Action Plan Digital Transformation in Mobility (AP-DTM)

A strategy for the implementation of the Mobility Master Plan 2030 in the digital sector

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Vienna, 2022

Implementation of the Mobility Master Plan 2030

The "Mobility Master Plan 2030", the new strategic climate protection framework for the transport sector, was published in July 2021 and provides the strategic framework for transport policy in the coming years. During the preparation of the Mobility Master Plan 2030, it was already evident that the dynamic developments in the field of digital technologies and services can make a significant contribution to achieving the climate targets 2040. Therefore, the preparation of a separate Action Plan for digital transformation in the mobility sector was announced at the ITS Austria Conference 2021. This is now available and the plan describes the measures that are to be implemented in the coming years in the area of digitalisation of mobility.

The demands on shaping the digital transformation were not simply limited to the use of new technologies but above on establishing suitable general organisational conditions in order to be able to implement existing and new technologies efficiently and sustainably for the users of the mobility system. Based on a common understanding of the public sector and related actors (e.g. operators) regarding the potential and goals of digital transformation in the mobility sector, the Action Plan specifies the targets and measures in the area of digital transformation in mobility. In this context, digitalisation is not seen as an end in itself, but has an important contribution to making decarbonisation in the mobility system possible, in addition to the social benefits. There is a very great need for measures to achieve the climate policy objectives, especially in the area of road transport and its interfaces with other modes of transport. That is why this Action Plan focuses on road transport and its interfaces with other modes of transport, where, if used in a targeted manner, digitalisation forms an important basis for increasing efficiency and reducing CO_2.

This Action Plan is just one of the future implementation strategies that will be drawn up on the basis of the Mobility Master Plan 2030 and that support a holistic view of the national mobility system.

Contents

1
The current situation

Digital transformation is evident in all sectors, especially in mobility.

Digitalisation has been a part of developments relating to mobility in Austria for more than 25 years. However, this not only concerns components on the vehicle side – from drive and control systems to information systems – but there has also been increased investment in digital elements on the infrastructure side – from traffic management systems to travel information systems. As a result of the improvement in information and communication technologies, during the last two decades, the users of the mobility system have recognised the direct significance of such digital services. They expect to be able to access the information and services they need at any time and in any place. The resulting "connected society", which includes all actors in both the public and private sectors as well as each individual user, needs new rules of cooperation and collaboration within the context of digital transformation in order to be able to generate the greatest possible added value for all participants in the mobility system.

This cooperation is indispensable, especially in the mobility sector. Instead of an isolated view and a detached offer of a specific form of mobility (from the car to public and rail-bound transport to newly emerging sharing offers), it is important to strive for an increased cooperation of all stakeholders. This should also be done in order to achieve the Austrian climate goals of the Mobility Master Plan 2030, whereby freedom from discrimination and fair competition must be maintained. A mobility system that integrates all modes of transport must also take into account the strengthening of Austria as a business location. In addition, this is subject to the existing European and national framework conditions, which will now be briefly described.

The European "Green Deal" of 2019 creates the fundamental European regulatory framework to counteract climate change also in the mobility sector. The focus is on the transformation to a sustainable, resource-efficient and competitive economy which by 2050 no longer emits any net greenhouse gases, dissociates its growth from the use of resources and finds social support. The transport sector accounts for a quarter of greenhouse gas emissions in the EU. In order to achieve the goal of climate neutrality in the mobility sector, the European Commission presented its **Sustainable and Smart Mobility Strategy** in 2020. Among other things, it includes measures for the transformation to a form of mobility that is cooperative, connected and automated, as well as for the strengthening of multimodal mobility.

In line with the **European Data Strategy** of 2020, the EU should take the lead in a data-driven society. A common European mobility data space is an important step in order to make Europe a pioneer in the development of an intelligent transport system that includes connected vehicles and other modes of transport.

In the mobility sector, the networking of various public and private platforms is also an objective, as is the availability and use of data based on the FAIR principles (findable, accessible, interoperable and reusable) for efficient, ecological and customer-friendly public transport systems. Mobility-relevant data should be made available via national access points.

With the **IVS-Aktionsplan** from 2011, the first specific steps were taken in Austria towards a stronger focus on the user perspective. A "Vision Zero" has been defined in the three target categories of safety, environment and efficiency. In order to achieve this vision, high-value services based on high quality data in the field of traffic information, traffic management and the roll-out of new mobility concepts are needed. These should be offered as comprehensively as possible. Through the design and implementation of individual measures, an important contribution has been made to a safer, more efficient and more environmentally friendly transport system.

With the publication of the **Aktionspaket Automatisierte Mobilität (2019–2022)** [Austrian Action Programme on Automated Mobility (2019–2022)], actions were defined for transparent information as well as for strengthening the active role of the public sector and the associated social dialogue in the area of automation in mobility. Using this as a basis, this action package aims at a safe test phase and regular operation. This should enable learning and the gathering of further experience in the field through interdisciplinary research and other projects. In this way, it forms an important basis for cooperative, connected and automated mobility (CCAM).

The Austrian **RTI Strategy Mobility 2040 addresses "innovation within and from of Austria for a climate-neutral mobility system in Europe by 2040"**. Innovations in technology, society and organisation should help to make mobility climate-neutral and also facilitate access to sustainable mobility services in rural areas. In addition to the development of environmentally compatible vehicle technologies, digitalisation plays an important role in making infrastructure, mobility and logistics services efficient and climate-friendly. In the **RTI Agenda Mobility 2026,** RTI topics and actions are specified for the next five years (for example, RTI funding, experimental spaces, strategic alliances and partnerships for implementation, European and international positions).

2
Aims and principles of the Action Plan

Digitalisation in the field of mobility systems is advancing rapidly, and here the BMK is taking on a formative role in order to use the digital transformation to create and operate a climate-friendly and sustainable mobility system.

Digitalisation, if used in a targeted manner, can contribute to the achievement of climate policy objectives, as it creates the required data basis for the operation of the mobility infrastructure as well as for the provision of mobility services.

In the digital transformation of mobility, the BMK is relying **on close cooperation with other public stakeholders** from the federal provinces, cities and municipalities as well as public and private operators of mobility services and infrastructures. This close cooperation involving stakeholders from industry and business forms the basis for the design of climate-friendly and sustainable mobility services and also serves to strengthen the innovative strength of Austria as a business location.

For the BMK, **monitoring the environmental impacts of the measures taken** is a central component in ensuring climate-neutral mobility. The data required for this must be made accessible and available so that the effect of the use of climate-friendly mobility options as an alternative to individual motorised mobility can be measured and analysed in an evidence-based manner. Here, the BMK will also actively advocate that corresponding analysis tools are operated in a non-discriminatory manner and that the analysis results are made publicly available.

The **announcement and mediation of alternative climate-neutral mobility services and forms of mobility**, which can offer alternatives to the use of one's own vehicle, are performed by digital services. This requires affordable and high-quality mobility services in the cities and regions. Even though information services are already available throughout Austria, the BMK supports their further development in order to increase the quality of real-time information for all modes of transport and to enable the integration of all mobility services including transfer points.

Integrated traffic management will provide a significant basis for sustainable mobility in the future. Today, traffic management focuses on individual traffic modes. Here, the BMK advocates further development towards integrated traffic management across operators and modes by creating the necessary legal framework and promoting the further development of existing systems. It should be possible to exploit the full potential of digitalisation by building integrated traffic management on an evidence-based steering logic.

With the support of the BMK, public stakeholders should initiate the **creation and establishment of pioneer regions for data and service governance** as national and international learning environments. The full potential that arises from the use of digital technologies and services should be analysed here, while taking into account fundamental rights such as data protection, in order to be able to apply the possibilities of digitalisation to the mobility sector. The data and service governance required for this must be anchored in the public sector across all levels and must constitute a central component in all its decisions, strategies, processes, measures and structures.

Image: stock.adobe.com - Miguel Lifestyle

3 Competences and existing activities

In the field of digitalisation in the context of mobility, Austria can draw on numerous initiatives and activities that form the basis for a successful transformation in the mobility sector.

For the mobility sector, digital principles have already been created, maintained and further developed. These form the basis for high-quality user services. In 2009, the foundation was laid for the development and maintenance of the corresponding databases in transport, which until then had only existed in a very heterogeneous manner and had been maintained by different agencies according to different standards and different points of view. The **Graph Integration Platform (GIP;** gip.gv.at**)** is the Austrian multimodal traffic reference system. In addition to the Austrian provinces, ÖBB-Infrastruktur AG, ASFINAG and the then BMVIT (Ministry for Transport) were also involved in the development of it. By using a jointly developed data standard, it was possible to exchange data on the individual transport networks, to combine them and to keep them available for the whole of Austria. Since January 2016, the Austrian Institute for Transport Data Infrastructure (Österreichisches Institut für Verkehrsdaten, abbr. ÖVDAT) has been responsible for the operation of the GIP, whereby the database is constantly kept up to date by means of e-government tools.

Figure: GIP – Traffic Reference System Austria – Source: ÖVDAT
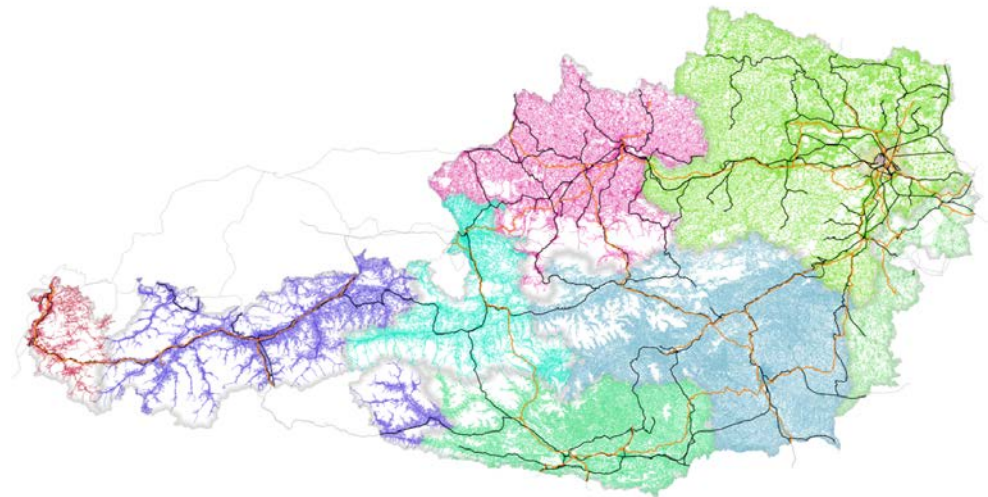
The development of the digital transport network GIP also offered the possibility of blending this data with existing geodata of the provinces and, as a result, of offering an OGD map base for Austria updated in the cycle of the GIP. The map material of **basemap.at** can be retrieved as an OGD database and also contains orthophotos and other cartographic services in addition to the actual map. This is also available as a "vector-tile cache".

