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REPORT

on autonomous driving in European transport
(2018/2089(INI))

Committee on Transport and Tourism

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(*) Associated committees – Rule 54 of the Rules of Procedure

CONTENTS

	Page
MOTION FOR A EUROPEAN PARLIAMENT RESOLUTION	3
EXPLANATORY STATEMENT	16
OPINION OF THE COMMITTEE ON THE INTERNAL MARKET AND CONSUMER PROTECTION	18
OPINION OF THE COMMITTEE ON LEGAL AFFAIRS	23
OPINION OF THE COMMITTEE ON INDUSTRY, RESEARCH AND ENERGY	28
INFORMATION ON ADOPTION IN COMMITTEE RESPONSIBLE	35
FINAL VOTE BY ROLL CALL IN COMMITTEE RESPONSIBLE.....	36

MOTION FOR A EUROPEAN PARLIAMENT RESOLUTION

on autonomous driving in European transport (2018/2089(INI))

The European Parliament,

- having regard to the Commission communication of 17 May 2018 entitled ‘On the road to automated mobility: An EU strategy for mobility of the future’ (COM(2018)0283),
 - having regard to the Commission communication of 30 November 2016 on a European strategy on Cooperative Intelligent Transport Systems, a milestone towards cooperative, connected and automated mobility (COM(2016)0766),
 - having regard to its resolution of 1 June 2017 on internet connectivity for growth, competitiveness and cohesion: European gigabit society and 5G¹,
 - having regard to its resolution of 13 March 2018 on a European strategy on Cooperative Intelligent Transport Systems²,
 - having regard to Rule 52 of its Rules of Procedure,
 - having regard to the report of the Committee on Transport and Tourism and the opinions of the Committee on the Internal Market and Consumer Protection, the Committee on Legal Affairs and the Committee on Industry, Research and Energy (A8-0425/2018),
- A. whereas the EU strategy on connected and automated mobility is closely linked to the Commission’s political priorities, notably those of its agendas for jobs, growth and investment, research and innovation, the environment and climate change, clean and safe mobility and transport, road safety and traffic decongestion, the digital single market and the Energy Union;
- B. whereas the rapid pace of technology development, both in the transport industry and in the robotics and artificial intelligence sector, has a significant impact on the economy and society; whereas autonomous vehicles will significantly change our daily life, determine the future of worldwide road transport, reduce transport costs, improve road safety, increase mobility and reduce environmental impacts; whereas the road transport sector could open the door to new services and modes of transport, thus satisfying the growing demand for individual mobility and goods transport, and could even help revolutionise urban planning;
- C. whereas the Commission aims to halve the number of annual road fatalities in the EU by 2020 compared to 2010, in line with the Vision Zero objectives; whereas progress in reducing the total numbers of fatalities and injuries seems to have stagnated recently, considering that in 2016 more than 25 000 people lost their lives on roads in the EU while a further 135 000 were seriously injured; whereas our cities are facing major mobility problems that are being compounded by pollution and climate change;

¹ OJ C 307, 30.8.2018, p. 144.

² Texts adopted, P8_TA(2018)0063.

- D. whereas advanced driver assistance systems such as lane departure warning and automatic emergency brakes have already proven to contribute to road safety and to reducing the numbers of severe accidents;
- E. whereas the overwhelming majority of road accidents are due to human error and, as such, there is an imperative need to reduce the possibilities for such accidents, by requiring the use of advanced vehicle systems which improve safety while maintaining personal mobility;
- F. whereas the positive trend in road safety that the EU has witnessed over the past decade has slowed; whereas road transport is still responsible for the bulk of transport emissions, in terms of greenhouse gases and air pollutants;
- G. whereas transport needs, for both passengers and freight, are increasing all over the world, in a context of greater awareness of the limits of our planet's resources, and whereas the efficiency of transport will, therefore, become an increasingly crucial issue;
- H. whereas the EU should encourage and further develop digital technologies for automated mobility to offset human error and reduce traffic incidents and road fatalities;
- I. whereas automation and deployment of new technology will increase the safety of transport and transport systems and eliminate some of the human factors involved; whereas in parallel with automation, both the diversity and the condition of transport systems in different Member States should be taken into account; whereas new transport systems need to be built and both new and existing transport systems equipped with adequate safety features before automation can be rolled out;
- J. whereas automation levels exist, levels 1 and 2 already being on the market, but the conditional, high and full automation levels (when a vehicle becomes self-driving) are expected to become available only in 2020-2030, and whereas driver assistance systems are therefore important as an enabling technology on the path towards full automation;
- K. whereas it is necessary to invest both at research stage and at the subsequent development stage in order to improve the available technologies and implement a safe, intelligent transport infrastructure;
- L. whereas several countries around the world (e.g. the US, Australia, Japan, Korea and China) are moving rapidly towards making both connected and automated mobility available on the market; whereas Europe needs to respond much more proactively to the rapid developments in this sector, to encourage initiatives and to promote stringent safety requirements for all traffic participants travelling by sea, waterway, road, air or rail and using mixed-mode transport;
- M. whereas the Commission expects the new market for automated and connected vehicles to grow exponentially, with revenues estimated to exceed EUR 620 billion by 2025 for the EU's automotive industry and EUR 180 billion for its electronics sector;
- N. whereas the Declaration of Amsterdam (2016) outlines cooperation between the Member States, the Commission and industry in the field of connected and automated driving;

- O. whereas autonomous transport covers all forms of remotely piloted, automated and autonomous means of road, rail, air, sea and inland waterway transport;
- P. whereas the Commission communication on the road to automated mobility constitutes an important milestone in the EU strategy for connected and automated mobility;
- Q. whereas emphasis must be placed on autonomous mobility, given that fully autonomous vehicles will bring noticeable road safety benefits and will be able to operate without connected functionalities; whereas ancillary capabilities and services may still require digital communication;
- R. whereas the roll-out of autonomous vehicles, expected already in 2020, will bring considerable benefits, but also entails a variety of new risks, namely regarding road traffic safety, civil liability and insurance, cybersecurity, intellectual property rights, data protection and data access issues, technical infrastructure, standardisation, and employment; whereas it is impossible to predict the full extent of the long-term impact of autonomous mobility on jobs and the environment; whereas it is of crucial importance to ensure that the EU legal framework is suitable to respond appropriately to those challenges and to increase public awareness and acceptance of autonomous vehicles;
- S. whereas the ethical issues surrounding the use of these technologies make it necessary to develop guidelines for the deployment of artificial intelligence, together with systems to ensure that these ethical issues are addressed coherently;

General principles

1. Welcomes the Commission communication on the road to automated mobility, which lays out an approach to make the EU the world leader in the deployment of safe systems for automated mobility, increasing road safety and efficiency, combating congestion, reducing energy consumption and emissions from transport, and gradually phasing out fossil fuels;
2. Recognises the initial steps taken by the Commission and Member States on automated mobility of the future and acknowledges the legislative initiatives regarding the ITS Directive¹ and the proposed revisions of the road infrastructure safety management directive² and the general safety of motor vehicles regulation³;
3. Affirms the important role of cooperative intelligent transport systems (C-ITS) in providing connectivity for Society of Automotive Engineers (SAE) level 2, 3 and possibly 4 automated/autonomous vehicles; encourages the Member States and industry to further implement C-ITS, and calls on the Commission to support the Member States and industry in deploying C-ITS services, notably through the Connecting Europe Facility, the European Structural and Investment Funds and the InvestEU programme;
4. Highlights the innovation potential of all autonomous means of road, rail, waterborne and air transport; underlines the need for European actors to join forces in order to reach and

¹ OJ L 207, 6.8.2010, p. 1.

² COM(2018)0274.

