

Ministry of Transport of the
Czech Republic

Autonomous Mobility Plan

until 2025 with a Prospect to 2030

Prague 2024



Ministerstvo dopravy



RESOLUTION OF THE GOVERNMENT OF THE CZECH REPUBLIC

of 10 April 2024 No 234

Concerning Autonomous Mobility Plan until 2025 with a Prospect to 2030

The Government

I. approves the Autonomous Mobility Plan up to 2025 with a Prospect to 2030 (hereinafter referred to as the “Plan”), forming Part III of document file no. 228/24;

II. assigns

1. the Minister of Transport

a) to ensure implementation of the Plan

b) to submit to the Government, by 31 December 2025, information on the implementation of the measures defined by the Plan and an update of the Plan and its individual measures,

2. members of the Government and heads of other central state administrative authorities

a) to cooperate with the Minister of Transport in the Plan implementation, monitoring and evaluation,

b) to use the Plan in the preparation of related strategic and regulatory documents, and

III. recommends to the regional governors, the Mayor of the Capital City of Prague, mayors of statutory cities and mayors of municipalities with an extended scope of authority

1. to cooperate in ensuring the implementation of the measures set out in the Plan and

2. to use the Plan in the preparation of similar strategic documents.

To be implemented by:

members of the Government,
heads of other central state administrative authorities

For information of:

regional governors,
the Mayor of the Capital City of Prague,
mayors of statutory cities,
mayors of municipalities with an extended scope of authority

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1. Preface

The Autonomous Mobility Plan (hereafter referred to as the “Plan”) builds on the strategic document titled “Autonomous Mobility Development Vision” and primarily addresses autonomous mobility in road transport and automated road vehicles. In a broader sense, autonomous mobility may also embrace various modes of transport, including rail, air, and water vehicles and equipment. While the measures relating to road transport may reach into other areas, this document does not aspire to become a comprehensive concept for the development of automation in other transport modalities. Autonomous mobility in other transport modes, i.e. railway, air and possibly inland waterway transport, will be addressed by a subsequent update of this Plan or in other strategic materials produced on the governmental level.

The transport sector is currently undergoing a step-by-step transformation towards the deployment of automated transport systems and vehicles. Autonomous mobility represents a major innovation for the automotive and telecommunication industries and other closely related sectors. At the same time, autonomous mobility will have a significant impact on the future shape and operation of the entire transport system in general, and road transport in particular, which will significantly affect the economy and the society. Autonomous mobility will bring a transformation not only in passenger and freight transport, i.e. general mobility and logistics as such, but also, secondarily through technological developments, in manufacturing, service provision, the energy sector, education, employment and urban planning, with associated wider social and environmental changes. Its implementation will optimise the use of the road network and traffic flows and improve traffic management, thereby reducing traffic problems (e.g. congestion), accidents from human error, air pollution and fuel consumption and shortening travel times for drivers as well as passengers.

Technological progress places increasing demands not only on the industry, but also on the public sector and the society as a whole. To achieve the expected benefits and eliminate potential risks, it is necessary to respond flexibly to these technological advances by adapting the existing frameworks and paradigms and introducing new measures that will contribute to sustainable development of autonomous mobility bringing benefits to society as a whole. Addressing ethical issues and promoting awareness and education are part of this process. The deployment of autonomous mobility will be slow, and the environment in which vehicles will move will continue to be mixed. Particularly in cities and larger conurbations, it will be necessary to take other road users into account.

Safety is therefore a fundamental guiding principle in the development of autonomous mobility and must be continuously enhanced by all possible means. The role of the public sector is essential here, as is continuous improvement of current technologies, that contribute to safer traffic. Autonomous mobility is developing in stages and full driving automation, or putting automated vehicles on the road, cannot be achieved within a short time horizon. However, in view of the developments in the world, and the actions taken by many European countries, it is necessary to prepare the environment for autonomous mobility entry in a way that ensures utilisation of its benefits with an impact on society as a whole. Among these benefits, the reduction in traffic accidents is particularly notable, as highlighted by numerous studies.. For instance in a technical report by the US National Highway Traffic Safety Administration, saying that human error is a contributing factor in 94% of all traffic accidents.

Damage caused by traffic accidents in the Czech Republic can be counted in the order of tens of billions of Czech crowns per year. In 2023, the Police of the Czech Republic investigated 94,945 traffic accidents. In these accidents, 455 persons were killed, 1,751 suffered serious injuries and 23,936 minor injuries. The total material damage, as estimated by police officers at the scene of the accidents, amounted to CZK 7,686.1 million¹. With increasing market penetration of automated vehicles, road safety will improve and the risk of road accidents with serious consequences will be reduced.

Another undoubted benefit of autonomous mobility is represented by increased user comfort and more efficient use of time, gained thanks to transferring need to drive to the system. Autonomous mobility also demonstrates a great potential to contribute to a more inclusive transport system and services, if it can also be used (currently within individual car transport) by disadvantaged groups of the population. Especially in cities, the growing trend towards car sharing, in which automated vehicles can be effectively deployed, will help optimise the use of parking areas. Autonomous mobility is also linked to the concept of mobility as a service and personalised services that can better reflect individual needs and improve transport in its currently underserved areas. Road traffic can be made smoother by convoys of vehicles (platooning – groups of vehicles moving together, close to one another), which can increase road capacity, speed up intersection passability, reduce traffic congestions, save cost of building new lanes and lower fuel consumption. But at the same time, there are many external influences that can significantly affect the benefits compared to current expectations. The development of the use of automation in other sectors should also be generally considered, if relevant and feasible with regard to the defined measures.

A well-managed deployment and progress of autonomous mobility is expected to bring numerous socio-economic changes and associated impacts, which can be, following scientific studies and expert group conclusions, divided into several main areas. These include an expected increase of transport efficiency and safety and the consequent positive impact on the environment through reduced emissions. The sharing economy is also an area, where significant changes are expected. The development of digitalisation, essential for the introduction of autonomous mobility, will generally be a determining factor for the speed of change and the associated impacts. Adapting and setting up an appropriate legal environment is also a crucial factor. The thesis of the benefit of autonomous mobility and the need for its development are confirmed by these and other related benefits and positive impacts, including competitiveness strengthening and technological advance of the knowledge-based society.

The transport sector is also one of the important parts of national economy, affecting virtually all areas of public, private and business life, and representing a necessary prerequisite for increasing overall competitiveness of the Czech Republic. The Czech Republic has adopted a long-term plan aimed at strengthening and consolidating the country's position as an innovation leader by 2030. The Innovation Strategy of the Czech Republic 2019–2030 sets out the key areas that will help the Czech Republic achieve this ambitious goal. These key areas also include autonomous mobility, which is characterised by a great transformation and innovation potential. The Czech Republic has the potential to capitalize on this opportunity.

¹ Source: Information on road accidents in the Czech Republic in 2023

The long-term vision of the Czech Republic is to be a knowledge-based and innovative society. The fulfilment of this vision is only possible, if the Czech Republic focuses on the development and strengthening of knowledge-based industries, i.e. on the development of new technologies and modern services with high added value. All of this brings with it the development of cutting-edge technologies, enhancement of technological and knowledge capabilities of companies, as well as advancement in other areas crucial to autonomous mobility, such as artificial intelligence, machine learning and big data processing. The development of these fields stimulates the creation of high-skilled jobs in the Czech Republic and encourages influx of new foreign investments into the country.

For the purposes of this material, a basic glossary of terms is provided below, with definitions allowing for a more precise specifications of the areas covered by the Plan.

Levels of driving automation refer to the extent to which vehicles are able to take up the role of the driver according to SAE J3016:²

- No automation (level 0)
- Driver Assistance (level 1)
- Partial automation (level 2)
- Conditional automation (level 3)
- High automation (level 4)
- Full automation (level 5)

Assisted driving is driving that uses vehicle systems to assist the driver in driving and requires the driver to be present and active.

Automated driving is driving that uses advanced vehicle systems to perform the steering function and does not require the driver to be present or active.

Self-driving vehicle is a motor vehicle with automated driving that uses an operating system to control the vehicle.

Autonomous mobility is a set of topics that seeks the most appropriate solutions for the movement of people and goods in order to achieve the highest possible degree of movement autonomy.

² <https://www.sae.org/news/2019/01/sae-updates-j3016-automated-driving-graphic>

2. Background

For the preparation and subsequent implementation of the Plan, it is necessary to define its main starting points and to summarise to-date developments in the Czech Republic. The activities and intentions in the field of autonomous mobility, as defined in other parts of the Plan, should also be outlined in the context of international developments, including a description of the main trends and a strategic approach to their future implementation.

2.1. Development in the Czech Republic

Autonomous mobility has been identified as one of the key areas to influence the shape of transport and related services in the future. In the Czech Republic, the process of identifying fundamental topics and theses has begun after intensive and long-term dialogue with representatives of the automotive industry, other ministries, and stakeholders. This effort led to the preparation of a document titled “Vision for the Development of Autonomous Mobility,” which was subsequently approved by Government Resolution 720 on October 11, 2017. This strategic material deals with the main topics related to autonomous mobility and its gradual introduction into real-world operations in the Czech Republic. It recommends basic steps for further development of autonomous mobility in the Czech Republic, including the development of an action plan, support for the implementation of testing and operation, and negotiation with neighbouring countries on cooperation in cross-border testing and collaboration in the field of autonomous mobility through the joint projects. These issues also fall within a broader intention to support automotive industry development in the Czech Republic as declared by individual members of the Czech government at the government colloquium held in Mladá Boleslav in February 2017. Based on these negotiations and further preparations, on 25 September 2017 the Government of the Czech Republic and the Automotive Industry Association AutoSAP jointly signed a crucial document to strengthen the future prospects of the Czech automotive industry – the Memorandum on the Future of the Automotive Industry in the Czech Republic (hereinafter referred to as the “Memorandum” only). In addition to the Memorandum, the Government of the Czech Republic approved the Action Plan on the Future of the Automotive Industry in the Czech Republic “Czech Automotive Industry 2025” by its Resolution No. 686 of 25 September 2017. The central themes of the Memorandum are electromobility, autonomous driving and digitalisation, which are important for the successful and sustainable development of the Czech Republic as a traditional manufacturer of transport vehicles in general, and passenger cars in particular.