However, the GIP is not only a basis for e-government; it also serves as the platform for Austria-wide multimodal traffic information. The development of this service began in 2009. A uniform multimodal transport information system for the whole of Austria was created based on the regional pilot scheme "AnachB" (from A to B). This can also be seen as a "proof of concept". Since summer 2015, **Verkehrsauskunft Österreich (VAO;** verkehrsauskunft.at**)** has been run as a separate company, which is now supported by ÖBB, ASFINAG, Mobilitätsverbünden Österreich, ÖAMTC, ÖVDAT and BMK. VAO is available to everyone in Austria free of charge via the travel information services of its

shareholders. It also replaced the previous travel information systems for several other stakeholders and led to an improvement in route information. Due to its intermodal conception and the possibility of providing information on park-and-ride routes, VAO also became the basis of the commuter calculator of the Federal Ministry of Finance.
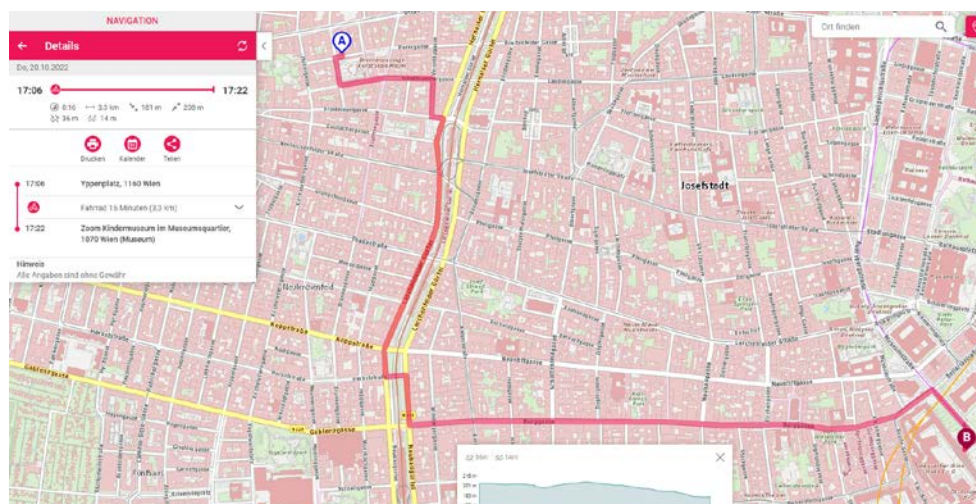
Figure: Austria-wide travel information service – Source: VAO

A significant contribution to the improvement of traffic management lies in enhanced inter-operator traffic management and, as a result, to the reduction of undesirable effects in the area of traffic safety, efficiency and, above all, the environment. A first step in this direction was to improve inter-operator traffic information, especially real-time information. This was implemented in the project **Echtzeit Verkehrsinformation Straße (EVIS;** evis.gv.at**)**. Within EVIS, the Austrian provinces, ASFINAG, the Federal Ministry of the Interior and also the ÖAMTC have begun to create the necessary information base by including and expanding roadside sensor technology, but also by using floating car data (FCD). In addition, the establishment of a message network and the use of previously unused data, such as planned road works, have enhanced the quality of monitoring the traffic situation in Austria. Currently, the results of the project are being transferred to the operational phase. This improved information will be available to the general public via the VAO services on the one hand but also to the operators in their daily traffic management on the other.

Attention should also be drawn to Austria's leading role in **cooperative systems (C-ITS).** Based on the national C-ITS strategy and the results of the Austrian "Testfeld Telematik" – a living lab for C-ITS – technical specifications for infrastructure to vehicle communication have developed that form an important basis for the Europe-wide roll-out of C-ITS services within the framework of European C-Roads Platform. Today, in addition to ASFINAG, the first cities such as Graz, Salzburg and Vienna have begun rolling out C-ITS services. Through these services, drivers receive safety-relevant warnings directly in their C-ITS equipped vehicles.

Since 2016, tests with **automated vehicles** on roads with public transport have been providing valuable insights into the current state of the art and are allowing the public to learn at the same time. The underlying Ordinance on Automated Driving **(AutomatFahrV)** defines the scope of possibilities for testing as well as regular operation and ensures the active involvement of the public administration. Projects in interdisciplinary research and development within the scope of test environments and lead projects provide valuable experience and highlight potentials as well as the need for additional action in the area of automated vehicles with a specific focus on people and society, technology and the overall system, as well as infrastructure and simulation. The establishment of endowed professorships also contributes to the development of scientific competence. In addition to technology development, such aspects as integration into the existing and future mobility systems were analysed and social involvement was addressed. The Austrian test environments of ALP.Lab (alp-lab.at) and Digitrans (digitrans.expert) also enable the development, validation and testing of new approaches and technologies. They are making a valuable contribution to the further development of cooperative, connected and automated mobility.

Since 2016, the **Austrian national access point (mobilitaetsdaten.gv.at)** has been providing access to the data categories specified by the European ITS regulations. The datasets that has been made available is constantly being expanded, so that even datasets are also made available that are not covered by the European legislation. The existing datasets are checked by the **national ITS Contact Point (ivs-stelle.at)** for compliance with the European specifications on the provision of data and services. A central component here is the use of uniform quality measurement methods and quality criteria for mobility-related data and services.

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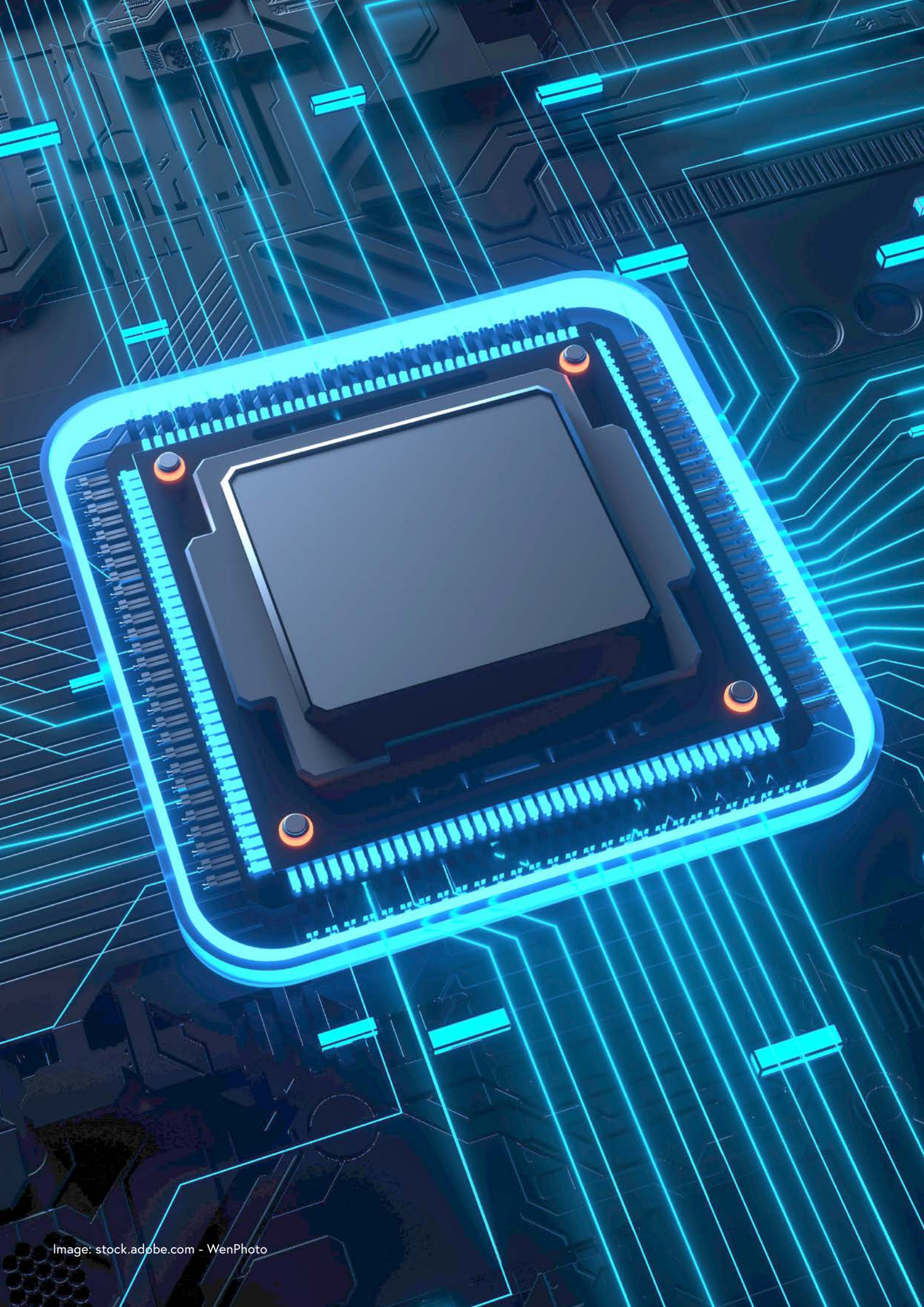
4
The digital transformation in mobility

In the context of mobility, digital transformation includes multimodal, connected and automated mobility, which encompasses software and hardware as well as data management and system integration skills, especially in the field of artificial intelligence (AI).

The design of the digital transformation must deal with more than just the pure digital mapping of the existing infrastructure. In addition to the provision and use of static information, it also deals primarily with dynamic components, for example in the form of sensor technology for the collection of real-time information, but also the full use of communication technologies. Data from the physical, digital as well as institutional infrastructure, such as legal requirements, are collected, made accessible, linked and used and, at the same time, compliance with data protection is observed. In this way, the digital transformation makes it possible to derive new insights from the traffic situation and to develop new control mechanisms for traffic management, fleet management and transport services. It also creates the necessary database for evaluating the effects of new measures and their contribution to the transition in mobility.

It is expected that the digital transformation will also lead to a change in the behaviour of society in the mobility sector, resulting in a strengthening of sustainable mobility services. In addition to measuring the contribution in the areas of emission reduction and resource consumption, digitalisation also makes it possible to determine the positive effects on increasing the capacity, productivity and quality of ecomobility.

4.1 Core elements of shaping the digital transformation in mobility

The full utilisation of the potentials of the digital transformation in mobility for the achievement of the sustainability goals will only be successful if there is increased co-operation between all public and private stakeholders. In this context, the public sector is called upon to create an environment that ensures non-discrimination in the use of and access to existing and new digital data and services in mobility, while, at the same time, allowing for competition and in doing so, promoting innovation.

In this context, it is important to develop and implement a jointly supported understanding of cooperation on basic digital services in the field of mobility. This basic digital service consists of the core elements of **data and interfaces, integrated traffic management, integrated mobility services** as well as the interaction between these areas. In the context of basic digital services, access to the above-mentioned areas, as the core elements of shaping digital transformation in mobility, should be ensured in a distributed system based on clearly defined general conditions accepted by all stakeholders.

Ensuring access to **data and interfaces** relevant to mobility in the sense of a basic digital service is seen as a core element. This includes data for location search, route planning, route calculation, real-time information, tariff information or availability of services for booking, payment or ticketing.

The **integrated traffic management system** must also make use of these data and interfaces across all modes. It is also important to connect the management solutions for individual transport modes with each other in order to be able to contribute to

transport management that is climate and environmentally friendly with a prioritisation of ecomobility. It will only be possible to create a resilient mobility system and provide optimal support for new mobility solutions, such as in the area of cooperative, connected and automated mobility or in the area of sharing, by connecting the management solutions of the individual transport modes.

Figure: The core elements of shaping the digital transformation in mobility
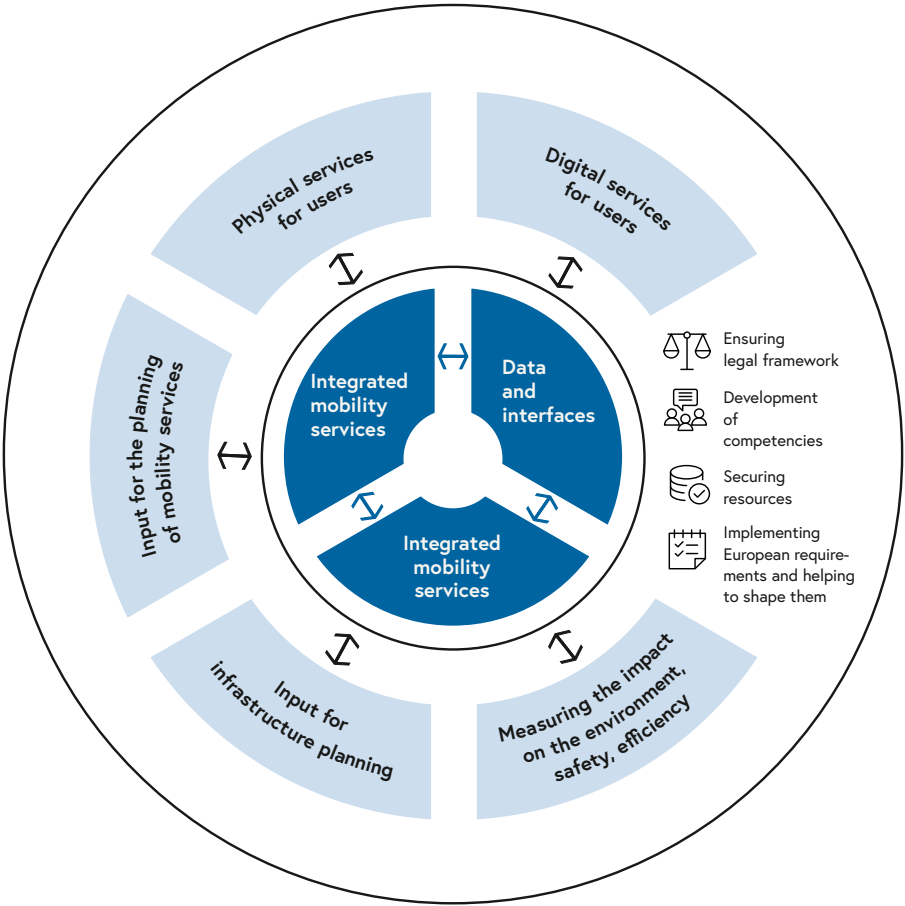
Integrated mobility services must link information from integrated traffic management across all modes with other data and interfaces in such a way as to ensure that users have simple and comprehensive access to the existing and available services of the mobility system. In addition to information, this mobility service should also include booking, payment and ticketing functions. Furthermore, feedback from road users will also be used to adapt traffic control measures and subsequently improve them. Integrated mobility services will offer an attractive alternative to the private car and contribute to a more resilient and robust overall mobility system by enabling emerging mobility services, such as in the area of sharing, to be easily and quickly offered in an integrative manner.

