



**D4.2 Step-by-step Guidelines for public authorities & practitioners
Policy Recommendations**

Edition notice

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Authors	Kathrin Raunig, Nora Spiegel, Lena Zeisel
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1 Introduction

These policy recommendations are the result of the activities within the CATAPULT (Policies for inclusive, demand-oriented and Target group-specific Automated mobility solutions for cities) project. The CATAPULT project lasted between March 2021 and February 2023. It aimed at collecting the needs and requirements of potential user groups as well as creating and adapting policies to improve target group-specific, inclusive and demand-driven automated mobility solutions in cities and urban regions. The potential user groups investigated within CATAPULT project were children, elderly persons and people with temporary and long-term physical or cognitive disabilities. The needs of these user groups regarding automated mobility services, their willingness to use them and appropriate use cases have so far been underrepresented in the development of automated mobility solutions. Research within the CATAPULT project took place in three countries, Sweden, Belgium and Austria.

In the CATAPULT project, we understand accessibility and inclusivity in the context of public mobility services in a way that as many people as possible are able to use these services, no matter their age or physical and cognitive capabilities. We are aware that also other factors, like health condition, gender, race, socio-economic conditions, etc. can affect access to public mobility services. Nevertheless, the detailed analysis of these factors was not within the scope of our project.

The scope of the CATAPULT activities comprised the whole travel journey with an automated shuttle, including pre-trip processes (e.g. ticketing, infrastructure of the stops, etc.), the ride with the automated shuttle and post-trip processes (e.g. getting off the shuttle, orientation). Screening through previous research as well as existing (national) strategies for mobility, it became evident that inclusion does not only comprise physical accessibility (vehicle + infrastructure), but also the accessibility of information. We therefore find it crucial that planning processes of automated mobility services consider all phases of a trip, including journey planning and real-time information, getting on and off the shuttle, rather than just the vehicle itself.

In CATAPULT, we worked with automated shuttles ([SAE Level 4](#)). These shuttles are designed to be used as shared fleets and are especially suited for first and last mile solutions. They can transport up to 15 people, depending on the manufacturer, model and applicable legal framework. All the data gathered on needs and requirements of different user groups are therefore in the context of collectively used automated vehicles (AVs), embedded in public mobility services. The recommendations in this document have to be interpreted in this context. In our opinion, automated mobility services promise the most potential in terms of economic, social and environmental sustainability when they are used collectively.

When looking at the three pillars of sustainability - social, ecological and economic sustainability - CATAPULT focused mainly on the social dimension of sustainability with the aim of creating accessible and inclusive public and shared automated mobility services that present an alternative to motorized private transport or immobility. Economic and ecological dimensions have not been in the scope of the project.

With this document, we want to reach policy makers, decision makers, mobility service providers, transport planners and city planners. We aim to give guidance on how to implement automated mobility services in an inclusive way. Our recommendations include a wide range of aspects that have to be considered in order to ensure accessibility and inclusivity in future automated mobility services. They are based on the assumption that cooperative, connected and automated mobility (CCAM) services like the shuttle we focused on in our research) will be legally allowed and technically able to operate without a safety driver on board. This is a future scenario for which the legal and

technical foundation is not given yet. Even though the technology might not be fully ready for deployment yet, it is necessary to make fundamental considerations and identify potential conflicts of interest at an early stage. Policy and decision makers must actively shape the developments of automated mobility services to benefit from their potential to contribute to a sustainable and just future mobility system. Even though aspects like vehicle design are not directly within the scope of responsibility of public authorities, it is within their scope of action and responsibility to include requirements (e.g. criteria of the universal design approach¹) in their public procurement and funding criteria.

The policy recommendations should be understood as guidelines that support the deployment of new automated mobility solutions in a way that is inclusive and takes into account the different needs of diverse target groups. We want to emphasize the fact that our focus was the process of deployment, including co-creation and participation methods, rather than technological features or details of the shuttle.