The measures implemented in the area of autonomous mobility through specific actions defined in the individual cards are as follows:

- *Creating an environment for testing partially/fully autonomous vehicles in real traffic*
- *Creating conditions for testing in a closed environment*
- *Creation of a national financial instrument to support the development of autonomous mobility*

- *Implementation of new functions of the Unified System of Traffic Information / National Traffic Information Centre (hereinafter referred to as "USTI / NTIC") necessary for the operation of partially / fully autonomous vehicles*
- *Support for international standardisation processes for automated driving of vehicles*
- *Legal aspects of the process of deployment of vehicles equipped with autonomous systems*
- *Education in and awareness of electromobility and autonomous systems and the National Programme of the Ministry of the Environment of the Czech Republic*
- *Ensuring that the focus of subsidy programmes for research and development is in line with the needs of the automotive industry*

To help implement the measure of "Creation of an environment for testing of partially/fully autonomous vehicles in real traffic", the Transport Research Centre (hereinafter referred to as "TRC") has prepared the Catalogue of Test Areas for Autonomous Vehicles in Normal Road Traffic working as a web application. The app contains a database with detailed information on selected roads and motorways in the Czech Republic and currently consists of two areas with a total length of over 2,000 km, including a virtual photorealistic model of a seven-kilometre section in the U Smart Zone in Ústí nad Labem. The form and scope of the catalogue makes it a unique tool for developers and engineers in the field of autonomous vehicles; its further development and operational model are now being addressed. In addition, specific locations for testing autonomous driving in the historic centre of Brno were proposed as part of the European SHOW project, which CTR has been involved in, with the testing started in 2022. Thanks to the introduction of 5G technology into cities (within the 5G competition), testing of autonomous vehicle control is also planned in the Ústí nad Labem region (within the aforementioned U Smart Zone). 5G activities are being developed in other cities, and there is also a plan to create cross-border 5G corridors with Germany. At the end of 2020, the City of Prague approved commissioning of a technical and economic study for the preparation of a pilot project for autonomous mobility in Prague. After abandoning the idea of a national polygon, the measure "Creation of the conditions for future testing in a closed environment" aims to support private initiatives and the involvement of private entities in the implementation of specific activities. The usability of and the requirements for the test facilities are subject to an analysis, that will reflect the current needs and will allow for the definition of appropriate next steps in this area.

In 2020, the Ministry of Transport executed a Memorandum of Understanding with Accolade regarding a planned polygon near Stříbro to ensure, inter alia, a possibility of addressing the potential needs of the state in this polygon and the openness of the polygon for research and development needs; the polygon construction is now in the preparatory phase.

Intensive work is also underway to analyse the current legal framework of the Czech Republic and its readiness for autonomous mobility development. On the basis of a questionnaire survey among the professional public addressing the measure "Legal aspects of the process of introducing vehicles equipped with autonomous systems", where many opinions on new legislative and other regulations were inconsistent, a need has arisen to carry out more in-depth research in this area, including focusing on foreign good practice.

Beyond the aforementioned, the Ministry of Transport, in cooperation with the expert community, is now working intensely on the preparation of an appropriate regulatory framework. The Ministry of Transport is about to submit a proposal for new legislation, that will enable the operation of automated vehicles in the Czech Republic to the Czech Government in 2024.

Within the framework of the creation of the financial instrument, the primary aim is to ensure alignment of the focus of subsidy programmes for research and development with the needs of the automotive industry, which is carried out through the implementation of the Programme for Support of Applied Research, Experimental Development and Innovation in the Field of Transport – TRANSPORT 2020+, under implementation since 2019, administered by the Technology Agency of the Czech Republic (hereinafter referred to as “TA CR”), or the follow-up programme TRANSPORT 2030, which was commenced by the first public tender in 2023. One of the four specific objectives of the programme focuses on automation, digitalisation, and navigation and satellite systems. The programme has also supported projects in the field of autonomous mobility, and there are further programmes that can also be used to support this area (e.g. TA CR’s SIGMA programme or the Ministry of Industry and Trade’s TREND programme, etc.), while the Ministry of Transport is striving to emphasise the area across all these programmes.

The implementation of the new USTI/NTIC functions necessary for the operation of partially/fully autonomous vehicles is addressed through the implementation of the measures of the Strategic Plan for Further Development of the USTI/NTIC with a 10-year outlook. As part of the implementation of the measure “Support of international standardisation processes for automated vehicle control”, a group was established at the Czech Agency for Standardisation (CAS) for sharing and exchanging information from the meetings of selected technical standardisation committees and groups with the possibility to actively participate in the activities.

The implementation of the area “Education in and Awareness of Electromobility and Autonomous Systems and the National Programme of the Ministry of the Environment” is carried out through the implementation of the BESIP 2021–2030 (Road Traffic Safety) Strategy and information campaigns and related materials on awareness-raising in the field of assistance systems. Beyond these measures, the Ministry of Transport is continuously implementing other steps leading to the development of autonomous mobility. These include, for example, the functioning of an Ethics Committee for the assessment of issues related to the operation of automated and autonomous vehicles in the Czech Republic. The main areas addressed by the committee include human-machine interaction, the issue of artificial intelligence behaviour in the event of accidents, the availability and security of shared data and the issue of liability for the software and infrastructure used in the Czech Republic. The Ethics Committee also aims at identification of other sub-topics related to the operation of automated vehicles. Coordination of other related activities is also underway, including support for innovation in the implementation of strategies in this area or through the CzechInvest agency, development of artificial intelligence, etc.

In particular, the Ministry of Transport is closely cooperating in the implementation of the Mobility Innovation Hub (hereinafter referred to as “MIH”) and the related project “Technology Incubation”, managed by the CzechInvest agency, with the aim of systematically supporting the development of innovations.

The focus on autonomous mobility as one of the main areas of MIH's activities consists, among other things, in strengthening cooperation with the private sector, universities and research institutes as well as regions and creating an interdependent environment for the development of innovations.

Within the framework of inter-ministerial cooperation, the Ministry of Transport participates in the preparation and implementation of the National Research and Innovation Strategy for Smart Specialisation of the Czech Republic 2021–2027 (hereinafter referred to as "RIS3 21+"), which is also directed by the Ministry of Industry and Trade as the main administrator into the field of transport.

Within the "Technologically advanced and safe transport" domain defined by RIS3 21+, autonomous mobility is also included as a strategic theme in the application sectors. The strategic theme covers a wide range of technical, systemic and socio-economic aspects related to the further development of the autonomous mobility trend. Related R&D activities and support for innovation within this strategic theme will contribute to accelerating the transition from the development to the implementation phase and will enable the Czech Republic to strengthen its competitiveness in this area. The aim is to support further development of the area and cooperation between research institutions and the private sector through specific instruments, thus contributing, among other things, to increased traffic safety, improved transport serviceability and accessibility, as well as Services and concepts focused on users and the environment.

The Ministry of Transport also works closely with the Ministry of Industry and Trade, leading the Working Group for Autonomous Driving, which falls under the Coordination Group for the Implementation of the Memorandum on the Future of the Automotive Industry. This working group, together with the Platform for Fully Autonomous Vehicles, established in 2017, also served as the main instrument of the Ministry of Transport for the preparation of the Autonomous Mobility Action Plan, which was prepared for approval by the Government and subsequently updated to its current form in view of further developments in the field. The outputs of the Platform for Fully Autonomous Vehicles served as the basis for the development of measures for the individual areas and were also used for the preparation of this Plan. Thus, the private sector and other actors such as research organisations and universities have been strongly involved in defining the needs of, activities related to and overall development of autonomous mobility.

Within the framework of the "Autonomous Vehicle Platform", 5 working groups were established to draw up opinions and recommendations for further development of autonomous mobility in road transport. Working Group 1 called "Legal Aspects" provided framework definitions of areas that may be affected by the introduction of autonomous mobility from the regulatory perspective: vehicle testing and operation, data protection, liability and type approvals. Working Group 2 focused on "Societal and Ethical Issues" identified the main topics of the impact of the development of autonomous transport on the society, including ethical and legal aspects of the autonomous vehicle operation (damage liability), communication and interactions between drivers, and impacts on individuals – in terms of quality of their lives, new mobility services, etc. Working Group 3 established to deal with "Autonomous Driving Technologies" addressed vehicle technologies (sensing, actuators, interfaces), reliability and safety of autonomous vehicles (functional parts, assembly), interaction between the driver and in-vehicle devices, requirements related to the driver taking control over the vehicle driving and vice versa, substitutability of systems and processes

in case of failure and safe integration of autonomous road vehicles with other road users. Working Group 4 for “Transport, Digital Infrastructure, Security and Spatial Data” themes analysed security and resilience of infrastructure, the provision of new mobility services (Mobility-as-a-Service), spatial data and their necessity for the operation of autonomous vehicles and the responsibility for their collection, parameters and guarantee. Working Group 5 with the name “Pilot Verification and Conformity Assessment” identified the main objectives for testing autonomous vehicles in the Czech Republic: reliability and safety of autonomous road vehicles, verification of safety of the automated systems and their fitness for operation, test operation and approval of technical fitness of road vehicles, conditions for testing and test operation of autonomous vehicles on urban (local) roads in built-up (municipal) areas and on roads outside urban areas. The activities of the Autonomous Vehicle Platform were subsequently merged with those of the Autonomous Driving Working Group, which is now the main and practically the only group bringing together all relevant stakeholders.

2.2. International Context

The Czech Republic, as a member of the EU and the UN and a country in the geographical centre of Europe, is influenced by the international environment, both directly and indirectly. At the same time, the shape of this environment needs to be formed actively to contribute and co-create frameworks for autonomous mobility.

A summary of the international context and the main milestones that influence the overall environment and development in the individual areas should therefore be placed in the context of national action. This chapter focuses in detail on developments especially at the European level, which are most relevant for the Czech Republic in terms of coordination mechanisms and adopted strategic documents defining the framework for the whole area. Early regulations in the field of autonomous mobility include UNECE Regulation 155 (cybersecurity), Regulation 156 (in-vehicle software) and Regulation 157 (automated lane keeping systems). The Vienna Convention on Road Traffic and the Vienna Convention on Road Signs and Signals also see significant developments with new amendments thereof. Specific examples in the area of vehicle and vehicle system development in the European and global context are also worth mentioning. The development of autonomous driving technology has made further progress in recent years. Functions on the SAE3 automation level are already offered commercially by automotive companies (e.g. Honda Sensing Elite, Mercedes Drive Pilot, BMW Personal Pilot L3 autonomous valet parking AVP, etc.). Audi has also developed a SAE3 system. The Norwegian city of Stavanger has started operating fully autonomous SAE4 level buses, and this is not a pilot test but a full-scale operation. Companies such as Waymo and Baidu are currently operating commercial taxi services in designated areas of cities such as Phoenix, San Francisco and Beijing, completely without drivers. In view of this context, continued directed support for this area is in the best interest of the Czech Republic.

2. 2. 1 High-Level Meetings on Connected and Automated Driving

The Czech Republic, through the Ministry of Transport, regularly participates in the High-Level Meetings on Connected and Automated Driving (HLM CAD) and participates in the preparation of their agendas and factual orientation. The HLM CAD, aimed at promotion of development in the whole area and cooperation between the European Commission, Member States and the industry, or associations representing the private sector (automotive,

teleoperators and others) or cities and regions, have been organised since 2017 on the basis of the signed Amsterdam Declaration on Cooperation in Connected and Automated Driving, which was signed on 15 April 2016 at an informal meeting of the EU Transport Council. The Amsterdam Declaration sets out common steps and objectives for Member States and the European Commission in the field of deployment of technologies and services related to connected and automated driving, with an emphasis on security and reliability of the related services.