All three of these core elements for the design of the digital transformation in mobility have a clear focus on users. First of all, information in the area of physical services, such as departure monitors, variable message signs or information on parking availability, will be improved or simply made available. In addition, digital services will be able to provide users with better access to existing mobility services, as well as to new ones. This will increase awareness of the use of environmentally friendly mobility services and make access to some environmentally friendly mobility services possible at all.

The second group of users of these defined core elements consists of the public sector and mobility service providers. The feedback of data regarding the use of mobility services makes it possible to improve the planning of both mobility services and the required infrastructural measures. The Austrian mobility system can be better adapted to the requirements of the users. The provision of targeted mobility services can also be a decisive factor in achieving climate targets. The data generated can also be used in appropriate models and simulations to provide more evidence about the environmental impact, but also about efficiency and safety in the Austrian mobility system.

However, the basic digital service as a core element in shaping the digital transformation in mobility will only succeed if the corresponding regulatory framework is also created or the existing framework is adapted to reflect the new perception. To achieve this, the potential of the legal framework must be fully exploited and, where necessary, further developed to ensure legal safeguards for the environmentally friendly and sustainable development of the mobility system. In this context, it is important not only to implement European regulation but also to play an active role in shaping them.

The digital transformation in mobility will also require additional resources. In addition to financial resources, the human resources required must be made available. Skills in the technological developments underlying the digital transformation must be developed and made available in both the public and private sectors. In addition to the pure development of expertise, the transfer of knowledge between the individual stakeholders in the mobility system is a decisive factor in ensuring the competitiveness of Austria as a business location in the medium to long term.

4.2 Enabling sustainable mobility – structuring the legal framework for digital transformation

The potential of the existing national and European legal framework must be fully exploited for the digital transformation in mobility. The first step here is to validate whether relevant legislation provides the required support for the implementation of digitalisation projects. Often, the specific legal wording of existing and emerging legislation hinders digital transformation in mobility. This is why urgent action is needed to ensure that the national legal system has legal provisions that support digital transformation in mobility. "Digital checks" should be used to ensure that the existing and future legal provisions are suitable for the digital transformation.

It is also important to put digital elements on an equal footing with physical elements by adapting the legal framework where this is necessary and possible. In addition to technical challenges, the main issue here is the potentially legally binding transformation and translation of existing legal provisions, including the correct processing and interpretation of information both by human road users and, in the future, by vehicles with automated functions. This applies, for example, to the digital announcement of traffic regulations, which currently has no legal basis. However, the potential of digital publication of traffic regulations is seen as a central element for automation in the mobility system and for the establishment of systems of dynamic traffic regulation, for example in the area of environmental zones.

In addition to the "digital check", a legal basis must also be created for testing and experimenting with new mobility solutions, for example in the area of cooperative, connected, automated mobility (CCAM). Cross-modal experimental environments for testing, experimentation and validation offer the opportunity to develop such regulations through proactive regulatory learning, enabling legislators to gain better regulatory knowledge and in identifying the best means of regulating innovations based on real-world evidence.

Furthermore, to pilot and test operations, the share of advanced, automated driving assistance systems is also continuously increasing in regular operation. Their legal application requires the adaptation of the current legal framework at the national level as well as the increased involvement of international bodies. Automated driving functions can be improved through cooperative support by the infrastructure. To make this possible, it is necessary to create a legal framework for their operation and to establish the legal-technical framework for the implementation of "Infrastructure Support for Automated Driving" via C-ITS, i.e. for infrastructure-based connected automated driving. In the future, stakeholders from research, industry, business and public authorities must increasingly take automation perspectives into account so that new mobility concepts can develop their full potential.

In general, transparent and comprehensible legal requirements for the collection, provision, access and use of mobility-relevant data are a prerequisite for their efficient use and the design of sustainable and environmentally friendly mobility system.

4.3 Optimal use of mobility data

Data is a cornerstone of digital transformation in the mobility sector. The term mobility data encompasses both data generated by the stakeholders and users of the mobility system as well as data from other sectors, such as weather or emissions data, which have an influence on the supply and operation of the mobility system. This means that mobility data forms the basis for optimisation processes and influences the demand behaviour of users. For this reason, structured access to and use of the continuously growing amounts of data is a key to further innovations in the field of digitalisation as

well as the digital services offered. The public sector has a central role to play in this "data-driven" mobility in order to ensure non-discriminatory, sustainable and affordable access to the mobility system for all users in the future.

This requires a clear commitment on the part of the public sector to provide and operate a digital infrastructure that ensures access, operation and maintenance of the physical infrastructure, including the physical mobility services. Through this digital infrastructure, sovereign tasks can be carried out more efficiently and cost-effectively, whereby the evidence on the status and use of the mobility system, which must be continuously reviewed, represents a central driving force.

In this context, the public sector must make use of new digital tools in order to be able to carry out its own actions in a structured and coordinated manner, both nationally and internationally. This is particularly important in order to reduce the information gap that currently exists between the private and public sectors. In this context, it is important to closely examine new possibilities offered by the European legal framework, such as the EU Data Act and the EU Data Governance Act, and to use the potentials of this legal framework to ease access to private data sources in Austria. In addition to cooperation between public stakeholders, it is also important to develop suitable cooperation mechanisms with private actors in order to exchange data under clearly defined conditions and to be able to use it both for control and for planning purposes.

National expertise in the field of mobility data is available and should be further expanded and qualitatively improved. Here, data collection and data storage are not an end in itself, but rather identified use cases define the required data, including their contents and qualities. In line with the use case requirements, data relevant to mobility in Austria should be collected as comprehensively as possible in a predefined quality and according to FAIR principles and made available in accordance with FRAND principles (fair, reasonable and non-discriminatory) in order to be able to operate a safe, efficient, climate-neutral and inclusive multimodal mobility system.

The graph integration platform GIP is an important pillar in this context that needs to be further expanded and jointly operated in cooperation with the public stakeholders. National access to mobility data should also be expanded and, in addition to the data specified by the European Union, also enable mobility-relevant datasets from research and pilot projects to be made accessible.

In any case, data protection must be considered as a central specification in all data-driven developments. This applies in particular to personal data, which should be kept pseudonymised wherever possible. In those areas where clear personalisation is necessary, such as in the area of travel booking, the highest data protection mechanisms should be applied and these should also be further expanded in accordance with national and international developments. In this context, the principle of data sovereignty of the data subject must be given the utmost attention.

Those involved the collection and provision of mobility-relevant data are in any case the use cases, that contribute to achieving the objectives of the Mobility Master Plan 2023, are the main drivers for the collection and provision of mobility relevant data.

In this context, the definition of the goals and specifications for the data itself, but also on the roles and responsibilities of the data owners with regard to data collection, provision and processing are of central importance. In order to be able to implement these processes efficiently and sustainably, the data standards and data formats to be used must also be defined.

4.4 Making transport fit for the future – integrated traffic management

A significant element of integrated traffic management is the consolidation of data from different sources of varying quality in order to obtain an accurate overview of the traffic situation. The basis of efficient traffic management lies in monitoring and analysing the effects of the traffic management measures that have been implemented. In this context, it is important to consider both short-term impacts of implemented traffic management measures, such as the forecast of immediate effects, as well as long-term effects with regard to the fundamental implementation of traffic management measures. Impact evaluation can also provide significant support for the definition of joint traffic management measures across networks and modes. On the one hand, the integrated view in the area of traffic management that encompasses all modes of transport represents an important basis for achieving the climate goals and, on the other hand, it can optimally provide support for new sustainable mobility solutions, such as in the area of cooperative, connected and automated mobility or in the area of sharing. The first step should be to focus on corridors and sensitive regions, even if a well-functioning traffic management system is envisaged for the whole of Austria.

In order to use the full potential of integrated traffic management, the control logics of the operators of the individual traffic modes must be aligned to the extent that cross-network and cross-modal traffic management is made possible. This integrated traffic management initially includes the cooperation of individual mode operators in the event of an incident, but will subsequently involve new challenges with regard to mobility support for travellers in sensitive regions. Travellers should be able to use the multimodal mobility system by means of integrated traffic management solutions in an energy-saving way and do so in compliance with climate policy objectives. In this context, mobility services offered by private providers will also be included in traffic management.

In addition, traffic management solutions must be increasingly demand-oriented. Besides the development of technological components that also enable smaller cities and regions to integrate these into their traffic management solutions, the needs of the users of the mobility system must be met. This includes, for example, the increased interconnection with energy management topics, such as energy provision and the selection of energy-saving routes.

In addition, measures must be taken to increase or optimise the occupancy rates and utilisation of individual vehicles in both passenger and freight transport.

4.5 Making sustainable mobility services more attractive to use – enabling integrated mobility services

In order to be able to provide the best possible service to the users of the mobility system, all providers of mobility services should cooperate to such an extent that access to the existing mobility services is provided in the form of integrated mobility services. This requires cooperation among all stakeholders involved in mobility in order to provide access to data (e.g. timetable, locations, parking spaces) and services (e.g. routing results, booking and ticketing interfaces, capacity utilisation) in a distributed system. This access will allow users to receive a better service in accordance with their needs because information and services from all mobility service providers can be integrated into their services.

In order to achieve this, a mutual understanding of the cooperation is required which can include both public and private stakeholders. The development of integrated mobility services is based on existing cooperation platforms (e.g. Verkehrsauskunft Österreich, carsharing.link), whereby individual organisations as well as thematic integrators or (regional) associations of various stakeholders can be involved. In any case, under the aspect of non-discrimination, small providers of services in the mobility sector (e.g. sharing and taxi providers in rural areas) should also be given the opportunity to be integrated into end-user travel information services. The most important basis for this is the creation of and compliance with uniform technical and organisational regulations that are accepted by all participants. Under no circumstances should the integration of mobility services lead to an unfair advantage for individual stakeholders.

The technical focus needs to be on harmonised technical interface specifications, along which access to data and services is made possible. The purpose of this harmonisation is to ensure that multimodal services for the end-user can be provided without much additional technical effort. Since the individual national stakeholders have a wide variety of technical systems in operation, it is necessary to define the interfaces between the individual systems. In doing so, profiles need to be developed for data and service interfaces that can be used nationally.

Since the individual mobility services usually address the same overall pool of users, it is important to ensure open and standardised access for these users. This provision of services includes the entire chain of travel information services, from reservation and booking to ticketing. However, in the event of disruptions (in the sense of securing connections), the provision of optimal services must be achieved without the necessity for collecting further personal data.

Data from both mobility service providers and end-user service providers must be made available under non-discriminatory, transparent and fair conditions, especially for planning purposes of the public sector (e.g. for demand modelling), but also for optimal service provision to users in the context of traffic management.

