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**FUTURE ARTIFICIAL INTELLIGENCE ACT,  
THE ROAD TRANSPORT INDUSTRY AND  
SAFETY IMPLICATIONS**



## FUTURE ARTIFICIAL INTELLIGENCE ACT, THE ROAD TRANSPORT INDUSTRY AND SAFETY IMPLICATIONS

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**Abstract:** Artificial Intelligence is set to be a disruptive element that could even surpass human capabilities. In this light, the European institutions want to anticipate full deployment and are finalising the future Artificial Intelligence Act, which will guarantee security, respect for fundamental rights and EU values. This act, in the dimension of the road transport industry, applies to three vectors: the autonomous or connected vehicle, intelligent infrastructure and V2V (vehicle-to-vehicle communication) or V2I (vehicle-to-infrastructure communication). However, this article breaks down and details the security implications of the application and integration of AI (Artificial Intelligence) systems in the industry, detailing both the legal and industry context.

**Resumen:** La Inteligencia Artificial está llamada a ser un elemento disruptivo que podría superar, incluso, las capacidades humanas. Frente a esto, las instituciones europeas quieren anticiparse al despliegue total y ultiman la futura Ley de Inteligencia Artificial que garantizará seguridad, respeto de derechos fundamentales y valores de la Unión. Esta ley, en la dimensión del sector transporte por carretera, aplica a tres vectores: el vehículo autónomo o conectado, la infraestructura inteligente y la comunicación V2V (Comunicación vehículo a vehículo) o V2I (Comunicación vehículo a infraestructura). Con todo, este artículo desglosa y detalla las implicaciones en seguridad que se obtienen con la aplicación e integración de sistemas de IA (Inteligencia Artificial) en el sector, pormenorizando el contexto tanto legal como sectorial.

**Keywords:** Artificial Intelligence; autonomous or connected vehicle; smart infrastructure; V2V – V2I; road safety; traffic monitoring and control; resilience; biometric identification.

**Palabras clave:** Inteligencia Artificial; vehículo autónomo o conectado; infraestructura inteligente; V2V – V2I; seguridad vial; vigilancia y control del tráfico; resiliencia; identificación biométrica.

## 1.- EUROPEAN LEGAL FRAMEWORK FOR IA IN THE ROAD TRANSPORT INDUSTRY

The National Artificial Intelligence Strategy, sponsored by the Ministry of Economic Affairs and Digital Transformation of the Spanish Government, takes the position and dimension of Europe. Accordingly, it takes over the definition of the term "*Artificial Intelligence System*" (hereinafter, AI system) from Article 3(1) of COM (2021) 206 final<sup>1</sup>, and refers to "software that is developed using one or more of the techniques and strategies listed in Annex I<sup>2</sup> and that can, for a given set of human-defined objectives, generate output information such as content, predictions, recommendations or decisions that influence the environments with which it interacts".

From the outset, the European Commission, in order to improve the functioning of the internal market, has been setting the overall strategy and three major related milestones have been reached.

The first, COM (2018) 795 final<sup>3</sup>, the *Coordinated Plan on AI*, enabled to direct investments undertaken by the EU-27 in order to boost performance, foster a framework for sharing best practices, promote cooperation among countries and articulate a joint path to compete globally.

Subsequently, COM (2020) 65 final<sup>4</sup>, the *White Paper on AI*, served as a consensus to promote the use of AI in everyday European society and address the risks that such technology could generate through its use. Consider that, from the outset, the EU (European Union) has advocated AI that respects fundamental rights and is supported by three essential components: AI must be lawful, AI must be ethical and AI must be robust (HLEG on Artificial Intelligence - European Commission, 2018).

Finally, the most recent and relevant milestone is COM (2021) 206 final<sup>5</sup>, the future *Artificial Intelligence Act*, which proposes a legal framework and lists certain specific

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<sup>1</sup> Proposal for a Regulation of the European Parliament and of the Council "setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union", COM (2021) 206 final of 4 April. Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](#)

<sup>2</sup> ANNEX I lists "*AI techniques and strategies*" and refers to "*Machine learning strategies, including supervised, unsupervised and reinforcement learning, employing a wide variety of methods, including deep learning; Logic and knowledge-based strategies, especially knowledge representation, inductive (logic) programming, knowledge bases, inference and deduction engines, expert and (symbolic) reasoning systems; Statistical strategies, Bayesian estimation, search and optimisation methods*", in "Annexes to COM (2021) 206 final of 4 April on the proposal for a regulation of the European Parliament and of the Council setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union." Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](#)

<sup>3</sup> Communication from the Commission to the European Parliament, the European Council, the European Economic and Social Committee and the Committee of the Regions on the "Coordinated Plan on Artificial Intelligence", COM (2018) 795 final of 7 December. Available at [EUR-Lex - 52018DC0795 - EN - EUR-Lex \(europa.eu\)](#)

<sup>4</sup> White Paper on "Artificial Intelligence –A European approach to excellence and trust", COM (2020) 65 final of 19 February. Available at [EUR-Lex - 52020DC0065 - EN - EUR-Lex \(europa.eu\)](#)

<sup>5</sup> Proposal for a Regulation of the European Parliament and of the Council "setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union", COM (2021) 206 final of 4 April. Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](#)

objectives which are to "[...] ensure that AI systems introduced and used on the EU market are safe and comply with existing legislation on fundamental rights and EU values; ensure legal certainty to facilitate investment and innovation in AI; improve governance and effective implementation of existing legislation on fundamental rights and security requirements applicable to AI systems; facilitate the development of a single market for the legal, safe and trusted use of AI applications and avoid market fragmentation."