In the framework of the Amsterdam Declaration, the European Commission committed itself to formulate a European strategy for connected and automated vehicles, with a focus on the legal framework, data use and protection, vehicle-to-vehicle and vehicle-to-infrastructure communication, social acceptance, definitions and international cooperation. Following the Amsterdam Declaration, a Letter of Intent was signed by representatives of 29 countries in Rome on 23 March 2017, in the context of the events of the “Digital Day”, to emphasise the need for cross-border cooperation in testing of connected and automated vehicles, creation of appropriate conditions for their use and exchange of data or cooperation between the public and the private sector. The above-mentioned high-level dialogue platform, the HLM CAD, was also established as a follow-up of the Declaration. The first meeting on this level took place in Amsterdam in February 2017, its main topics including promotion of a common European approach, vehicle-to-vehicle (V2V) communication, cross-border testing, cooperation with UNECE and the issue of the national legislative frameworks. A further meeting was held in Frankfurt in September 2017 to discuss issues related to cross-border testing, data access and use, and societal and ethical implications. A follow-up meeting was held in Gothenburg in June 2018, and the conclusions of this meeting defined specific areas where European cooperation needed to be strengthened. These included skill development and impact on the labour market, which cut across all areas of automation, including the adoption of measures to support industry transformation and labour market modernisation, social acceptance and awareness raising, support for cross-border collaboration and testing, data use and cybersecurity, vehicle-to-infrastructure communications, international regulation and the impact on transport operators and communication managers and operators.

The subsequent two meetings in Vienna (Nov. 2018) and Vilnius (June 2019) were held at the expert level without formal conclusions and with the aim of discussing the above-mentioned topics, share good practices and current implementation experience. Another meeting, organised by Finland, was held online in October 2020, the main topics of the meeting being the focus on humans in the development of autonomous mobility, data and data sharing and the regulatory approach to automation in transport. The meeting adopted conclusions underlining the need for the development of automated transport in accordance with a human-centred approach aiming to achieve its societal benefits, develop the topic of ethics, define the role of individual stakeholders in the field of automated driving systems, and create standards for development meeting the transparent approach principle and ensure data security. The conclusions also mentioned the need for a common model governance structure for data sharing and further coordination within the EU and at EU and UNECE levels. The most recent meeting was organised under the French Presidency of the EU Council in 2022, and topics included the area of data and data exchange, or the need for a common European approach to architecture, security and privacy issues, shared guidelines for security verification at national and EU level, and a generally uniform approach to the authorisation of test and trial operations. In the area of research and development, the discussion topics

included the focus of European funding on the area of shared autonomous resources, verification tools and the areas of requirements for digital infrastructure (incl. 5G and GNSS).

In the course of the Czech Presidency of the Council of the European Union in 2022, the Czech Republic organised a meeting at the expert level for the purpose of definition of the needs for a coordinated approach and the establishment of a long-term platform that would enable Member States and the European Commission to address the CCAM related needs in a structured manner at the European (EU) level. The CCAM platform (see Section 2.2.2 below) has ceased its activities, and there is no equivalent group or platform where coordination and joint action could take place on a regular basis. The Czech Presidency also reported on this need, on which there was a general consensus, at the meeting of the Transport Council in December 2022.

2. 2. 2 CCAM Platform and CCAM Partnership

The Single Platform for Open Road Testing and Pre-deployment of Cooperative, Connected, Automated and Autonomous Mobility (hereafter “CCAM Platform”) was established by the European Commission in 2019 with the aim to create an informal expert group focusing on the coordination and development of research and testing activities in the field of data connected and automated mobility. The CCAM Platform was formed by representatives of EU Member States’ state administrations, public organisations and representatives nominated by interest groups or individual experts, and its main contribution was to achieve a more effective coordination of activities in the areas of research, development and testing. The Ministry of Transport actively participated in the CCAM Platform, both by attending its plenary meetings and by coordinating Czech participation in the working groups.

The activities of the CCAM Platform were divided into six working groups focusing on different aspects of research and innovation activities in the field of autonomous mobility: 1) Development of a Testing Agenda, 2) Coordination and Cooperation of Research, Innovation and Testing Activities, 3) Physical and Digital Road Infrastructure, 4) Traffic Safety, 5) Connectivity and Digital Infrastructure, and 6) Data Access and Exchange and Cybersecurity. There were representatives of the Czech Republic in all these working groups, nominated by the Ministry of Transport to participate in the definitions of sub-areas. The outputs of the CCAM Platform working groups were reflected in the setting of a future partnership in the area of cooperative, data-connected, automated and autonomous mobility, established for the period between 2021 and 2027 through the EU’s 9th Framework Programme for Research and Innovation Horizon Europe, which was subsequently approved. In the context of the Programme, calls are announced for research and innovation projects in all areas relevant to the development of autonomous mobility. The themes include in particular large-scale demonstrations, vehicle technologies, validation, integration of autonomous vehicles into the transport system, key technologies, societal aspects and user acceptance and research coordination.

The aim of the Ministry of Transport is thus to continue the national involvement in these activities as well as set up an appropriate system of support for these topics at the national level in a way that contribute to the synergies with all-Europe’s topics. The Czech Republic must continue to actively contribute to the definition of priorities and their implementation, and the MoT, as the coordinator of autonomous mobility, will play a key role in this. Specifically, the Ministry represents the Czech Republic within the Group of State

Representatives, which was established together with the launch of the above-mentioned partnership and has worked under Czech presidency by a representative of the Czech Ministry of Transport since November 2022. This also enables to strengthen our influence in the European debate and to direct it towards areas that are essential for the Czech Republic.

In general, the group focuses on identification of areas that are crucial for the implementation of the results of the projects and activities of the partnership and where cooperation with Member States and other associated countries is required. At the same time, the group serves as a means for the exchange of information between representatives of the partnership and the members of the group. The specific areas within which the group serves as an interface with the partnership include activities at the national level in the field of research, development and innovation, including the identification of specific activities and areas of cooperation, also in the framework of the introduction of technologies and innovative solutions, as well as measures to increase the impact of the results achieved through dissemination and other activities and actions that will lead to the use and implementation of the results achieved by the partnership.

2. 2. 3 European Strategies for Autonomous Mobility

The development of autonomous mobility in the Czech Republic must also be set in the European strategic context. It is important to follow the essential policies and their implementation. One of the major milestones in the area of strategic orientation setting was the publication of the Communication from the European Commission titled “Towards automated mobility: An EU strategy for the mobility of the future” published in May 2018, in response to the dynamic changes in digitalisation and automation and artificial intelligence development. It is also closely related to the transport sector and influences its further development, including in the field of autonomous mobility. Increasing safety by minimising the negative impact of human error is considered one of the main benefits of automated vehicles. The development of shared mobility services and the mobility as a service concept are among the trends by which the introduction of automated vehicles will be accelerated.

This European Commission Communication covers issues that will need to be addressed to enable the development of automated driving. These include data sharing and protection, impact on the labour market, provision of services that are linked to the use of vehicles on higher levels of automation, etc. In this context, it will be necessary to adopt an appropriate regulatory framework so that automated vehicles can become part of the transport system in the medium to long term. The European Commission has launched a process to identify specific cases for automation use in passenger, freight and public transport. According to the mentioned European Commission Communication, significant investment in R&D to support testing, pilot projects and international cooperation will be necessary to enable further technology and infrastructure development within the EU. The development of cross-border 5G corridors, the promotion of services linked to the use of the Galileo satellite navigation system and the digital map reliability improvement are among the topics promoted by the European Commission under the Horizon Europe framework programme for research and innovation to be implemented in the period 2021–2027. At the same time, development of digitalisation in transport is supported by the use of the Connecting Europe Facility (CEF).

In order to develop an internal market enabling the deployment of autonomous mobility, the vehicle approval framework was revised in 2018 and the approach to assessing the safety of automated vehicles was harmonised. This will take into account areas related to

the human-machine interface and the expected driver and vehicle tasks for different levels of automation, as well as infrastructure improvement. The issue of liability and the related vehicle equipment with recording devices and their regulation is another topic focused by the European Commission. Assurance of reliable and secure communication between the vehicle and the infrastructure and among vehicles, as well as cybersecurity and data protection are prerequisites for successful integration of automated vehicles into the transport system. The mentioned European Commission Communication also addresses and intends to further explore the socio-economic impacts of the future introduction of automated mobility. The European Commission will also support the development of skills related to the advancing digitalisation process and the need to respond to the changes it brings about. The progress and deployment of the relevant technologies and development of the necessary physical and digital infrastructure are expected to require significant investment, with most of the funding expected to come from the private sector. In some cases (e.g. when equipping transport infrastructure with the necessary facilities, equipping public passenger transport vehicles, etc.) the public sector (at the national, regional and city levels) also joins as an investor.

Another major document is the one issued by the European Commission in December 2020 under the title Strategy for Sustainable and Intelligent Mobility, which follows on from the 2011 White Paper on European Transport Policy and responds to the new challenges and targets for reducing transport emissions and digitising the transport sector faced by the EU. The strategy sets out the objective of using digitalisation and automation to further increase safety, security, reliability and convenience levels, thus maintaining the EU's leadership in the production of transport equipment and services. In the area of digitalisation of transport, the strategy focuses on automated mobility implementation, including the creation of a legal framework for transparent and efficient data sharing through the Common European Mobility Data Space. The European Commission's ambition for automated mobility is to reach the milestone of large-scale deployment of automated mobility by 2030. Also, in view of this milestone, the European Commission is proposing the creation of an EU-wide coordination mechanism. Another aspect closely related to the development of autonomous mobility is the promotion of the development of artificial intelligence and digital infrastructure, including 5G networks. Given the need for breakthrough solutions in this area, the European Commission will support research and deployment of innovative and sustainable transport technologies, including through the CCAM partnership mentioned above. CCAM is also one of the priority areas defined by the approved revision of the ITS Directive (2010/40/EU), where its Annex specifies the need for action in the development of Cooperative Intelligent Transport Systems (C-ITS) technology to support CCAM, through data exchange among vehicles, between vehicles and the infrastructure and among vehicles, infrastructure and other road users, data availability, the use of a standardised message format for vehicle-to-infrastructure communication and, in general, the definition of a reliable communication infrastructure.

3. Objectives of the Plan

The main objective of the Plan is to create favourable conditions for the development of autonomous mobility in the Czech Republic and to exploit all its potential benefits for the economy and the society of the Czech Republic. By supporting autonomous mobility, the Czech Republic can become a sought-after centre for research, development and testing of autonomous systems in Central Europe, which will not only help maintain the position of the Czech automotive industry in international competition, but also possibly strengthen this position and further develop the innovation and technological potential of the Czech Republic in new technologically promising and cross-cutting areas such as artificial intelligence, 5G or big data. Within the framework of the autonomous driving technology implementation, the use of its social benefits, consisting especially in increasing traffic safety and accessibility of services, as well as in reducing the negative impact of transport on the environment to the maximum extent possible, must be actively promoted by the Czech Republic on an ongoing basis. The main roles of the state in the field of autonomous mobility can be seen in the following areas: long-term support for research, development and testing of automated vehicles, active support for the introduction of technologies, reduction of barriers and preparation of an appropriate legal and infrastructural environment, active participation and cooperation on issues addressed in the international environment, raising awareness and educating the public about autonomous mobility.

