



*Association Européenne des Concessionnaires
d'Autoroutes et d'Ouvrages à Péage*

**POSITION PAPER
ON
CONNECTED AND AUTOMATED DRIVING**

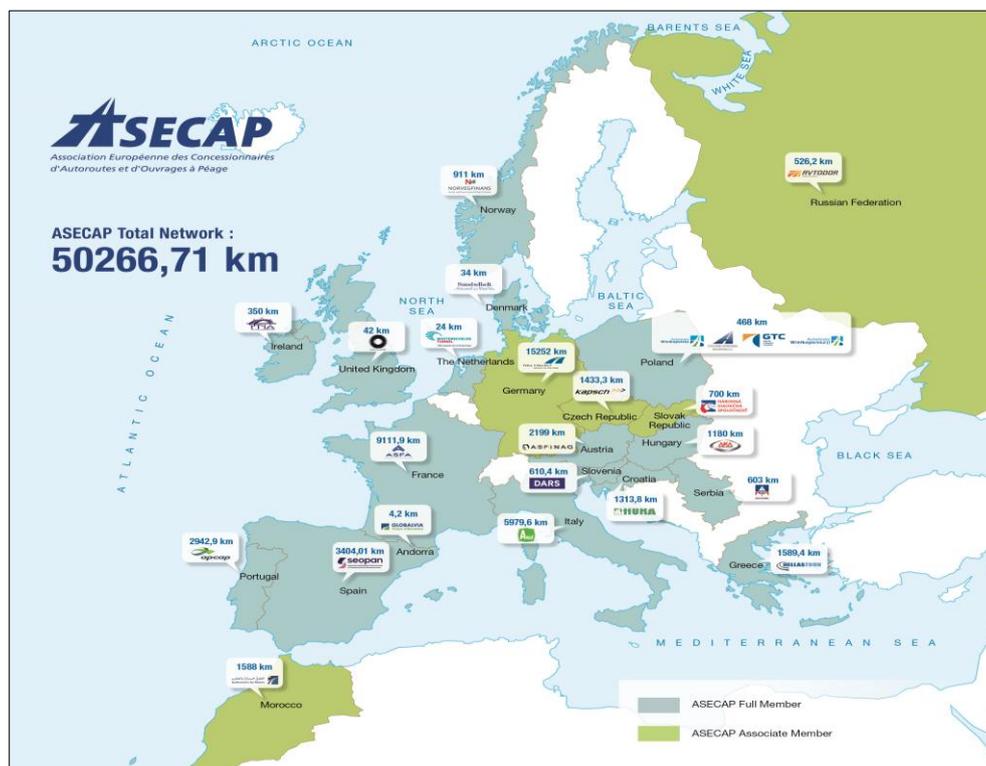
ASECAP

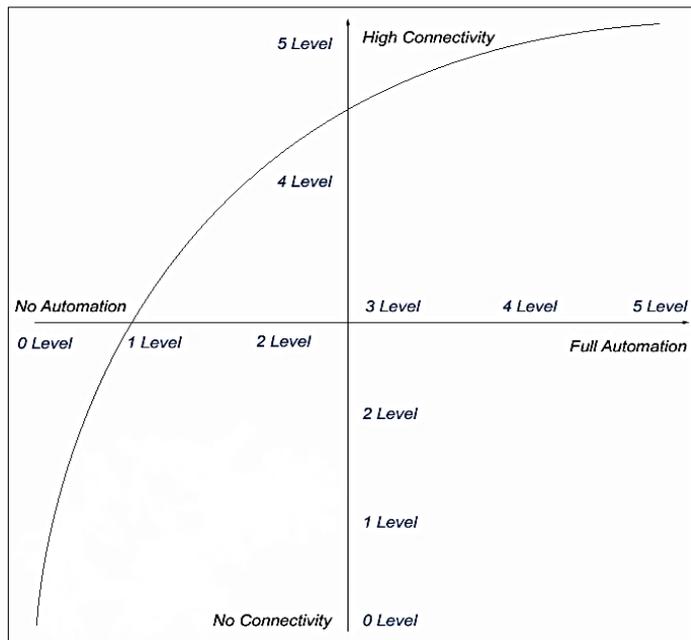
ASECAP is the European Association of Operators of Toll Road Infrastructure, Bridges and Tunnels. It is the sole pan-European organization that brings together operators responsible for the management of more than 50.000 km of motorways, bridges and tunnels, in 22 countries. The network of ASECAP's members constitutes a large part of the Trans-European Road Network connecting cities, airports and ports.