Thus, detailing and dimensioning COM (2021) 206 final<sup>6</sup> to the road transport industry, three key situations to consider in the implementation and application of AI systems can be identified.

On the one hand, Article 6(1)(a) and (b) of COM (2021) 206 final<sup>7</sup>, identifies and classifies "*high risk AI system*" when it "... is intended to be used as a safety component of a product covered by Union harmonisation legislation as listed in Annex II<sup>8</sup>, or is itself such a product" and, in addition, "... must undergo a conformity assessment undertaken by an independent body for its placing on the market and/or putting into service". Regarding road transport, paragraph 6 of Section B of Annex II to COM (2021) 206 final<sup>9</sup> cites and affects Regulation (EU) 2018/858<sup>10</sup> and Regulation (EU) 2019/2144<sup>11</sup>, which focus on type-approval requirements for motor vehicles. That is, AI systems that are incorporated and applied in vehicles as safety components will be considered high risk

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<sup>6</sup> Proposal for a Regulation of the European Parliament and of the Council "setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union", COM (2021) 206 final of 4 April. Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](#)

<sup>7</sup> Proposal for a Regulation of the European Parliament and of the Council "setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union", COM (2021) 206 final of 4 April. Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](#)

<sup>8</sup> ANNEX II refers to the <list of Union harmonisation legislation> and includes "Section A - List of Union harmonisation legislation based on the New Legislative Framework; Section B - List of other Union harmonisation legislation", in "Annexes to COM(2021) 206 final of 4 April on the proposal for a Regulation of the European Parliament and of the Council setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain Union legislation." Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](#)

<sup>9</sup> Proposal for a Regulation of the European Parliament and of the Council "setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union", COM (2021) 206 final of 4 April. Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](#)

<sup>10</sup> Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on type-approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, amending Regulations (EC) No. 715/2007 and (EC) No. 595/2009 and repealing Directive 2007/46/EC. *Official Journal of the European Union*, No. 151 of 14 June 2018, pages 1 to 218. Retrieved from <https://www.boe.es/doue/2019/091/L00045-00076.pdf>

<sup>11</sup> Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 concerning type-approval requirements for motor vehicles and their trailers, together with their systems, components and separate technical units intended for such vehicles, with regard to their general safety and the protection of vehicle occupants and vulnerable road users, amending Regulation (EU) 2018/858 of the European Parliament and of the Council and repealing Regulations (EC) No. 78/2009, (EC) No. 79/2009 and (EC) No. 661/2009 of the European Parliament and of the Council and Regulations (EC) No. 631/2009, (EU) No. 406/2010, (EU) No. 672/2010, (EU) No. 1003/2010, (EU) No. 1005/2010, (EU) No. 1008/2010, (EU) No. 1009/2010, (EU) No. 19/2011, (EU) No. 109/2011, (EU) No. 458/2011, (EU) No. 65/2012, (EU) No. 130/2012, (EU) No. 347/2012, (EU) No. 351/2012, (EU) No. 1230/2012 and (EU) 2015/166. *Official Journal of the European Union*, No. 325 of 16 December 2019, pages 1 to 40. Retrieved from <https://www.boe.es/doue/2019/325/L00001-00040.pdf>

and will have to be type-approved and certified as required by European legislation on type-approval and market surveillance.

On the other hand, in terms of management and operation of essential infrastructure linked to the road transport industry, Article 6(2) of COM (2021) 206 final<sup>12</sup> mentions that "[...] AI systems listed in Annex III<sup>13</sup> shall also be considered as high risk". Specifically, point 2(a) of Annex III of COM (2021) 206 final<sup>14</sup> designates as a high-risk IA system those "intended for use as safety components in the management and operation of road traffic and the supply of water, gas, heat and electricity." Therefore, AI systems that are incorporated and applied on urban and interurban roads will also be considered as high risk.