The Plan aims to enable the operation of automated vehicles in the Czech Republic, which is also in line with the Strategy for Sustainable and Intelligent Mobility. All the measures defined in the Plan are therefore targeted at enabling the operation itself and creating the conditions that are essential for its safety, efficiency and sustainability. The Plan also focuses on integrating autonomous mobility into the transport system, and in particular into emerging schemes. Autonomous mobility cannot be seen in isolation, but rather in the context of other changes under way in the transport sector. The aim of the Czech Republic must therefore be not only to enable the technical and technological development, but also to develop the whole area comprehensively, including social acceptance, implementation in practice, support for related topics and integration into existing schemes, using all the benefits available. The Plan defines multiple thematic measures through which this objective is to be implemented. The Ministry of Transport will be the main promoter of the Plan's measures. Some of the measures will require cooperation of other ministries and entities to be implemented. At the same time, the Plan defines areas that are essential for the development of autonomous mobility, but where no specific measures are defined by the state or are part of other strategies or action plans. These areas are only mentioned to set the context. The Czech Republic must also strengthen its current position in research, development and innovation in the period up to 2030 and ensure that the development of autonomous mobility technologies is supported to the maximum extent possible. Therefore, support for research and development in this area must be further increased and effectively implemented in the Czech Republic and an environment must be created that will enable the results to be applied in practice. However, another essential aspect is to be able to put the results of research and development into practice effectively. Part of the results will also be directed to state administration and local governments in the form of regulatory and methodological approaches. Introduction of autonomous mobility requires innovative approaches by the state and the municipalities, and it is therefore also appropriate to support projects focusing on this area.

4. Measures

The purpose of this section is to define the individual measures as well as the main areas that are essential for the development of autonomous mobility. The measures can be divided into 4 main areas, namely (1) traffic technology measures, (2) regulatory, standardisation and ethical measures, (3) research, development and innovation measures, and (4) awareness-raising measures. A total of 13 thematic measures are included in these areas. Each measure includes a description of the current situation, the objective, a description of the measure, the responsibility and co-responsibility for its implementation, an indicator of achievement, the implementation deadline and the expected method of financing or expected financial resources. All measures will be implemented, or rather all expenditure will be covered within the overall expenditure limits (of the affected state budget chapters) approved for the given periods without any further additional demands on the state budget.

This Plan does not contain measures that are already covered by other strategic documents. For the entire transport sector, these include the Transport Policy of the Czech Republic for the period 2021–2027 with an outlook to 2050. Measures related to the development of cooperative intelligent transport systems (C-ITS), used for communication between the vehicles and the infrastructure and among vehicles, are defined by the Strategy for the Development of Intelligent Transport Systems 2021–2027 with an outlook to 2050, approved by the Government of the Czech Republic in January 2021.

The area of development of digital infrastructure for autonomous mobility is addressed and the main objectives are defined in the strategies titled “Implementation and Development of 5G Networks in the Czech Republic – The Road to the Digital Economy” and “Strategy for the Development of Intelligent Transport Systems 2021–2027 with an outlook to 2050”, adopted by the Government of the Czech Republic in January 2020. The implementation of both strategies and the execution of specific measures align with the development of autonomous mobility and the possible specific needs will need to be taken into account. Collaboration on the implementation of these strategies and the definition of user needs, including those of the private sector, are therefore crucial.

Beyond the action cards below, there are also a number of areas where specific actions have not been defined within this Plan. These areas should also be mentioned in the context of the development of autonomous mobility, and any future needs should be continuously monitored and evaluated and responded to in an appropriate manner. These areas include databases and registers of driver or vehicle data. In the future, these data will need to be supplemented with data related to the automated vehicle operation.

The broad area of data and data policy, traffic and vehicle data collection and storage, or redistribution, are other topics to be further monitored including evaluation of the need for specific measures, e.g. in connection with the expansion of information collection by the National Traffic Information Centre (hereinafter referred to as “NTIC”). In the case of the NTIC, the areas of its development are defined within the framework of the “Strategic Plan for Further Development of the USTI/NTIC with a 10-year Outlook” approved by the Czech Government in 2017. The Strategic Plan determines the overall development and functions to be performed by the NTIC in each stage.

The Strategic Plan for further development of USTI/NTIC with a 10-year outlook and the Strategic Plan for further development of the Road Databank of the Regional Directorate of Transport with a 10-year Outlook, which is to lead to the unification of control systems, infrastructure and vehicles, does not envisage functionalities taking into account new technological concepts, including autonomous driving, though.

However, this function with its purpose of improving the approach to traffic management and organisation would already be useful now. Furthermore, the documents do not foresee a function for intelligent vehicles and there is no concrete, definable idea of it yet. In view of the developments in autonomous mobility, it is clear that both functions will have to be further developed and their concrete form, from conception to implementation, will have to be considered in the further elaboration of both strategic plans. In general terms, data is the basis for a number of applications and services that are implemented in the context of development of the mobility as a service concept. A possible definition of the role to be performed by the state is a long-term goal, to which the conclusions of research projects and studies carried out in the Czech Republic and abroad may contribute, among other things.

Another related area is edge computing, which uses the distribution of computing power across a series of devices to speed up processes while saving the power of the data processing servers. It is therefore advisable to monitor the area within an effort to ensure a more efficient use of such a solution in the future, e.g. by road management, leading to cost optimisation. At the same time, it is advisable to support projects that use edge computing and to evaluate their effectiveness and the possibility of reducing costs for specific cases of potential use.

4.1. Traffic Technology Measures

For testing and operation of automated vehicles and their security, including cybersecurity, the necessary infrastructure will need to be developed in cooperation with other entities, and an environment will have to be created for easier and more efficient use of these vehicles. Given the nature of the whole area, for which testing and pilots are an important source of further knowledge, it is essential to provide further support for the testing environment development. Currently, support for testing is focused on sub-activities and projects. With further development of advanced vehicle assistance and safety systems, these technologies are expected to require further intensive testing to ensure a high level of safety. Testing takes place under laboratory, virtual or real conditions. In addition to the aforementioned Catalogue of Test Areas for Autonomous Vehicles in Normal Road Traffic, private plans and projects for the construction of closed test facilities, so-called polygons, are emerging. Within the framework of state support for such projects, it is necessary to define how specific projects can contribute to the development of the environment as a whole, what their usability will be in the academic and research sphere, or whether they have the potential to appeal to foreign teams and be sufficiently competitive.

The aim is to contribute to strengthening of the Czech Republic position internationally and to create a competitive environment for testing automated vehicle control technologies that will be sufficiently attractive for both Czech and foreign entities. Two main activities can therefore be defined, namely support for the establishment of a traffic technology infrastructure for research, development and testing, followed by support for pilot projects implemented in both closed and real-life environments that would develop automated vehicle operability and interoperability. In this respect, coordination is necessary between the Ministry of Transport and the Ministry of Industry and Trade (especially in the case of the development of new generation networks), or other ministries (e.g. the Ministry of Regional Development), as well as representatives of the private sector and the academic and research sphere. The private sector is a partner mainly in the sense of investing in the building of testing and trial infrastructure (polygons). The role of the state administration is to promote development of such infrastructure directly and indirectly, e.g. by setting up usable support tools and other applicable instruments of indirect support. As in the past, the use of the European Structural and Investment Funds, among others, is expected to continue in the next period. In the framework of the individual operational programme preparations, support for testing infrastructure was included in their text.

Furthermore, measures for the development of digital infrastructure defined in the framework of the “Strategy for intelligent transport system development 2021–2027 with an outlook to 2050”, containing 16 measures, will be implemented. Especially measures in the area of the “Digital Transport Infrastructure Layer”, including the data area in terms of static data on transport infrastructure and dynamic data, are relevant for the development of autonomous mobility and for the step-by-step deployment of automated vehicles in real operation. In this sense, it is necessary to continue monitoring updates to this strategy and its action plan and to define specific needs where appropriate. Specific prerequisites for 5G are defined in the strategic document titled “Implementation and Development of 5G Networks in the Czech Republic”. Its chapter on “Intelligent Transport Systems, Automated and Autonomous Mobility” defines that 5G is a prerequisite for autonomous mobility development mainly with regard to the need to ensure stable, high-capacity, fast and secure

communication, but also with regard to the possibility of using all existing advanced network options, e.g. for on-board infotainment and entertainment systems or the development of the related service sector. For further development of 5G networks, which is the primary responsibility of the Ministry of Industry and Trade, the necessity to identify partial needs is defined there as well. This must be carried out continually in cooperation with all key partners as well as with cities and municipalities in order to apply the smart city concepts of which autonomous mobility is a part. At the same time, it is essential to focus on covering the main transport corridors, including cross-border sections. This coverage must meet certain basic conditions, including security and critical infrastructure requirements, and be uninterrupted to enable full use for testing and operation. In addition to possible financial instruments, the role of public administrations is to ensure an appropriate regulatory environment and conditions for the next generation networks operation. Specific use-cases and the resulting requirements will be defined on an ongoing basis which must primarily come from the manufacturers. Another beneficial activity will be mapping current coverage for ease of use and planning of pilot operations. Development of the 5G network potential also involves supporting research and innovation activities, including real-world testing of autonomous mobility applications and pilot projects, through direct instruments (with a focus on using European resources).

Measure Designation
4.1.1 Coherent ecosystem supporting automated driving technology testing
Description of Current Status
<p>Currently, support for testing is focused on sub-activities and projects. With further development of advanced vehicle assistance and safety systems, these technologies are expected to be tested extensively, especially to achieve a high level of safety. Testing takes place under laboratory, virtual or real conditions. In support of real-world testing, the Catalogue of Test Areas for Autonomous Vehicles in Normal Road Traffic was put in operation with further ongoing adaptations, and at the same time private plans and projects have been emerging for the construction of closed test facilities, so-called polygons.</p>
Measure Purpose
<p>The main purpose of the measure is to support development of a suitable concentrated testing environment working in a way able to contribute to reducing existing barriers, such as a lack of capacity or level of infrastructure facilities and facilitate the whole area development in the Czech Republic. The aim is to contribute to strengthening the position of the Czech Republic internationally and to create a competitive environment for testing automated vehicle technologies, which will be sufficiently attractive for both Czech and foreign entities. Two main activities will be carried out in order to achieve the objective, namely</p> <ol style="list-style-type: none"> 1) support for the establishment of traffic and technological infrastructure for research, development and testing and subsequently 2) support for pilot projects in both closed and real environments that would develop automated vehicle operability and interoperability, through a call or tender for support such projects and their implementation. <p>A secondary effect of the activities is to use the project outputs as the basis for creating conditions for testing and approvals within the Czech Republic and the EU. In terms of integrity and interoperability of the systems, it is part of the C-ITS testing. The development of traffic and technological infrastructure for testing the needs of autonomous mobility will also accelerate the development of the relevant regulations needed for the autonomous driving technology implementation in the follow-up steps.</p>
Measure Description
<p>Due to the complexity of the systems and their interactions and communication, processing of large amounts of data by artificial intelligence and the necessary interoperability, it is vital to support research, development and testing of these systems in closed environments as well as in real operation. That means support to the test environment itself, i.e. its creation, equipment and complementarities between its individual components. This specifically includes, for example, coordination of plans so as to avoid duplication of infrastructure financing, or activity linking in a way enabling effective development of such infrastructure. It is also essential to ensure the best possible continuity with the real-world testing environment and combine the different types of testing as effectively as possible.</p>

The supported activities should also aim at developing and implementing new approval needs, with the three main pillars of approval for these systems and vehicles being the real-world test drive, the physical certification tests as part of testing the vehicles and their systems, and quality audits and assessments. The above-mentioned needs should therefore be met by creating new or equipping existing test polygons, circuits, complexes or centres and, where appropriate, the transport infrastructure. Such projects must include an analysis of the overall environment, a possible building layout, technological equipment and a sustainability model. The implementation of this measure also includes support for concrete activities carried out in relation to these infrastructures and in real operation through existing or newly prepared frameworks.