Optimal information and service for users going to and at transfer points is another important basis for the provision of new mobility services, especially in the area of sharing. This is also applicable in the context of traffic management where, for example, as the result of a disruption in road traffic, diversion to other modes of mobility becomes necessary and users must be able to use the transfer point efficiently without experiencing any problems and be able to do so even without any local knowledge. In addition to the physical design of these transfer nodes, the digital infrastructure must also meet these specifications.

In general, digital services will only be accepted by users if the services provided represent an added value for them. That is why it is important that services are implemented after they have been tested to make sure that they function, are easy to use and are up to date.

4.6 Accompanying measures

The digital transformation supports access to an environmentally friendly and sustainable Austrian mobility system through its digital services. Nevertheless, an accompanying marketing and Public relations strategy is required in order to be able to convey to the users information about the existing mobility service as well as the objectives of digitalisation. In addition to the creation and improvement of digital tools, these must be known, accepted and used by the users in order to make a positive contribution to achieving the climate goals in the mobility sector.

In this context, the awareness and use of digital services needs to be regularly analysed and this, together with a dialogue with different groups of users should contribute to designing new mobility services which are in line with the expectations of different target groups. Furthermore, formats need to be created and used to highlight the added value and take the concerns of data subjects seriously about the provision of their own mobility data, as this data is a central basis for demand-oriented mobility information.

In addition to informing and involving users in digital services, it is also important to provide or create training and further education formats for public and private stakeholders in the field of mobility. Such training programmes must ensure that the public sector is fit for the digital transformation in mobility and, as a result, they will be able to play an active role in shaping it.
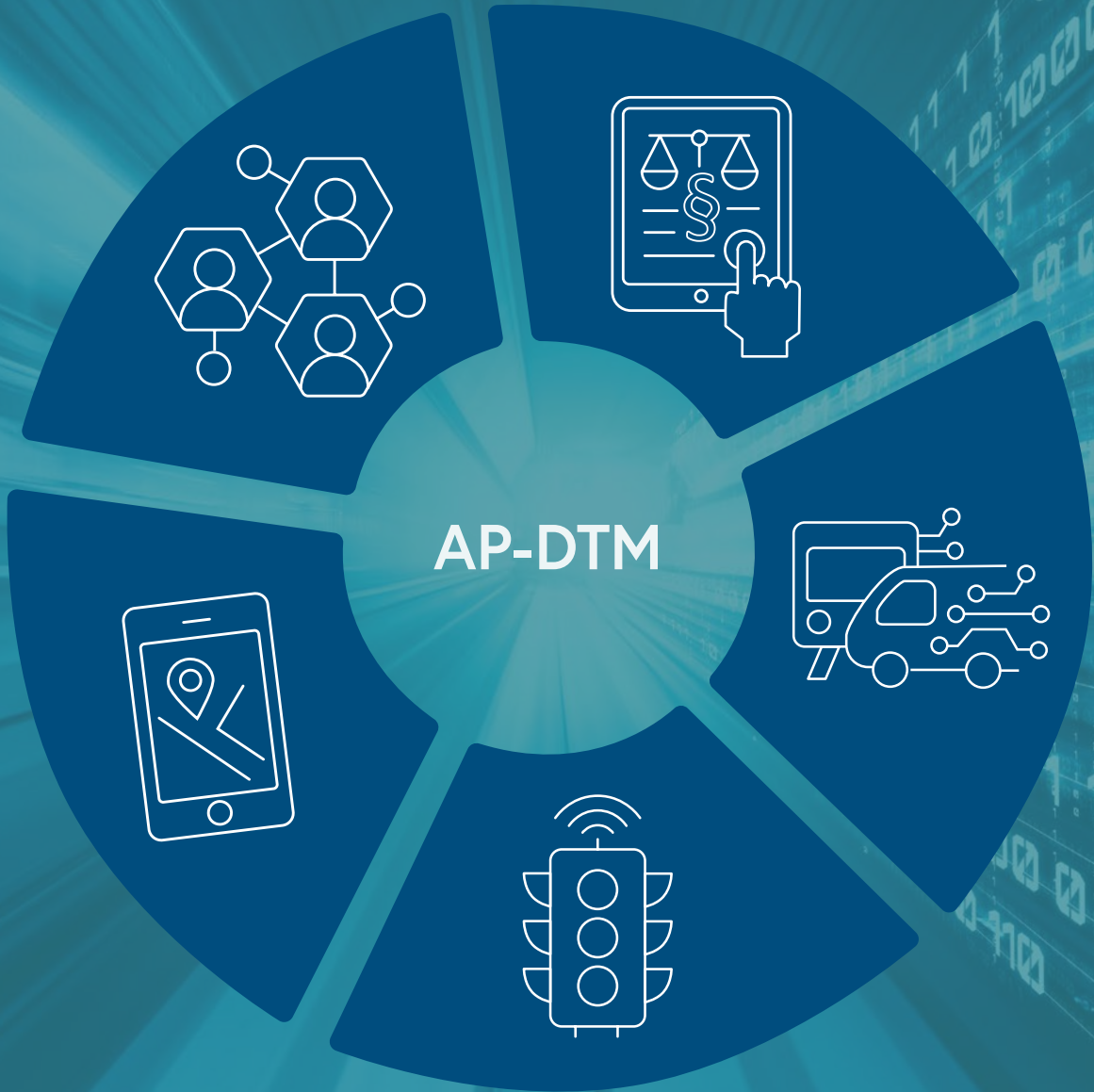
AP-DTM

5
Measures of the AP-DTM

The first set of measures for shaping the digital transformation in mobility focuses on the actions to be launched in the short term, i.e. in the next one to three years. Further measures can be defined and launched at a later stage on the basis of these initial actions.

A common understanding of the relevant topics to be addressed was developed based on a broad stakeholder process organised within the framework of the ITS Austria platform, which included the actions to be taken and the expected effects. In this process, important contributions, especially from public stakeholders, were collected and coordinated. These contributions are also reflected in the present Action Plan Digital Transformation in Mobility and the first set of measures.

This first defined set of measures will be implemented through a mix of different intervention mechanisms. The implementation of the measures will use the entire available mix of instruments – from research activities and studies to piloting and implementation. Since the design of the digital transformation in mobility requires a new understanding of cooperation between all participants, one focus will be on the development of new methodologies for cooperation mechanisms. In this context, the ITS Austria Platform will play an important role in accompanying, monitoring and deepening the implementation, as the goals of this Action Plan can only be achieved in cooperation.

In order to be able to implement measures, elements such as budgets, responsibilities, detailed timetables and – where necessary for organisations – impact assessments will have to be agreed in partnership with the stakeholders involved in the implementation. It will be essential that all stakeholders involved are appropriately engaged and that they define and contribute their own goals, strategies and implementation priorities. After three years, an evaluation according to their own goals of the impact of Action Plan Digital Transformation in Mobility is planned. Based on the results and recommendations of the evaluation, further measures will be defined and implemented.

5.1 Enabling sustainable mobility – structuring the legal framework for digital transformation

The measures depicted here contribute to the objectives of the AP-DTM presented in chapter 4.2.

Measure 1: Digitising and applying legal provisions

Within the scope of this measure it is analysed how legal provisions can be digitally recorded, provided and published. In particular, an analysis will be made of the legal framework needed to potentially enable legally binding digital publications of traffic regulations throughout Austria for the road users involved, including the correct interpretation of these publications. In this context, the requirements for the legal framework will be defined so that the existing regulations can be surveyed and the specifications for the digital processes from the request to the digital provision and publication can be drafted. The legal basis for cooperation beyond individual networks and modes should also be analysed in view of the implementation of integrated traffic management. Examples, in this context, are the integration of the rolling road in route planning or display information.

Information on speed and access restrictions as well as environmental zones or exit bans on the motorways is already partly available in digital form. However, such information is only collected and displayed to a very limited extent by operators of traffic information services, especially on the private side. Digital traffic guidance and routing information that is currently provided by infrastructure managers is only regarded as a non-binding recommendation and is not adopted by information service providers and, as a result, it is not followed by users. The analysis will include establishing which legal possibilities exist to ensure that traffic guidance and routing measures have to be displayed by operators of traffic information services. This will also include finding out whether de-tour instructions can be made mandatory, and if so, how. With the establishment of the digital publication of traffic regulations and the definition of the associated processes and technical implementation solutions, drivers of vehicles as well as vehicles with automated driving functions can be addressed directly and bindingly in the future. Legally binding regulations in digital form provide support for the implementation of traffic management strategies and create new opportunities for integrated traffic management. In this way, they also contribute to the goal of shifting traffic to public transport.

In order to undertake the necessary steps for the implementation of the digital publication of legal provisions and, as a result, to promote their mandatory use, a common understanding of the potentials and use cases must be created in cooperation with the stakeholders. The preparation of a study that analyses the legal issues in connection with digital publication is the starting point. This study includes a legal and organisational concept of the stages and qualities as well as the period of time needed to record

traffic relevant provisions or prescribed actions in digital form that can be published in a legally binding manner and taking into account barrier-free access.

Responsible for implementation
- BMK

Most important cooperation partners
- ASFINAG
- AustriaTech
- Provinces of Austria
- Research facilities and infrastructures
- Interest groups
- ÖBB
- Cities and communities
- Standardisation bodies

Fundamentals and instruments
- The procedure is based on existing national regulations in traffic law, such as the StVO and the KFG as well as the EisbG and EisbBBV, but also takes into account the B-VG, the BGBLG and international and EU legal requirements such as the IVS-G, which forms the Austrian transposition of the ITS Directive.
- Stakeholder process involving responsible authorities and operators.

The following steps will be needed: the analysis and concept development for the gradual implementation of the Austria-wide harmonised collection, provision and legally secure transmission of the digital legally binding announcement; the legally secure data transmission to the road users being addressed, to vehicles (incl. rail vehicles) as well as to automated vehicles and the correct interpretation and processing of the information at the respective addressees.

In addition, the aim is to have pilot use cases of the concept of the legal organisation. The aim of the pilot projects is the continuous digitalisation of the present regulations, including the collection and mapping of the recording, processing and publication processes.

Implementation period
- From 2023: Inventory of traffic-related announcements currently in existence
- From 2023: Creation of a concept/guideline for the creation of a legal framework for the digital publication of legal provisions
- From 2025: Implementation of pilot project

Active contribution to the digital transformation in mobility
The measure reflects the committed ambition to actively shape the mobility system in the context of the legal framework and represents a significant basis for the digital transformation of the mobility system towards a sustainable overall system. Legally binding traffic regulations that are precise and digitally available form a significant basis for access or environmental zone management, speed bans, information and routing systems, for example, as well as for traffic management which is especially important for the shift to public transport.

Measure 2: Enabling the testing of innovative mobility solutions

This measure aims at enabling the testing of innovative mobility solutions that have a direct impact on public space. For this, it is necessary to create the framework conditions for innovative mobility solutions, especially for vehicles (incl. rail vehicles) that have a high degree of automation up to unattended operation.

Innovative technical solutions usually pose considerable challenges for the public sector when it comes to testing innovative mobility solutions and creating the necessary framework conditions. With this measure, it should be possible to analyse trends and possible mobility solutions and proactively implement framework conditions for their test operation or start the process for discussion (e.g. parcel delivery robots, automated trains). The associated specifications will need to be collected and subsequently integrated in tests, e.g. with the help of mobility laboratories and test environments.

The implementation of this measure is divided into the following parts:

1. Establishing new evaluation and assessment methods: New evaluation and assessment methods will be developed with the help of digital solutions (e.g. for scenario-based testing, virtual testing, testing in test environments). The development of a catalogue of national test scenarios as well as Austria-specific specifications should help to standardise future evaluations and decision-making with regard to the safety of automated vehicles. This also helps to facilitate an evaluation of general vehicle safety, functional safety as well as safety in specific scenarios and exceptional situations.

2. Creating legal certainty for testing: The ordinance for automated driving – the AutomatFahrV – should be further developed and regularly take into consideration demand surveys, current trends and European and international specifications (e.g. UNECE WP 29). In the process, access to tests is to be harmonised and the associated process optimised for all parties involved.