Finally, Article 82 of COM (2021) 206 final<sup>15</sup> handles the amendment of Regulation (EU) 2019/2144<sup>16</sup> in its Article 11 concerning "*Specific requirements relating to automated and fully automated vehicles*" and links the two legal texts. The future AI Act refers to and assumes that AI systems will help develop the technical specifications for automated driving. According to Article 11(1) of Regulation (EU) 2019/2144<sup>17</sup>, these

<sup>12</sup> Proposal for a Regulation of the European Parliament and of the Council "setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union", COM (2021) 206 final of 4 April. Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](#)

<sup>13</sup> ANNEX III lists the <high-risk AI schemes> and refers to "1. Biometric identification and categorisation of natural persons; 2. Management and operation of critical infrastructure; 3. Vocational education and training; 4. Employment, employee management and access to self-employment; 5. Access to and enjoyment of essential public and private services and their benefits; 6. Law enforcement matters; 7. Migration, asylum and border control management; 8. Administration of justice and democratic processes", in "Annexes to COM(2021) 206 final of 4 April on the proposal for a regulation of the European Parliament and of the Council setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union". Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](#)

<sup>14</sup> Proposal for a Regulation of the European Parliament and of the Council "setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union", COM (2021) 206 final of 4 April. Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](#)

<sup>15</sup> Proposal for a Regulation of the European Parliament and of the Council "setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union", COM (2021) 206 final of 4 April. Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](#)

<sup>16</sup> Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 concerning type-approval requirements for motor vehicles and their trailers, together with their systems, components and separate technical units intended for such vehicles, with regard to their general safety and the protection of vehicle occupants and vulnerable road users, amending Regulation (EU) 2018/858 of the European Parliament and of the Council and repealing Regulations (EC) No. 78/2009, (EC) No. 79/2009 and (EC) No. 661/2009 of the European Parliament and of the Council and Regulations (EC) No. 631/2009, (EU) No. 406/2010, (EU) No. 672/2010, (EU) No. 1003/2010, (EU) No. 1005/2010, (EU) No. 1008/2010, (EU) No. 1009/2010, (EU) No. 19/2011, (EU) No. 109/2011, (EU) No. 458/2011, (EU) No. 65/2012, (EU) No. 130/2012, (EU) No. 347/2012, (EU) No. 351/2012, (EU) No. 1230/2012 and (EU) 2015/166. *Official Journal of the European Union*, No. 325 of 16 December 2019, pages 1 to 40. Retrieved from <https://www.boe.es/doue/2019/325/L00001-00040.pdf>

<sup>17</sup> Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 concerning type-approval requirements for motor vehicles and their trailers, together with their systems, components and separate technical units intended for such vehicles, with regard to their general safety and the protection of vehicle occupants and vulnerable road users, amending Regulation (EU) 2018/858 of the European Parliament and of the Council and repealing Regulations (EC) No. 78/2009, (EC) No. 79/2009 and (EC) No. 661/2009 of the European Parliament and of the Council and Regulations (EC) No. 631/2009,

technical specifications are: "(a) systems to replace driver control of the vehicle, including signalling, steering, acceleration and braking; (b) systems to provide the vehicle with real-time information about the state of the vehicle and the surrounding area; (c) systems to monitor driver readiness; (d) event data recorders for automated vehicles; (e) harmonised data exchange format in case of e.g. multi-brand vehicle platooning; (f) systems to provide safety related information to other road users."

## 2.- IA SYSTEMS IN THE ROAD TRANSPORT INDUSTRY

There are recent disruptive elements that were not foreseen some time ago in the field of road mobility.

First, the market penetration of electric vehicles and their charging points, known as electric stations. In this respect, COM (2021) 556 final<sup>18</sup> is awaiting the last formal approval of the European Council to definitively ban the sale of new cars with internal combustion engines by 2035. Also, the US Environmental Protection Agency (EPA) has presented the *Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles - Phase 3*<sup>19</sup> plan which envisages increasing the sale of electric vehicles by 2032.

Another disruptive element are technologies that seek to streamline the management of the road transport industry, such as, for example, the effective control of Low Emission Zones or the collection of an electronic toll without the need to slow down the vehicle, known as *Free-Flow* or electronic tolling.

On the one hand, the LEZs (Low Emission Zones) provide cities with a virtual and sustainable geographical boundary, control vehicles that enter without complying with the previously established requirements and provide the required information for the appropriate administrative sanction by the Competent Authority.

On the other hand, and as contextualised in the final master's thesis *The future of high-capacity roads in Spain from a national security perspective* (Casamitjana, 2022, p. 7), the electronic toll system is based on 5.8 GHz microwave technology that involves the automatic reading of OBE (On Board Equipment)-VIAT devices and cameras with Optical Character Recognition that allow the reading of number plates in real time. In turn, it is supported by a physical structure based on gantries that is over 99% effective for charging purposes. And for optimal configuration, all users of the infrastructure are

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(EU) No. 406/2010, (EU) No. 672/2010, (EU) No. 1003/2010, (EU) No. 1005/2010, (EU) No. 1008/2010, (EU) No. 1009/2010, (EU) No. 19/2011, (EU) No. 109/2011, (EU) No. 458/2011, (EU) No. 65/2012, (EU) No. 130/2012, (EU) No. 347/2012, (EU) No. 351/2012, (EU) No. 1230/2012 and (EU) 2015/166. *Official Journal of the European Union*, No. 325 of 16 December 2019, pages 1 to 40. Retrieved from <https://www.boe.es/doue/2019/325/L00001-00040.pdf>