1.1 Basis for the policy recommendations

The policy recommendations are mainly based on considerations derived from the CATAPULT deliverables². The deliverables summarize our activities, methods, processes as well as the results of our research. The deliverables relevant for the policy recommendations are:

- D2.1 Results of the literature review and desk research
- D2.2 Catalogue of needs and requirements, report on statistical data analysis results (Riess et al., 2021)
- D2.4 Conceptual Design of the serious game
- D3.1 Results of the field studies with children, older adults, and persons with disabilities
- D3.2 serious game Report
- D4.1 Structured overview on requirements of the user groups (Flores et al., 2023)

Deliverable 4.1. can be seen as the main resource for the policy recommendations since it summarizes the main results of all previous deliverables in a structured way.

Additionally, the CATAPULT project built upon the findings of other projects that have looked into related research questions. The most important projects were [SURAAA](#), [AM inklusive!](#), [Digibus Austria](#), [ELIN](#), TOP Noordrand, [Mijn Tuinlab](#), [SHOW](#) and [INDIMO](#). Lastly, the policy recommendations include feedback from experts in the field of inclusivity and accessibility that have been interviewed at different stages of the project. These expert interviews were conducted with the purpose of getting informed feedback on our methods and results as well as to identify potential use cases for the serious game. Therefore, we are confident that such results and the policy recommendations derived from are essential considerations that can be taken into account if new, automated mobility services are deployed.

The results of these pillars (research activities within the project, results of other projects, feedback from experts) were reflected by the project team, bringing in our own expertise in the fields of automated mobility, co-creation and participatory processes, policy development, accessibility and user-behaviour. From this process, we derived the following policy recommendations.

¹ “[Universal design](#) means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (UN General Assembly, 2007)

² Deliverable 2.2, 4.1 and 4.3 can be found on the project website: www.catapultproject.eu

The recommendations are divided into four chapters:

1. Recommendations for more inclusive public transport
2. Policy Recommendations for more accessible automated mobility services regarding technical and organisational aspects
3. Policy recommendations on co-creation methods in the development process of inclusive automated mobility solutions
4. Policy recommendations on research and innovation

Finally, we present the main topics of the panel discussion at the CATAPULT, SmartHubs and JUSTICE Conference.

2 Policy recommendations for more inclusive public transport

During the project's fieldwork and workshops, a great variety of wishes and needs was expressed. An in-depth description and analysis of the users' needs and requirements that we collected can be found in deliverable 2.2 (Riess et al., 2021). Based on our interactions with persons with physical and or mental disabilities, as well as representatives from various advocacy groups, key challenges and issues were identified and policy recommendations derived. In this chapter, recommendations for more inclusive public transport address general issues related to people's journeys, while the recommendations focused particularly on automated mobility solutions are presented in the following chapter.

While CATAPULT takes a focused view on automated mobility services, it is relevant to keep recommendations for the current public transport system (without higher levels of automation) in mind, since these apply to future CCAM services as well. National regulatory documents and strategy papers were consulted (find list in chapter 0 Annex) to build upon the existing guidelines and regulations.

Information barrier - use a multisensory approach (visual, acoustic and tactile)

Regardless of a person's abilities and age, the use of a public transport should be granted universally. Multisensory signaling and information provision enables the usage of mobility services. By providing information that is directed to more than one sense (e.g. visually and acoustically / visually and in a tactile format/ acoustically and in a tactile format) and in easy inclusive language at stations, stops and inside the vehicles, people can navigate and use these services as independent and self-reliant as possible.

Ticketing needs to be easy and affordable

Information about ticketing, points of sale and public transport passes needs to be transparent, easy to access and non-discriminatory. Particularly elderly persons and children expressed the wish for analogue forms of ticket purchase, preferably on board of the vehicle or at the station/stop. The ticket prices should be in correspondence to different economic factors of user groups, for example discounts for elderly persons and persons with disabilities are required.

Accessibility - regarding the quality of stay

Our target groups criticized the design and provision of facilities at transport stations and stops repeatedly. Usability of benches, provision of shelter and amenities (e.g. toilets at stations or drinks machines) need to be thoroughly planned, and developed with the participation of diverse user groups. Generally, functionality should be on the same level of importance as aesthetic aspects in the design.

Operational aspects of public transport

Operating short routes and fast connections can lead to inadequate services. Especially elderly persons reported problems after boarding a vehicle. Several feel the need to rush to sit down in order to avoid falling when the vehicle accelerates. Others, reported unmanageable changing times, and missed connections due to short transition times between different lines or means of transport. The needs of different user groups should be considered when planning the operational aspects of public transport.