³ COM(2018)0286.

maintain a position as a global leader in autonomous transport; notes that advances in autonomous mobility, particularly in road transport, require the synergistic cooperation of many sectors of the European economy, including vehicle manufacturing and the digital sectors;

5. Acknowledges the significant potential of automated mobility for many sectors, offering new business opportunities for start-ups, small and medium-sized enterprises (SMEs), and the industry and enterprises as a whole, in particular in terms of the creation of new mobility services and employment possibilities;
6. Underlines the need for the development of autonomous vehicles that are accessible for persons with disabilities and reduced mobility (PRMS);
7. Urges the Commission to present a strategy, particularly regarding data, data access and cyber security, as per Parliament's resolution of 13 March 2018 on a European strategy on C-ITS, ensuring a technology-neutral, market-ready approach; recognises the opportunities presented by the Commission's upcoming recommendations on access to in-vehicle data and resources;
8. Affirms the need to explore legislative actions to ensure fair, secure, real-time and technology-neutral access to in-vehicle data for some third party entities; takes the view that such access should enable end users and third parties to benefit from digitalisation and promote a level playing field and security with regard to storage of in-vehicle data;
9. Notes that similar questions in relation to intellectual property rights and corresponding usage rights will arise in respect of artificial intelligence for the purpose of autonomous mobility as in other areas, such as proprietary or usage rights to code, data and inventions created by the artificial intelligence itself; considers, however, that solutions which are as general as possible should be found to these questions;
10. Draws attention to the need, when drafting the new legislative framework on the regulation of autonomous mobility, to ensure that any obstacle to furthering technological progress, research and innovation can be overcome;
11. Points out that the Commission communication on the road to automated mobility lacks analysis of and proposals for autonomous vehicles in all modes of transport; calls on the Commission to ensure mode-specific analyses and strategies, including in the fields of intermodal transport and mobility;
12. Calls on the Commission and the Member States to enlarge their policies on autonomous driving so as also to include collective transport, as well as to expand their vision to cover all modes of transport;
13. Welcomes the work done at the Council High Level Meetings on autonomous driving and would like to see that work extended also to address modes of transport other than road transport;
14. Underlines that technical standards for vehicles and infrastructure (e.g. traffic signs, road markings, signalling systems and C-ITS) should be developed and aligned at international, EU and national level, building on existing work and forums to prevent

duplication, based on the principles of an open, transparent and technology-neutral approach, increasing road safety, and ensuring seamless cross-border interoperability;

15. Notes that reliable in-vehicle and route data are fundamental building blocks for the achievement of both autonomous and connected driving in a single European transport area and for competitive services for end users; urges the Commission, therefore, to ensure that obstacles to the use of such data are dismantled and a robust regulatory system in this respect is put in place before 1 January 2020, ensuring the same data quality and availability across Member States;
16. Notes the urgency of providing legal certainty for both users and stakeholders as regards the conformity of autonomous vehicles with key existing legislation, with particular reference to ePrivacy legislation and the General Data Protection Regulation¹; calls on the Commission to specify which categories of information generated by autonomous vehicles are to be treated as open data and made available in real time, and which are to be treated as confidential;
17. Highlights the importance of ensuring that users have control over and access to both personal and in-vehicle data produced, collected and communicated by autonomous vehicles; stresses that consumers must be offered a maximum level of cyber protection;
18. Stresses the expected massive increase in data produced by and gathered and transmitted from autonomous vehicles, and underlines the need to use these data, in particular non-personal and anonymised data, to facilitate the deployment of autonomous vehicles and to further develop innovations within the framework of new mobility solutions; points out that the protection of privacy and sensitive data generated by autonomous vehicles must be an absolute priority;
19. Underlines that fully autonomous or highly automated vehicles will be commercially available in the coming years and that appropriate regulatory frameworks, ensuring their safe operation and providing for a clear regime governing liability, need to be in place as soon as possible in order to address the resulting changes, including interaction between autonomous vehicles and infrastructure and other users;
20. Notes that the existing liability rules, such as Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products² (the Product Liability Directive) and Directive 2009/103/EC of 16 September 2009 relating to insurance against civil liability in respect of the use of motor vehicles, and the enforcement of the obligation to insure against such liability³ (the Motor Insurance Directive), were not developed to deal with the challenges posed by the use of autonomous vehicles and stresses that there is growing evidence that the current regulatory framework, especially as regards liability, insurance, registration and protection of personal data, will no longer be sufficient or adequate when faced with the new risks emerging from increasing vehicle automation, connectivity and complexity;

¹ OJ L 119, 4.5.2016, p. 1.

² OJ L 210, 7.8.1985, p. 29.

³ OJ L 263, 7.10.2009, p. 11.

21. Takes the view that, in the light of the dynamic technological changes in the sector, there is a need to clarify who should bear the damage in the event of accidents caused by fully autonomous vehicles, and when the level of autonomy is such that the vehicle can operate either fully autonomously or be driven by a driver it must be established beyond a shadow of a doubt who the responsible party is in each specific scenario; stresses that there is a particular need to examine whether the view that a very small proportion of all accidents has so far been attributable to technical factors would justify a shift in liability to the manufacturer which, as a risk factor that is independent of negligence, can be linked simply to the risk posed by bringing an autonomous vehicle onto the market; stresses also that there is a further need to examine whether specific road safety obligations on the part of the vehicle owner and instruction obligations applicable to the driver in each case might adequately compensate for this liability shift; calls, therefore, on the Commission to carry out a thorough assessment, to adapt the current EU legal framework and to introduce, if necessary, new rules on the basis of which responsibility and liability are allocated; calls also on the Commission to assess and monitor the possibility of introducing additional EU instruments to keep pace with developments in artificial intelligence;
22. Maintains that global navigation satellite system (GNSS)-based technologies and the Galileo project have an important part to play in improving the interaction and interoperability of on-board and network digital systems; calls for the remaining satellites to be finalised and launched as soon as possible, so that the European Galileo positioning system can be used as the default positioning system in automated vehicles;
23. Notes that universal access to automated mobility technologies will not be possible without access to high-speed internet and 5G networks; regrets that there are regions where the roll-out of the current generation of 4G networks is still lagging behind expectations, especially in rural areas;

Road transport

24. Recalls the new safety rules contained in the guiding principles for human machine interface proposed in the GEAR 2030 final report;
25. Underlines the need for road safety legislation at United Nations Economic Commission for Europe (UNECE), EU and national level to be primed to support technological innovations and autonomous driving as soon as possible, so as to reduce human error, traffic incidents and road fatalities;
26. Underlines the importance of adopting an ambitious new General Safety Regulation for motor vehicles, given the short-term life-saving potential of the mandated installation of new vehicle safety technologies, which will, furthermore, also be used for the deployment of connected and automated vehicles (CAVs) in the future;
27. Recalls that the development of CAVs has largely been driven by the technology push; stresses the need to study and acknowledge the human and societal aspects of CAV development and ensure that their deployment fully respects societal, human and environmental values and goals;
28. Urges the Commission and the Member States, bearing in mind the importance of mobility in the EU, to reach a common position and to cooperate in order for the EU to

take and maintain a leading role in the international technical harmonisation of automated vehicles within the framework of the UNECE and the Vienna Convention, in particular in all discussions by the UNECE World Forum for Harmonisation of Vehicle Regulations (Working Party 29) and the Working Party on Automated/Autonomous and Connected Vehicles (GRVA);