<sup>18</sup> Proposal for a Regulation of the European Parliament and of the Council "amending Regulation (EU) 2019/631 regarding strengthening CO2 emission performance standards for new passenger cars and new light commercial vehicles in line with the Union's enhanced climate ambition, pending final formal approval by the Council to definitively ban the sale of new cars with internal combustion engines by 2035", COM (2021) 556 final of 14 July. Available at [EUR-Lex - 52021PC0556 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/eli/reg/2021/556/20210714/eng)

<sup>19</sup> "Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles - Phase 3" plan, *Environmental Protection Agency*, 12 April 2023. From <https://www.epa.gov/regulations-emissions-vehicles-and-engines/proposed-rule-greenhouse-gas-emissions-standards-heavy#rule-summary>

required to register in the electronic toll application by linking the number plate with the OBE/VIAT device and linking a personal means of payment.

Another recent element that brings us closer to AI applied to the road transport industry is Intelligent Transport Systems. Article 2(1) of Royal Decree 662/2012<sup>20</sup> defines "ITS" as "[...] systems in which information and communication technologies are applied in the road transport industry, including infrastructure, vehicles and users, and in traffic and mobility management, as well as for interfaces with other forms of transport". According to the Directorate General of Traffic, this type of system has three main areas of action: road safety, traffic management and surveillance and control.

However, the disruptive element that breaks with the balances established to date is the application of AI systems in the road network, generating intelligent roads. This paradigm shift is directly linked to the evolution of the connected or autonomous vehicle and 5G concepts. The digitisation and monitoring of both vehicles and infrastructures, and the implementation of 5G with its latency<sup>21</sup> create a new scenario for these AI systems to be implemented. Thus, data transfer and sharing between V2I and V2V is instantaneous. That is, the data obtained from the road and the vehicles on it, with its corresponding integration and management, enables algorithms to help, imitate and/or optimise the related human decisions.

The future European Act on Artificial Intelligence, as detailed in the previous section of this article, envisages the legal possibility of developing AI systems on the road network. At an earlier stage, the regulatory framework of the road transport industry already foresaw this possible paradigm shift and highlights Article 11 of Regulation (EU) 2019/2144<sup>22</sup> concerning "*Specific requirements relating to automated vehicles and fully automated vehicles*"; Article 3(1) of Royal Decree 662/2012<sup>23</sup> which states "...the priority areas and actions listed in Annex I<sup>24</sup> shall be carried out in accordance with the measures

<sup>20</sup> Royal Decree 662/2012 of 13 April establishing the framework for the implementation of Intelligent Transport Systems (ITS) in the road transport industry and for interfaces with other modes of transport. *Official State Gazette*, No. 90, 14 April 2012, pages 29,524 to 29,530. From <https://www.boe.es/boe/dias/2012/04/14/pdfs/BOE-A-2012-5043.pdf>

<sup>21</sup> "Latency" refers to the delay between sending and receiving data. The latency of 5G stands at 1 millisecond, while the latency of 4G, for example, is 200 milliseconds.

<sup>22</sup> Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 concerning type-approval requirements for motor vehicles and their trailers, together with their systems, components and separate technical units intended for such vehicles, with regard to their general safety and the protection of vehicle occupants and vulnerable road users, amending Regulation (EU) 2018/858 of the European Parliament and of the Council and repealing Regulations (EC) No. 78/2009, (EC) No. 79/2009 and (EC) No. 661/2009 of the European Parliament and of the Council and Regulations (EC) No. 631/2009, (EU) No. 406/2010, (EU) No. 672/2010, (EU) No. 1003/2010, (EU) No. 1005/2010, (EU) No. 1008/2010, (EU) No. 1009/2010, (EU) No. 19/2011, (EU) No. 109/2011, (EU) No. 458/2011, (EU) No. 65/2012, (EU) No. 130/2012, (EU) No. 347/2012, (EU) No. 351/2012, (EU) No. 1230/2012 and (EU) 2015/166. *Official Journal of the European Union*, No. 325 of 16 December 2019, pages 1 to 40. Retrieved from <https://www.boe.es/doue/2019/325/L00001-00040.pdf>

<sup>23</sup> Royal Decree 662/2012 of 13 April establishing the framework for the implementation of Intelligent Transport Systems (ITS) in the road transport industry and for interfaces with other modes of transport. *Official State Gazette*, No. 90, 14 April 2012, pages 29,524 to 29,530. From <https://www.boe.es/boe/dias/2012/04/14/pdfs/BOE-A-2012-5043.pdf>

<sup>24</sup> ANNEX I refers to <Priority areas and actions> and includes "(a) Priority areas: 1. Optimal use of data on the road network, traffic and trips. 2. Continuity of Intelligent Transport System (ITS) services for traffic and freight management. 3. Intelligent Transport Systems (ITS) applications for road transport safety and security. 4. Connecting vehicles to the transport infrastructure; b) Priority actions: 1. The provision of



adopted for this purpose by the Ministry of Interior and the Ministry of Public Works, within the scope of their respective powers"; Article 2(1), point IV. of Directive 2010/40/EU<sup>25</sup> which refers to "connecting vehicles to the transport infrastructure" as a priority area for action.