3 Policy recommendations for more accessible automated mobility services regarding technical and organisational aspects

We want to emphasize that all recommendations for a more inclusive public transport system (Chapter 2) have to be considered also with automated public mobility systems, in order to ensure inclusivity and accessibility. The following recommendations are specifically targeting automated public mobility services under the assumption that no human operator has to be on board by law. This is a hypothetical future scenario for which the legal foundations are not yet in place.

During our research activities, we were able to collect many data of needs and wishes regarding automated mobility services. Several of them include design features of and in the vehicle. While the design of vehicles is essential to ensure accessibility and inclusion, the policy recommendations on accessible automated mobility go beyond design and include organisational aspects and considerations that have to be made prior to implementing an automated mobility service. Policy makers and public authorities should involve universal design criteria in their public procurement requirements.

Make safety a priority

The CATAPULT research results showed that safety is an important factor – if not the most important – for increasing acceptability of AVs, especially for elderly persons. What features are important for passengers to feel safe, might differ between user groups. Various features such as emergency buttons, emergency breaks, seatbelts, airbags, fire alarms, etc. have been discussed. User groups also tended to link safety with ease of use / usability (e.g. a safe and weather-proof ramp, sufficient poles and handles) and communication (e.g. with a (remote) operator, especially in case of emergencies or unexpected incidents.).

Furthermore, technical systems can be considered to perform safety tasks that the driver usually does apart from driving such as: checking that people have time to sit down before the bus starts or that no one has fallen or had some other type of accident. It is necessary, to include different user groups in the development process of automated mobility services, identify the most important safety features at an early stage and make sure that these safety tasks a driver usually performs apart from driving are replaced in an appropriate manner.

Offer training and education

Our research showed that a soft implementation of automated mobility services is important for people to get used to the technology. The target groups of CATAPULT project expressed their need for education on automated mobility: how does it work, how do I have to behave, what do I do in case of an emergency or incident, etc. Training and education have to be target-group oriented and set up in a way that it reaches as many people as possible regardless of age, gender, income, socioeconomic status etc.

Education and training can be implemented on different levels. Automated mobility and the interaction with automated vehicles could become part of the driving license training. Furthermore, cities and municipalities can start information campaigns, explaining their intentions with the deployment of automated mobility services and answering the most frequent questions. This should be done proactively by public authorities, picking up users where they can easily be reached (e.g. in kindergarden and schools, day care centres for the elderly, etc.). Training and education on automated mobility can also be implemented at a university level, where automated mobility should be included in curricula of relevant study programs (e.g. spatial planning, transport planning, logistics, etc.).

Information is key!

Information is a key aspect when it comes to using automated vehicles and to building trust and feeling safe with it. All user groups that were included in our project expressed the wish and need for transparent, real-time information on various aspects of their journey, including amongst other things: driving intervals and waiting times, intentions of the shuttle, reasoning for certain manoeuvres like abrupt braking, technical failures, change of route or interaction of the shuttle with other road users. Especially in the case of emergency, users want to be informed on what to do, who to address and when to expect support. This information must be easily accessible and communicated via at least two sensory channels (see recommendation on multisensory principle). Furthermore, digital and analogue channels should both be considered.

Define responsibility

Linking to the aspect of information, one common concern amongst user groups was the potential lack of a responsible person on board, in case of any problem, incidents or emergencies. User groups see the need for a responsible person. This person does not necessarily have to be physically on board of the automated vehicle. Remote operation is commonly seen as a suitable alternative, if communication can be established easily.

Regarding responsibility, decision makers also need to make considerations of who will take over/what can replace the “informal” services that a driver provides, such as: intervening when there is a conflict or incident on board, holding the door when someone is running towards the bus station, providing the feeling of not being alone, etc.

Furthermore, the participants of our field studies were concerned about their responsibilities as passengers (e.g. what to do in case of an emergency, stepping in if another passenger is facing problems due to malfunctions of the shuttle, etc.). We therefore recommend defining clear responsibilities and making this information as well as possible communication channels transparent and accessible.

Finally, liability and accountability has to be regulated before the full deployment of automated mobility services. Public authorities have to make considerations, implement legal frameworks and define (financial & personal) liability. These aspects also have to be communicated to the public.

