



Smart Mobility Hubs as Game Changers in Transport

WP6. Governance, policy guidelines and knowledge exchange

T6.1. Policy and governance impacts

Deliverable D 6.1

Policy and governance impacts. The SmartHubs Living Lab activities from a democratic integration perspective

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EXECUTIVE SUMMARY

This Deliverable D6.1 addresses the role of participation and co-creation in enhancing democratic integration and inclusivity of mobility hubs. The SmartHubs project encompasses four Living Lab (LL) areas, each featuring one to three mobility hubs, where researchers conducted co-design processes involving citizens and stakeholders to assess preferences and features for mobility hubs. The Deliverable examines the participatory processes during the project and their local development of mobility strategies. The guiding heuristic for this analysis is the SmartHubs integration ladder grounded in participatory governance research. Evaluating the development of mobility hubs based on democratic integration facilitates an understanding of potential societal impacts when realizing participation. Democratic integration refers to the active involvement of citizens in governance processes at various levels, allowing them to have a say in decision-making and policy development. The report underscores the impact of citizen engagement on shaping mobility policies: It reflects on the complexities and limitations of citizen involvement, balancing opportunities for experimentation with constraints like time and financial limits. It also acknowledges chances for constructive citizen initiatives as well as challenges, like protests against unpopular measures, highlighting the importance of meaningful participation beyond tokenism either way. Additionally, the report provides insights into conducting participatory formats, emphasizing factors like setting and inclusivity to ensure effective citizen engagement. It discusses tools and methods employed within the SmartHubs project for citizen involvement, such as co-design games, surveys, and appraisal tools, each offering different levels of democratic integration. The report concludes with recommendations for participation organizers.

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1. INTRODUCTION

The SmartHubs project examines mobility hubs as part of intermodal mobility and the shift towards inclusive, sustainable urban mobility and accessibility. The main objective is to assess if a co-designed, user-centric development of hubs is a game changer for the mobility transition towards inclusive and sustainable transport. Mobility hubs can be understood as the physical manifestation of multimodal mobility. Their goal is to facilitate a smooth transition between different modes of transportation, particularly addressing the first or last part of a multimodal journey, known as last/first-mile mobility. Mobility hubs play a role in integrating digital, spatial, and social aspects (Geurs et al., 2023).

The sustainable mobility transition implies changes like new mobility services, technological innovation, and more multi- and intermodal mobility. These dynamics result in transforming governance frameworks and changing the roles of actors. Following the notion of society-centered research, the crucial role of the state is still recognized but supplemented by considering a broader range of actors, practices, and knowledge, such as businesses or NGOs (Karner et al., 2020; Verlinghieri & Schwanen, 2020). Based on a horizon scanning approach, mobility researchers consider participation and citizen engagement as well as social justice and inclusion as important themes to be addressed by future mobility research. They claim that participatory transport planning is still underused and limited in scope. Therefore, the development of new engagement methods is needed and research questions in this thematic field merit more attention (Ryghaug et al., 2023).

Deliverable 6.1 contributes to this desideratum by examining the SmartHubs Living Labs (LLs) with a participatory governance perspective. This Deliverable results from task 6.1, “Policy and governance impacts” of the SmartHubs project. It uses a participatory governance approach to examine the governance impacts of the co-creation processes regarding mobility hubs in the four SmartHubs Living Labs. The task aims to identify factors that successfully promote democratic integration in transport policy-making, with particular attention to the procedural dimension of co-creation as well as horizontal and vertical integration of the hubs in (trans)regional policy-making. This report uses research data and outputs from SmartHubs work packages WP2, WP3, and WP4. This report pays particular attention to citizen participation even though it also considers different forms of stakeholder participation regarding mobility hub implementation. According to the SUMP guidelines, this report defines citizens as all people living and/or working in the functional urban area. Stakeholders are all individuals, groups or organisations affected by and/or being able to affect the SUMP. While citizens are a part of this group, the term stakeholders mainly refers to institutional stakeholders, such as public authorities, political parties, citizen and community groups, business organizations, transport operators, and research institutions (Ruprecht Consult, 2019, p. 45). This broader scope means that not only single citizens, residents, or users of mobility hubs and their surrounding area are considered in this report, but also organized civil society in the form of associations, advisory boards, enterprises or other NGOs.