Generic examples of the applicability of AI systems in the industry would be all those linked to services that enable more efficient, safe and sustainable mobility: prediction of traffic conditions to avoid traffic jams and search for alternatives; prediction and mitigation of fatal accidents by taking temporary control of the vehicle; application of advanced mobility management strategies based on the automation of the Traffic Management and Control Centre and affecting the infrastructure, such as automatic lane closures in the presence of pedestrians, animals or objects not previously notified, variable speed signals adjusted to the prediction, establishment of a virtual lane for emergencies if required or instant correction of the safety distance between vehicles; application of advanced mobility management strategies based on the automation of the Traffic Management and Control Centre and affecting the vehicle, such as full autonomous driving or detection of critical vehicle breakdowns and the obligation, by taking temporary control of the vehicle, to stop the vehicle; automatic monitoring via video analysis of the use of seat belts and automatic notification to the Competent Authority; direct communication between infrastructure and vehicle or driver to alert of weather incidents or approaching emergency vehicles, among others; optimisation in the maintenance of the structures that make up the road, such as, for example, the state of the pavement or tunnels.

Specific cases that are already in the implementation or study phase include the smart motorway covering the Salerno-Reggio Calabria route (Italy) and the EUMOB project<sup>26</sup> (Spain and France).

The *Autostrada del Mediterraneo* (A2, Salerno-Reggio Calabria section), the managing body of which is Anas S.p.A., bases the operation of the asset on autonomous driving, connectivity and sustainable energy production. It currently has local administrative approval for self-driving cars to drive on the road without driver intervention.

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*multimodal travel information services. 2. The provision of real-time traffic information services. 3. Data and procedures for providing, where possible, minimum universal traffic information on road safety, free of charge to users. 4. The harmonised provision of an emergency call number (eCall). 5. The provision of information services based on intelligent transport systems (ITS) on safe and secure parking spaces for lorries and commercial vehicles, particularly in service and rest areas on the road network. 6. The provision of secure and protected parking space reservation services for lorries and commercial vehicles; c) Other actions: Specifications and standards for other actions, other than priority actions, will be developed within the priority areas."* in Royal Decree 662/2012 of 13 April establishing the framework for the deployment of Intelligent Transport Systems (ITS) in the road transport industry and for interfaces with other modes of transport. *Official State Gazette*, No. 90, 14 April 2012, pages 29,524 to 29,530. From <https://www.boe.es/boe/dias/2012/04/14/pdfs/BOE-A-2012-5043.pdf>

<sup>25</sup> Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 laying down the framework for the deployment of Intelligent Transport Systems in the road transport industry and for interfaces with other transport modes. *Official Journal of the European Union*, No. 207, 6 August 2010, pages 1-13. From <https://www.boe.es/boe/doue/2010/207/L00001-00013.pdf>

<sup>26</sup> The EUMOB project is a supranational study based on the digitisation of roads that envisages smarter, safer and more sustainable mobility. Available at <https://www.eu-mob.eu/>. Accessed 30.04.2023

On the other hand, the EUMOB project, approved by the European Commission and included in the *CEF-2 5G Corridors* framework <sup>27</sup> "[...] will analyse the comprehensive feasibility for the digitisation of a road at European level between two countries, in order to achieve a harmonised deployment of advanced services for connected mobility". (Autopistas, 2022). It is coordinated by the subsidiary of the Spanish group Abertis, Autopistas, in combination with the Spanish company Cellnex, and foresees the implementation of twenty-five services as a result of this digitalisation. Including: optimising maintenance costs, reducing the carbon footprint of users, improving road safety ratios, etc.

### 3.- SECURITY IMPLICATIONS

The following is a list of the different implications of the applicability of AI systems for security in Spain, grouping them into four main groups and assuming as a conceptual limit the future European Act on Artificial Intelligence and the industry context.

#### 3.1.- Road safety

In the run-up to the incorporation of AI systems and their relationship with road safety, there are two terms that need to be specified: the ITS Plan of the General Traffic Directorate and Advanced Driver Assistance Systems (ADAS).

In Spain, and expanding on the information provided in the previous section, there is an ITS Plan<sup>28</sup> that contributes to improving road safety and is made up of systems that support "...users in making decisions and improving their understanding of the road, thereby preventing errors that could lead to traffic accidents". (Dirección General de Tráfico, 2022). Block I<sup>29</sup> of this plan lists the different *<road safety instruments>* and highlights "I.1. Automated diversion due to adverse weather conditions (fog or wind)" or "I.6. Detection of vulnerable road users". All these solutions are track-based and enable individual drivers to take preventive action and reduce the associated risk.