There is no one-size-fits-all approach – important features for safety, security and comfort have to be presented in a multisensory way

Working with different target groups, it became evident that needs and requirements regarding important features and communication of information are very heterogeneous. Therefore, it is essential to follow a multisensory principle, meaning that every feature/information should be presented through at least two sensory channels (e.g. visual and auditory, visual and haptic, auditory and haptic, etc.) and both digital and analogue channels should be considered. While this

recommendation is also important for a non-automated public transport system (see chapter 2), it becomes even more crucial when the driver as a fallback option for additional communication is removed. It is important that all passengers as well as road users can communicate with the automated vehicle or a remote operator and vice versa. This should include people with speech, language, hearing disabilities or other relevant disabilities. This also supports the findings of other projects, like “AM inklusive! (Knoll et. al, 2021)”.

Be aware of conflicts of interest

In our research activities, it became evident that the needs regarding automated mobility services of different user groups might be in conflict with those of other user groups. While elderly persons for example prefer an „offline“ ticketing system, young adults tend to prefer a ticketing system that is digitalised. Furthermore, children tend to prefer a higher shuttle speed than the current shuttles are allowed to drive while elderly persons mostly feel very comfortable with the current low speed. Furthermore, commuters want to reach their workplace as fast as possible while elderly persons and persons with disabilities mostly prefer decelerated transfer times. Those conflicts of interest need to be identified at an early stage of developing automated mobility services and considered in connection with other mobility offers so proper solutions can be found.

Consider the automated shuttles as part of the complete public transport system

Automated shuttles will rarely be the only mode of transport for people with some kind of mobility restrictions. Therefore, fast, easy and reliable change between different modes of transport is required. The automated shuttles can increase the range passengers with mobility restrictions can travel to some extent, if properly connected to other services. In addition, the shuttles can be used to overcome hurdles that may not be very important for most passengers but are huge barriers for people with mobility restrictions, such as (even short) steep hills, dangerous crossings, or construction sites where normal infrastructure (e.g. pavements) is not working properly.

4 Policy recommendations on co-creation methods in the development process of inclusive automated mobility solutions

Co-creation and participation processes are an important element in making new mobility services such as automated mobility services as beneficial, inclusive and accessible as possible for the public good. Including diverse persons in the design process of new mobility services can prevent pointless implementations and the need for expensive modifications. Through our research activities and by using participatory methods (workshops, field tests, focus group interviews, different versions of a serious game), we were able to identify numerous needs and requirements of the defined target groups. Furthermore, our methods supported an inclusive planning process of fictional automated mobility services involving different stakeholders and diverse user groups (see e.g. Flores, Vanongeval & Steenberghen, 2023; Flores et al., 2023). The policy recommendations in this chapter emphasize the importance of using participatory formats and co-creation methods such as serious games and at showing how their use can be supported. The policy recommendations represent our experiences in the CATAPULT project and refer to when the idea has already been born that a shuttle should be introduced, regardless of financial feasibility and/or ecological considerations. If it should be implemented and in whatever way, e.g. on-demand, route, use case, etc., is a matter of co-creation and negotiation, and has to be adapted to local conditions.

Support a culture of participation and co-creation in your country, organisation or team.

A prerequisite for developing an automated shuttle service inclusively and accessible is the involvement of people who will and/or should be affected by the new service. If it does not exist yet,

you should develop a participation culture on the level of your sphere of influence (national, regional, local, organizational level, educational institutions etc.). We experienced that very often policy makers, planners and decision makers are not aware of the diverse needs and requirements of different stakeholders and user groups because they do not involve them. It is important to integrate diversity and accessibility aspects in every innovation implementation, public strategy, policy, guidelines such as legal, funding, education plans and building requirements. However, it is equally important to involve diverse stakeholders and (potential) users continuously and on an equal footing in planning and development procedures. This can be done by using participatory and co-design processes as a common way to achieve the best possible accessibility and inclusion. To raise awareness about the diverse experiences people make in our mobility system you can use our serious game "Change of Perspective" described in CATAPULT deliverable 4.3 (Flores & Steenberghen, 2022).

Always consider the slogan "Nothing for and about us, without us!"