ASECAP's mission is to promote tolling as the most efficient tool to finance the construction, operation and maintenance of motorways and other major toll road infrastructure. ASECAP and its members are committed to:

- ❖ Exchange information, experiences and best practices on road transport policies;
- ❖ Fully implement the European “user-pays” and “polluter pays” principles in order to create a single transport system in Europe based on multimodal, sustainable and efficient transport solutions;
- ❖ Strengthening the efficiency of their network and permanently improving the level of services provided to the European citizens, by keeping up with the latest technology developments and the best operational practices.

ASECAP members have an annual turnover of more than € 28 billion which they constantly invest in the maintenance and upgrading of the road infrastructure and on the improvement of the services provided to their customers.





Automated driving in Europe

Automated driving is considered as the major technological advancement that will shape the future of mobility in Europe. ASECAP fully supports the Amsterdam Declaration¹ on “Cooperation in the field of connected and automated driving”, affirming that connected and automated driving contributes to:

Automation versus Connectivity (Source ASECAP)

- ❖ Road Safety by changing the interactions between the elements (vehicle – infrastructure – driver) of the safety triangle and therefore addressing the human factor responsible for more than 90 % of road accidents;
- ❖ Efficiency and environmental objectives by delivering a more sustainable driving mode and optimizing the driving conditions in order to reduce energy consumption and limit noxious emissions from cars;
- ❖ Accessibility, Comfort & Social inclusion by providing to all users the possibility to have a new mobility option and move freely according to their specific needs.

Several national or European consortium/network have been extensively working on this topic by providing concrete project results, ‘roadmaps’ and position papers highlighting their main concerns and recommendations. ASECAP members contribute to this work, particularly through their active participation in major projects (C-ROADS, SCOOP@F, ECo-AT, etc.), by specifying and developing a set of cooperative (Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) communications) safety and eco-driving systems/applications.

Currently Advanced Driver Assistance Systems (ADAS) within levels 1 & 2 are already in the market for both passenger and goods vehicles². Level 1 & 2 ADAS will pave the way for the introduction, in the next years, of more advanced automated driving solutions, to reach possibly, after 2030, fully automated driving. Systems belonging to level 3 or higher, will be deployed, firstly, on motorways

¹ Amsterdam Declaration was acknowledged by the 28 transport ministers during the informal meeting of the Transport Council on the 14th of April 2016. It lays down agreements on the steps necessary for the development of self-driving technology in the EU.

² In addition, by European Regulation No 661/2009 of the European Parliament and of the Council, installation of Lane Departure Warning Systems and Emergency Braking System are mandatory for new vehicles, for some categories of large passenger vehicles and Heavy goods vehicles.



as they represent the most suitable environment. This future scenario relies closely on the V2I & I2V communications and on the active role of road operators.

| Automated driving system levels | | | | | | Communication levels | |
|--|------------------------|---|-----------------------------------|--|-----------------------------------|--------------------------|---------------------|
| Automated level | Name | Execution of Steering and Acceleration/Deceleration | Monitoring of Driving Environment | Fallback Performance of Dynamic Driving Task | System Capability (Driving Modes) | Name | Communication Level |
| Human driver monitors the driving environment | | | | | | | |
| 0 | No Automation | Human driver | Human driver | Human driver | n/a | No Communication | 0 |
| 1 | Driver Assistance | Human driver and system | Human driver | Human driver | Some driving modes | Communication Assistance | 1 |
| 2 | Partial Automation | System | Human driver | Human driver | Some driving modes | High Communication | 2 |
| Automated driving system ("system") monitors the driving | | | | | | | |
| 3 | Conditional Automation | System | System | Human driver | Some driving modes | High Communication | 3 |
| 4 | High Automation | System | System | System | Some driving modes | Full Communication | 4 |
| 5 | Full Automation | System | System | System | All driving modes | | 5 |

Levels of Driving Automation – C2X Communication levels (source ASECAP)

Road infrastructure and its interface with the vehicle must be fully recognized as an essential component of the 'road safety' interactive triangle. Road infrastructure operators manage safety and traffic and provide safety and traffic information to the driver, allowing the driver to grasp the traffic situation beyond his perception of the driving environment. The current interaction between the infrastructure and the driver will change, leading to a closer interaction between the infrastructure and the vehicle, via V2I & I2V communications coexisting with DSRC 5.8 GHz used for Electronic Toll Services.