On the other hand, there are ADAS (Advanced Driver Assistance Systems) systems that assist and increase the driver's active attention by means of lasers, cameras, lidar, etc., which interpret information from the vehicle's surroundings and alert the driver if necessary to protect occupants or road users. These rest on the vehicles and are already a requirement for type-approval. There are 9 in total: Intelligent Speed Assist (ISA), event data recorder (black box), emergency braking signal, drowsiness alert, *alcolock* installation interface, rear cross-traffic detection system, lane keeping assistant, tyre pressure monitoring system and advanced emergency braking system.

<sup>27</sup> The EU-27 and EU industry are cooperating to prepare for the large-scale deployment of 5G corridors for connected and automated mobility on European transport routes. <https://digital-strategy.ec.europa.eu/en/policies/cross-border-corridors> Accessed 29/04/2023.

<sup>28</sup> Available at <https://www.dgt.es/export/sites/web-DGT/galleries/downloads/muevete-con-seguridad/tecnologia-e-innovacion/Plan-ITS-de-la-DGT.PDF> . Accessed 30.04.2023

<sup>29</sup> BLOCK I concerns *<road safety tools>* and includes "I.1. Automated diversion due to adverse weather conditions (fog or wind); I.2. Automated diversion in singular infrastructures due to incidents, accidents or natural disasters; I.3. System for traffic guidance in adverse weather conditions; I.4. Smart crossings; I.5. Automatic detection of animals on the roadway; I.6. Detection of vulnerable road users; I.7. Intelligent traffic lights on crossings; I.8. Pushbuttons for the activation of light signals at points of special risk for pedestrian road safety" in "ITS Plan of the General Traffic Directorate.

Ultimately, the above two concepts are assumed to be the stepping stones to fully autonomous driving based on AI systems, once real and effective V2V-V2I communication is in place. Therefore, the biggest positive impact, in terms of safety, of the emergence of AI systems in the road transport industry is the substantial or complete reduction of accident rates through the prediction and mitigation of accidents by taking temporary control of the vehicle.

At European level, the reduction of road accidents is a strategic line and, with the implementation of AI systems, it is planned to reach the goal of 0 road fatalities by 2050. (Comisión Europea, 2020).

In Spain, the State Security Forces and Corps, responsible for traffic surveillance, regulation, assistance and control, could be direct beneficiaries of the applicability of AI systems on the road, as they could considerably reduce the number of rescue actions in accidents<sup>30</sup>.

### 3.2.- Traffic monitoring and control

Another dimension with security implications is the surveillance and control of road traffic by the FCSE and how different AI systems can assist and/or support the processes.

The efficacy-efficiency binomial is used simultaneously in any type of entity, including the administration. Efficiency is the inverse relationship between used resources and the improvement of objectives. If the data and information arising from the digitisation of the road and vehicles is available, it would free up police resources (human, financial and time) and thus improve performance. On the other hand, effectiveness is understood as the ability to achieve the desired or expected effect (Real Academia Española, s.f.).

For example, in article 4 of the February 2023 Special Issue of the CUGC's Logos Scientific Journal<sup>31</sup>, "*New road safety offences*" are identified as "the offence of excessive speed; driving under the influence of alcoholic beverages, toxic drugs, psychotropic substances and narcotics; driving with manifest recklessness; driving with manifest disregard for the lives of others; the offence of leaving the scene of an accident; refusal to submit to tests; driving without a licence or permit" (Sánchez-Melgar, 2023). In order to combat this effectively, V2I-based AI systems could prevent speeding by remotely limiting connected and/or autonomous vehicles on the road; foresee and warn of driving behaviour under the influence of prohibited substances and consequently take temporary control of the vehicle until the police appear; foresee, identify and warn of driving with

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<sup>30</sup> The General Chief of the Traffic Grouping of the Guardia Civil (Agrupación de Tráfico de la Guardia Civil, ATGC), in the framework of the III Master in International Security of the University Centre of the Guardia Civil (Centro Universitario de la Guardia Civil, CUGC), explained that the digital transformation and quality are pillars of the strategy based on the operational exploitation of data and the updating of processes. (Criado, 2022). In this sense, the ATGC has a daily performance during 2022 of 266 reports, 637 assists, 2.25 fatalities and 263 accidents (8 serious). (Criado, 2022). Therefore, taking on-track AI systems could imply a significant improvement of ratios for clustering and an extra provision of information for Accident Reconstruction Teams (Equipos de Reconstrucción de Accidentes, ERAT).

<sup>31</sup> Sánchez-Melgar, Julián (2023). The new road safety offences. *Logos Scientific Journal of the University Centre of the Guardia Civil*, special issue, p. 49 – 65. <https://revistacugc.es/article/view/5495>

manifest recklessness or with manifest disregard for the lives of others and take temporary control of the car, etc.