New automated mobility services should obligatory be developed, planned and designed together with the affected persons considering diverse life realities from the beginning and throughout the whole development and decision process. Policy makers, decision makers and planners should always demand the inclusion and participation of the persons who will be affected by the automated mobility services. This can prevent frustration, planning past people's needs and (costly) re-building afterwards. For example, in our research and participation formats we found that the existing (automated) mobility services often do not represent the actual needs and requirements of the user groups and therefore, are not considered as a mode of transport to the possible extent. The participants can be a source of numerous innovative ideas and solutions. Publicly funded mobility services should be put in best use for everyone that is why we argue to check the operational necessity for and usability of automated shuttles in the certain area with affected persons and stakeholders.

Identify use cases together with local user groups

From our experience, test projects of automated shuttles are often set up without involving a representative group of the local population (considering age, education, professional backgrounds, gender, class, language, ethnicity, life realities, abilities and mobility restrictions as well as persons in different stages of life). Test projects do not necessarily cover use cases that seem relevant to the local population or satisfy local needs. For future deployment of automated mobility solutions that go beyond testing, we therefore recommend to identify potential use cases together with potential local user groups. Furthermore, decision makers need to identify together with local population, if the technology is really the right solution for the context in question or if different solutions should be applied.

Our project results show that a targeted use of automated shuttles in particular areas of operation is promising. Promising locations include cemeteries, closed (hospital) areas, or door-to-door services. Our various CATAPULT serious games, which we have adapted according to the specific country needs described in CATAPULT deliverable 4.3 (Flores & Steenberghen, 2022), can be used to discuss and plan routes including the necessary infrastructure for new automated mobility services together with these diverse user groups as well as other stakeholders such as politicians, representatives from various advocacy groups, investors etc.

The setting for participatory processes must be inclusive and accessible

Make sure that the setting and modes for conducting participatory and co-creation processes are inclusive and accessible. Make sure to adapt your participatory processes and co-design methods to

the requirements of your target groups starting with the invitation formats and the dissemination channels (keyword: digital divide). This can mean to adapt your methods, to work online or in an analogue setting, to offer financial compensation and/or to provide assistance such as a translator. In CATAPULT, we adapted the serious game versions to the abilities of our target groups e.g. we used simple language in the serious game version for children in Belgium and big fonts for depicting the points of interest in the Austrian serious game session with elderly persons for finding a route. Furthermore, the venues where we have hosted the serious game sessions had to be accessible for persons with walking impediments and additional seats for assistants had to be provided at the tables. We have designed online as well as analogue versions of the serious games. You can find more of our learnings and recommendations regarding all these aspects as well as information on the serious game versions in CATAPULT deliverable 3.2 and deliverable 4.3 (Flores & Steenberghe, 2022).

Be transparent about decision and co-creation processes

Besides enabling and incentivizing the involvement of diverse persons in participatory and co-creation processes through e.g. an inclusive setting, gamification and/or financial compensation, it is important to be transparent about the starting point, layers of influence (e.g. be part of the decisions making or only generating ideas) and possible outcomes of the participation process. Examples for questions to clarify are: Is it possible that wishes will be overruled? If yes, by whom? Is it an option to refuse the proposed technology or is it a political given? How are the different pillars of sustainability weighted (social, economic, and ecological)? The integration of the results of participation and co-creation processes into development and decision procedures should be binding and can be reached by obtaining commitment from decision makers in advance. In CATAPULT, as a next step we could discuss feasibility of the proposed routes with experts to collect arguments for or against certain routes proposed by our target groups and bring them back to the participants of the co-creation process.

5 Policy recommendations on research & innovation

Research on inclusive solutions in transport is fundamentally different from technology-based research. It is about downscaling instead of upscaling, individualizing instead of generalizing, thick data instead of big data. This is not typically measurable through Key Performance Indicators (KPI's), thus making research and innovation technology driven rather than putting the human at the center. We take the position that research and innovation processes need to allow qualitative factors to be introduced in performance checks, to include human centered evaluation approaches.

Furthermore, inclusive research already starts before the actual research activity. It also includes the way a call is written (multilingual, simple language, etc.), the funding requirements (requirements to the diversity of the consortiums, aspects regarding diversity and inclusion that have to be considered within in the project, etc.) and the way in which results are presented.