The SmartHubs project has four LL areas, including one to three mobility hubs. In each LL, researchers from the SmartHubs project organized a co-design process and involved stakeholders to examine preferences for location, design, signage, willingness to pay, available modes, and additional features for a mobility hub (see WP 3, 4, and 5). In this report, we do not aim to reconstruct each step of the LL process but focus on the democratic integration within single formats. The following research questions guide this report's academic interest: How can participatory governance help to increase democratic integration and inclusivity of mobility hubs? What criteria can be used to examine participatory processes? How can experimental governance help to facilitate participatory processes in sustainable mobility transitions?

The SmartHubs integration ladder serves as a heuristic for assessing and comparing the development of mobility hubs. This ladder is grounded in three dimensions: physical, digital, and democratic integration (see Garritsen et al., 2024). Through the SmartHubs integration ladder, various hubs with diverse services can be compared, allowing for an understanding of potential effects and incorporating societal goals into mobility hub developments. The underlying assumption is that the “smarter” the mobility hubs, “the more user value is created, higher usage and user satisfaction levels are achieved and increased societal impacts can be expected (in terms of reduced car use and ownership levels, accessibility impacts, impact transport emissions, etc.)” (Geurs et al., 2022, p. 37). To put it simple,

highly integrated smart mobility hubs are poised to be a transformative force in achieving inclusive, sustainable urban mobility and accessibility.

This report is structured as follows. Chapter 2 discusses the theoretical framework, encompassing participatory governance and experimental governance. Chapter 3 elaborates on the methodology and data used for this report. Chapters 7 to 7 detail the SmartHubs Living Labs in Brussels, Rotterdam/The Hague, Eastern Austria, and Munich, covering governance frameworks, participation roles, regional/local mobility planning, and co-design processes. Chapter 8 presents discussions and learnings, and Chapter 9 concludes the document.

2. THEORETICAL FRAMEWORK

2.1. SmartHubs integration ladder

An important part of the SmartHubs integration ladder is the pillar of democratic integration. Together with the other two pillars physical and digital integration, it represents the potential for an increasing integration performance from single mobility services to a mobility hub to a ‘smart’ mobility hub. A comprehensive explanation of the three dimensions of the SmartHubs integration ladder has already been developed in previous publications (Geurs et al., 2023; Geurs & Münzel, 2022). The ladder assumes that participation and integration interact with each other and reinforce each other positively. Accordingly, more participation leads to better democratic integration. At the same time, it makes the LL more attractive to people, who consequently want to and are able to use the mobility hub facilities which in turn benefits the development of sustainable mobility. Democratic integration is very central in this context because, in view of the depth of transformation of mobility for people's everyday lives and the associated change in their daily routines and habits, the questions of legitimacy and citizenship, participation, social acceptance as well as expertise come to fore. With regard to particularly vulnerable citizens and their needs and barriers, we refer to Deliverable 3.2 (Martinez, Pappers, & Keserü, 2022).

Based on the criteria Kern (2008) has launched for participatory governance and the Schweizer-Ries (2011) approach for participation, as well as the principles of universal design, D2.1 proposed the following typology of participation processes (Geurs & Münzel, 2022).