3. Enabling fully automated and remotely operated driving: A concept should be developed for testing and practical trials of fully automated vehicles also on infrastructures in regular operation (e.g. motorways, railway lines) without safety drivers inside the vehicle and with remote operation. The associated technical,

legal and social issues are to be identified and included. In addition, it is important to promote research activities in this area in order to obtain an improved decision-making basis for the further development of the legal framework.

4. Monitoring of testing: Creation of a concept for monitoring the testing of innovative mobility solutions and their implementation.

Responsible for implementation
*   BMK

Most important cooperation partners
*   ASFINAG
*   AustriaTech
*   Provinces of Austria
*   Research facilities and infrastructures
*   Industry and the economy
*   Interest groups
*   ÖBB
*   Cities and communities

Fundamentals and instruments
*   The identification of potential innovative mobility solutions and analysis of the existing or required legal framework.
*   Adaptation of existing legal materials (AutomatFahrV, KFG, StVO, EisbG, EisbBBV) and creation of new decision-making bases, evaluation and monitoring methods.
*   Enabling the testing of innovative forms of mobility under real conditions, also on infrastructures in regular operation, under regulatory supervision and guaranteeing appropriate protective measures.
*   Evaluation of existing and future partnerships (e.g. D-A-CH cooperation, trilateral cooperation) and cooperation with partner countries.

Implementation period
*   By 2023: Completion of a concept for the realisation of the legal framework for teleoperated and fully automated driving Based on this: Enabling the testing of fully automated vehicles without operators inside the vehicle
*   From 2023: Regular dialogue and coordination with the provinces for the realisation of cross-border testing opportunities
*   From 2023: Continuation of the experimental areas/RTI funding for the further development of multimodal test environments as well as the development of the necessary technologies

> **Active contributions to digital transformation in mobility**
>
> The measure represents a significant basis for the digital transformation of the mobility system towards a sustainable overall system. It will contribute to testing the application of innovative driving assistance and automation systems in order to create the basis for their safe use in regular operation. It will also enable the development of new vehicle concepts that ensure a more efficient and sustainable approach to passenger and freight mobility.

Measure 3: Legally enabling and monitoring the regular operation of cooperative, connected and automated vehicles

The measure aims to further develop C-ITS services to support automated driving functions and also to permit them legally. To achieve this, C-ITS infrastructure services (I2V) and next generation use cases (Day 1.5 and Day 2 services) that support automated driving functions must be defined, profiled and implemented. Information on short-term or long-term changes, e.g. road topology due to road works, or information on road users and/or objects, information on installed road signs and traffic lights are used as sources and transmitted directly into the vehicle as a basis for the digital announcement of legal regulations.

On the other hand, the regular operation of modern driving assistance systems, as well as highly and fully automated vehicles in defined areas of application (operational design domains) needs to be facilitated. To achieve this, the conditions for the legal framework of driving assistance systems produced in series (e.g. automatic lane change assistant, motorway assistant) must be created in order to enable their legal use at the national level. The necessary framework conditions for the regular operation of vehicles with a high degree of automation (highly and fully automated – SAE levels 3 and 4) must be identified and their application in regular operation in Austria must be made possible quickly in order to fulfil the European and international requirements. Special attention must be paid to the fleet operation of highly automated vehicles, as this is considered to have great potential for reducing the burden on the environment. This is especially true if the vehicles are used for both passenger and freight transport.

In addition, the interaction of the different traffic modes must be taken into account (e.g. railway crossing) and the regular operation of cooperative, connected and automated rail vehicles must also be applied to the rail system as described above. In particular, the legal validity of the signalling on the vehicle has to be clarified, as well as the legal prerequisites and responsibilities for controlling access of the vehicle.

Responsible for implementation
- BMK

Most important cooperation partners
- ASFINAG
- AustriaTech
- Provinces of Austria
- Research facilities and infrastructures
- Industry and the economy
- Interest groups
- ÖBB
- Cities and communities

Fundamentals and instruments
- For the next generation C-ITS services (Day 1.5 and Day 2 services), the respective current C-Roads specifications that have been agreed with the industry will be used as a basis. This ensures the coordinated deployment of such future services throughout the provinces.
- Regular identification and monitoring of relevant driver assistance systems which, due to their legalisation at European and international level (UNECE), require an amendment of the AutomatFahrV as well as other specialist legislation (e.g. StVO).
- Identification of the necessary adaptations of technical legislation (e.g. KFG, StVO, Transport Guidelines Act) for the implementation of fleet operation with automated vehicles for public transport.
- Identification of the necessary adaptations of technical legislation (e.g. EisbG, EisbBBV) to enable legally compliant ETCS/ATO implementations and the necessary localisation systems.
- An independent testing organisation is to be set up to evaluate the safety of automated vehicles in regular operation as well as the periodic assessment required. This will serve as a basis for decision-making by the public authorities for both test and regular operation.

Implementation period
- 2022: Start of the measure, ongoing monitoring of activities at international level (e.g. UNECE WP 29)
- From 2023: Amendment of the AutomatFahrV to enable the legal use of driver assistance systems, such as the automatic lane change assistant
- From 2023: Examination of the adaptation of legal material required for railways
- From 2023: Creation of a concept for the establishment of an independent testing organisation to ensure the evaluation of the safety of automated vehicles in regular operation

> **Active contribution to the digital transformation in mobility**
> The measure represents a significant basis for digital transformation in the mobility system in the area of safe and legal national use of driver assistance systems in individual and public transport and their correct application. This should counteract the incorrect use of driver assistance systems and contribute to increasing road safety but also lead to a more efficient driving style and optimise the operation of the means of transport.

Measure 4: Digital check of legal matters

The purpose of this digital check is to review and, if necessary, adapt existing and future legal provisions in the area of digitalisation possibilities in mobility or a secure and efficient use of data and communication technologies. In this way, possible weaknesses and required changes can be identified at an early stage and adapted at the draft stage in such a way that digital practicability is advanced.

Often, the specific wording of existing legislation hinders the digital transformation in mobility. New legislation in the field of mobility is also not systematically checked for its (potential) digital implementation/compatibility. In the course of the measure, corresponding specifications and processes will be developed to ensure that, as far as possible, the Austrian legal system will in future contain legal provisions that support digital transformation in mobility.

In addition, work is to be carried out to ensure that, on the one hand, the legislature takes greater account of digital aspects when passing new legislation and, on the other hand, that the executive takes greater account of digital aspects when applying these regulations. For this purpose, a corresponding (target) definition of a digital check is being developed, including criteria on how legislation can support digitalisation. Legislation is digitally suitable, for example, if it is formulated in such a way that, among other things, digital communication between the parties involved can take place, including automated processes in public administration. As far as possible, concepts and data should be reused across authorities. In addition to ensuring secure data processing, the prevention of fraud and errors must be given due consideration.

Responsible for implementation
• BMK

Most important cooperation partners
• Provinces of Austria
• Research facilities and infrastructures

Fundamentals and instruments

- An examination, analysis and discussion of how to check the digital suitability of legal provisions (creation of "Guiding Principles" for a digital check) and how a corresponding process can actually be introduced is to be carried out in the framework of this measure together with the stakeholders involved. This requires the organisation of working groups and the willingness of stakeholders to make their time available for these consultations and for potential intermediate tasks.

Implementation period

- From 2023: Creation of the "Guiding Principles" for the digital check

Active contributions to digital transformation in mobility

By developing a common understanding of the digital check of legal provisions among all stakeholders and by demonstrating the possibilities and potentials of the digital check, a basis for discussion is established with the stakeholders involved. This also facilitates long-term, efficient cooperation.

All in all, the measure contributes to an improvement in the digital suitability of legislation, which can have positive effects on the environment and the efficiency of the overall system, but also on an increase in safety.

Measure 5: Measuring the impact of experimenting with innovative mobility solutions

The aim of this measure is to define how the impact of technologies and services tested in experimental environments (e.g. test environments or mobility laboratories) on users can be measured and validated in the best possible way. This also includes setting up a corresponding data management system for the exchange of data and information between the experimental environments and the public sector in order to make the knowledge gained as widely accessible as possible.

Currently, the potential of monitoring, evaluation and also scaling and knowledge transfer of experimental environments is not fully exploited because the synergies between the results are difficult to identify and, as a result, they remain unused. Unless the findings are brought together, the need for adapting the general legal framework will not be defined. In many cases, the experimental environments also lack a specific focus on the behaviour of users. The consistent collection of and access to data on the behaviour of users offers the possibility of a well-founded assessment of the effectiveness of new forms of mobility (e.g. sharing of e-vehicles and the influence on energy consumption and emissions over a longer period of time or the influence of driver assistance systems on road safety in certain infrastructure sections, cross-modal use, seasonal use, etc.).

Within the scope of this measure, the specifications for the monitoring itself as well as the required data infrastructure need to be defined in order to promote and ensure the exchange between the stakeholders. This allows the opportunities of digitalisation in the area of knowledge transfer to be fully exploited by sharing experiences and consequently unlocking added value. In addition to the development and testing of processes and procedure models, the measure includes the establishment of tools to ensure data access, data exchange and data use between the stakeholders. This measure also defines proposals for specific solutions for the use of the results generated in experimental environments, in addition to the possibilities for impact evaluation. In addition, the findings can be used to structure the existing legal framework in Austria in a targeted and evidence-based manner.

Responsible for implementation
- AustriaTech
- BMK

Most important cooperation partners
- Provinces of Austria
- Research facilities and infrastructures
- Cities and communities

Fundamentals and instruments
- In cooperation with the stakeholders, a common understanding of the potentials of monitoring and impact measurement is to be created and a guideline on the specifications for implementation developed. This includes the uniform measurement of the behaviour of users of innovative mobility solutions. In general, national and international concepts as well as procedural models and experimental environments must be taken into account.
- During the pilot phase, it is important to implement the findings presented in the guidelines and to set up an appropriate data management system for the exchange of data and information.

Implementation period
- From 2022: Set up a stakeholder process to create a guide for experimental environments that is publicly available and has a specific focus on measuring user behaviour
- From 2023: Define the necessary infrastructure for data and information exchange
- From 2024: Implementation of pilot projects

> **Active contributions to digital transformation in mobility**
> The envisaged structure opens up the possibility for various stakeholders to discuss and share experiences and insights in experimental environments. This will enable faster learning with the help of digitalisation and give the public sector more certainty regarding the adaptation of the legal framework that is needed.

5.2 Optimal use of mobility data

The measures described below contribute to the objectives of the AP-DTM as presented in chapter 4.3.

Measure 6: Ensuring the provision of basic data relevant to mobility

With this measure, existing structures, platforms and data governance frameworks such as the Graph Integration Platform (GIP), the national access point to traffic data or EVIS will be expanded and deepened in order to make mobility-relevant data more usable and, as a result, ensure a basic supply of this data. In accordance with the specifications of national service providers in the mobility sector, focal points will be identified (e.g. the use of in-vehicle-generated data, data for stationary traffic, data for better truck routing, parking areas, loading zones) and purpose-related quality requirements defined. This also includes the identification and use of data sources for the mobility sector that have received little attention to date, such as those from the field of earth observation. The broad applicability of new data sources is to be promoted based on targeted research priorities, and the integration and intersection with other mobility-relevant data is to be enabled and improved.

The availability, accessibility and maintenance of mobility-relevant data represents a basic building block of the digital transformation in mobility and forms the basis for integrated mobility services. Although a lot has been done in recent years to obtain the broadest possible data basis in the transport sector in Austria, some data is still not available or not accessible, which is why it cannot be used either by service providers or users. This data needs to be collected and made accessible as a contribution to the further in-depth digitalisation of the mobility system. The focus is on the needs of Austrian service providers in the mobility sector and addresses them in particular.

The ÖVDAT forms a significant basis for the area of data collection and provision in Austria which needs to be used more data collection and provision in Austria, which should be used increasingly. As part of the medium to long-term strategic and financial orientation of the GIP from 2026 to 2036, the identified data needs are to be addressed. In addition, the resources required for data collection and data maintenance have to be made available. A first focus is to improve the database of the GIP with regard to the already ongoing activities on active mobility and, in particular, with regard to the

low-ranking road network. Further activities are to ensure the improvement of the data supply on stationary traffic on the public good, but also from private operators (P&R facilities, P&D facilities, B&R facilities, bike rental systems, commercially operated parking garages/parking areas) as well as the further digitalisation of legal traffic measures in general and in particular for HGV traffic (HGV driving bans and restrictions). In order to be able to use the GIP as a data basis for C-ITS services and automated driving in the future, it is necessary to formulate and coordinate the requirements of these new traffic systems.