Conduct more research on diverse user groups and their needs and requirements regarding automated mobility services

In CATAPULT, we covered the target groups: children, elderly persons and persons with physical and/or cognitive disabilities. We did not cover all life realities of these target groups. Therefore, we recommend to conduct further research and innovation with these target groups and their diverse life realities and additionally with further target groups. The CATAPULT activities showed that the diversity of many persons have not yet been (sufficiently) included in research and innovation regarding automated mobility services including our target groups. Additional underrepresented

target groups are, for example, persons with dementia, persons who have problems with sensory overload, persons who have to care for others, women, etc. Generally, more research and innovation should be conducted regarding mobility systems and diversity aspects (education, race, class, sexuality, ability, age, gender, ethnicity, culture, language etc.). This research also has to be intersectional. As pointed out in chapter 4, we argue for the involvement of diverse person groups through participatory and co-creation methods in development and decision processes. In our opinion, the same applies for research as well as innovation processes. Furthermore, the CATAPULT project only covered collectively used automated shuttles. Research on the needs and requirements of diverse user groups should also be done regarding other automated mobility services.

Make the funding ecosystem accessible and include diversity and inclusion aspects in funding criteria

It is necessary that an appropriate funding landscape is implemented. It is the task of policy makers, politicians and legislators to fund, manage and enable research and innovation by, with and for people with diverse life realities following an universal design approach. To enable research and innovation by and with people with diverse life realities funding calls should be written in simple and different languages. Furthermore, funding calls should always request that research and innovation considers a diverse group of people and, even better, involves a diverse group of persons or their interest representatives using participatory and co-creation methods. Diversity, inclusivity and accessibility should always at least be a cross-sectional topic in research and innovation. Finally, the results and outputs of research and innovation activities should be easily accessible, easy to use and ideally prepared for the respective target groups such as public authorities, mobility service providers, planners, etc. This should be set as a funding requirement.

Enable inclusive research and innovation

In addition, the (legal) framework should enable research and innovation by, with and for people with disabilities from the beginning. In Austria, for example, due to the legal situation, persons using wheelchairs were excluded from participation in the test operation of automated shuttles. The law stated: "During the test period, people must be carried exclusively in the intended seats and not commercially." In April 2022, the legal framework was adapted and amended: "During the test period, people must be carried exclusively in the intended seats and not commercially. People in a wheelchair and people with a pram may be transported if appropriate safety measures ensure that there is no increased danger for all vehicle occupants." Furthermore, local conditions (e.g. weather conditions) should also be considered in testing projects, especially when they are conducted by an international consortium. Finally, funding for the implementation of well-researched innovations should always be linked to specifications and directives regarding accessibility and diversity aspects. For example, not only should a certain number (if not all) e-charging stations be accessible, but also information on which charging points are designed accessible should be provided.

6 Reflection on the topic of inclusive and accessible automated mobility services

On February 23rd, 2023, the CATAPULT, SmartHubs and JUSTICE conference took place in Brussels. For CATAPULT, the conference marked the end of the project (learn more about the conference on www.catapultproject.eu). The JUSTICE and SmartHubs projects also focus on the development of an inclusive and accessible mobility system. Their preliminary findings reaffirmed one of our main conclusions: the current mobility system is still to a large extent not inclusive and accessible. A focus

on mere technological aspects will not be enough to overcome barriers in the mobility system. This also affirmed the importance of considering needs and requirements of diverse target groups regarding accessibility at an early stage of the development of a new technology, not only throughout the deployment phase.

During the conference's panel discussion, experts reflected on the topic of making automated mobility services more inclusive, co-creation and participation processes, how structural trends influence the mobility system and the role of research and policy. We want to share these reflections because they include important aspects, which should be considered regarding the topic. The panellists were Suzanna Kraak (Policy Officer, European Commission), Delphine Grandsart (Research Officer, EPF), Giulia Renzi (Project Manager, ICOOR) and Pedro Homem de Gouveia (Senior Policy & Project Manager, POLIS).