Road Infrastructure concerns

From the road operators' perspective, the key role of the 'traffic management centres' must be underlined in order to effectively and safely manage traffic and, in case, accidents/incidents by regulating the traffic flow both for conventional and automated vehicles. These traffic management centres will have to provide, through V2I & I2V communications, new and dedicated road safety and traffic information/data and services, to automated vehicles depending on their level of automation, while also providing conventional services via existing communication links, to non-automated vehicles.

V2I and I2V communications will have to coexist interference-free based on several communication technologies, to ensure the continuous exchange of information between the vehicle and the road infrastructure. The change of interactions amongst the key elements of the safety triangle by means



of wireless exchange of information/data via V2V and V2I communications, will engage new stakeholders (vehicle manufacturers, mobile devices suppliers, telecom operators, map makers, editors and broadcasters of navigation and information services, etc.) which will have to bear safety responsibilities that have to be clearly defined. Under this definition, it should be borne in mind that traffic information, on one side, and accident/incident and traffic management on the other hand, are closely interdependent.

A common European framework will have to be implemented for the definition and development of new traffic management concepts, which will have to be based on European services homogeneity and interoperability. In this respect, common standards will have to be developed and implemented; and clear and stable legal framework will have to be established.

Data security is another crucial aspect behind the deployment of communication and automated vehicles as it guarantees the security of the system against any external attempt of hacking or sabotage that can seriously jeopardizes the safety of the driver. Furthermore data need to be accessible to all the relevant stakeholders, under a clear legal, contractual and economic framework. These information are crucial to effectively plan and manage the operations on the different transport networks.

On the other side, the privacy of the data collected and used is a key pre-condition that have to be respected and protected under a proper European framework. Citizens have to know under what conditions and for what purposes data are collected and used in order to avoid any privacy-related issue and, at the same time, engage citizens to play an active role towards this challenge.

ASECAP position

ASECAP believes that road operators play a key role in the deployment of automated driving, since it is their task to the highest standards of safety on their road network. ASECAP and its members are fully committed to thoroughly study and analyse the impact, to support the introduction and operation of automated vehicles and their interaction with the physical infrastructure in order to ensure the highest benefits to European citizens.

ASECAP upholds the following principles:

1. Safety remains the highest priority and automated driving has the potential of improving safety on our roads.
2. Automated driving shall be based on legal certainty, binding EU-wide security rules, and consistent EU privacy and certification frameworks.
3. Communication between vehicle and infrastructure has to be standardised, to allow vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications amongst all types of vehicles and road networks.
4. The access to vehicle data under fair, reasonable and non-discriminatory conditions is key to safely manage traffic, for both mixed automated and non-automated scenarios.
5. The operation of automated vehicles and their strong interconnection with road operators will require robust data security mechanisms in order to avoid abuses or criminal activities which might influence the safety operation of automated vehicles. ASECAP envisages a European solution across all vehicle brands.
6. New legal frameworks, processes and European standards will have to be put in place assuring the smooth implementation and operation of these innovative 'automated mobility' concepts. European services interoperability will have to be ensured at all time.
7. Consistent and long-term investments are needed to deploy intelligent transport solutions and maximise the potential benefits of automated driving in all the different road environments. Physical infrastructure, by definition, requires a long-term vision and planning and, therefore, a clear European roadmap with indicators and targets must be adopted and uphold across Members States.
8. Well defined and targeted European projects & initiatives in order to approach all automation levels in a harmonised way are needed. It is crucial that such projects are adequately funded, taking into account the framework conditions of road concessionaires.





*Association Européenne des Concessionnaires
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Siège de l'Association / Head offices
3, rue Edmond Valentin • F-75007 Paris

Bureaux / Offices
Rue Guimard, 15 • B-1040 Bruxelles
Tel 0032 2 289 26 20 • Fax 0032 2 514 66 28

www.asecap.com • E-mail: secretariat@asecap.com