Responsible and Co-Responsible Bodies

Ministry of Transport
 Ministry of Industry and Trade (co-responsibility)

Achievement Indicator

Number of announced calls or organised tenders (minimum 1)

Completion Date

2030

Expected Sources of Funding

State budget, EU funds, private sector investment

Measure Designation
4.1.2 Cybersecurity and data protection in the context of autonomous mobility
Description of Current Status
<p>Cybersecurity and data protection is one of the key areas, as automated vehicles contain a significant number of sensors, computers and software equipment, which exposes them to the risk of cyber-attacks. The communication among vehicles and between vehicles and the infrastructure generates a large volume of information necessary for traffic management and communication between systems. The Internet of Things (IoT), a network of physical devices, which in the case of traffic automation also include the vehicles themselves, is characterised by network connectivity, the essence of which is the exchange and transmission of data. Similarly, clouds designed to store and manage data and run applications where individual information is easily accessible will need to have a high level of protection. The implementation of certified procedures in the manufacture of components and systems by their manufacturers themselves is essential to ensure a sufficient level of safety. The role of the state is then to set up these procedures and ensure conformity assessment of the individual systems and components. The issue must be addressed throughout the entire life cycle of the transport system, from design, through implementation to the operational phase, so that the transport system meets the “security by design” approach and guarantees all required security parameters, including the integrity and undeniableness of data (e.g. control instructions). At the same time, efforts should be made to ensure independent assessment of the transport systems compliance with technical standards, methodological documents and other underlying materials. Cybersecurity is regulated at the international and national level (EU Cybersecurity Act, Directive (EU) 2016/1148 of the European Parliament and of the Council on measures to ensure a high common level of network and information systems security in the Union, the so-called NIS (Network and Information Systems) Directive, Act No. 181/2014 Coll. (The Cybersecurity Act), and therefore compliance with this legislation in the area of transport systems is necessary.</p>
Measure Purpose
<p>The purpose of the measure is to seek systematic solutions to state protection from the perspective of cybersecurity. These involve establishment of the basic elements of state protection, which undoubtedly include critical infrastructure, including transport information centres and other elements. Many of the elements that will fall under state protection interests involve several different entities. In order to ensure communication between them, it is advisable to establish a cybersecurity platform for this area (e.g. in the form of a working sub-group of the already existing Autonomous Mobility Working Group), where these entities will have an opportunity to jointly respond to emerging conditions and impact of legislative acts, rules and regulations. At the same time, if there is a consensus on such a need, then it is time to establish a process to ensure certification for systems and components used in autonomous mobility.</p>

Measure Description
The role of the state in this area is to reflect the cybersecurity needs of autonomous vehicles and to strengthen resilience to potential threats. Such threats may occur in the field of transport in general and the more so in the field of autonomous mobility. There are no effective solutions to the emerging threats and no effective countermeasures to date, so it is essential to work on eliminating such threats in the long term. Addressing a safe transport space by certifications of products and systems only, even though this may become part of a potential overall solution, appears insufficient for the state under the present situation.
Responsible and Co-Responsible Bodies
Ministry of Transport National Cybersecurity Authority (co-responsibility)
Achievement Indicator
Creation of a cybersecurity platform for the purpose of autonomous mobility development
Completion Date
By 2026
Expected Sources of Funding
State budget

4.2. Legislation, Standardisation and Ethics

Essential prerequisites for autonomous mobility development include a favourable regulatory environment that emphasises the users and their safety. This environment also influences the speed at which new technologies are introduced into operation. Creation of a favourable legal environment is the main task for the public administration in the implementation period of the Plan.

The following measures are included in this section:

- Creation of a favourable legal environment for autonomous mobility development in the Czech Republic;
- Active participation in the development of the relevant international regulations and standards, including active involvement in UNECE;
- Active participation in the development of the relevant EU legislation;
- Assessment and reflection on the ethical issues associated with autonomous mobility under the conditions of the Czech Republic.

Measure Designation
4.2.1 Establishment of legal environment for autonomous mobility development in the Czech Republic
Description of Current Status
<p>With the progressive development of technical and technological solutions, changes in virtually all sectors are reflected in legislation with a delay. The operation of automated vehicles imposes specific requirements on: the entire vehicle approval process, trial operation, driver duties, roadworthiness testing, driver’s licences and much more. It is essential that legislation responds flexibly to changes in the trend towards automation in transport to enable the development of a technology with the potential to significantly improve road safety and driver comfort. According to current Czech legislation, operation of vehicles at the SAE2 level is possible in the Czech Republic at present. A comprehensive study of the current legislation completed in 2022 has identified areas where changes are needed. These specifically include introduction of the concept of autonomous vehicle, definition of the driver and driver’s duties, the so-called technical supervision or remote driver, the duties of vehicle operators and the operating space definition. Recommendations also include the areas of vehicle operation caused damage liability, insurance and criminal liability. The area of data processing and the related regimes is primarily addressed by European legislation (in force or under preparation) and its legal framework must be primarily aimed at minimising interference with the data subjects’ rights. This recommendation is also contained in the report of the Ethics Committee³, which furthermore generally recommends modifications of the legal framework, including the definitions of concepts, obligations and requirements for vehicle equipment. There are groups within UNECE and the EU currently working on some of the above areas (for more information see the measure “Active participation in the development of relevant international regulation and standards, including active involvement in UNECE”) and first legislative regulations or recommendations begin to emerge. It is clear that changes to Czech legislation must reflect EU legislation and respect the Czech Republic’s obligations under international treaties. Within the framework of the terms of reference preparation in 2023 and 2024, several meetings have been held, on the basis of which a variant approach has been defined and preparation of specific legislative changes will be continued, with special focus on Act No. 361/2000 Coll., on Road Traffic and on Amendments to Certain Acts (Road Traffic Act), as amended.</p>
Measure Purpose
<p>The aim of the measure is to create a legal framework for autonomous mobility in the Czech Republic that will enable step-by-step introduction of automated vehicles into real operation.</p>

Measure Description

The measure will consist in a detailed substantive assessment of the need, scope and manner of amending the existing legislation and the subsequent preparation and discussion of draft amendments to the legislation, which must follow technical and technological developments in the field of transport automation. Current analytical activities have focused on individual relevant legal institutes, including trial operation, approvals of vehicles for use, vehicle registration, technical requirements for the vehicles, requirements for their drivers, international recognition of vehicle approvals, rights and obligations including the liabilities of the entities concerned (road users, owners and operators of transport infrastructure, public authorities, etc.), insurance, protection of personal data, cybersecurity, road accidents, traffic management, professional competence to use vehicles, etc. For the field of autonomous mobility, a comprehensive study commissioned under the BETA 2 programme identified the following road transport legislation as most relevant in 2022:

Act No. 361/2000 Coll., on Road Traffic and on Amendments to Certain Acts (Road Traffic Act), as amended,

Act No. 111/1994 Coll., on Road Transport, as amended,

Act No. 13/1997 Coll., on Roads, as amended,

Act No. 247/2000 Coll., on the Acquisition and Improvement of Professional Competence to Drive Motor Vehicles and on Amendments to Certain Acts, as amended,

Act No. 30/2024 Coll. on Motor Vehicle Liability Insurance

Act No. 56/2001 Coll., on the Conditions of Operation of Vehicles on Roads and on Amendments to Certain Acts, as amended,

Also relevant are regulations on damage liability, electronic communications, cybersecurity, etc. Possible adjustments within these must be addressed in cooperation with their promoters.

Responsible and Co-Responsible Bodies

Ministry of Transport

Ministry of Finance (co-responsibility)

Ministry of Justice (co-responsibility)

Ministry of Industry and Trade (co-responsibility)

National Cybersecurity Authority (co-responsibility)

Achievement Indicator
<p>1) Preparation of terms of reference detailing the need for, scope and method of change to the existing legislation (including cooperation with the automotive industry on this preparation)</p> <p>2) Preparation and discussion of the draft paragraph wording of Act No. 361/2000 Coll. and submission to the Government</p> <p>3) Ensuring the preparation and discussion of draft amendments to legislation.</p>
Completion Date
<p>1) 2024</p> <p>2) 2024</p> <p>3) 2024 and further on an ongoing basis</p>
Expected Sources of Funding
<p>State budget</p>

Measure Designation
<p>4.2.2 Active participation in the development of relevant international regulations and standards, including active involvement in UNECE</p>
Description of Current Status
<p>Autonomous mobility is a topic that cuts across many established areas and sectors. Cross-cutting solutions across them must be systematic, organised and harmonised. Forums, groups and commissions are being set up to address the many related challenges and issues. By actively participating in the International Forum for Harmonisation of Vehicle Regulations, the International Road Safety Forum and in working groups on motor vehicles under the auspices of the UNECE or the EU, the Czech Republic can defend its interests and thus participate in shaping the environment of autonomous mobility. However, the list of identified opportunities for participation is not exhaustive as it continues to expand.</p>
Measure Purpose
<p>The purpose of the measure is to set up mechanisms and conditions enabling the Czech Republic to actively contribute to the preparation, negotiation and approval of the relevant UNECE regulations and support the needs of the Czech Republic related to the development of autonomous mobility in the process. Another goal is to set up a mechanism to coordinate the needs and position of the Czech Republic, including expert input. A further objective is to keep the needs up to date, especially with regard to the development of technology and the need to ensure security of the systems in operation.</p>
Measure Description
<p>A fully functional involvement of the Czech Republic requires to set up an appropriate coordination mechanism at the national level to share the necessary information in the most effective way, to define the needs and interests as well as the position of the Czech Republic. This coordination, promotion of the interests and needs of the Czech Republic, as well as the timely translation of international regulations into the national environment will eventually help increase competitiveness of the Czech Republic. It is essential for the Czech Republic to actively participate in and contribute to these processes, as the regulations currently under development will have a major impact on further development in the area. The essence of the measure is to ensure the active participation of the Czech Republic in the development of relevant UNECE regulations, to participate in the meetings of the relevant working groups, to coordinate any expert input or prepare analyses, and eventually to ensure reflection of the international legislation developed into the legislation of the Czech Republic. It is precisely for these purposes of keeping the Czech Republic competitive in the topic of autonomous mobility that it is necessary to establish an expert group within the Ministry of Transport. The subject of the group activity is to monitor and establish cooperation with newly emerging forums, groups and commissions, to systematically participate in addressing the identified problems by preparing documents, elaborating project plans and creating strategic papers, to coordinate the activities and needs of industries, research and possibly other ministries with regard to the currently addressed international topics, to monitor relevant regulations, regulations and documents and to evaluate their impact on the Czech Republic with appropriate</p>

implementation steps, introduction of measures or establishment of principles. The Expert Group of the Ministry of Transport will be linked to the existing Autonomous Driving Working Group. It is important to create a stable core of the working group that will regularly work on specific topics that are as a rule identified within the UNECE, then prioritise them from the perspective of the Czech Republic and propose design of actions.