Co-creation processes need to go further than simply engaging with different user-groups. It is crucial to involve people, listen to what they need, want and desire and to use experience as an enabler for inclusiveness. Processes for co-creation need to be set up in a way that everybody feels comfortable:

“The three key aspects for making mobility more inclusive are: involvement, listening and experience. We should involve people, not just engage them. We should listen carefully to them and start from their experience. Co-creation processes need to be comfortable for everyone.” – Giulia Renzi (ICOOR)

Moreover, it is necessary to shift the perspective and start developing technology and new services from what users need and want. A societal perspective on new technology needs to be integrated from the start of a development process. Research and innovation must also take responsibility. Considerations about how the services will be useful and how they will impact different user groups need to be made at an early stage:

“Responsibility for inclusivity starts with research and innovation. Societal needs should be the starting point. Co-creation, co-design and universal design are essential for putting research and innovation to use for society.” – Suzanna Kraak (EC)

Furthermore, the scope of accessibility was discussed. It became evident, that accessibility needs to go beyond physical components and include accessible information as well.

The panellists also reflected on best practices and challenges to approach different stakeholders. One main message was that it is important to include user and stakeholder groups from the beginning and to shift from a technological push to a user-centric approach. Research and innovation on automated mobility needs to become more trans- and interdisciplinary and a common language and understanding must be established. This is also important when it comes to communicating research results, e.g., policy recommendations, to public authorities, cities, transport planners, etc.

“Research and innovation need to shift from a technology-focused approach to one with humans in the centre. Also, it is not enough to produce long reports, but more practical, useful outcomes are required that are available and accessible to a non-scientific community.” – Delphine Grandsart (EPF)

Finally, potential trade-offs between social, economic and ecological factors were discussed. One difficulty in assessing potential trade-offs originates from the uncertainty of the conditions of automated mobility services once they move beyond prototypes and piloting. It is not clear yet, what the costs of vehicles will be or who will pay for these services. Furthermore, it is hard to classify certain aspects into different categories, e.g. safety can be seen as a social factor, but also as an economic factor. It

might be necessary to introduce new evaluation concepts that are more holistic than current methods of evaluation. Trade-offs and compromises might be necessary, which reinforce our opinion that public authorities have to start making fundamental considerations at an early stage of the deployment of cooperative, connected and automated mobility (CCAM) solutions.

The uncertainty of the future is something that needs to be considered in mobility research as well as governance:

“Climate Change and Population Ageing are two key structural trends that will shape our future. They have profound economic, social, and political implications for the future of cities, and for the governance of all things urban, including urban mobility.” – Pedro Homem de Gouveia (POLIS)

Even though it might be uncertain how the future looks like, policy makers need to prevent negative effects of new automated mobility services. Cooperative, connected and automated mobility can be one solution, but will probably not be the only solution for existing problems.

The discussion ended with a reminder for all of us that inclusion in research, innovation and policy making is a learning process. We need to establish a culture of failure and reflect on our own processes to keep improving. This also applies to public policy makers that need to make bold and courageous decisions to ensure an inclusive future public mobility system.

7 References

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8 Annex

Annexstrategy Title	Territorial scope	Date of release	Available in English? (Yes/no)	Aim/content of the strategy	available here:
Barrierefreiheit und Verkehr. Rechtsgrundlagen und Institutionen	Austria	2022	no	A summary of legal prescriptions on the topic	Link
Barrierefreiheit und Verkehr. Beispiele aus der Praxis	Austria	2022	no	good and bad accessibility and usability practice for different transport modes	Link
Leitfaden für barrierefreien Öffentlichen Verkehr	Austria	2009	no	guideline for accessible public transport	Link
Barrierefreie Stadt. Altersfreundliche Mobilitätsangebote im städtischen Raum. Ein Handbuch für ExpertInnen und EntscheidungsträgerInnen zur Umsetzung von Barrierefreiheit.	Austria and beyond	2016	no	Handbook for accessible urban mobility	Link
Kumm steig um. Mobilitätsleitbild für die Region Linz	Linz and surroundings	2018	no	Regional mobility concept	Link
salzburg.mobil 2025. das Landesmobilitätskonzept 2016-2025. Expertenbericht Teil 2 - Ziele-Strategie-Maßnahmen	Salzburg (region)	2016	no	Regional mobility concept	Link
Mobilitätskonzept Niederösterreich 2030+	Lower Austria (region)	2015	no	Regional mobility concept	Link
Mobilitätsmasterplan Kärnten 2035	Carinthia (region)	2016	yes (summary)	Regional mobility concept	Link
Step 2025. Urban Mobility Plan Vienna	Vienna	2015	yes	Regional mobility concept	Link
Mobilitätskonzept Vorarlberg 2019	Vorarlberg (region)	2019	no	Regional mobility concept	Link

Deliverable 4.2.