29. Underlines that market surveillance procedures related to automated vehicles throughout their lifetime should be as standardised, transparent and verifiable as possible, including cross-border testing performed on open roads and in real driving conditions as well as periodic roadworthiness tests;
30. Underlines the need for clear legislation, that is regularly reviewed, updated where necessary, and harmonised, obligating the installation of event data recorders in line with the revised General Safety Regulation in order to improve accident investigations and to clarify and enable the tackling, as soon as possible, of issues of liability; notes that these event data recorders are necessary to determine the responsibilities of the different actors involved in the event of an accident;
31. Highlights the necessity of incorporating safeguard systems right from the transition phase, during which automated vehicles will coexist with vehicles with zero connectivity and zero automation; stresses the importance of driver assistance systems as a step towards fully automated driving, in order even now to prevent road accidents by means of active safety systems or mitigate the seriousness of accidents by means of passive safety systems;
32. Calls on Member States to provide safe, high-quality road infrastructure, which will facilitate the use of automatic and autonomous vehicles;
33. Calls on the Commission and Member States to ensure that all systems that include digitally communicated road traffic information are interoperable;
34. Underlines the emerging concerns over user complacency when using vehicles that require a degree of driver intervention; calls for better clarification of the definition and differentiation of requirements of ‘vehicles with advanced driver-assistance systems’ (SAE levels 1 to 3) compared with ‘automated vehicles’ (SAE levels 4 to 5) in road safety legislation, and for further studies to be conducted on the feasibility and safety of level 3 automated vehicles, especially regarding the issue of signalling the need for intervention to the driver and dangers that can arise from any delays in intervening;
35. Calls on the Commission to lay down clear ethical guidelines for artificial intelligence;
36. Calls on the Commission to develop responsibility criteria and safeguard systems to protect people, in order to provide a coherent approach to the ethical issues surrounding autonomous systems for automated vehicles;
37. Stresses that ethical aspects of self-driving vehicles need to be addressed and resolved by the legislator before these vehicles can be fully accepted and made available in traffic situations; emphasises, therefore, that automated vehicles need to undergo a prior assessment to address these ethical aspects;

38. Highlights the congestion challenges to urban mobility expected to result from a widespread uptake of autonomous vehicles; considers that autonomous vehicles and solutions such as car sharing and ride hailing should contribute to addressing these challenges; calls on authorities to develop policies to ensure that autonomous vehicles improve travel options, including public transport and other solutions, for all citizens;
39. Stresses that platooning has a promising future, as it saves fuel and energy and improves road safety, and therefore calls on Member States, the Commission and the industry to implement the measures set out in the Declaration of Amsterdam; calls on the Commission to propose a regulatory framework to promote vehicle-to-everything (V2X) connectivity for highly and fully automated vehicles (e.g. platooning), especially in long-haul road transport;
40. Argues that both passive and active safety features in autonomous vehicles have an important role in reducing the number of collisions, and injuries and fatalities resulting from collisions, since collisions may still occur, especially during the intermediate mixed-traffic stage; calls on the Commission and Member States to increase road safety;
41. Underlines the risks pertaining to a growing trend of mixed traffic featuring both traditional and autonomous vehicles, thus calling for more on-site tests in order to support future-proof research and development by public and private enterprises and bodies, but also to provide concrete data helping to duly adapt civil liability rules;
42. Underlines that a possible solution to address the existing gaps and shortcomings could be the setting up of a no-fault insurance framework for damage resulting from autonomous vehicles;
43. Stresses that, as stated in its resolution of 16 February 2017 on civil law rules on robotics¹, there should be no limitation of liability regarding the nature and extent of the damage to be compensated in order to guarantee adequate victim protection;

Air transport

44. Highlights the recently adopted EASA Regulation² on the updated aviation safety rules which include, among other things, provisions offering a sound legal basis for the first-ever set of comprehensive EU rules for all kinds of civil drones; recalls how very necessary the adoption of the EASA Regulation was, given that new technologies, such as unmanned aerial vehicles (UAVs), are also appearing in European skies, and that it required the adaptation of the current EU regulatory framework and diverging national rules;
45. Urges the Commission also to present without delay detailed rules for automated aircraft, which require specific and tailor-made specifications, given that a single UAV and operational approach is not appropriate to ensure the safe integration of automated aircraft into airspace shared with manned aircraft; recalls that UAVs will need safe, and where appropriate, certified intelligence systems, as well as a specific air space management environment; stresses that such rules applicable to UAVs should also take into account

¹ OJ C 252, 18.7.2018, p. 239.

² OJ L 212, 22.8.2018, p. 1.

the nature and risk of the operation or activity, the operational characteristics of the unmanned aircraft concerned and the characteristics of the area of operations, such as population density, terrain characteristics, and the existence of buildings and other sensitive infrastructure;

46. Points to the importance of protecting personal data when automated aircraft are used in the aviation sector;
47. Recalls the 2016 Warsaw Declaration on Drones as a lever for jobs and new business opportunities; reiterates the importance of the planned actions to develop the EU drone ecosystem, which are expected to be in place by 2019, and to build on the guiding principles of the Riga Declaration;
48. Points to the importance of coordinated development of technologies and operating concepts that will enable aircraft to be safely integrated for the purposes of air traffic management services in line with the aims of U-Space, a programme run by the SESAR Joint Undertaking (SESAR JU); acknowledges the activities carried out to date by the SESAR JU, which should continue to be supported;
49. Recalls that funding for current research and experimentation programmes concerning UAVs, such as U-Space, will have to be increased in future budgeting periods; notes that these experiments, which have made it possible to test the deployment of a large fleet of UAVs in real-life conditions while ensuring maximum safety in air-traffic management and the attendant security conditions, could serve as an example for experiments on autonomous surface vehicles;
50. Notes that it is necessary to create suitable test areas for autonomous aircraft technologies, including drones, in order to provide safe conditions for simulating new technological solutions before their final implementation;

Sea and inland waterway transport

51. Underlines the potential and added value of autonomous ships, especially on inland waterways and in short-sea shipping, which can lead to a decrease in the number of accidents at sea and on waterways, most of which stem from human error;
52. Underlines the potential of automation to eliminate a portion of human error and to allow personnel on the bridge more time for optical observation, especially in narrow sea lanes and port areas; stresses, however, that information exchange and communication are imperative to safety, especially in close proximity with other ships, and therefore that bridges need to be kept staffed;
53. Welcomes the work of the PIANC working group on smart shipping and the International Network for Autonomous Ships;
54. Calls on the Commission to outline and define the levels of automation for both inland and sea navigation and common standards, including for ports, in order to harmonise and stimulate the uptake of autonomous vessels in interaction with automated and non-automated users and infrastructure;

55. Emphasises the importance of developing and expanding digital hubs and interconnected TEN-T corridors by means of up-to-date terminal facilities and efficient electronic traffic management systems, such as River Information Services and the RhinePorts Information System (RPIS), in order to achieve a fully multimodal autonomous transport system;
56. Calls on the Commission to develop a comprehensive strategy with the aim of stimulating further automation in inland shipping, its infrastructure, fairways and traffic management and the development of automated ports, taking into account the position of inland ports as multimodal hubs when preparing the Digital Inland Waterway Area (DINA);
57. Calls for more support for and promotion of cross-border test areas, as well as for more projects like NOVIMAR and Maritime Unmanned Navigation through Intelligence in Networks (MUNIN), co-funded by the EU under its Seventh Framework Programme and Horizon 2020 to further develop autonomous shipping and automated infrastructure technology in the EU;
58. Stresses that the standards applicable to vessels must be developed with, and aligned with those of, the International Maritime Organisation in order to establish an international legal framework for the safe operation of ships;

Rail transport

59. Calls on the Commission, in consultation and coordination with the industry and other stakeholders, to create common protocols and standards enabling autonomous train and light-rail systems;
60. Calls for improvements to the framework conditions for autonomous vehicles in rail transport and for the transition to a digital rail sector to be accelerated; notes that the European Train Control System (ETCS) serves as the basis for automation in the rail sector, which is achieved by linking the ETCS to automatic train operation (ATO); urges the Commission to accelerate and prioritise the deployment of the ETCS in existing and future EU funding schemes;
61. Emphasises the importance of digital interlockings as an important new milestone to foster the digitalisation of railway infrastructure, and calls on the Commission and Member States to support this deployment;
62. Calls on the Commission to continue the Shift2Rail programme with a view to providing for further developments towards a digital rail network and fully automated train operation, including the development of a standard for ATO over ETCS and of cybersecurity;
63. Underlines the growing challenges to urban mobility related to congestion, as well as the opportunities afforded by rail-based automated public transport systems to tackle those challenges; calls on the Commission and the Member States to promote and support projects addressing those challenges through rail-based automated public transport innovations;