For the implementation of the measure in the area of dynamic data, the framework conditions for the exchange of further data categories (e.g. vehicle data or C-ITS data) need to be created in cooperation with the **EVIS** partners. Furthermore, the responsibilities have to be defined for data collection, data maintenance, message management and quality assurance. In addition, innovative methods for data collection and maintenance (e.g. traffic monitoring, infrastructure data collection) will be used, which are more cost-effective and can be carried out more frequently.

Within the framework of this measure, the national access point will also be expanded in accordance with the European framework conditions to include the mobility data of all data holders concerned, data according to the priorities set and data from R&D projects, and will be redesigned to make it more user-oriented. The basic supply of mobility-relevant data that is available will be supported by visual presentations (interactive maps) and prepared in an attractive manner for both service providers and users. The possibility of low-threshold data collection will also be created for small companies providing mobility data. In addition, the current utilisation of transport modes needs to be determined on the basis of the data on mobility.

In order to further identify national focal points, a use-case-oriented expansion of the data basis required for basic services will be given priority in stakeholder dialogues. The development of further national minimum profiles for data provision is being sought in order to ensure uniform data standards. In cooperation with other European Member States, the interoperability, accessibility and comparability of the available datasets on national access points will be advanced further. The accessibility of experience in the collection and use of research data is another focus of this measure.

Responsible for implementation
- AustriaTech
- EVIS-Kooperation
- ÖVDAT

Most important cooperation partners
- ASFINAG
- BMK
- Provinces of Austria
- ITS Austria

- Mobilitätsverbünde Österreich
- ÖBB
- Broadcasters
- Cities and communities

Fundamentals and instruments
- The measure is based on the IVS-G as well as the existing structures EVIS, national body, national access point and ÖVDAT.
- Extension of EVIS cooperation to further data categories.
- Strategic orientation of ÖVDAT for the years 2025+.
- R&D pilot projects for the collection and provision of prioritised data in the main focal points (pedestrian and cycling traffic, stationary traffic).
- Incorporation of the digitalisation of pedestrian and cycling traffic into funding programmes.
- R&D pilot projects in the thematic area of space data.
- Amendment of the IVS-G based on the revision of the ITS Directive and redesign of the national access point.
- Dialogue forums and workshops with stakeholders within the framework of ITS Austria.
- Drawing benefits from EU funding.
- Significant basis for the national mobility data space.

Implementation period
- From 2022: Improvement of the data basis in the GIP with regard to active mobility
- From 2023: Expansion of EVIS cooperation to further data categories
- From 2023: Amendment of the IVS-G based on the revision of the ITS Directive and redesign of the national access point

Active contributions to digital transformation in mobility
The measure represents an important component for the national mobility data space. The improved mapping of active mobility in the GIP as well as the collection of additional dynamic data categories will enable new applications. These will have a positive impact on increasing the efficiency, sustainability and safety of the Austrian mobility system. Through standardised data access to data relevant to mobility from different stakeholders, this measure supports the implementation of services relevant to traffic safety, real-time traffic information services and multimodal travel information services. Furthermore, the measure serves to promote networking and collaboration in the provision of mobility-relevant data across stakeholders and modes.

Measure 7: Using data to build evidence

The aim of this measure is to create an image of the supply and demand of the mobility system from existing data and data yet to be developed. This image (evidence) will provide support for monitoring of the measures of the Mobility Master Plan 2030 and it also serves as a basis for the planning and management of infrastructure and transport services. An aim of this measure is the continuous determination of mobility key performance indicators (KPI) which can also be published in the form of dashboards. This will enable short-, medium- and long-term monitoring and description of changes in the mobility system. These can serve as a measurement tool for the impact of the Mobility Master Plan and, as a result, help to make capacity shifts visible. Where data and tools are already available, the operationalisation of data collection will be implemented in the course of the measure. For indicators for which the data basis is currently not available or accessible, ways need to be found to make such data accessible (e.g. transport demand in public transport, modal split, performance of sharing offers, environmental data). For this purpose, data sources that are currently often unused (e.g. in the context of drones and earth observation) can also be addressed. For those indicators for which no datasource is yet available, measures such as research initiatives, data collection campaigns and the like need to be taken to create the necessary datasets (e.g. active mobility, stationary traffic) and to develop and maintain appropriate analysis tools. Should data collection or data transfer be possible, the question of cost sharing between authorities will need to be addressed and clarified.

As one of the use cases, the impact evaluation of (cross-modal) traffic control measures should be evaluated within the framework of this measure. Without information on the impact (or at least an assessment of the impact) of (cross-modal) traffic management measures, both the agreement on certain measures between different stakeholders will be difficult or unrealistic as well as an effective implementation of the measures. The specifications of infrastructure operators and mobility service providers for an impact analysis need to be ascertained and, based on this, feasible methods need to be evaluated. As far as possible, a method (or a set of methods adapted to the needs in Austria) for measuring the impact should be developed that is harmonised internationally so that the effect of cross-modal traffic control measures can be demonstrated. In this context, the creation of common strategic guidelines will also be investigated and, in a further step, the support of the planning of traffic management measures through digitalisation. This can be done, for example, through simulations based on realtime data to determine the impact on different objectives (e.g. environment, safety, efficiency) of measures in integrated traffic management. This will provide a basis for conscious prioritisation of optimisation criteria.

In the transport sector, digital data is collected in various forms by a large number of stakeholders, but it is not usually processed as Austria-wide indicators or made available to the stakeholders in the mobility system or the public. This measure consolidates the data required for the key figures and also processes these key figures. The potentials of digitalisation are increased through the use of data, the use of digital processing and

analysis tools and the strengthening and creation of new digitally supported processes for cross-organisational data collection, data maintenance and data transfer.

The evidence created in the form of key figures can be used to provide the planning and operation of transport infrastructure and transport services with a reliable basis for measuring their impact as well as science. With this as a basis, it will be possible to promote the mobility transition through the targeted use of funding, improved traffic management and the provision of integrated mobility services. From the evidence gained from this data, it will be possible to make the mobility system more efficient and also serve its users in a better way. The data used in the course of this measure to determine the mobility indicators constitute an important content of the national mobility data space.

Responsible for implementation
- BMK

Most important cooperation partners
- ASFINAG
- AustriaTech
- Operators of digital mobility services
- Provinces of Austria
- Interest groups
- ITS Austria
- Mobilitätsverbünde Österreich
- ÖBB
- Cities and communities

Fundamentals and instruments
- The measure draws on existing structures, such as the Mobility Master Plan 2030, the Mobility Master Plan's Key Performance Indicator (KPI) system, the Austrian Transport Model or the "Österreich unterwegs" Austrian mobility survey.
- The data situation should be improved through more in-depth cooperation between the BMK and public transport providers and infrastructure operators.
- In public transport, measures are to receive support that improve the data situation for the use of transport services. In addition, the development of alternative data for the use of public transport services should be supported.
- The development of methods and technologies for data collection and motivation research in the context of mobility should be supported by research initiatives.
- An improvement in the exchange between the provinces and the federal government should be sought in order to increase possible synergy effects in transport surveys.
- The data situation (e.g. networks and traffic performance) on pedestrian and cycle traffic should be improved, also as a basis for the targeted use of funding.

- Measures for facilitated data access or reporting obligations of sharing providers (car, bike, scooter sharing) to cities and municipalities should be supported in order to improve the data situation for sharing services.
- Framework conditions should be created to oblige operators/data owners (e.g. mobile network operators for FCD data, OEMs for in-vehicle data) to provide continuous data for mobility analysis and research at no cost.

Implementation period
- From 2023: KPIs will be collected for the Mobility Master Plan 2030

Active contribution to the digital transformation in mobility
Changes in traffic patterns can be observed through the regular evaluation of KPIs. In particular, those changes that have an effect on the goals of the Mobility Master Plan 2030 can be depicted by KPIs and monitored over the long term.

Measure 8: Designing the National Mobility Data Space

A national mobility data space for uniformly structured data access is to be established based on existing data governance frameworks, systems and components in order to make existing and future data more easily available to the population and the economy. The national mobility data space will form a bond between existing structures and a coordinating governance structure. It should provide a comprehensive overview of both privately and publicly available data for sustainable mobility solutions and enable non-discriminatory data access and its exchange. The national mobility data space will be established as an open, distributed governance structure or system that data providers and users can use to offer and use mobility data in a secure, trustworthy manner and under defined rules.

Mobility-relevant data is currently available and mapped in different structures in Austria. These structures or data governance frameworks currently exist and act independently of each other. By connecting and coordinating the structures in an Austria-wide mobility data space, mobility data can be made available in a low-threshold manner. On the basis of this linking, new services for a sustainable, clean and safer mobility system can be better developed and also provided more quickly.

The national mobility data space will be built upon existing systems and components in Austria (e.g. ÖVDAT, EVIS). These data governance frameworks will be expanded and deepened accordingly and their use and scope of application strengthened. Together with the necessary stakeholders, the technical and organisational measures for the networking of the existing structures and components will be developed in a roll-out plan for the implementation of the national mobility data space. European legal framework conditions and international standards will be taken into account. In addition, the roll-out

plan will take into account and incorporate the experience of other countries in setting up mobility data spaces. These will be compiled in advance within the framework of a study. The roll-out plan should describe the non-discriminatory operation of an open data space in which both public and private data can be made available or exchanged.

In addition, the national mobility data space is to be tested for international compatibility, especially in the area of European activities for the European mobility data space, so that it will also provide a basis for monitoring and managing international traffic across borders.

Responsible for implementation
- BMK

Most important cooperation partners
- ASFINAG
- AustriaTech
- Operators of digital mobility services
- Provinces of Austria
- EVIS-Kooperation
- Research facilities and infrastructures
- Industry and the economy
- ITS Austria
- Mobilitätsverbünde Österreich
- ÖBB
- ÖVDAT
- Cities and communities
- VAO

Fundamentals and instruments
- Numerous databases, such as the data platform of the mobility associations, DIO, EVIS, GIP, national access point, are available for the development of the national mobility data space and these will be taken into account.
- Accompanying stakeholder process as input for the creation of the national roll-out plan. These will take into account the experience of other countries.

Implementation period
- From 2023: Preparation of the roll-out plan for the national mobility data space
- From 2024: Implementation of the national mobility data space

> **Active contribution to the digital transformation in mobility**
> Built on a common understanding of all participating national stakeholders, the national mobility data space enables non-discriminatory and transparent data access. In addition, access to and use of mobility data from different data platforms will be simplified or made possible under standardised conditions.

Measure 9: Cross-sector strategy on digitalisation and data spaces

This measure deals with the embedding and interaction of a national mobility data space in and with the digital activities of other sectors. Here, the cross-sectoral interrelationships will be defined as well as how these can be used in the future to steer developments in society towards overall objectives, such as the reduction of CO_2 emissions.

Currently, the digital transformation is being driven forward in all sectors and digital innovations are contributing to the further development of the digital world. There are also numerous developments in the field of mobility that have a close connection to other sectors, for example with the sectors of work, energy, leisure, health, tourism, supply, economy or housing. Examples include e-mobility with the required energy supply at charging points or operational mobility solutions that are being developed parallel to the existing mobility system. The topic of mobility is also increasingly being included in the areas of tourism or real estate development (e.g. sharing concepts in the area of smart cities). And all the innovative developments have a connection with digitalisation, but they are emerging side by side. A lot of potential can be lost through uncoordinated introduction.

Within the framework of this measure, cross-sectoral strategy documents will be developed in order to present the interactions between the sectors relating to digitalisation in the field of mobility. Organisations involved in the implementation are also to be included and a roadmap for individual digitalisation measures is to be defined from the perspective of the mobility sector (taking into account existing legal obligations). Starting from the mobility sector, this measure can be used to launch extensive, potentially new cooperations with numerous stakeholders in the future, in order to ultimately use data spaces jointly and derive benefits from them.