Strategiepapier Fußverkehr Wien	Vienna	2014	no	raise modal share of walking	Link
Barrierefreies Bauen für ALLE Menschen (Graz). Planungsgrundlagen	Graz	2006	no	urban construction principles	Link
National Action Plan Disability 2022-30		2022	no	long term strategy to realize the UN-Disability Rights Convention	Link
Masterplan Gehen LiDo (Floridsdorf, Donaustadt)	2 Viennese districts	2023 (forthcoming)	no		
Tillgänglighet i ett hållbart samhälle – Målbild 2030 (Trafikverket)	Sweden	2019	no	Mobility goals for Trafikverket and their relation to UN goals	Link
Trafik- och mobilitetsplan - För ett mer tillgängligt och hållbart Malmö	Sweden, Malmö (city)	2016	yes	High level description of Malmö's plan for mobility	Link
Mobilitetsplan för Skåne	Sweden, Skåne (region)	2017	no	High level description of Skåne's plan for mobility	Link
Riktlinjer för mobilitet och parkering i Göteborgs Stad	Sweden, Gothenburg (city)	2018	no	Description of Gothenburg's plan for parking and mobility, focused on building permits	Link
Länsplan för regional transportinfrastruktur i Stockholms län 2022–2033	Sweden, Stockholm (region)	2022	no	Description of the Stockholm regions plan for transport infrastructure 2022-2033	Link
Hållbarhetsbedömning för Länsplan för Region Stockholm: Strategisk miljöbedömning och social konsekvensbedömning	Sweden, Stockholm (region)	2021	no	Assessment regarding sustainability of the transportation available in the Stockholm region	Link
Riktlinjer Tillgänglighet för barn, äldre och personer med funktionsnedsättning	Sweden, Stockholm (region)	2020	no	Functional guidelines for how transport infrastructure should be made accessible	Link

Deliverable 4.2.

Mobilitet för gående, cyklisterna och mopedister	Sweden	2022	no	High level recommendations for the application of mobility guidelines, taking accessibility into consideration	Link
Trafik- och mobilitetsstrategi för Upplands Väsby kommun	Sweden, Upplands Väsby (county)	2022	no	High level description of Väsby's plan for mobility	Link
Trafik- och mobilitetsstrategi	Sweden, Norrtälje (county)	2022	no	High level description of Norrtäljes plan for mobility	Link
Vlaamse Mobiliteitsvisie 2040	Flanders	2022	no	High level policy priorities and levers	Link
Decreet basisbereikbaarheid	Flanders	2019-modified 2020	no	Decree containing various provisions on common transport, general mobility policy, road infrastructure and road policy	Link
Toegankelijkheid en Mobiliteit voor Allen	Brussels Capital region	2019	no	Set up as support, as part of the Decree related to 'The Social Map' in 2019	Link
Conceptnota uitwerking mobiliteitscentrale (Hoppincentrale)	Flanders	2019	no	Provide transport solutions for all users and for special needs groups	Link
Vrijwilligersvervoer en Minder Mobielen Centrale (MMC)	Municipalities	2017	no	Service of volunteers providing mobility to people with reduced mobility (including low oncome)	Link
Vademecum toegankelijk publiek domein	Flanders	2020	no	Design criteria for accessible public space	Link
Vademecum voetgangersvoorzieningen	Flanders	2003	no	Design criteria for pedestrian facilities	Link
Vademecum fietsvoorzieningen	Flanders	2005	no	Design criteria for cycling facilities	Link
Vademecum vergevingsgezinde wegen voor zwakke weggebruikers	Flanders	2020	no	Design criteria for new or refurbishment of pedestrian and cycling infrastructure	Link

Deliverable 4.2.

Bushaltegids	Flanders	2019	no	Part of the masterplan accessibility: local authoriries get financial support, coaching and every 2 years there is an award for the more mobile municipality	Link
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