Consumer rights and competitive conditions

64. Calls on the Commission to create comprehensive rules setting out the responsibilities and rights of manufacturers, drivers and operators at every level of automation across all modes of transport; underlines that those responsibilities need to be communicated to drivers or operators in a clear, self-explanatory manner through commercial labelling or other forms of communication; considers it essential to ensure the safety of vehicles and their regular maintenance throughout their life cycle and points out the enabling role of fair market access to in-vehicle data and resources for relevant stakeholders in this regard;
65. Calls on the Commission to ensure that all systems in autonomous vehicles are designed in such a way as to enable vehicle owners or users to choose freely between competing service providers, without having to rely solely on the services offered by the vehicle manufacturer;
66. Stresses the need to guarantee fair market access for independent automotive service providers in the area of the servicing and repair of autonomous vehicles; recalls that entities of this kind, in particular, parts manufacturers, small workshops and service centres, are an important competitive element in the automotive market and have a positive impact on the availability and prices of these services;
67. Notes that in a digitised automotive services market, direct and timely access to data and functions in the vehicle will determine whether the market for automated and combined mobility services will be subject to fair competition; recalls that independent operators play a very important role throughout the automotive supply chain;
68. Predicts that competition on the single market in the autonomous vehicle servicing industry could be put at risk if manufacturers make it difficult for independent repairers to access the systems installed in these vehicles; stresses that this market segment should be subject to the provisions of Commission Regulation 461/2010¹;
69. Stresses that consumers should be informed in advance about the vehicles they purchase and the repair services they can access;
70. Takes the view that the switch to automated vehicles, besides its positive impact on road safety, fuel consumption, the environment and the creation of new employment in the telecommunication and automotive sectors, might also lead to job losses in the transport sector and have negative consequences on the insurance sector, which must be tackled as soon as possible to ensure a smooth transition;

Research and educational needs

71. Stresses the need to develop key autonomous technologies (e.g. formalisation and simulations of the human brain and cognition when driving, environmental perception systems and artificial intelligence) in the EU to keep up with global competition and create new jobs;
72. Emphasises the fact that once available on the market, automated vehicles will have a deep impact on the distribution and consumption of goods; considers, therefore, that there is an urgent need to assess this impact and ensure measures to support the affected sectors

¹ OJ L 129, 28.5.2010, p. 52.

and people;

73. Calls for initiatives to map and address issues of changes in employment supply and demand in view of the need for new and specialised skills both in vehicle production and professional use through educational reconversion (for instance, courses and training sessions), with a view to facilitating the transition towards new forms of mobility;
74. Urges the Commission, together with the Member States, to propose initiatives promoting the skills, education and training needed to keep the EU at the forefront of the autonomous transport sector; emphasises that it is important for Member States to take into account these newly arising trends in their educational programmes in order to respond to the need for a highly qualified and skilled workforce in the different transport sectors;
75. Recalls the EUR 300 million dedicated under Horizon 2020 to research and innovation programmes on automated vehicles from 2014 to 2020 and recommends that these programmes be continued and extended for all modes of transport in the next multiannual financial period for 2021-2027 (Horizon Europe);
76. Stresses the important role of collaborative research in ensuring the swift advancement of transport automation through the involvement of the entire innovation ecosystem;
77. Calls on the Commission to establish a Joint Undertaking along the same lines as Shift2Rail for rail transport and CleanSky for the aeronautics industry, so as to create an industry-driven strategic initiative on autonomous transport, which should be compelling for EU citizens, make significant commercial sense, leverage the EU's research and innovation potential on the basis of the wide collaboration of the industrial, public and academic spheres, and foster the development and deployment of technologies in a harmonised and interoperable manner, in order to create a globally scalable multi-modal transport system for autonomous transport;
78. Stresses the need for real-life testing sites across the EU in order to thoroughly test and develop new technologies; urges each of the Member States to designate, by 2020, urban and extra-urban areas where autonomous research vehicles can be tested in real-life traffic conditions, while safeguarding road safety in those areas, and to ensure that EU cross-border and interoperable testing frameworks are created;
79. Points out that some EU citizens have expressed distrust of automated mobility; stresses, therefore, that legislators must address the ethical dimension in order to improve public acceptance in this respect; calls for investment in extensive research on artificial intelligence and on other dimensions of automated mobility;
80. Calls for extensive research on the long-term effects of autonomous transport on issues such as consumer adaptation, societal acceptance, physiological reactions, physical responses and social mobility, reducing accidents and improving transport in general;
81. Urges all stakeholders, including vehicle manufacturers, component suppliers and software and design services, as well as the Member States and authorities involved, to cooperate in fostering innovation, in ensuring investment in infrastructure fit for automated mobility, both on highways and on city roads, and in facilitating cross-border testing; highlights the need to increase investment in adjusting current infrastructure,

building new infrastructure and improving the connectedness of European roads; points out that a distrust of European citizens towards automated driving can be observed and that awareness campaigns to increase their confidence should be put in place; calls for investment in extensive research on artificial intelligence and on the ethical dimension of autonomous and connected transport;

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82. Instructs its President to forward this resolution to the Council and the Commission.

EXPLANATORY STATEMENT

Background

Our mobility system is undergoing profound changes to become more digital, safer and cleaner. Further automation of vehicles in all transport modes, and namely regarding connected and automated road vehicles, together with advances in information and communication technologies provide rich opportunities to improve traffic flows, increase safety for all users and reduce the environmental impacts of transport. At the same time, they hold a strong potential to strengthen the competitiveness of European industry and businesses in and beyond the transport sector. Once available on a large scale and every-day basis, automated mobility is expected to result in significant benefits to our society as regards innovative mobility services in cities and rural areas, more flexible public transport and better tailored choices for all citizens.

While technological progress is rapid and vigorously pursued internationally, there remain significant issues related to the development and integration of automated vehicles and related mobility services concerning technical standards of vehicles and infrastructure, the use, safety and privacy of data, responsibilities in vehicle operations, liability, ethics, societal acceptance and the co-existence of automated with human controlled vehicles.

Regarding connected and automated road transport, initiatives by Member States, industry and the Commission already tackle important elements of an integrated policy in the field, including both vehicle related aspects (namely the GEAR 2030 report) as well as transport and communication infrastructure (namely the European strategy on C-ITS). Following the Declaration of Amsterdam of 2016 on cooperation in the field of connected and automated driving, work is further ongoing within the Council High Level Meetings on autonomous driving. The European Parliament in March 2018 in its resolution on the C-ITS strategy recommended, inter alia, strengthening the EU legislative framework to ensure EU-wide cross-border interoperability and liability rules for connected transport, to provide rules for access to in-vehicle data.

With its Communication on an EU strategy for the mobility of the future, to which this report relates, the Commission sets out a European agenda, including a common vision and identifying supporting actions for the development and deployment of key technologies, services and infrastructure related essentially to autonomous driving on roads. The envisaged shorter-term initiatives include contributions of automated mobility to the Vision Zero by 2050 project to reduce road fatalities, support of infrastructure deployment through the Connecting Europe Facility, 5G testing and legislative proposals with a view to the safe implementation of automated mobility. In particular, the proposed revisions of the Road Infrastructure Safety Directive and of the General Safety Regulation for motor vehicles aim to integrate specific safety considerations related to automated driving in the EU legislation.

Your Rapporteur's views

The connected and automated car is currently spearheading developments of automated mobility. Passenger cars with automated driving functions beyond the current level 3 are bound to enter European road transport very soon from 2020 on and technologies will further advance and extend to all types of road transport, including utility vehicles and trucks. It is therefore imperative to continue and intensify at all levels the related efforts: regarding the regulatory framework, research and innovation, real-life testing and deployment of vehicles and road and

communication infrastructure. It is key for Europe to stay at the forefront of this field, in order to reap the benefits of automated road transport and to successfully compete with the enormous thrust of efforts elsewhere in the US, China or Japan. Your Rapporteur proposes in particular to address in a prompt manner outstanding issues in data protection, vehicle and route data use, and cyber security. Moreover, standardisation efforts at international level, namely in the framework of the UNECE and Vienna Convention, need to be further coordinated and help to ensure seamless interoperability of vehicles across borders. Building on growing experience with level-3 automated cars, research efforts should address new phenomena such as driver complacency. With artificial intelligence systems playing an ever increasing role it is also becoming urgent to develop guidelines on ethical issues of such systems in autonomous vehicles.