Responsible for implementation
- AustriaTech
- BMK

Most important cooperation partners
- ASFINAG
- Operators of digital mobility services
- Provinces of Austria
- Research facilities and infrastructures
- Industry and the economy

- ITS Austria
- ÖBB
- Cities and communities

Fundamentals and instruments
- It is important to define a common picture of the potentials and the implementation of digitalisation as well as the need for the mobility data space together with the stakeholders and in doing so take into account national and international concepts and process models.
- Within the framework of the stakeholder process, cross-sectoral strategy documents are to be drawn up concerning data requirements, data access and data exchange.
- Definition of digitalisation measures from the perspective of the mobility sector in a roadmap.
- Implement pilot projects

Implementation period
- From 2022: Cross-sectoral stakeholder processes for the preparation of cross-sectoral strategy documents
- From 2023: Development of roadmaps with regard to cross-sectoral data exchange and data access from the perspective of the mobility sector
- From 2024: Implementation of cross-sector pilot projects

Active contribution to the digital transformation in mobility
The cross-sectoral coordination of mobility-relevant activities with regard to aspects concerning digitalisation helps to identify synergies and new transformative potentials as well as the targeted use of resources. This prevents duplication with other sectors.

5.3 Making transport fit for the future – integrated traffic management

The following measures are the first step in implementing the objectives of the AP-DTM as described in chapter 4.4 below.
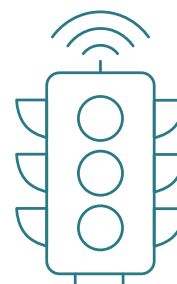
Measure 10: Integrated traffic information and integrated traffic management

In order to enable an efficient and comprehensive organisation of the complete Austrian transport system (high-level and lower level road transport as well as public transport or publicly accessible services), a discussion forum is to be established to achieve a consensus in the field of multimodal transport information and traffic management (recommendations, information and traffic management) as well as to develop definitions. The goal is to complement existing regional and interregional traffic management institutions and to cooperate with them. As a first step, a superordinate multimodal traffic management is to be designed and defined within the framework of this measure.

Currently, there are traffic management centres in Austria that are responsible for regions and such that are responsible for specific networks. There are individual or spatially limited bilateral cooperations between these centres, but no umbrella body that is operationally active with a focus on integrated traffic management for passenger transport. As a result, implementing cross-modal traffic management measures is a considerable challenge. Digitalisation is a significant prerequisite for the implementation of cross-modal information and traffic management. Without digital exchange these can only be carried out in a very simple form. Within the framework of a superordinate traffic control system, the optimisation of traffic flows and, where necessary and possible, a shift from road to rail is also made possible by the increased exchange of data at the road-rail interface.

In a definition phase, public authorities and operators are to define strategies for traffic information and traffic management. In addition to the pure consideration of each mode of transport, holistic and situation-specific concepts must be developed on the actions and information needed for the coordinated multimodal use of all modes of transport. This must take into account all modes and means of transport. The development of a common understanding of traffic information and traffic management in Austria is a significant element, as are the tools available for this purpose, including their potential, as well as the development of multimodal traffic management strategies and an agreement on targeted traffic information strategies. The aim is to influence traffic behaviour, optimise traffic flows and operationalise and improve the efficiency of traffic systems and optimise traffic management for both planned and unplanned events. One of the significant goals should be the early avoidance of motorised road traffic while at the same time shifting traffic to environmentally friendly forms of transport.

The measure will also analyse how cooperation between organisations involved in traffic management can be digitally supported or enabled in order to facilitate rapid and targeted management of traffic flows involving different modes of transport and organisations.

Responsible for implementation
- BMK

Most important cooperation partners
- ASFINAG
- AustriaTech
- Operators of digital mobility services
- Provinces of Austria
- EVIS-Kooperation
- Mobilitätsverbünde Österreich
- ÖBB
- Organisations representing road users
- Broadcasters
- Cities and communities
- VAO

Fundamentals and instruments
- This measure draws on existing developments in the field of VAO or EVIS. In addition, the existing traffic management plans, including multimodal ones, can be used for the implementation of the measure.
- Pilot projects are to be carried out to promote the implementation of these measures.

Implementation period
- From 2023: Creation of a joint concept for traffic information and traffic management in Austria
- From 2024: Implementation of pilot projects

Active contribution to the digital transformation in mobility
Digitalisation facilitates more complex cross-modal measures for traffic information and traffic management. This measure represents the first step and thus the basis for the realisation and development of integrated traffic management.

Measure 11: C-ITS implementation as a contribution to a sustainable and safe mobility system

A national governance structure is to be established to support and guide pilot projects and the implementation of C-ITS services both in individual transport, in public transport and between public transport and individual transport as a contribution to a sustainable and safe mobility system. Particular attention will be paid to the needs of emergency services, cities and regions, and relevant cross-modal intersections (e.g. railway crossings).

C-ITS services are currently being implemented in Austria both on the high-level road network and in urban pilot projects. The implementation is based on European uniform technical specifications of the C-Roads Platform. However, there is still a strong need for support and coordination at both the organisational and technical levels when implementing the use cases described in the specifications, especially in urban areas. In order to fully exploit the potential of C-ITS in terms of increased road safety (protection of road users with special needs, support at critical junctions, benefits for emergency services) support must be provided for the implementation. This also applies to increased efficiency (traffic light use cases) and, as a result, sustainability.

For the implementation of the measure, a stable governance framework, consisting of infrastructure operators, infrastructure managers, and the public authorities, is to be established which will provide both technical and coordinative support for the implementation of C-ITS use cases in Austria. The coordinative support includes the elaboration and sharing of best practices with regard to the selection of initial use cases, advice on concrete implementation as well as approaches and indicators for evaluation.

Furthermore, message brokers will be used for the IP-based exchange of C-ITS messages within the C-ITS trust environment in order to be able to exchange C-ITS messages between the different operators of C-ITS services at the boundaries of their responsibility. This can ensure that the origin of messages and the certificates behind them can always be clearly assigned to the responsible infrastructure operators.

An evaluation infrastructure (road infrastructure plus pool vehicles or users) is needed to assess the impact of C-ITS services on Austrian roads. This will be created within the framework of this measure. Without such a test infrastructure, the evidence-based measurement of the impact of C-ITS in real traffic independently of commercial manufacturers of C-ITS systems or vehicle manufacturers is not possible. In this way, the impact of selected C-ITS Day 1 services in urban and rural areas can be evaluated. In the long term, an evaluation of future Day 2 services should be possible. The evaluation will be based on C-Roads results.

Responsible for implementation
- BMK

Most important cooperation partners
- ASFINAG
- AustriaTech
- Provinces of Austria
- Industry and the economy
- ÖBB
- Cities and communities

Fundamentals and instruments
- Within the framework of the European C-Roads initiative, principles such as the C-Roads specifications and the C-Roads pilot projects have been established and it is intended that these will be expanded.
- European C-ITS projects to be implemented in other cities and regions.
- Within the scope of this measure, the basic functions of a C-ITS broker are to be defined and the rules for operation and exchange between different brokers will be determined. The next decisions for setting up and launching the brokers will be prepared and taken.
- The necessary infrastructure will need to be purchased in order to be able to measure the impact of C-ITS in real traffic. The internationally coordinated methodology will lay the foundation for internationally comparable results that can be used as a basis for further investment decisions.

Implementation period
- From 2022: Establishment of a governance framework for the support of the implementation of C-ITS in coordination with relevant stakeholders
- From 2023: Define the basic functions of a C-ITS broker and establish the rules for operation and exchange between different brokers
- From 2023: Development of a standardised measurement methodology for the impact of C-ITS services

Active contribution to the digital transformation in mobility

C-ITS services cannot be considered in isolation but must be integrated into existing traffic management solutions. In doing so, C-ITS services not only serve to connect individual vehicles with each other and with the infrastructure, but can also be used for improved support by other applications, such as improving blue-light services by enabling the prioritisation of emergency vehicles at intersections. C-ITS brokers will ensure that C-ITS works smoothly across city, state or national borders, urban and interurban. This will provide all infrastructure operators with information that can improve cross-network and cross-modal traffic management. The criteria for evaluating the effectiveness of this measure primarily relate to the development of a scientifically sound, internationally agreed measurement methodology as well as the implementation of C-ITS impact measurements in real traffic. The criteria for measurement are efficiency, (traffic) safety and sustainability compared to the status quo.

Measure 12: Using the digital transformation for climate and environmentally friendly traffic management

The central theme of this measure is the development of a common understanding of the benefits and potentials of climate and environmentally friendly traffic management and the associated digital information as a contribution to environmentally sound mobility. It will only be possible to offer information services that are comprehensible to users if the transport management measures that are possible on the basis of the current environmental situation are clearly defined and it is shown how these can contribute to achieving the climate targets at the national level. This must be done in cooperation with regional and local stakeholders. The provision of digital information is especially important for non-German speaking users of transport infrastructure so that they have easy access to current and at present active climate-based transport management strategies. Ideally, this information, which is available digitally, should be transmitted directly to the users of the mobility system via navigation systems and mobility applications (e.g. regional departure and access regulations based on source-destination regulations). Another challenge concerns the verification of compliance with measures in environmental zones. On the one hand, resource-intensive monitoring options can be considered here, such as those already used today in the context of parking space management. On the other, digitalisation in the mobility system offers opportunities to use digital tools here. In any case, an exchange with other European countries is also important.

The topic of climate and environmentally friendly mobility management, traffic management and environmental zone management is one of the central mobility topics at national as well as European level in order to make an active contribution to a sustainable mobility system in the sense of the "European Green Deal". In this context, measures relevant to mobility are taken according to vehicle emissions and the current

environmental situation in certain areas in order to reduce high-emission mobility services and to redirect mobility to more sustainable modes of transport.

In order to be able to use the potentials of climate and environmentally friendly traffic management in an optimal way, a working group should first be convened to develop a common understanding of the benefits and potentials. A special focus should be placed on the potentials of dynamic traffic management based on the respective environmental situation. As a result of this analysis of the potential, a common framework is to be designed. In a further step, an evaluation of the possibilities for checking compliance with the relevant ordinances with regard to (dynamic) environmental zone management using digital tools is to be carried out.

Responsible for implementation
- BMK

Most important cooperation partners
- ASFINAG
- AustriaTech
- Provinces of Austria
- Industry and the economy
- ÖBB
- Cities and communities

Fundamentals and instruments
- The basis for this is the mapping of zonal restrictions in the Delegated Regulation (EU) 2022/670, which will come into force on 1 January 2025.
- Successful digitalisation activities of regional departure and transit regulations for source-destination traffic.
- Convening a working group to develop a common understanding of the benefits and potentials of (dynamic) environmental zone management and to design a common framework and harmonised digital images of the regulations.
- Evaluation of the possibilities to check compliance with the relevant regulations with regard to a (dynamic) environmental zone management using digital tools.
- Establishment of pilot projects.

Implementation period
- From 2023: Definition of the framework conditions for a (dynamic) environmental zone management including the evaluation of the possibilities to verify compliance with the relevant regulations
- From 2024: Start of pilot projects on climate and environmentally friendly traffic management

5.4 Making the sustainable mobility services more attractive to use – enabling integrated mobility services

The following measures represent the first step towards achieving the goals outlined in chapter 4.5.

Measure 13: Simplifying access to sustainable mobility services for users

Cooperation amongst national mobility service providers must be deepened and improved. Based on a new cooperation logic, in the end, mutual access to data (e.g. timetables, locations, parking spaces) and services (e.g. routing results, capacity utilisation information) must be ensured. Through this access, each stakeholder can optimally serve its users and, if necessary, also provide information about or integrate offers from neighbouring stakeholders and make them accessible across operators. In this context, integrated mobility services refer to any kind of user services, be it services via the web, smartphone apps, C-ITS, RDS-TMC, DAB+ or displays from the infrastructure side, etc.