Responsible and Co-Responsible Bodies

Ministry of Transport
 Ministry of Foreign Affairs (co-responsibility)
 Ministry of Industry and Trade (co-responsibility)

Achievement Indicator

- 1) Setting up a system of coordination and representation of the Czech Republic in WP.1 and WP.29 of UNECE, and possibly forming another group (Expert Group of the Ministry of Transport)
- 2) Transposition of the relevant UNECE regulations into Czech legislation to enable the operation of automated vehicles on roads (see the measure “Creation of a suitable favourable legal environment for development of autonomous mobility in the Czech Republic”)

Completion Date

2024 and subsequently on an ongoing basis

Expected Sources of Funding

State budget

Measure Designation
4.2.3 Active participation in the development of the relevant EU legislation
Description of Current Status
<p>The EU intervenes in the field of autonomous mobility through directly applicable regulations or directives, which set out the objective to be achieved through national legislation. Important regulations or directives in the field of autonomous mobility include the following:</p> <ol style="list-style-type: none"> 1. Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the 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 No 595/2009 and repealing Directive 2007/46/EC 2. Regulation (EC) No 661/2009 of the European Parliament and of the Council of 13 July 2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended for such vehicles 3. Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 concerning type-approval requirements for the general safety and protection of vehicle occupants and vulnerable road users of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles (“the General Safety Regulation”) 4. Commission Implementing Regulation (EU) 2022/1426 laying down implementing rules for Regulation (EU) 2019/2144 of the European Parliament and of the Council as regards uniform procedures and technical specifications for the type-approval of automated driving systems (ADS) for fully automated vehicles 5. Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport, as amended, including the European Commission’s delegated implementing regulations <p>The General Safety Regulation came into force in July 2022 and introduced a series of mandatory advanced driver assistance systems to improve road safety. It also set out a legal framework for the approval of fully automated vehicles in the EU. It has also initiated commencement of preparation of delegated acts under the General Safety Regulation building on the UNECE approved regulations in the field of cybersecurity and event data recorder (EDR) to enable operation of vehicles of automation level SAE3 on motorways and of automation level SAE4 on designated routes.</p>
Measure Purpose
<p>The purpose of the measure is to set up conditions for the Czech Republic to be able to actively contribute to the preparation, negotiation and approval of relevant EU legislation related to autonomous mobility development.</p>

This specifically includes active participation in the Working Group on Motor Vehicles (MVMG, No. E01295) and its subgroups focused on automated vehicles, i.e. currently the Automated and Connected Vehicles (ACV) subgroup. Another objective is to keep the needs up to date, especially with regard to the development of technology and the need to ensure security of the systems in operation.

Measure Description

A fully functional involvement of the Czech Republic requires setting up an appropriate coordination mechanism at the national level to serve for a most effective sharing of the necessary information, for definition of the needs and interests and formulation of the position of the Czech Republic. This coordination, promotion of the interests and needs of the Czech Republic, as well as timely reflections of international regulations in the national environment will in effect help increase competitiveness of the Czech Republic. The essence of the measure is to actively participate in the development of the relevant EU regulations or directives and regulations issued by UNECE and to ensure their incorporation into Czech legislation where needed.

Responsible and Co-Responsible Bodies

Ministry of Transport
 Ministry of Foreign Affairs (co-responsibility)

Achievement Indicator

- 1) Setting up a system of coordination and representation of the Czech Republic in EU working groups
- 2) Implementation of EU regulations or transposition of EU directives

Completion Date

Ongoing activity

Expected Sources of Funding

State budget

Measure Designation

4.2.4 Assessment and reflection on the ethical issues associated with autonomous mobility under Czech Republic conditions

Description of Current Status

The field of autonomous mobility and automated vehicles raises a number of ethical issues. The area of ethics is thus one of the topics that needs to be continuously addressed. In April 2020, the Ministry of Transport therefore established the Ethics Committee for the assessment of issues related to the operation of automated vehicles in the Czech Republic (hereinafter referred to as the “Ethics Committee”), whose members were nominated with the aim to ensure its interdisciplinary nature. They include experts in artificial intelligence, transportation systems, philosophy, ethics and law. The Czech Republic has thus become one of the few countries addressing the developing automation in transport in a comprehensive way, including opts setting in the ethical context.

The main areas addressed by the Ethics Committee include in particular human-machine interaction, the issue of setting the behaviour of artificial intelligence, the availability and security of shared data and the question of responsibility for the software and infrastructure used in the Czech Republic. The Ethics Committee draws on existing conclusions of the European Commission’s Expert Group (i.e. the Report on the Ethics of Data-Connected and Automated Vehicles published in September 2020), ethics committees of other countries and expert studies. In its first year of operation, its aim was to produce a report containing a set of recommendations that should be reflected upon in the context of autonomous mobility introduction into operation and in the preparations for its development. The report, which focused on three areas, i.e. ethical principles, legal aspects and technical aspects, was published in 2021 and contains 21 recommendations.

The follow-up activities of the Ethics Committee, based on the topics defined in its recommendations, emphasise putting automated vehicles in operation in harmony with the principles of ethics. In 2023, recommendations and impact assessments of possible regulation of autonomous driving in terms of ethics and other related areas were also formulated.

Measure Purpose

The aim is to take measures, based on the recommendations already available, that will lead to the development of autonomous mobility and seamless integration of automated vehicles into everyday life. These measures specifically include those related to integration of automated vehicles into the global mobility scheme, promotion of safety and environmental performance, and monitoring of compliance with ethical principles in general and ethics of data use in particular. The measures taken in the legal area will focus on creating a legal framework respecting the principles of ethics, privacy and data protection, fair allocation of responsibility and the pursuit of the legal system of strict liability. The purpose of the measure is to develop further sub-topics important from the perspective of the ethical dimension of automated vehicle development and to generally promote the topic of ethics and its principles in the context of testing, trial operation and putting of automated vehicles into operation in cooperation with the Ethics Committee and other entities.

Measure Description
<p>Following the recommendations issued in 2021 and further progress in the area of the legal framework preparation (see Measure 4.2.1.), an ethical-legal analysis has already been prepared. Now individual steps are going to be taken in the area of education and awareness-raising on the ethical principles to be implemented in the course of automated vehicle development at all levels. In addition, the Ethics Committee will address the issue of ethically correct data collection, security and use in the coming years.</p>
Responsible and Co-Responsible Bodies
<p>Ministry of Transport</p>
Achievement Indicator
<ol style="list-style-type: none"> 1) Preparation of a schedule for implementation of the recommendations 2) Analysis on the topic of data collection and security 3) Implementation of information and awareness-raising activities in connection with the promotion of ethical principles
Completion Date
<ol style="list-style-type: none"> 1) 2024 2) 2025 3) ongoing
Expected Sources of Funding
<p>State budget</p>

4.3. Research, Development and Innovation

Support for research, development and innovation is integral to further development of autonomous mobility and is not only a key enabler of the pace of technological progress, but also an essential prerequisite for furthering knowledge of the societal impact and adoption of autonomous mobility. The potential of research institutions, universities and the private sector is also being developed, especially through projects and research and innovation activities, which, among other things, represents a prerequisite for the transformation of the industry into a more modern form with an even higher added value of its outputs and strengthening of the long-term focus on one of its traditionally very strong areas, i.e. the development and production of motor vehicles. The state must assure targeted development of support for research, development and innovation in this dynamic area, which is further closely related to progressive topics such as artificial intelligence offering a great potential for the Czech Republic.

The technical aspects and socio-economic impacts are the subject of continuing research that needs to be supported, like pilot testing and trial operations. To achieve full operability and functionality of the breakthrough technologies, their further refinement and innovations are needed. These allow, among other things, integration into the existing transport systems and further development of the related services. In addition to support at the national level through direct instruments and indirect support, it is necessary to develop the potential and expand the possibilities of international cooperation and involvement of Czech entities in projects and consortia. This will lead to acquisition of key competences, addressing transnational issues and strengthening competitiveness of the Czech Republic by, among other things, development of the potential of the participants in the cooperation in the dynamic areas that are related to autonomous mobility. The international aspect is a crucial element in autonomous mobility research, development and innovation. There are a number of reasons for this, among the most important being the need to exchange existing experience and knowledge through contacts and joint projects with established research institutes, to expand the potential for cooperation with the private sector, and to define new research topics with an international overlap in order to push the boundaries of current knowledge (so-called frontier research) and to conduct research at the cutting edge level.

It is also essential to further develop and support research into road accidents, which is a prerequisite for improving road safety and thus reducing the overall number of accidents and mitigating their consequences. Solutions leading to these positive trends can be systemic or technical. The development of autonomous mobility, or vehicle functionality, is also closely linked to the field of artificial intelligence – machine learning and deep learning or big data processing and evaluation. In the context of activities aimed at strengthening the field of artificial intelligence, it is necessary to specifically link the cross-cutting theme to the field of automated vehicles. Artificial intelligence is an important element that creates smart and interconnected solutions that can automate decision-making processes and predict prescribed real-world traffic scenarios. At the same time, in addition to the development of AI elements, it is necessary to anticipate possible systemic risks associated with its application.

This section includes the following areas related to the preparation and implementation of measures in the field of research, development and innovation, active support for research, development and innovation in the field of autonomous mobility, development of international cooperation and creation of favourable conditions for the involvement of Czech entities in international projects and consortia, research into traffic accidents in the field of autonomous mobility, and support for the development of artificial intelligence in the field of autonomous mobility.