In addition to road transport, the potential of automated vehicles is becoming increasingly apparent in the logistics sector, in public transport and also other modes of transport, that is, autonomous vessels in inland waterway transport and short-sea shipping, drones transporting goods (and even air taxis), and automated light rail systems such as in urban public transport. Those fields were unfortunately left untouched by the Commission in its communication.

Regarding air transport, your Rapporteur considers that detailed rules for automated aircraft and their safe integration into airspace need to be presented without delay, building on e.g. the U-Space blueprint of June 2017 and the new EASA Regulation.

Regarding waterborne transport, where autonomous ship can reduce accidents stemming from human error, the Commission should be proactive in stimulating the adoption of autonomous ships and develop a common approach to automation of inland sea navigation along with relevant technical standards.

Regarding rail transport, your Rapporteur underlines the potential of innovative automated public transport systems to tackle urban mobility and congestion challenges and calls for measures to promote and support projects addressing those issues.

With future mobility moving towards automation, it is essential to develop key autonomous technologies and science, through initiatives promoting research, education and training in the field which should be supported for instance under the Horizon Europe programme. In addition, your Rapporteurs considers that the potential long-term effects of autonomous/driverless transport in terms of its societal implications merit more research efforts.

Your Rapporteur is also convinced that any policy approach of the EU on autonomous mobility needs to include initiatives to address the likely changes in employment patterns and demand for new skills in vehicle manufacturing and usage.

15.10.2018

OPINION OF THE COMMITTEE ON THE INTERNAL MARKET AND CONSUMER PROTECTION

for the Committee on Transport and Tourism

on autonomous driving in European transport
(2018/2089(INI))

Rapporteur for opinion (*): Arndt Kohn

(*) Associated committee – Rule 54 of the Rules of Procedure

SUGGESTIONS

The Committee on the Internal Market and Consumer Protection calls on the Committee on Transport and Tourism, as the committee responsible, to incorporate the following suggestions into its motion for a resolution:

1. Welcomes the Commission communication of 17 May 2018 entitled ‘On the road to automated mobility: an EU strategy for mobility of the future’ (COM(2018)0283); acknowledges its potential and importance for all autonomous private and public means of road, rail, waterborne and air transport, as well as the spill-over effects that this policy has on many sectors and on the new business models enabled by automated driverless mobility, which will bring benefits for companies and consumers with a view to making Europe a leader in vehicle technologies; draws attention also to its implications for users, including persons with special needs or disabilities and the visually impaired;
2. Stresses that a shared European strategy and a clear, simple and innovative regulatory framework is crucial in order to place Europe at the forefront of the market in driverless vehicles, to maintain competitiveness in the private sector and to foster job creation and innovation; acknowledges that technologies currently available on the market present vulnerabilities for users which need to be addressed and urges the automobile industry to take responsibility for the safety and security of drivers and passengers;
3. Points out that while the deployment of connected and automated mobility can contribute to road safety, help to combat traffic congestion and reduce road fatalities to a minimum in Europe by 2050, as well as favour social inclusion and overall transport

efficiency and productivity, societal acceptance will be achieved only if autonomous vehicles can offer the highest safety and security standards;

4. Stresses that ethical aspects of self-driving vehicles need to be addressed and resolved by the legislator before these vehicles can be fully accepted and made available in traffic situations; emphasises therefore that automated vehicles need to undergo a prior assessment to address these ethical aspects;
5. Calls on the Commission to publish a legislative proposal on access to in-vehicle data and resources by the end of 2018; emphasises that clear information about the automated features of a vehicle must be made available to potential consumers before they acquire a vehicle, including changes to these features that may take place during the vehicle's lifetime; underlines that a level playing field and fair, non-discriminatory, direct, real-time and technology-neutral access to in-vehicle data and resources for different market players offering repair and maintenance is essential to ensure equitable and undistorted competition, especially for independent SMEs, while promoting innovation and ensuring rights and service quality for consumers; underlines that both consumers and third parties need to have proper rights and redress mechanisms;
6. Acknowledges that data recorders and access to the recorder are an essential tool to clarify the actual cause of events leading to damage or incident, and that autonomous vehicles are technologically complex and differ substantially from current motor vehicles on the road; welcomes the Commission's proposal in its communication of 17 May 2018 to regulate data recorders for automated vehicles as part of the revision of the General Safety Regulation and Motor Vehicle Directive, to further address the issue of liability for automated vehicles in case of accident; stresses that comprehensive and clear legislation providing for a legal framework on liability and on insurance for autonomous driving is crucial in order to safeguard consumer rights and to prevent situations in which presently unknown risks may potentially be borne by injured parties;
7. Highlights the importance of users having control of and access to both their personal data and in-vehicle generated data produced and collected by connected and automated vehicles; points out that future in-vehicle systems should be designed in a manner that ensures free choice for consumers and allows users to select from competing service providers which one shall be authorised to have access to and use of their vehicle data for a given service, while respecting data protection and intellectual property legislation; emphasises the importance of the transmission and storage of data between vehicles, and between vehicles and connected infrastructure, being protected by a minimum set of security measures that include encryption, software updates and strong authentication mechanisms, while respecting data protection and intellectual property legislation and the principle of privacy, providing the highest levels of security by design and by default; stresses that consumers must be offered the maximum level of protection against hacking and cyber-attacks;
8. Affirms that technical standards adapted by different brands must be aligned with global guidelines, be drafted using a technology-neutral approach and ensure interoperability; stresses that the forthcoming UNECE regulations on cybersecurity and on over-the-air software updates are to become a benchmark for future European legislation, and that the European Union should lead on further developing international standards in order

to ensure data security, privacy and liability provisions prior to the moment when autonomous vehicles are used globally;

9. Urges all stakeholders, including vehicle manufacturers, component suppliers and software and design services, as well as the Member States and authorities involved, to cooperate in fostering innovation, in ensuring investment in infrastructure fit for automated mobility, both on highways and on city roads, and in facilitating cross-border testing; highlights the need to increase investment in adjusting current infrastructure, building new infrastructure and improving the connectedness of European roads; points out that a distrust of European citizens towards automated driving can be observed and that awareness campaigns to increase their confidence should be put in place; calls for investment in extensive research on artificial intelligence and on the ethical dimension of autonomous and connected transport.

INFORMATION ON ADOPTION IN COMMITTEE ASKED FOR OPINION

Date adopted	11.10.2018
Result of final vote	+: 33 -: 1 0: 2
Members present for the final vote	John Stuart Agnew, Pascal Arimont, Carlos Coelho, Anna Maria Corazza Bildt, Daniel Dalton, Pascal Durand, Evelyne Gebhardt, Maria Grapini, Robert Jarosław Iwaszkiewicz, Liisa Jaakonsaari, Philippe Juvin, Antonio López-Istúriz White, Morten Løkkegaard, Eva Maydell, Marlene Mizzi, Christel Schaldemose, Andreas Schwab, Olga Sehnalová, Jasenko Selimovic, Richard Sulík, Róza Gräfin von Thun und Hohenstein, Mylène Troszczynski, Marco Zullo
Substitutes present for the final vote	Lucy Anderson, Biljana Borzan, Edward Czesak, Igor Gräzin, Arndt Kohn, Julia Reda, Martin Schirdewan, Lambert van Nistelrooij, Sabine Verheyen
Substitutes under Rule 200(2) present for the final vote	Ramón Jáuregui Atondo, Stanislav Polčák, Flavio Zanonato, Tomáš Zdechovský

