITS security system is unique in the way that it is agreed and it is being deployed. It will be a key part of Europe's future digital landscape and its significance will go beyond merely road transport.

ASECAP believes that this agreed security system makes Europe a leader in the field of C-ITS. It is a piece of key security infrastructure that many European industry actors can benefit from and needs to be recognised as a key asset Europe has in the field of connectivity.

Patent litigation-free environment

In January 2020, the German Federal Ministry for Economic Affairs and Energy published the "Fact finding study on patents declared to the 5G standard". Amongst its conclusions, the study points to the large volume of standard-essential patents in the field of 5G and raises legal questions on the pricing of the licensing of these patents. Previously, a study on "Patents and standards in the auto industry" indicated that thousands of standard-essential patents cover cellular technology while only a few hundred cover ITS-G5.

The DG competition should make sure that patent holders do not hinder competition within the internal market by refusing to license their technologies or by imposing abusively high royalties.

Indeed, the number of patents covering 5G technologies raises concerns in ASECAP:

- 1.) Road safety is a public good and hence should be delivered in the most cost-efficient manner;
- 2.) a large amount of standard essential patents in specific technology are likely to lead to patent- litigations involving implementers and integrators;
- 3.) roads are strategic infrastructure, a large volume of the standard essential patents is held by non-EU companies. This aspect deserves analysis.

ASECAP believes that technology for C-ITS should not hold any risk of patent litigation. Road operators have a special responsibility not to provide their services via highly patented technology. High royalties lead to a knock-on effect on the final users. Money invested in roads should flow into their construction and maintenance rather than into royalties and litigation costs.

Road safety, as well as sustainable road transport, are key responsibilities borne by road operators. They are public goods that yield positive externalities for society and the economy overall. Road operators are happy to share data for this purpose and make it available to third parties to allow them to contribute to these shared goals. In return, road operators expect to receive minimum road safety-related data from third parties free of charge. We believe that as service providers accept 112 emergency calls free of any charge, data exchange between road operators and service providers should run free of charges or fees for end users, in order to save lives.

ASECAP believes that data used for road safety has to be exchanged free of charge. Road operators gather their own data and make it available for the purpose of protecting motorists and improving the sustainability of Europe's motorways. The way we make data available for safety and decarbonisation, we expect to receive it – free of any charge.

Data Protection

The GDPR provides for a strict protection mechanisms and penalties in order to give control to individuals over their personal data and to simplify the regulatory environment for international business, by harmonising the regulation within the EU. The GDPR sets out principles that controllers and processors of personal data must comply with by establishing appropriate technical and organizational measures: 1.) lawful, fair, transparent data processing; 2.) purpose limitation; 3.) data minimisation; 4.) accuracy; 5.) storage limitation; 6.) accountability ; 7.) integrity and confidentiality.

ASECAP believes that road operators are able to establish appropriate technical and organisation measures ensuring that deployment of C-ITS complies with GDPR.

ASECAP believes that processing personal data for road safety purposes is legitimate and proportional.

About ASECAP:

ASECAP is the European Association of Operators of Toll Road Infrastructures across 21 member countries representing 142 companies employing more than 50.000 direct jobs and 200.000 indirect jobs. They operate, maintain, manage a network of more than 88.000 km with a long-term vision that ensures highest quality standards to make the road infrastructure safest thank to the user/payer principle providing sustainable financing. Road operators play an essential role in service integration and the traffic information provided to end-users. ASECAP focuses

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