		Physical integration	Digital integration	Democratic integration
Smart Mobility Hub	4	Conflict free and place making	Integration of societal goals and policies, and consideration of universal design principles	Social learning
	3	Visibility and branding	Integration of service offers and consideration of universal design principles	Integration of different knowledge
	2	Wayfinding and consideration of universal design principles	Integration of booking and payment and consideration of universal design principles	Deliberative engagement of stakeholders, including (vulnerable) user groups
Mobility hub	1	Acceptable walking distance to shared and public transport, minimum inclusive design standards	Digital integration of information	Appropriate representation of stakeholder interests, no or limited attention for vulnerable user groups
Single mobility services	0	No physical integration	No digital integration	No stakeholder involvement and consideration of (vulnerable) user needs

Figure 1 SmartHubs integration ladder (own adjustments based on Geurs et al. 2023: 18)

Regarding the dimension of democratic integration, the following levels have been defined. The following analysis in Chapters 4 to 7 refers to the following heuristic as well.

Level 0: No involvement

At this level, stakeholders are not involved in the decision-making process, and no efforts are made to follow universal design principles.

Level 1: Appropriate representation of stakeholder interests

Stakeholders and citizens get asked in consultation processes stakeholder dialogs, or similar formats. Participants recognize the information provided and show responsivity. The usage of a service also belongs to this level. However, no or only limited attention is given to including vulnerable groups as active participants.

Level 2: Deliberative engagement of stakeholders

This level is marked by active, argumentative engagement of all stakeholders, including vulnerable groups, in decision-making. Different positions are exchanged and have been heard in a participation process. Participants including vulnerable users, actively take part in a format offered. Organizers make an invitation for participants and listen to the articulation of stakeholder and citizens interests.

Level 3: Integration of different knowledge

Stakeholder and citizen inputs, encompassing a wide range of ideas, wishes and concerns, are not only heard but actively integrated into the development process. Inputs are developed further collaboratively and contribute to the outcome of the process. Organizers create room for decision making, and participants are willing to make informed decisions.

Level 4: Social learning

Social learning is the highest level of engagement, where stakeholder participation becomes an autonomous part of the community, fostering an environment of continuous improvement and learning. Accordingly, participation becomes permanent or is meant to become permanent. The participation process has its own dynamic and becomes independent from external moderation (Geurs & Münzel, 2022, 29f.).

2.2. Legitimacy and Citizenship

In view of changing statehood in globalization, scientists have been thinking about the significance of citizenship for some time (Lafferty & Meadowcroft, 1996). With a changing state, cultural and social structure, the political order, which in (Western) Europe is strongly characterized by democracies, is also changing. The understanding of citizens and their rights and duties in the environmental realm oscillates between two partly opposing poles. While environmental citizenship in liberal democracies mainly refers to the rights of people and their freedom of choice (Bell, 2005), the republican understanding of environmental citizenship emphasizes much more the duties of citizens, which in turn arise from the need not to exceed planetary boundaries with the individual way of life in favour of the common good (Barry, 2006). This creates a field of tension that has different approaches and assessments of what a city must or should do in order to achieve a sustainable transition and, at the same time, what role legitimizes this approach in the face of the respective political system.

Accordingly, the role of citizens reaches from actively shaping policies as the main sovereign of the political order up to the rather passive lending of (market) *acceptance* expressed by using the services offered. In the first (republican) understanding, it is a civic duty to participate in actively shaping the mobility options which in this case become a common good. In the second case, acceptance is expressed through the demand for the product. While this liberal understanding also recognizes the participation of citizens in the political process, their commitment to the common good is left to individual choice (Bohn, 2021).

The different understandings of citizens correspond with different perceptions of *legitimacy*. Legitimacy can be understood as the effectiveness of policy outcomes (output legitimacy) for the population, and input legitimacy, understood as the responsiveness of governments to citizens' concerns as a result of

public participation (Scharpf, 1970) as well as throughput. Throughput legitimacy is assessed on the basis of the efficiency, accountability and transparency of governance processes as well as their inclusiveness and openness to consultation with the population (Schmidt, 2012, p.2). Here, participation, ties in with the assessment of the political order, the associated understanding of citizens as well as an assessment of legitimacy.