Another obvious applicability, for example, in the case of the Guardia Civil, is the use that units of the Traffic Investigation and Analysis Group (Grupo de Investigación y Análisis de Tráfico, GIRAT), part of the ATGC, could make of the AI systems deployed on the road network. Also, the developed AI systems could improve and optimise the information interoperability between DGT and ATGC of their own systems: SIGO (Integrated Operational Management System), Arena 2 (Accident Capture and Information System), SAEX/OBI (Statistical Analysis and Exploitation System), GLERA (accident data acquisition file for exploitation), MRI/MRU (system for measuring and controlling results and activity, productivity) and PSAN (database exploitation, infringements).

### 3.3.- Resilience of road transport and logistics

The lack of safety experienced by lorry drivers when travelling in Europe due to the lack of secure parking facilities is very latent. Nearly 72% of the truck parking areas in the continent are unguarded and the economic loss due to theft is estimated at EUR 8 billion (Transporte Profesional, 2022). According to the European Transport Workers' Federation (ETF, 2022), only 3% of parking spaces are certified to the standards required by European safety and security recommendations.

Europol recently warned that criminal groups linked to this type of crime are becoming increasingly organised. In Spain, the number of thefts of goods amounts to 1,500 per year, 50% of which take place in rest areas, 30% in urban areas, 18% in industrial areas and 2% on the road using the "surfer method". (Transporte Profesional, 2022). It is fair to consider that the figures shown for Spain are not higher than the EU average values.

In response to the problems above, the "Mobility Package I" (Comisión Europea, 2020) was approved in 2020 and came into force in the first half of 2022. One of the contents focuses on the categorisation of parking areas for heavy goods vehicles which are categorised as: Platinum, Gold, Silver and Bronze. For a rest area to have the highest Platinum rating, it must have access control gates and exits to control the interior movement of vehicles, among other conditions.

Therefore, with the digitisation of the road and connected cars, possibilities are opening up for AI systems to offer a protection service to the road transport industry, foreseeing and alerting about safety incidents so that they can be minimised. For example, strange driving or route behaviour in the area around the vehicles could be anticipated. With V2V technology, a vehicle could anticipate an incident and receive an immediate safety incident signal.

In addition, in order to achieve greater resilience in the road network, the Annex to Directive (EU) 2022/2557<sup>32</sup> refers to *<Sectors, sub-sectors and categories of critical*

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<sup>32</sup> Directive (EU) 2022/2557 of the European Parliament and of the Council of 14 December 2022 on the resilience of critical entities and repealing Council Directive 2008/114/EC. *Official Journal of the European Union*, No. 333 of 27 December 2022, pages 164-198. Retrieved from <https://www.boe.es/buscar/doc.php?id=DOUE-L-2022-81965>

entities>. In Sector 2. (Transport) and Subsector d) (Road transport), categorises "...road authorities as defined in Article 2 point 12 of Commission Delegated Regulation (EU) 2015/962<sup>33</sup> responsible for traffic management control, excluding public entities for which traffic management or ITS operation is a non-core part of their general activity; ITS operators as defined in Article 4 point 1 of Directive 2010/40/EU<sup>34</sup> of the European Parliament and of the Council" as a critical entity. In other words, road operators that develop ITS, it is redundant that when they take on IA systems as well, they will be designated as a critical entity and the transposition into national legislation will allow for greater resilience in the road transport industry.

### 3.4.- Article 5 - artificial intelligence act<sup>35</sup>

The use by the FCSE of the digital ecosystem and AI systems that will inhabit both the road network and cars for law enforcement purposes is very extensive and has already been detailed in previous sections. However, there are limitations set forth in Article 5 of Title II of COM (2021) 206 final<sup>36</sup> which refers to "prohibited artificial intelligence practices".

Article 5(1)(d) of COM (2021) 206 final refers to the "...use of "real-time" remote biometric identification systems in publicly accessible areas for law enforcement purposes" as a prohibited AI practice. However, it leaves a window open for certain cases in which the above does not apply. These are listed in Article 5(1)(d)(i), (ii) and (iii) of COM (2021) 206 final, and their use should be closely linked to one or more of the following goals: "the targeted search for possible individual victims of a crime, including missing children; the prevention of a specific, serious and imminent threat to the life or physical safety of natural persons or of a terrorist attack; the detection, location, identification or prosecution of a person who has committed or is suspected of having committed an offence referred to in Article 2(2) of Council Framework Decision 2002/584/JHA<sup>37</sup>, for which the legislation in force in the Member State concerned

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<sup>33</sup> ARTICLE 2, POINT 12, of Commission Delegated Regulation (EU) 2015/962 of 18 December 2014 supplementing Directive 2010/40/EU of the European Parliament and of the Council regarding the provision of real-time traffic information services throughout the European Union considers "road authority" as "a public authority responsible for the planning, control or management of roads within the territorial area of its competence". From <https://www.boe.es/doue/2015/157/L00021-00031.pdf>