Measure Designation

4.3.1 Active support for research, development and innovation in the field of autonomous mobility

Description of Current Status

Research, development and innovation in autonomous mobility is currently funded by several main sources. At the national level, the main instrument for support of research, development and innovation is represented by the Programme for the Support of Applied Research, Experimental Development and Innovation in Transport, i.e. the Transport 2020+ Programme, which was approved by the Government of the Czech Republic in 2019 for the years 2020–2026 with a total allocation of CZK 1,950 million. Projects in the field of autonomous mobility are supported under one of the four specific objectives of the programme formulated as “Automation, digitalisation, navigation and satellite systems”. In 2023, implementation of the follow-up programme to support applied transport research “TRANSPORT 2030”, approved by the Government on 7 September 2022, was launched. The programme period was set from 1 January 2023 to 31 December 2030, with the first public call for tenders in research, experimental development and innovation announced in 2023, and the actual support starting in 2024. One of its three specific objectives, “Automation, digitalisation and technologically advanced transport”, focuses on autonomous mobility and can fund such projects and thus support actionable results. Other programmes of the Technology Agency of the Czech Republic, programmes of other providers (Ministry of Industry and Trade, Ministry of Education, Youth and Sports) or operational programmes, i.e. funds from the European Structural and Investment Funds, can also be used for support.

Measure Purpose

The purpose of the measure is to stabilise the support for research, development and innovation at the national level and provide sufficiently effective instruments to support research, development and innovation in this area enabling research organisations and companies to implement projects or innovate products and processes. In addition to support programmes, it is equally important to support incubation of ideas and projects at an early stage or to strengthen building of platforms for sharing good practice in development, testing or piloting, including activities leading to interconnections of related or similar research projects. The allocation of resources to research and development of technologies, their validation and subsequent application in real-life operation and in the wider context of autonomous mobility must take into account the highly interdisciplinary nature of the whole issue. Thus, support for complex and interdisciplinary research projects is recommended.

Measure Description

The measure will be fulfilled by expanding the possibilities of support for research and innovation topics related to autonomous mobility, through appropriate definition of support frameworks and implementation of particular steps, i.e. announcing calls, supporting the creation of project consortia, strengthening cooperation between the research and the private sector and supporting increased participation of Czech entities in international projects and programmes. In addition, new objectives will be defined or other related modifications to an existing grant call will be made to focus directly on the development of autonomous mobility.

These will include topics related to strategies for the development and implementation of autonomous mobility from the technical perspective, the legal environment and social and user acceptance angles. Sub-topics will include support for virtual and physical testing, development and validation of sensors, control and decision-making algorithms, support for software tools and devices for mapping and localisation of autonomous vehicles, as well as the area of spatial and information data acquired for the need of advanced vehicle control or management systems or the theme of system architecture of autonomous vehicles. The implementation of research, development and innovation projects will also help fulfil the research needs and measures defined in the Plan and thus contribute to their achievement. The subject of support for research, development and innovation must comprise activities with the common outcome of establishment of the Czech Republic's position as one of the leading countries in the development and testing of automated vehicles. At the same time, these activities will enable the Czech industry, strong in the area of transport technology, to focus on this area with a high level of underlying know-how and added value already available. As the development of autonomous mobility depends on progress in research, development and innovation, the continued promotion of these areas is a prerequisite for its further progress.

Responsible and Co-Responsible Bodies

Ministry of Transport
 Technology Agency of the Czech Republic (co-responsibility)
 Ministry of Industry and Trade (co-responsibility)
 Ministry of Education, Youth and Sports (co-responsibility)

Achievement Indicator

- 1) Total amount of funding for projects developing autonomous mobility (total min. CZK 100,000,000) in individual support instruments over the Plan duration;
- 2) Total number of supported projects (min. 10 over the Plan duration)

Completion Date

Ongoing activity

Expected Sources of Funding

State budget, European Structural and Investment Funds

Measure Designation

4.3.2 Development of international cooperation and creation of favourable conditions for the involvement of Czech entities in international projects and consortia

Description of Current Status

For the Czech Republic, current and future involvement in international cooperation represents an opportunity to comprehensively address the topic of autonomous mobility and to keep pace with this rapidly developing area. The most important Community programme is the EU Framework Programme for Research and Innovation, Horizon Europe, which will be implemented between 2021 and 2027 and through which international projects can be realised. Involvement of Czech entities in international consortia implementing projects under the EU Framework Programmes for Research and Innovation or other schemes is generally rather low and the potential represented by international cooperation should be used more effectively. The Ministry of Transport is responsible for the transport part of Pillar II of Horizon Europe, i.e. a representative of the Czech Ministry of Transport is a delegate in Cluster V, Climate, Energy and Mobility, and at the same time further activities are being developed to strengthen cooperation with neighbouring countries (primarily Germany) with the aim of defining common themes and projects.

Measure Purpose

The purpose of the measure is development of cross-border and European cooperation, which represents an opportunity to connect international teams as efficiently as possible and, through the creation of joint projects, to address a range of common topics – the development of automated vehicles, V2X communication, the development of 5G corridors, human-machine interfaces, data processing, sharing and security, legal issues or socio-economic topics. In cooperation on research projects, the aim is to use the relevant support instruments, namely the EU Framework Programmes for Research and Innovation or other instruments (e.g. in the field of digitalisation). The aim is to participate in and influence the orientation of the Horizon Europe Partnership for Data Connected, Cooperative, Automated and Autonomous Mobility (CCAM Partnership), including topics for calls, etc. Furthermore, the measure aims at development of bilateral and multilateral cooperation with European partners, including the implementation of support activities leading to the cooperation establishment. Another objective is to further develop cooperation with non-European countries such as the USA, Israel, South Korea, Japan, Singapore and Australia, which offers opportunities, especially in view of the significant progress in the development of autonomous mobility.

Measure Description
<p>Within the framework of the measure, an entire ecosystem of support for international cooperation in research, development and innovation will be developed, from the definition of objectives and topics, through the representation of the Czech Republic in the bodies where these issues are addressed, i.e. in the programme committees of the EU Framework Programmes for Research and Innovation, to subsequent activities related to creating increased awareness of the possibilities offered by the use of the Prague Technology Centre, preparation of project plans and consortia, as well as acquisition of knowledge from projects and its application in practice. It is also necessary to promote priorities and thus ensure sufficient financial resources for international cooperation at national and European level. Specifically, through active participation in the preparation of support programmes (e.g. under the responsibility of the Technology Agency of the Czech Republic or the Czech Ministry of Education, Youth and Sports) and specific calls for proposals, funds will be channelled more effectively into the field of autonomous mobility. Events will be organised and activities will be performed for networking and project consortia formation.</p>
Responsible and Co-Responsible Bodies
<p>Ministry of Transport Ministry of Education, Youth and Sports (co-responsibility) Technology Agency of the Czech Republic (co-responsibility) Ministry of Industry and Trade (co-responsibility) Ministry of Regional Development (co-responsibility)</p>
Achievement Indicator
<p>1) Involvement in the CCAM European Partnership 2) Number of implemented international projects with Czech participation (min. 10)</p>
Completion Date
<p>Ongoing activity</p>
Expected Sources of Funding
<p>State budget, EU Community programmes</p>

Measure Designation

4.3.3 Research on traffic accidents in the field of autonomous mobility

Description of Current Status

Overall, the increasing technical and technological requirements in transport are the reason for the search for new tools and more efficient use of the existing ones. The databases, records and registers currently contain information that can be used for further development in the relevant transport area. However, for example accident records, offence records, injury records, vehicle registers, weather databases and possibly other databases and registers are not yet ready for the future needs of autonomous mobility. Current practices and tools in accident investigation do not sufficiently capture new accident conditions and facts related to automated vehicles. The methodology implemented within the existing National Traffic Accident Research (CzIDAS), the “Methodology for in-depth analysis of traffic accidents”, will have to be adapted for the analysis of accidents involving automated vehicles. The required procedural change is conditioned by the definition and implementation of the prerequisites necessary for the examination and investigation of traffic accidents (e.g. what data can be obtained from automated vehicles and registers, how this data can be obtained, what will be needed to obtain and process the data, etc.).

Measure Purpose

The purpose of the measure is to modify the procedures for in-depth analysis of traffic accidents involving automated vehicles and the procedures for the investigation of traffic accidents by the Police of the Czech Republic. The secondary objective is to obtain relevant data for the development of new technologies to improve road safety and for preventive education purposes.

Measure Description

The measure will include an analysis of the needs for supplementing the Methodology for in-depth analysis of traffic accidents in connection with the introduction of automated vehicle operation. Specifically, the data needed for the analysis of accidents involving automated vehicles will be identified, as well as the ways of obtaining them (with a primary focus on the needs of the Police of the Czech Republic or other authorised entities. A modification of the methodological procedures for in-depth analysis of traffic accidents involving automated vehicles and a proposal of methodological procedures for the investigation of traffic accidents by the Police of the Czech Republic will be defined. It is necessary to identify specific data for the analysis of accidents involving automated vehicles, the manner and extent of access to this data and the rules for handling it.

Responsible and Co-Responsible Bodies
Ministry of Transport Ministry of the Interior (co-responsibility) CDV (co-responsibility) Police of the Czech Republic (co-responsibility)
Achievement Indicator
<ol style="list-style-type: none"> 1) Analysis of the conditions necessary for investigation of traffic accidents involving automated vehicles, including acquisition of the relevant data (method, type of data) 2) Summary of recommendations and modifications for investigation of traffic accidents involving autonomous vehicles by the Police of the Czech Republic 3) Draft recommendations for further use of data from investigations of accidents involving automated vehicles (purpose, authorised subjects, access to and rules of handling the data)
Completion Date
<ol style="list-style-type: none"> 1) 2026 2) 2027 3) 2027
Expected Sources of Funding
State budget

Measure Designation
4.3.4 Support for artificial intelligence development in the field of autonomous mobility
Description of Current Status
The year 2019 saw the release of the National Strategy for Artificial Intelligence in the Czech Republic, which sets the goal of making the Czech Republic one of the most developed countries in the field of artificial intelligence and related research activities. The development of the whole area also includes building innovation hubs or supporting start-ups in the highly specialised field of artificial intelligence, or machine learning, deep learning and high volume data analysis. Support for research and innovation projects should therefore be appropriately complemented by support provided to start-up companies, which subsequently create a knowledge and technical base and also generally help in the development of the potential of the Czech Republic.
Measure Purpose
The purpose of the measure is to support research and development in the field of artificial intelligence by identifying specific topics related to autonomous mobility and then preparing appropriate financial instruments through which it will be further developed. At the same time, the topic will be emphasised within the setting of the environment and the whole ecosystem, including support mechanisms such as innovation hubs or start-up incubators. Autonomous mobility will be promoted as a topic in support schemes and activities for the development of artificial intelligence, including incubation support programmes (e.g. AI Hub) or involvement in the European Digital Innovation Hubs (EDIH) network.
Measure Description
Given the long-term nature of the measure, a consultation process will be initiated involving all stakeholders in order to prioritise specific areas and subsequently develop them through the appropriate set-up of support instruments identified as most effective. This process will involve collaboration between representatives of the public, the private and the academic sphere. National and European tools will be analysed and an overview will be prepared to facilitate their use for the autonomous mobility development needs. Furthermore, in cooperation with CzechInvest and other co-organisers, activities will be developed to support the area in the form of direct and indirect support for companies and the innovation environment. The measure includes definition of further sub-objectives in line with current needs in the long term.
Responsible and Co-Responsible Bodies
Ministry of Transport Ministry of Industry and Trade (co-responsibility) Office of the Government of the Czech Republic – Office of the Deputy Prime Minister for Digitalisation (co-responsibility), CzechInvest (co-responsibility)