If we look at the SmartHubs integration ladder and the pillar of democratic integration in particular (see above), it becomes clear that the development of smart mobility hubs and the participation of citizens in their development have implications about the political order and the associated understanding of citizens. Furthermore, an assessment of legitimacy becomes possible. At the lower ranks, output legitimacy can be achieved that corresponds to the liberal understanding of political order, because citizens can demand mobility options from mobility hubs or not. Input legitimacy, on the other hand, is linked to the responsibility of municipalities towards the concerns of citizens, which become visible in participation. In addition, throughput legitimacy not only looks at whether participation has taken place, but it also looks at the transparency and accountability of the processes, which is central to smart mobility hubs. It also looks at the inclusion of people. Against this backdrop, we can therefore say that the democratic integration ladder, with its particular focus on considering people who are affected by exclusion, addresses a special and profound possibility of legitimacy. Mutual learning from each other as the highest level of integration implies taking responsibility for social processes, which involves spending time and being willing to think oneself into other positions. Consequently, it can be argued that in order to achieve throughput legitimacy, elements of a more republican political order become effective.

2.3.Participatory and experimental governance

Regardless of the political order, the participation of citizens is a prerequisite for achieving legitimacy. The quality of participation is decisive for the type of legitimacy that can be achieved. An important facet of legitimacy is acceptance by citizens, which is given to political processes, but also to products and services. Participation in sustainable mobility transitions refers to the involvement of various stakeholders, including individuals, communities, organizations, and governments, in planning, implementing, and evaluating initiatives aimed at achieving sustainable mobility transitions. The involvement of stakeholders, especially those vulnerable to exclusion, is crucial in sustainable mobility transitions to ensure that transportation systems meet the needs of all members of society (Bickerstaff et al., 2002; Karner et al., 2020; Karner et al., 2016; Martinez, Pappers, & Keserü, 2022; Verlinghieri & Schwanen, 2020). These needs can only be considered, if a dialog between different social groups, including planners and governmental bodies, is facilitated. This dialog provides expertise that would otherwise have been underrepresented and may contribute to the transition in a positive way.

There is no uniform understanding of participation; rather, academics and practitioners have devised various terminologies to describe approaches to citizen participation. What all approaches have in common is that they depict participation as a decentralized element of governance. Terms such as Collaborative Governance (Ansell & Gash, 2007), Participatory Governance (Walk, 2008), Democratic Innovation (Smith, 2009) or Radical Democracy (Cohen & Fung, 2004) are part of the debate. They all consider that governance is characterized by power shifts from the state to non-state actors (NGOs, companies), heterogenic and changeable (interest and discourse) coalitions and flexible preference structures.

Contemporary approaches to governance emphasize experimental spaces that can promote policy change, because they can have a positive influence on acceptance through the possibilities of trial and error and can initiate (incremental) change in a timely manner through the practices of trial and error. So-called experimental governance is an instrument that promotes or accelerates innovation by testing and developing new types of solutions, technologies, and services (Kronsell & Mukhtar-Landgren, 2020, p. 120). Examples of experimental governance in the context of sustainable urban mobility are pop-up bike lanes and mobility hub pilots. The SmartHubs design game, the digital pillar experiment, as well as the onsite events, are also to be mentioned in this row. Collaborative and creative activities, such as the design game evolve from participatory design. Here, the participants transcend their roles as mere users, consumers, or customers and are instead acknowledged as experts in their comprehension of

living and working environments. Through their active involvement, these participants evolve into co-designers (Tellioglu et al., 2023). Critical voices disclose that city streets increasingly become spaces for experimentation, while a systematic assessment and critical reflection on the potential to transform urban mobility are missing (Bertolini, 2020, p. 735). In this context, institutional barriers, e.g., legal frameworks or social norms such as the dominance of the car, play a pivotal role (VanHoose et al., 2022).