In Austria, cooperation between mobility service providers is currently highly fragmented. The users of the mobility system primarily have one-to-one relationships with the individual mobility service providers. Private mobility services are rarely integrated into the services of the public operators. Users often find it difficult to use the full range of services in a multimodal and multi-operator travel chain. This is because cross-operator travel information is often not tailored to their needs. As a result, they often have to accept an offer that is not optimally tailored to their needs.

The first step in achieving a new form of cooperation is to develop a common, written understanding of the new cooperation logic. Based on this, clear rules regarding access to data and services must be developed from an organisational as well as a technical and legal point of view, and the participating stakeholders must undertake to comply with them. The potential embedding in European initiatives/offers should also

be ensured. These rules should be tested and checked for practicability on both the technical and organisational levels within the context of pilot initiatives. The financial cost effectiveness for users as well as the visibility and accessibility of existing and new services must be guaranteed. Accessibility includes available information and services, tickets and journeys, as well as self-explanatory access at every stage of the travel chain. The user-friendliness of analog and digital systems also plays an important role.

Responsible for implementation
* BMK
* Provinces of Austria
* Cities and communities

Most important cooperation partners
* ASFINAG
* AustriaTech
* Operators of digital mobility services
* Mobility providers
* Mobilitätsverbünde Österreich
* ÖBB
* One Mobility
* Organisations representing road users
* VAO

Fundamentals and instruments
* The measure is based on the principles of the ITS Austria working groups and the results of relevant research projects.
* In order to be able to achieve the new form of cooperation, intensive coordination of all cooperation partners is required as well as the development of a common written understanding of the new cooperation logic.
* The cooperation partners must then develop clear rules regarding access to data and services, both from an organisational and a technical point of view.
* The rules of the game can then be tested, sharpened and validated in pilot regions.

Implementation period
* 2022: Start of coordination of all cooperation partners
* From 2023: Establishment of a common written understanding of the new cooperation logic and development of clear rules
* From 2024: Start of pilot activities

Measure 14: Establishing national profiles for data and service interfaces

The technical linking of the existing systems of mobility service providers for access to data and services is carried out via data and service interfaces. As different technical architectures and standards are used within the individual systems, a national harmonisation of the standards used at the interface level (and not at the system level) is necessary in order to enable access to data and services for third parties – according to clearly defined agreements – without major additional expenditure. Subsequently, the compatibility of the interfaces or the integration of international standards should be examined in order to ensure their application in the European area.

The integration of mobility services often fails not only due to the lack of organisational structures and specifications, but also due to the complex technical integration. The integration of mobility services into existing or newly emerging travel information services is simplified from a technical perspective through the harmonisation of the standards used for access to data and service interfaces and the definition of how standards for data and service interfaces are to be entered. In addition, the European specifications refer to standards that are little or not used in Austria. For this reason, the development of national minimum profiles for data and service interfaces also defines how the European requirements are implemented here. In this way, the providers of mobility services achieve "implementation security", as the interfaces used will comply with the legal requirements both nationally and internationally.

The national harmonisation of technical interfaces is based on the development of national minimum profiles for data and service interfaces. A clear definition of the national interfaces to be used is needed which takes into account the European requirements. It should be noted, however, that the profiles used nationally do not necessarily have to correspond to the European standard specifications. In addition, smaller providers of mobility services must be able to connect to the specified interfaces despite their lack of know-how or digital infrastructure.

Responsible for implementation
- BMK

Most important cooperation partners
- ASFINAG
- AustriaTech
- Operators of digital mobility services
- Provinces of Austria
- Industry and the economy
- Mobility providers
- Mobilitätsverbünde Österreich
- ÖBB
- One Mobility
- Cities and communities
- Standardisation bodies
- VAO

Fundamentals and instruments
- The European requirements from the Delegated Regulations of the European ITS Directive with regard to the standards DATEX II, NeTEX, SIRI, OJP, TN-ITS serve as a basis on the one hand, and on the other, the results achieved to date in various national and international project initiatives (e.g. Prio Austria, CROCODILE, LinkingAlps).
- The development of national profiles for data and service interfaces can take place within the framework of ITS Austria working groups.

Implementation period
- From 2023: In accordance with the European requirements, the development of national minimum profiles in the road sector, starting with the data and service categories
- From 2023: Development of national minimum profiles in the public transport sector, in accordance with the European requirements, starting with the data and service categories
- From 2024: Start of the development of national minimum profiles in the area of demand-responsive mobility services, including sharing services and micro-public transport
- From 2023: Testing the OJP service interfaces in an international environment in order to obtain in-depth findings on the potentials

> **Active contribution to the digital transformation in mobility**
>
> The development of national minimum profiles for data and service interfaces will simplify the integration of mobility services and, as a result, reduce the costs of service integration.
>
> The harmonisation of interfaces at national and international level ensures "investment security" for the providers of data and services. In addition, this measure strengthens Austria as a business location, as it can play a pioneering role at the European level.

5.5 Accompanying measures

The following measures are intended to support the digital transformation in the mobility system as presented in chapter 4.6.

Measure 15: Increasing acceptance of digital services

The promotion of digital services to support sustainable mobility solutions is considered an important accompanying measure. On the one hand, this is to spread the knowledge of existing mobility services and, on the other, to achieve a higher level of acceptance among users. Digitalisation can only make a positive contribution to the mobility transition if mobility-relevant apps and internet services are downloaded and used.

Many of the measures described in the Action Plan Digital Transformation in Mobility will be successful if they are accepted and followed by the users of the mobility system. In this way, digitalisation will be able to make the desired positive contribution to achieving the climate goals in the mobility sector. Often, users are not aware of the existing mobility services and the benefits of certain applications. Without an appropriate marketing strategy, many of the new digital mobility services will only be used by a few and the broad use of these services, including the use of sustainable climate-friendly mobility offers instead of one's own car, will be delayed. In addition to the essential marketing strategies that are the responsibility of the operators, an analysis should also be made of which focal points would be appropriate within the framework of a marketing strategy that would apply to all operators. It is also important to increase the usability of digital services and mobility solutions.

Here, the potential campaigns for users do not focus on individual mobility services, but rather on promoting access to sustainable mobility services with a focus on the overall system and the benefits for society and climate policy. At the same time, the requirements of different groups of users are to be taken into account in the dialogue in order to be able to design existing and new services according to the requirements and expectations of specific target groups. Aspects of inclusion should also be taken into account. Incentive systems for the adoption of solutions can also be considered.

Responsible for implementation
- BMK

Most important cooperation partners
- ASFINAG
- AustriaTech
- Operators of digital mobility services
- Provinces of Austria
- Interest groups
- ITS Austria
- Mobility providers
- Mobilitätsverbünde Österreich
- ÖBB
- Organisations representing road users
- Broadcasters
- Cities and communities
- VAO

Fundamentals and instruments
- Based on a national process of stakeholders, a survey will be conducted to identify the potential for an Austria-wide campaign to promote the use of national mobility services.

Implementation period
- 2023: Stakeholder process to survey the potential for an Austria-wide campaign on the use of national mobility services
- From 2023: Establishment of target group-specific dialogue formats for the design of needs-oriented mobility information
- From 2024: Austrian campaign for the use of mobility services starts

Active contribution to the digital transformation in mobility
The digital transformation in mobility can only unfold its full potential if it reaches the users of the mobility system and if the mobility services are accepted by them. This measure is intended to contribute to this by supporting the broad dissemination of knowledge about the existing mobility services and about digital access to these services, and by reducing any prejudices that may exist on the part of the general public.

Measure 16: Developing an education and training concept for the digital transformation in mobility

Within the framework of this measure, it needs to be ensured that the necessary digital expertise can be provided or created by public and private actors in the field of mobility.

The digital transformation does not only influence the mobility system as a whole, but also the current employees of public and private stakeholders. In particular, existing staff must actively support the digital transformation and have a positive attitude towards it. Changes in the tasks of individual employees must not lead to insecurity or scepticism. Suitable training and further education formats play an important role here so that people can cope with new tasks and devote their full energy to the tasks at hand. However, it is currently extremely difficult to find an appropriate and suitable range of training and further education opportunities. These are needed in order to be able to optimally utilise and support the potential of the digital transformation with the necessary human resources.

For this reason, a mapping of competences should be carried out by the public stakeholders within the framework of closer cooperation with the industry. This mapping should not only depict existing competences, but also refer to future requirements. It is important to focus on the skills needed for the development and, above all, for the operation of the digital elements of the Austrian mobility system. In order to develop and maintain the required expertise and competences, appropriate training and further education programmes (e.g. in the area of cross-actor job rotation) should be defined and developed based on the results of the competence mapping.

Responsible for implementation
- BMK
- ITS Austria

Most important cooperation partners
- ASFINAG
- AustriaTech
- Provinces of Austria
- Research facilities and infrastructures
- Industry and the economy
- Mobilitätsverbünde Österreich
- ÖBB
- Cities and communities

Fundamentals and instruments
- Competence mapping for public stakeholders in cooperation with industry and research institutions.
- Needs assessment and design of a training and development concept.

Implementation period

- From 2022: Competence mapping
- From 2023: Organisation of a training and further education concept

Active contribution to the digital transformation in mobility
Without providing and maintaining the necessary human resources, the digital transformation in mobility will not be able to be promoted with the required consistency and speed. For this reason, this accompanying measure represents an important basis for the successful implementation and design of the digital transformation.

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Action Plan Digital Transformation in Mobility (AP-DTM)

Abbreviations

Short form	Long form
ATO	Automatic Train Operation
AutomatFahrV	Automatisiertes Fahren Verordnung [Automated Driving Ordinance]
BGBLG	Bundesgesetzblattgesetz [Austrian Federal Law Gazette]
B-VG	Bundesverfassungsgesetz [Austrian Federal Constitutional Act]
CCAM	Connected, Cooperative and Automated Mobility
C-ITS	kooperative intelligente Verkehrssysteme [cooperative intelligent transport systems]
DAB	Digital Audio Broadcast
DATEX	Data Exchange Standard
DIO	Data Intelligence Offensive
EisbBBV	Eisenbahnbau- und -betriebsverordnung [Railway Construction and Operation Ordinance]
EisbG	Eisenbahngesetz [Eisenbahngesetz]
EU	Europäische Union [European Union]
EU CCMS	European C-ITS Security Credential Management System
ETCS	European Train Control System
EVIS	Echtzeit Verkehrsinformation Straße [Real-time traffic information road]
FAIR	findable, accessible, interoperable, reusable
FCD	Floating Car Data
FRAND	fair, reasonable and non-discriminatory
FTI	Forschung, Technik, Innovation [Research, Technology, Innovation]
F&E	Forschung und Entwicklung [Research and Development]
GIP	Graphenintegrations-Plattform [Graph integration platform]
ITS	Intelligent Transport Systems
IV	Individualverkehr [Individual transport]
IVS	intelligente Verkehrssysteme [intelligent transport systems]
IVS-G	IVS-Gesetz [ITS Act]
IVS-RL	IVS-Richtlinie [ITS Directive]
I2V	Infrastruktur-Fahrzeug-Kommunikation [Infrastructure vehicle communication]
KFG	Kraftfahrgesetz [Motor Vehicles Act]

Short form	Long form
KI	künstliche Intelligenz [Artificial Intelligence]
KPI	Key Performance Indicator
Lkw	Lastkraftwagen [HGV – heavy goods vehicle]
NeTEx	Network Timetable Exchange Standard
OEM	Original Equipment Manufacturer
OGD	Open Government Data
OJP	Open Journey Planner
ÖV	öffentlicher Verkehr [public transport]
ÖVDAT	Österreichisches Institut für Verkehrsdateninfrastruktur [Austrian Institute for Transport Data Infrastructure]
P&D	Park and Drive
Pkw	Personenkraftwagen [passenger car]
P&R	Park and Ride
RDS-TMC	Radio Data System – Traffic Message Channel
RIS	Rechtsinformationssystem des Bundes [Legal Information System of Austria]
SAE	Society of Automotive Engineers
SIRI	Service Interface for Real-Time Information
StVO	Straßenverkehrsordnung [road traffic regulations]
TEN-T	Trans-European Transport Network
UNECE	United Nations Economic Commission for Europe
VAO	Verkehrsauskunft Österreich [Traffic Information Austria]

Action Plan Digital Transformation in Mobility (AP-DTM)