FINAL VOTE BY ROLL CALL IN COMMITTEE ASKED FOR OPINION

33	+
ALDE	Morten Løkkegaard, Jasenko Selimovic
ECR	Edward Czesak, Daniel Dalton, Richard Sulík
EFDD	Robert Jarosław Iwaszkiewicz, Marco Zullo
ENF	Mylène Troszczynski
PPE	Pascal Arimont, Carlos Coelho, Anna Maria Corazza Bildt, Philippe Juvin, Antonio López-Istúriz White, Eva Maydell, Stanislav Polčák, Andreas Schwab, Róza Gräfin von Thun und Hohenstein, Sabine Verheyen, Tomáš Zdechovský, Lambert van Nistelrooij
S&D	Lucy Anderson, Biljana Borzan, Evelyne Gebhardt, Maria Grapini, Liisa Jaakonsaari, Ramón Jáuregui Atondo, Arndt Kohn, Marlene Mizzi, Christel Schaldemose, Olga Sehnalová, Flavio Zanonato
Verts/ALE	Pascal Durand, Julia Reda

1	-
EFDD	John Stuart Agnew

2	0
ALDE	Igor Gräzin
GUE/NGL	Martin Schirdewan

Key to symbols:

+ : in favour

- : against

0 : abstention

16.10.2018

OPINION OF THE COMMITTEE ON LEGAL AFFAIRS

for the Committee on Transport and Tourism

on autonomous driving in European transport
(2018/2089(INI))

Rapporteur (*): Emil Radev

(*): Associated committee – Rule 54 of the Rules of Procedure

SUGGESTIONS

The Committee on Legal Affairs calls on the Committee on Transport and Tourism, as the committee responsible, to incorporate the following suggestions into its motion for a resolution:

- A. whereas the rapid pace of technology development, both in the transport industry and in the robotics and artificial intelligence sector, has a significant impact on the economy and society; whereas autonomous vehicles will significantly change our daily life, determine the future of worldwide road transport, reduce transport costs, improve road safety, increase mobility and reduce environmental impacts; whereas the road transport sector could open the door to new services and modes of transport, thus satisfying the growing demand for individual mobility and goods transport, and could even help revolutionise urban planning;
- B. whereas the roll-out of autonomous vehicles, expected already in 2020, will bring considerable benefits, but also entails a variety of new risks, namely regarding road traffic safety, civil liability and insurance, cybersecurity, intellectual property rights, data protection and data access issues, technical infrastructure, standardisation, and employment; whereas it is impossible to predict the full extent of the long-term impact of autonomous mobility on jobs and the environment; whereas it is of crucial importance to ensure that the EU legal framework is suitable to respond appropriately to

those challenges and to increase public awareness and acceptance of autonomous vehicles;

1. Notes that the existing liability rules, such as Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products (the Product Liability Directive) and Directive 2009/103/EC of the European Parliament and of the Council of 16 September 2009 relating to insurance against civil liability in respect of the use of motor vehicles, and the enforcement of the obligation to insure against such liability (the Motor Insurance Directive), were not developed to deal with the challenges posed by the use of autonomous vehicles and stresses that there is growing evidence that the current regulatory framework, especially as regards liability, insurance, registration and protection of personal data, will no longer be sufficient or adequate when faced with the new risks emerging from increasing vehicle automation, connectivity and complexity;
2. Takes the view that, in the light of the dynamic technological changes in the sector, there is a need to clarify who should bear the damage in the event of accidents caused by fully autonomous vehicles, and when the level of autonomy is such that the vehicle can operate either fully autonomously or be driven by a driver it must be established beyond a shadow of a doubt who the responsible party is in each specific scenario; stresses that there is a particular need to examine whether the view that a very small proportion of all accidents has so far been attributable to technical factors would justify a shift in liability to the manufacturer which, as a risk factor that is independent of negligence, can be linked simply to the risk posed by bringing an autonomous vehicle onto the market; stresses also that there is a further need to examine whether specific road safety obligations on the part of the vehicle owner and instruction obligations applicable to the driver in each case might adequately compensate for this liability shift; calls therefore on the Commission to carry out a thorough assessment, to adapt the current EU legal framework and to introduce, if necessary, new rules on the basis of which responsibility and liability are allocated; calls also on the Commission to assess and monitor the possibility of introducing additional EU instruments to keep pace with developments in artificial intelligence;
3. Underlines the risks pertaining to a growing trend of mixed traffic featuring both traditional and autonomous vehicles, thus calling for more on-site tests in order to support future-proof research and development by public and private enterprises and bodies, but also to provide concrete data helping to duly adapt civil liability rules;
4. Underlines that a possible solution to address the existing gaps and shortcomings could be the setting up of a no-fault insurance framework for damage resulting from autonomous vehicles;
5. Stresses that, as stated in its resolution of 16 February 2017 on civil law rules on robotics¹, there should be no limitation of liability regarding the nature and extent of the damage to be compensated in order to guarantee adequate victim protection;
6. Considers that an EU-level approach will incentivise the cross-border development of autonomous transport systems, promote the competitiveness of the European Union's

¹ OJ C 252, 18.7.2018, p. 239.

automotive industry, ensure a high level of consumer protection and avoid fragmentation in the internal market;

7. Stresses the need to guarantee fair market access for independent automotive service providers in the area of the servicing and repair of autonomous vehicles; recalls that entities of this kind, including in particular part manufacturers and small workshops and service centres, are an important competitive element in the automotive market and have a positive impact on the availability and prices of these services;
8. Underlines the need to consider amendments to international agreements such as the Vienna Convention on Road Traffic, the Vienna Convention on Road Traffic and the Vienna Convention on Road Signs and Signals, aimed at facilitating the deployment of fully autonomous vehicles;
9. Welcomes the Commission proposals to regulate the protection of vehicles against cyber-attacks and to equip autonomous vehicles with data recorders as part of the review of the General Safety Regulation for motor vehicles with a view to helping to determine the cause of accidents and clarifying who is deemed to be liable in the event of an accident; stresses that autonomous mobility presents important challenges in connection with the protection of personal data and privacy, namely as a result of the need for geolocation and monitoring of the movements of these vehicles, and calls on the Commission to further clarify rules on the protection and sharing of the data collected by those vehicles, including data that indirectly identifies persons, and access to such data, while fully respecting the requirements of Regulation (EU) 2016/679 of the European Parliament and of the Council; notes that there is a need to examine whether and how to guarantee that users can monitor and control access to their data in accordance with the GDPR, but also for the purpose of their right to defend themselves when their liability is in question, and to consider introducing blockchain technology to this end; calls on the Commission also to enable interoperability between systems and data portability in order to prevent lock-in effects and promote fair competition and innovation, thereby enabling users to choose from among various service providers and ensuring that smaller vehicle service providers do not lose their livelihoods;
10. Notes that similar questions in relation to intellectual property rights and corresponding usage rights will arise in respect of artificial intelligence for the purpose of autonomous mobility as in other areas, such as proprietary or usage rights to code, data and inventions created by the artificial intelligence itself; considers, however, that solutions which are as general as possible should be found to these questions.
11. Draws attention to the need, when drafting the new legislative framework on the regulation of autonomous mobility, to ensure that any obstacle to furthering technological progress, research and innovation can be overcome.