Apart from the heterogeneity of the approaches and the increasing number of governance experiments, there are some characteristics that most participation approaches share, especially when we think about the inclusion of people vulnerable to exclusion in sustainability transitions:

- People vulnerable to exclusion should be represented in person and with their interests in decision-making processes
- their expertise should be a result of deliberation, object to social learning, and part of the solution, possibly via co-creation
- planning should be collaborative and embedded in community engagement
- accessibility is key to participation; this includes the deconstruction of (informational, social and infrastructural) barriers
- it may lead to capacity building, which enables the empowerment of people
- processes evaluated and monitored under the conditions of transparency and accountability (for instance, Verlinghieri & Schwanen, 2020).

3. METHODOLOGY

This report follows a qualitative research design. However, it does not imply additional data collection but relies on data from previous tasks. The following figure explains the data from which deliverables were used:

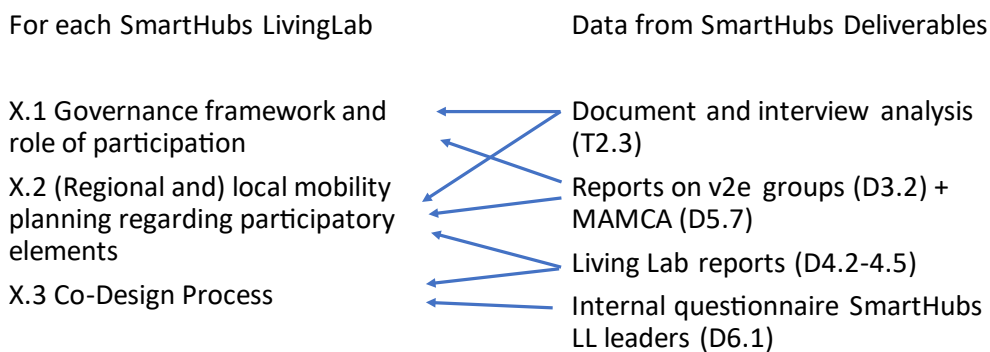


Figure 2 Overview of data used from SmartHubs deliverables (own figure).

This Deliverable uses knowledge and data from task 2.3 on the governance frameworks in the four SmartHubs LLs. Researchers from the University of Münster conducted qualitative expert interviews with experts from city and regional administrations, public transport operators, sharing providers, and civil society for each LL. The abbreviations used in chapters five to eight refer to the semi-standardized expert interviews conducted in the context of this task (for the concrete interview partners, see Graf & Hansel, 2023, p. 22). The interviews mainly focused on the governance frameworks, but also implied some questions on stakeholder and citizen participation within mobility planning and mobility hubs implementation in specific. Additionally, policy documents on local and regional mobility planning were collected and analyzed (for a detailed presentation of the methodology and research design, see Graf & Hansel, 2023, 19ff).

The Living Lab reports (Duran-Rodas et al., 2023; Garritsen et al., 2023; Kirchberger et al., 2023; Martinez, Baguet, & Keserü, 2023) were an important source for the local and regional mobility plans as well as the locally organized co-design processes. Additionally, all SmartHubs LL leaders filled out an internal questionnaire on their participatory activities to examine the co-design processes in detail. It completed the data drawn from the LL reports to analyze the democratic quality of different participatory formats. The questionnaire included the following information (see table 2 below):