Achievement Indicator
<ul style="list-style-type: none"> 1) Identification of specific areas within which it is appropriate to support the development of artificial intelligence in the Czech Republic in relation to autonomous mobility 2) Inclusion of autonomous mobility in national AI activities, including funding for specific activities and projects
Completion Date
<ul style="list-style-type: none"> 1) 2024 2) Ongoing
Expected Sources of Funding
State budget, European Structural and Investment Funds, EU Community programmes

4.4. Education and Awareness

Integration of new technologies into operation and their use includes promotion of education and awareness-raising activities. The aim of the measures is to ensure sufficient awareness of the whole area and to develop activities that will deepen it and help implement autonomous driving technology in order to maximise its benefits, especially in the area of safety. This section covers the following areas relating to the design and implementation of awareness-raising and education measures:

- Update on driver training and education
- Raising awareness and disseminating information on the behaviour, benefits and risks of automated vehicles
- Development of activities and projects leading to a systematic review of education at all levels of the education system and the National Qualifications Framework

Measure Designation
4.4.1 Update on driver training and education
Description of Current Status
<p>Driver training and education is an important aspect that must always respond to developments in the transport sector. Vehicles with driver assistance systems are commonly available on the market, but new systems are coming with new functionalities that present both relief and challenges for drivers in terms of use. Effective ways to overcome these challenges include personal experience of driving these vehicles and sufficient awareness of these systems. Driving lessons at driving schools are usually heavily influenced by the topics covered in the tests to be passed to obtain the driver's licence. The response to the change in the tests may be introduction of the given theme in the lesson curriculum. Currently, automated driving features are not included in the tests, but as the technology advances, it is expected that such features should be added to them over time.</p>
Measure Purpose
<p>The purpose of the measure is to increase knowledge and awareness of automated driving systems by updating the tests for the final examinations at driving schools. By this, the training will be updated by including the relevant topics in the driving school curricula. Driver follow-up training will be reinforced by instruction aimed at understanding technologies in the field of automated in-vehicle systems by the drivers.</p>
Measure Description
<p>The questions in the tests for the driver's licence should practically test the knowledge of the automated vehicle system control. Drivers should also be aware of the conditions under which the systems work properly and what other actions they need to take before starting the journey. Theoretical skills include correctly distinguishing between possible LED indicators, warning signals and warnings. The most suitable is the actual driving demonstration or the actual experience with a vehicle equipped with various ADAS systems within the driving courses. The instruction may include access to a vehicle simulator equipped with ADAS and other future systems, which should be accompanied by an explanation. It is appropriate to apply discussion methods in driving schools in order to involve all participants, e.g. a debate on the benefits of automated systems.</p>
Responsible and Co-Responsible Bodies
<p>Ministry of Transport</p>

Achievement Indicator
Continuous content updating of the final test in driving schools
Completion Date
Ongoing activity
Expected Sources of Funding
State budget

Measure Designation

4.4.2 Raising awareness and improving understanding of the behaviour, benefits and potential risks of automated vehicles

Description of Current Status

Public awareness of the benefits and risks of autonomous mobility is an essential part of its acceptance and subsequent use. According to the survey conducted within the PAVAMTIO project, less than five percent of the Czech population are well acquainted with autonomous mobility as a whole, while more than a quarter of respondents do not know anything about it. However, knowledge of the subject is crucial for successful development of autonomous mobility, as it is then possible to make informed decisions about the possible use of this technology and to be able to use it effectively, in the right way and, above all, safely. Related to this is, for example, the support of traffic psychology research projects focused on the area of driver/automated vehicle interaction, in particular on the issue of the transition between the different phases of driving and the associated taking over and handing over of control, as well as research on possible non-driving activities after handing over control to the vehicle. Advanced automation in transport brings with it a certain natural level of resistance and rejection from potential users. One of the ongoing activities is the operation of the information web portal autonomne.cz, supported by the Ministry of Transport, which focuses on education in the field of autonomous mobility. The aim of autonomne.cz is to inform the public about topics and news in the field of autonomous mobility and about the activities that the Czech Republic is implementing in this area. Awareness raising is supported by the work of the Ethics Committee, addressing, among other things, the topics of human-machine interaction, the behaviour of artificial intelligence in the event of accidents, the availability and safety of shared data and the issue of liability, which are frequently discussed among the general public.

Measure Purpose

The aim of the measure is to raise public awareness of autonomous mobility, to explain the benefits and potential risks, and to help promote acceptance of the technology and its correct and safe use. A campaign towards this goal should be positive but absolutely objective. In particular, sensitive topics such as the behaviour of automated vehicles in traffic accidents or their interactions with other road users need to be explained well, and further work is needed to address imbalances in awareness between genders, age groups or other groups of people by properly targeted campaigns. The continuation of awareness-raising activities on the autonomne.cz platform and further focusing the activities of the Ethics Committee are also part of the objectives of the measure.

Measure Description

In addition to raising general awareness of automated vehicles and their systems, an awareness campaign in all types of mass media must address the general area of traffic safety and the safety of all road users. It is necessary to inform the public that the state has not neglected the safety of the entire system and does not leave it to its own development but, on the contrary, creates conditions for the deployment of technology that is proven and safe.

The information campaign should explain the benefits and risks of autonomous mobility to the public in an objective way, based on credible sources and research results. Pilot and demonstration projects and real demonstrations of the technology in practice can also help raise awareness and bring the topic closer to the public. At the same time, the information website autonomne.cz will be further developed and updated through the CDV to spread awareness of the issues of autonomous mobility.

Responsible and Co-Responsible Bodies

Ministry of Transport
CDV (co-responsibility)

Achievement Indicator

- 1) Implementation and evaluation of information campaigns (min. 1 per year)
- 2) Continuous updating of the autonomne.cz website and other awareness-raising activities

Completion Date

Ongoing activity

Expected Sources of Funding

State budget

Measure Designation

4.4.3 Development of activities and projects leading to a systematic review of education at all levels of the education system and the National Qualifications Framework

Description of Current Status

The current educational system is not ready for the coming trend of autonomous mobility, which incorporates technologies related to a number of disciplines. In practice, it is not possible to have a number of specialists handling only a small part of the work on a vehicle, except in very specialised and expensive sectors such as air transport. With further development of advanced vehicle assistance and safety systems, it is therefore expected that there will be a demand for experts capable of developing, manufacturing, operating and repairing or assessing the functionality of these devices (e.g. radar and laser sensors, high-frequency cameras, advanced communication devices, etc.). The intention of the Czech Republic should be to prepare a sufficiently qualified workforce that will be competitive on the labour market and will also meet the demanding requirements of positions that are now virtually only emerging. Autonomous mobility also cuts across a number of related fields, such as information technology, where the potential use of knowledge and skills in autonomous mobility should also be targeted.

Measure Purpose

Following an analysis of the need for new qualification, the purpose of the measure will be to define them in the National Qualifications System (defined by Act No.179/2006 Coll., on the Verification and Recognition of the Results of Further Education, as amended, which sets out the qualification and assessment standard for professional qualifications, the material and technical background for the examination and the professional competence of the examiner). The training system should reflect the needs related to the development of automated vehicles. Appropriate support for related fields will strengthen competitiveness of the graduates, reflect the demand of employers and may also increase the attractiveness of the Czech Republic as a country with a skilled workforce. With the trend towards autonomous mobility, it is also necessary to prepare for the expected changes in the employment structure. The state should therefore seek cooperation in the preparation of retraining programmes and projects that reflect the changes in the areas concerned.

Measure Description

It is necessary to continuously analyse qualifications within the National Qualifications Framework and, if necessary, propose their modification or extension. The state must be prepared for the development of autonomous mobility and the impact on education and skills needs and create the best possible conditions for development of the relevant professions and sectors. At the same time, it is necessary to implement measures related to changes in the structure of the labour market, i.e. to participate in the creation of retraining courses and other forms of education, e.g. for professional drivers and other professions. At the same time, it will be necessary to train professions to install, operate and maintain intelligent systems or products. One of the necessary actions will be to respond by changing or expanding the existing teaching and learning fields across the educational system and the associated adjustment of the National Qualifications Framework.

Responsible and Co-Responsible Bodies
Ministry of Transport Ministry of Education, Youth and Sports Ministry of Industry and Trade (co-responsibility)
Achievement Indicator
1) Analysis of the need for new skills 2) Application of new qualifications in the National Qualifications Framework (if confirmed by the analysis)
Completion Date
1) by 2025 2) by 2026
Expected Sources of Funding
State budget

5. Conclusion

The vision of the Czech Republic is to become an innovation leader. The fulfilment of this vision is only possible if the Czech Republic focuses on the progress and strengthening of industries based on the development of new technologies and modern services with high added value. Autonomous mobility represents a major innovation not only in the automotive industry but also in the society as a whole. This trend involves many levels, i.e. transport, technical, R&D and innovation, legislative, educational, ethical, etc. Autonomous mobility offers a great development potential not only for the vehicle and component manufacturers themselves, but also for cities and regions, research and educational institutions and others who may get involved at all these levels. The Czech Republic will therefore continue to strive to become a Central European leader in research, development and testing of automated vehicles and to develop other related areas in order to strengthen competitiveness and create products and services with high added value.

In addition to the benefits of autonomous mobility, there are also several challenges and obstacles that can complicate or slow down its development. It is therefore essential to focus on identifying and addressing them. The development of autonomous mobility requires the creation of a clear and stable legal framework, not least in order to increase potential users' confidence. Autonomous mobility is widely discussed not only from the point of view of the technology, but also, very intensively, with regard to societal benefits and safety implications. Cybersecurity and the protection of user data and personal information are areas with a significant impact on the society's overall trust in new transport technologies. Sharing of only the minimum amount of information by the user and justifiable data collection, together with subsequent data protection, constitute the necessary paradigm on the basis of which sufficiently stable user trust can be built. Without it, the success of autonomous mobility deployment is at risk, as acceptance by the society is its key component. This also includes the general perception of safety related to the acceptance of autonomous mobility, or minimisation of the drivers' concerns and fears of other road users, for whom a sufficient level of awareness is essential.

When introducing this technology, one cannot ignore the fact that there is an undoubted psychological component to the attitude towards, or willingness to accept, new technologies such as autonomous vehicles. The society's concern about the potential impact on employment in the transport sector is another potential barrier to successful implementation. Awareness and education play an important role in this context, as does the need for retraining for those directly at risk of losing their jobs as a result of the introduction of the autonomous systems. Prevention of any potential negative employment impacts is an essential part of the process. This includes financing the construction and development of transport infrastructure suitable for the operation of automated vehicles, including electronic communication networks and spatial data infrastructure.