INFORMATION ON ADOPTION IN COMMITTEE ASKED FOR OPINION

Date adopted	10.10.2018
Result of final vote	+: 22 -: 0 0: 0
Members present for the final vote	Max Andersson, Joëlle Bergeron, Jean-Marie Cavada, Kostas Chrysogonos, Mady Delvaux, Rosa Estaràs Ferragut, Enrico Gasbarra, Lidia Joanna Geringer de Oedenberg, Sajjad Karim, Sylvia-Yvonne Kaufmann, Gilles Lebreton, António Marinho e Pinto, József Szájer, Axel Voss, Francis Zammit Dimech, Tadeusz Zwiefka
Substitutes present for the final vote	Geoffroy Didier, Pascal Durand, Angel Dzhambazki, Angelika Niebler, Virginie Rozière, Tiemo Wölken

FINAL VOTE BY ROLL CALL IN COMMITTEE ASKED FOR OPINION

22	+
ALDE	Jean-Marie Cavada, António Marinho e Pinto
ECR	Angel Dzhabazki, Sajjad Karim
EFDD	Joëlle Bergeron
ENF	Gilles Lebreton
GUE/NGL	Kostas Chrysogonos
PPE	Geoffroy Didier, Rosa Estaràs Ferragut, Angelika Niebler, József Szájer, Axel Voss, Francis Zammit Dimech, Tadeusz Zwiefka
S&D	Mady Delvaux, Enrico Gasbarra, Lidia Joanna Geringer de Oedenberg, Sylvia-Yvonne Kaufmann, Virginie Rozière, Tiemo Wölken
VERTS/ALE	Max Andersson, Pascal Durand

0	-

0	0

Key to symbols:

+ : in favour

- : against

0 : abstention

7.11.2018

OPINION OF THE COMMITTEE ON INDUSTRY, RESEARCH AND ENERGY

for the Committee on Transport and Tourism

on autonomous driving in European transport
(2018/2089(INI))

Rapporteur: Hans-Olaf Henkel

SUGGESTIONS

The Committee on Industry, Research and Energy calls on the Committee on Transport and Tourism, as the committee responsible, to incorporate the following suggestions into its motion for a resolution:

- A. whereas the Commission aims to halve the number of annual road fatalities in the EU by 2020 compared to 2010, in line with the Vision Zero objectives; whereas progress in reducing the total numbers of fatalities and injuries seems to have stagnated recently, considering that in 2016 more than 25 000 people lost their lives on roads in the EU while a further 135 000 were seriously injured; whereas our cities are facing major mobility problems that are being compounded by pollution and climate change;
- B. whereas advanced driver assistance systems such as lane departure warning and automatic emergency brakes have already proven to contribute to road safety and to reducing the numbers of severe accidents;
- C. whereas the safe development of autonomous driving is crucial for accepting this technology in our society; whereas human error is estimated to play a decisive role in the majority of road accidents, and hence automated and autonomous vehicles are expected to improve road safety substantially; whereas our cities are facing major mobility problems that are being compounded by pollution and climate change; whereas autonomous vehicles could bring mobility to those who are unable to drive, stimulate the use of public transport and car-sharing schemes, and optimise the use of infrastructure by relieving traffic congestion, since autonomous vehicles will need less proximate urban parking, while also increasing fuel efficiency and facilitating alternative energy sources, thereby contributing to meeting the 2030 climate and energy targets and the EU's commitments under the Paris Agreement; whereas automated mobility could contribute to realising the EU's ambitions by making its industry more powerful and competitive, creating jobs and stimulating economic growth;

- D. whereas transport was listed by the Commission in its communication of 23 November 2017 on strengthening Europe's energy networks¹ as being among those sectors in which electricity will be crucial for decarbonisation; whereas, therefore, electric mobility based on renewable energy sources is to be fostered while phasing out fossil fuels, with a view to speeding the transition to a net-zero GHG economy by 2050 at the latest;
- E. whereas the ethical issues surrounding the use of these technologies make it necessary to develop guidelines for the deployment of artificial intelligence, together with systems to ensure that these ethical issues are addressed coherently;
- F. whereas the Commission expects the new market for automated and connected vehicles to grow exponentially, with revenues estimated to exceed EUR 620 billion by 2025 for the EU's automotive industry and EUR 180 billion for its electronics sector;
- G. whereas other countries such as the US, the UAE, China and Japan are progressing quickly in the development of autonomous driving and are already adopting strategies for automated vehicles and attracting investment in this field; whereas the economic impact of automated mobility in the EU will be strongly dependent on the ability of European industry to keep pace with international competitors; whereas Europe accounts for 23 % of global motor vehicle production, but needs to invest more in the development and application of safe connected and automated mobility systems; whereas automated mobility offers economic potential for many sectors, including start-ups, SMEs and industry, and the EU's vision must be to become a world leader for fully autonomous safe mobility;
1. Stresses that autonomous driving will represent a major paradigm shift that will significantly alter current models of mobility and ownership of vehicles; considers that if well framed, autonomous driving can represent a major improvement in vehicle-use efficiency, as well as contributing significantly to reducing congestion and, consequently, also reducing CO₂ emissions and other pollutants, for instance by means of solutions like platooning;
 2. Considers that non-existent, incomplete or different national legislative approaches still form a major obstacle on the path to the market introduction of automated and especially autonomous vehicles; considers that regulatory changes will have to follow, so as to ensure consistency between national traffic regulations, avoid conflicts over vehicle regulations at EU level, and build a future-proof framework enabling cross-border automation; calls on the Member States to offer sufficient flexibility to accommodate innovation and necessary testing;
 3. Calls on the Commission, in view of the global nature of the automotive industry, to urgently accelerate negotiations at UN level and to present future regulatory changes in line with UN Economic Commission for Europe (UNECE) outcomes and within the current legal framework of the 1968 Vienna Convention; calls on the Commission to devote particular focus to common standards on vehicle safety, type approval, fair and equal access to in-vehicle generated data, and cybersecurity;

¹ COM(2017)0718

4. Stresses that in order to contribute to the fulfilment of our transport policy goals, autonomous driving should be implemented in a way that significantly contributes to a sustainable transport system that takes into account factors including the environment, climate, road safety, noise and good accessibility for all;
5. Emphasises the fact that once available on the market, automated vehicles will have a deep impact on the distribution and consumption of goods; considers, therefore, that there is an urgent need to assess this impact and ensure measures to support the affected sectors and people;
6. Notes that some autonomous vehicles have caused a limited number of serious or fatal accidents; believes it is therefore essential that such vehicles are always fitted with a central human override function; calls on the Commission to take the current infrastructure and age of the vehicle fleet in the Member States into consideration, and to address the coexistence of connected, automated and autonomous vehicles with non-connected vehicles, drivers, cyclists, motorcyclists, pedestrians and any other road users;
7. Considers the current procedure of EU exemptions granted on the basis of a national ad hoc safety assessment to be insufficient, because it constitutes an excessive investment risk and jeopardises the introduction of vehicle automation technologies; calls on the Commission to initiate work on EU type approval legislation for automated and autonomous vehicles in line with UNECE outcomes, with particular reference to Working Party 29; underlines that market surveillance procedures related to automated vehicles throughout their lifetime should be as standardised, transparent and verifiable as possible, including cross-border testing performed on open roads and in real driving conditions as well as periodic roadworthiness tests;
8. Declares that cybersecurity must be guaranteed and that all data transfers between the in-vehicle system, the manufacturer's central server, other vehicles and road infrastructure must be protected from unauthorised disclosure and manipulation; recalls that in its resolution of 13 March 2018 on a European strategy on Cooperative Intelligence Transport Systems¹, Parliament urged the Commission to submit a legislative proposal on access to in-vehicle data and resources by the end of the year; calls on the Commission to propose a common policy on security based on backend server systems and cybersecurity standards harmonised at European level, taking UNECE norms into account; calls in this regard for clear rules ensuring a level playing field on access to in-vehicle data, offering protection with regard to problems of cybersecurity and protection of personal data as well as promoting innovation and fair competition;
9. Highlights the importance of also having a climate perspective in research and technological development in this industry, with a special focus on increasing renewable energy use in the sector.
10. Underlines that the liability of manufacturers and operators of automated and autonomous vehicles needs to be clearly regulated, and that both users and third parties need to have proper rights and redress mechanisms; welcomes the initiative of the

¹ Texts adopted, P8_TA(2018)0063.