Headline	Explanation
Context	LLM; LLEA; LLRD, LLB;
Participation format	ex. public consultation or display of information; stakeholder/panel/roundtable discussion; design game; online or offline questionnaire;
Short description	
Date	Date and daytime
Place	Location, accessibility of site, central location, PT access, etc
Childcare available	
Public event or closed group	
Number of participants (estimation)	
Organizers	Who organized the format?
Invitation	How did the people get invited and by whom? (ex. Social media, flyers, privatized letters, ...) Who was invited? Did people vulnerable to exclusion get invited?
Structure / Moderation	Who moderated the format? Involved stakeholder or external moderator? Who was contact person in case of questions, feedback, etc.?
Purpose	What was the purpose of the participation format? Which topics / content was discussed? Was there an open decision-making process? Inform, ask for opinions, exchange ideas, networking, etc.
Inclusiveness / Heterogeneity of participants	Were people vulnerable to exclusion present, especially regarding targeted vulnerable to exclusion groups of the LL? Who was there? Whose interests were represented?
Impression	Observing participation of SH team members: in general, what was your impression of the format? How was the atmosphere? Did people actively participate? Were there lively discussions?
Follow up	Will there be other meetings? Is there a follow-up planned? Will there be an integration into the local community? What happens with the results? Were there any networking effects? Contacts, exchanges or even institutionalized meetings beyond format?

Documentation Links / Screenshots / Pictures / ...	Was the format documented, if yes by whom? What happens with it? Will it be published, etc.?
Additional Remarks	Where is the documentation to be found?

Table 1 Internal questionnaire D6.1 SmartHubs Living Lab leaders (own table)

Each LL organized several participatory formats with different focuses. For example, they included open on-street events, outdoor and indoor workshops, supported offline surveys, and stakeholder workshops.

Researchers from the SmartHubs project used the insights from Deliverable 3.2 (Martinez, Pappers, & Keserü, 2022) to define the individual focus of each LL and the vulnerable users one LL specifically aims to focus on.

Task 3.4 of the SmartHubs project involved a co-design game developed specifically for each LL. Each game was adapted to local preconditions and follows a unique game structure (Tellioglu et al., 2023). Design Games were used as a tool to establish and carry out planning of mobility and design of urban environments in a participatory and playful manner. SmartHubs Deliverable 5.6 can be consulted to learn more about the analysis of the design games (Tellioglu & Mikusch, 2024).

The co-design process was also used to gain data on different research interests. First, the SmartHubs project developed a large-scale survey on demographic information, mobility behavior, and willingness to pay for digital and physical features of mobility hubs (Garritsen et al., 2024; Gkavra et al., 2024; Grigolon et al., 2024). D5.1 explains the full setup and data-gathering process of the survey, focuses on the full sample of the survey, and focuses on mobility patterns, user clusters, and mode choice (Gkavra et al., 2024). D5.3 explicitly focuses on the pre-defined vulnerable to exclusion groups and analyses the survey results from the perspective of those groups. It uses input from the afore-mentioned D3.2 regarding the needs and barriers of vulnerable to exclusion groups (Garritsen et al., 2024). D5.5 focuses on the hub design and the willingness to pay for different hub elements (Grigolon et al., 2024). Second, researchers in the LLs Brussels and Rotterdam/The Hague conducted a digital pillar experiment, testing different features of a digital pillar for mobility hubs. After the experiment, participants filled in two surveys, one on the kiosk about satisfaction and usefulness, and one directly asked by a UT team member. The experiment explored ways to enhance the inclusivity of digital kiosks and facilitate the utilization of the mobility hub, particularly for individuals with limited digital skills (Baguet, 2022).

Finally, each LL applied a SmartHubs Appraisal Tool (MAMCA or SIS) to enable reflection on stakeholders' preferences and identify relevant criteria concerning the design and implementation of mobility hubs. To ensure the tool's inclusivity, sustainability, and community responsiveness, engaging diverse stakeholders, from local residents to local or regional governments, public transport operators, and shared mobility operators, is central. SmartHubs Deliverable 5.7 can be consulted to learn more about the analysis of the SmartHubs Appraisal Tool (Martinez, Kirchberger, et al., 2023).