<sup>34</sup> ARTICLE 4, POINT 1, of Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 laying down the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other transport modes, considers "Intelligent Transport Systems" or "ITS" as "systems in which information and communication technologies are applied in the field of road transport, including infrastructure, vehicles and users, and in traffic and mobility management, as well as for interfaces with other forms of transport". From <https://www.boe.es/buscar/doc.php?id=DOUE-L-2010-81417>

<sup>35</sup> It refers to the Proposal for a Regulation of the European Parliament and of the Council "setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union", COM (2021) 206 final of 4 April. Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/lexuris/ui/act/52021PC0206)

<sup>36</sup> Proposal for a Regulation of the European Parliament and of the Council "setting forth harmonised rules in the field of artificial intelligence (Artificial Intelligence Act) and amending certain legislative acts of the Union", COM (2021) 206 final of 4 April. Available at [EU R-Lex - 52021PC0206 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/lexuris/ui/act/52021PC0206)

<sup>37</sup> Council Framework Decision 2002/584/JHA of 13 June 2002 on the European arrest warrant and the surrender procedures among Member States. *Official Journal of the European Communities*, No. 190, 18 July 2002, pages 1 to 20. From <https://www.boe.es/buscar/doc.php?id=DOUE-L-2002-81377>

imposes a custodial sentence or a detention order for a maximum period of at least three years, as determined by the legislation of that Member State".

In addition, as set out in Article 5(2)(a) and (b) of COM (2021) 206 final, the Public Force shall consider in detail any of the exceptions listed above: "the nature of the situation giving rise to the possible use, and in particular the seriousness, likelihood and extent of the harm that would occur if the system were not used; the consequences of using the system for the rights and freedoms of the persons involved, and in particular the seriousness, likelihood and extent of such consequences".

Regarding the above, exceptions and law enforcement considerations, and as stated in Article 5(3) of COM (2021) 206 final, the use of AI systems in the "real-time" remote biometric identification dimension "[...] shall be subject to prior authorisation by a judicial authority or an independent administrative authority of the Member State where such a system is to be used, which shall grant it upon a reasoned request and in accordance with the detailed rules of national legislation referred to in paragraph 4<sup>38</sup>". However, the door remains open, in cases of duly justified urgency, to "[...] start using the system before obtaining the relevant authorisation, which may be requested during or after use".

Putting all of the above into practice, a digitalisation model is being deployed at national level in the road transport industry, involving the installation of hardware for data capture. At a later stage, the information obtained enables the development of predictive services based on AI systems that have been detailed throughout the article. Video imaging plays a very important role in all this architecture. By concept, the camera circuit should be comprehensive and total over the width and length of the road network where connected, intelligent and autonomous driving is intended. It is in this case, and contextualised with article 5 of the future Artificial Intelligence Act, that AI systems that enable video analytics could be developed. These AI systems, which enable real-time or delayed biometric identification, among other activities, do not need to be embedded or run internally in the track-vehicle structure and can be a one-off, external complement, owned by the FCSE, for example, and run on an ad hoc basis.

For example, one police unit that could benefit greatly from the approach above is the Mobility Operational Unit, part of the *Transport Division* of the *Mossos d'Esquadra*, which is a criminal investigation unit that covers any offence occurring or initiated on Catalan high-capacity roads.

#### 4.- CONCLUSIONS AND PERSPECTIVES

European institutions will set the legal limits, starting with the future Artificial Intelligence Act, so that AI systems do not go against the interests of the Union.

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<sup>38</sup> PARAGRAPH 4 refers to the rules of national legislation and indicates that "...Member States may decide to provide for the possibility of authorising, either in whole or in part, the use of 'real-time' remote biometric identification systems in publicly accessible areas for law enforcement purposes within the limits and under the conditions set out in paragraphs 1(d), 2 and 3. To this end, they shall lay down in their respective internal rules the required detailed rules applicable to the application for, granting and exercise of the authorisations referred to in paragraph 3, as well as to the supervision of such authorisations. Such rules shall also specify for which of the purposes listed in paragraph 1, section (d), and where appropriate in relation to which of the offences listed in subparagraph (iii) thereof, the competent authorities may be authorised to use such systems for law enforcement purposes" of Article 5 of COM (2021) 206 final.

Specifically, in the road transport industry, AI systems to be incorporated and applied both in cars and on the road network will be considered high risk and will have to be pre-approved.

With well-defined legal boundaries, the evolution of the connected or autonomous vehicle and 5G concepts will create an optimal scenario for instant V2I and V2V data transfer and sharing. This way, the data obtained from the road and the vehicles on it, with their corresponding integration and management, will enable algorithms to help, imitate and/or optimise the related human decisions.

In the dimension of security implications with the adoption of AI systems in the industry, the major beneficiaries will be in the fields of road safety, traffic monitoring and control, resilience of the road transport industry and biometric identification for law enforcement purposes.

However, it is beyond the scope of this article to analyse how the future Artificial Intelligence Act, specifically in the road transport industry, will be understood, case by case, with the GDPR (General Data Protection Regulation), both of which are European in scope.

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