Commission to regulate data recorders for automated vehicles, and calls on the Commission to present a broader liability framework for damage caused by accidents in which autonomous and automated motor vehicles are involved;

11. Calls on the Commission and the Member States to ensure and facilitate the necessary investments needed, in particular for SMEs, to develop the relevant technologies, to create the necessary infrastructure support, and to foster greater public acceptance for automated mobility; stresses that road infrastructure will play a key role in supporting automated vehicles; calls on the Member States to invest in unambiguous road signs, road markings, street furniture, safety measures and communication enablers, as well as to revise national traffic rules systems and reporting in order to support converging approaches across the EU;
12. Calls on the Commission, the Council and the Member States to ensure an efficient use of the European GALILEO satellite technology and connectivity technologies and to finalise digital high-speed network coverage, thus providing better guarantees of interoperability between services and greater systems security, as gaps in digital coverage, especially in border regions, make the cross-border operation of automated and connected vehicles impossible;
13. Calls on the Commission and the Member States to make present and future drivers more aware of the development of driver assistance applications through information campaigns and driver training complementing standard driving lessons with specific instruction in the functionality and limitations of the new technologies, including informed consent rules regarding in-vehicle systems, data sharing and eco-driving guidelines, and also encouraging the use of electric vehicles with renewable energy charging systems;
14. Calls on all relevant actors, Member States and authorities to show collaborative leadership and coordinate and cooperate in order to promote innovation, safeguard investments in automated mobility infrastructure and facilitate cross-border testing; urges Member States and regions to use the opportunities offered by EU regional policy and the European Structural and Investment Funds to cofinance investment in research, innovation and the implementation of autonomous driving in European transport; welcomes the financial support from the EU's Horizon 2020 framework programme for research and innovation allocated to automated vehicles, and highlights the need for research on artificial intelligence with the aim of making future autonomous systems smoother and more efficient; asks the Commission to further expand research and innovation programmes for automated vehicles, within the Multiannual Financial Framework 2021-2027 and Horizon Europe 2021-2027 and in line with the Open Science principle;
15. Calls on the Member States to set up national observatories to monitor automated mobility and related developments, encourage debate among stakeholders, help formulate national strategies that are in line with Union strategy, promote international debate, and raise awareness of both the opportunities and the hazards of automated driving systems; also calls on the Member States to collect and analyse data through appropriate platforms for the ongoing and effective monitoring of accidents involving automated or semi-automated vehicles;

16. Stresses that the deployment of connected and automated mobility technologies in commercial road traffic has structural effects on the labour market, in particular in the transport sector; calls on the Commission and the Member States to actively facilitate a dialogue with and between stakeholders, including the social partners, on how to manage and mitigate this structural change; believes it is essential to ensure a just transition for potential workers whose jobs may be transformed or disappear due to automation, offering them every opportunity, e.g. through upskilling and retraining initiatives, to acquire the skills and knowledge they need to master new technology, as well as to support them during labour market transitions;
17. Acknowledges that autonomous transport covers all forms of piloted, automated and autonomous means of road, rail, air, sea and inland waterway transport; calls on the Commission and the Member States to enlarge their policies on autonomous driving so as also to include collective transport, as well as to expand their vision to cover all modes of transport.

INFORMATION ON ADOPTION IN COMMITTEE ASKED FOR OPINION

Date adopted	5.11.2018
Result of final vote	+: 46 -: 1 0: 4
Members present for the final vote	Zigmantas Balčytis, Bendt Bendtsen, José Blanco López, Jonathan Bullock, Cristian-Silviu Buşoi, Jerzy Buzek, Jakop Dalunde, Pilar del Castillo Vera, Ashley Fox, Theresa Griffin, Rebecca Harms, Seán Kelly, Jeppe Kofod, Jaromír Kohlíček, Peter Kouroumbashev, Miapetra Kumpula-Natri, Paloma López Bermejo, Edouard Martin, Tilly Metz, Dan Nica, Morten Helveg Petersen, Miroslav Poche, Carolina Punset, Massimiliano Salini, Neoklis Sylikiotis, Dario Tamburrano, Patrizia Toia, Evžen Tošenovský, Vladimír Urutchev, Kathleen Van Brempt, Lieve Wierinck, Anna Záborská, Flavio Zanonato, Carlos Zorrinho
Substitutes present for the final vote	Amjad Bashir, Mario Borghezio, Rosa D'Amato, Jens Geier, Benedek Jávor, Werner Langen, Marian-Jean Marinescu, Rupert Matthews, Gesine Meissner, Clare Moody, Markus Pieper, Sofia Sakorafa, Giancarlo Scottà, Davor Škrlec, Pavel Telička
Substitutes under Rule 200(2) present for the final vote	Michael Gahler, Ulrike Rodust

FINAL VOTE BY ROLL CALL IN COMMITTEE ASKED FOR OPINION

46	+
ALDE	Gesine Meissner, Morten Helveg Petersen, Carolina Punset, Pavel Telička, Lieve Wierinck
ECR	Amjad Bashir, Ashley Fox, Rupert Matthews, Evžen Tošenovský
EFDD	Rosa D'Amato, Dario Tamburrano
ENF	Mario Borghezio, Giancarlo Scottà
PPE	Bendt Bendtsen, Cristian-Silviu Buşoi, Jerzy Buzek, Pilar del Castillo Vera, Michael Gahler, Seán Kelly, Werner Langen, Marian-Jean Marinescu, Markus Pieper, Massimiliano Salini, Vladimir Urutchev, Anna Záborská
S&D	Zigmantas Balčytis, José Blanco López, Jens Geier, Theresa Griffin, Jeppe Kofod, Peter Kouroumbashev, Miapetra Kumpula-Natri, Edouard Martin, Clare Moody, Dan Nica, Miroslav Poche, Ulrike Rodust, Patrizia Toia, Kathleen Van Brempt, Flavio Zanonato, Carlos Zorrinho
VERTS/ALE	Jakop Dalunde, Rebecca Harms, Benedek Jávor, Tilly Metz, Davor Škrlec

1	-
EFDD	Jonathan Bullock

4	0
GUE/NGL	Jaromír Kohlíček, Paloma López Bermejo, Sofia Sakorafa, Neoklis Sylikiotis

Key to symbols:

+ : in favour

- : against

0 : abstention

INFORMATION ON ADOPTION IN COMMITTEE RESPONSIBLE

Date adopted	22.11.2018
Result of final vote	+: 33 -: 3 0: 0
Members present for the final vote	Daniela Aiuto, Lucy Anderson, Marie-Christine Arnautu, Inés Ayala Sender, Georges Bach, Deirdre Clune, Michael Cramer, Luis de Grandes Pascual, Andor Deli, Isabella De Monte, Jacqueline Foster, Innocenzo Leontini, Peter Lundgren, Elżbieta Katarzyna Łukacijewska, Marian-Jean Marinescu, Gesine Meissner, Markus Pieper, Gabriele Preuß, Christine Revault d'Allonnes Bonnefoy, Massimiliano Salini, Clăudia Țapardel, Keith Taylor, Pavel Telička, István Ujhelyi, Marita Ulvskog, Wim van de Camp, Janusz Zemke, Roberts Zile
Substitutes present for the final vote	Jakop Dalunde, Mark Demesmaeker, Michael Gahler, Franck Proust, Anders Sellström, Henna Virkkunen
Substitutes under Rule 200(2) present for the final vote	Clare Moody, Flavio Zanonato

FINAL VOTE BY ROLL CALL IN COMMITTEE RESPONSIBLE

33	+
ALDE	Gesine Meissner, Pavel Telička
ECR	Mark Demesmaeker, Roberts Zīle
EFDD	Daniela Aiuto
PPE	Georges Bach, Deirdre Clune, Andor Deli, Michael Gahler, Innocenzo Leontini, Marian-Jean Marinescu, Markus Pieper, Franck Proust, Massimiliano Salini, Anders Sellström, Henna Virkkunen, Luis de Grandes Pascual, Wim van de Camp, Elżbieta Katarzyna Łukacijewska
S&D	Lucy Anderson, Inés Ayala Sender, Isabella De Monte, Clare Moody, Gabriele Preuß, Christine Revault d'Allonnes Bonnefoy, István Ujhelyi, Marita Ulvskog, Flavio Zanonato, Janusz Zemke, Claudia Țapardel
VERTS/ALE	Michael Cramer, Jakop Dalunde, Keith Taylor

3	-
ECR	Jacqueline Foster, Peter Lundgren
ENF	Marie-Christine Arnautu

0	0

Key to symbols:

+ : in favour

- : against

0 : abstention