Critical reflection on used data and methodology

The authors of this Deliverable 6.1 were not involved in the conception and implementation of the local co-design processes. This brings advantages and obstacles to the evaluation of the processes. On the one hand, the authors have a critical distance to the processes and can act as neutral observers. On the other hand, precisely this distance may be a weakness, as the researchers depend on evaluating observations and documentation from external project partners. These challenges of the research process should not be assessed conclusively but, above all, be made transparent.

4. SMARTHUBS LIVING LAB BRUSSELS

4.1. Governance framework and role of participation

Constitutionally, the Belgian state is a federal state. It has different federal regions along geographical and linguistic borders. The geographical regions are Flanders, Wallonia, and Brussels Capital Region (BCR) (Becker, 2013). BCR Region is officially bilingual and includes 19 municipalities. The role of participation in Belgium varies amongst regions and municipalities. Flanders, for instance, foresees mandatory youth councils, which enable the consultation and participation of youth during the implementation of local policies. The Flemish and French-speaking communities in Brussels also have a Youth Council (jeugdraad and Conseil de la Jeunesse). They are independent advisory bodies for political representatives to the Flemish and French Community Commission and organize consultation and participation of children, young people and their organizations. The youth councils are consulted on specific topics, but also make proposals or comments on their own initiative (Brussels Capital Region, 2024). However, their impact seems limited as they often are only consulted in the final stages, as described for the example in Flanders (Ceuninck & Verhelst, 2021, 58ff.). Getting involved at final stages bears the risk of only allowing for level one participation. Deliberate engagement (level two) and knowledge integration (level three) requires early involvement of the citizens to have a real impact on the decision instead of only acknowledge and (dis)agree to final plans. Besides, there are compulsory advisory boards on spatial planning, consisting of experts such as planners, architects, and representatives (Ceuninck & Verhelst, 2021, p. 63). The Local Mobility Commission is a multidisciplinary and compulsory local standing committee crucial to gaining support for mobility projects. It is involved in preparing and evaluating mobility projects. However, it depends on the local government (mainly concerning its composition) and is therefore limited in autonomy (Ceuninck & Verhelst, 2021, 65f.).

The BCR has a regional mobility council composed of representatives of the main stakeholders involved in urban mobility: public transport companies, local and regional authorities, trade unions, businesses, public transport users, pedestrians, cyclists, environmental associations, vulnerable passengers, and car drivers. The Regional Mobility Council has four specialized sections, one of which particularly represents the interests of people with disabilities. The others focus on walking, cycling and urban logistics. The council meets monthly and is involved in mobility planning. Members can exchange opinions, raise critiques, and participate in agenda-setting. Still, their decisions are not binding to the government, so this council has only advisory functions (B14 26, B16 66ff.; Brussels Mobility, 2024). However, it regularly contacts political decision-makers and was also involved in developing the Good Move plan (B4 24, 59; B6 66ff.; Brussels Mobility, 2021, p. 19). These mobility councils are somewhat permanent and have their own dynamic, which might indicate characteristics of social learning (level four democratic integration). However, they depend on the public administration in terms of their organization. Therefore, they cannot be classified as level four on the democratic integration ladder.

The Brussels mobility administration claims to follow a “fairly hands-off approach” towards regulating mobility services. It perceives its role as a service provider and enabler of an attractive mobility system for citizens (B3 22; B4 24, 58ff.). Accordingly, citizens’ interests are also integrated through customer satisfaction surveys from public transport providers and a strong user perspective (B3 24; B5 20).

The complex multi-level governance framework and organisational requirements of Belgium and BCR demand intense stakeholder cooperation amongst regional and local stakeholders. In some cases, this leads to conflicting opinions (B5 60). The municipal level generally has more and closer contact with citizens than the regional administration (B1 30, 72; B2 236). The local mobility administration of Anderlecht consults citizens and inhabitants about mobility and urban development projects directly. It facilitates room for discussion and deliberate exchanges based on pre-planned proposals. Representatives from the administration claim that recommendations from citizens and other stakeholders are mostly included in the planning process (B1 178, 238ff.). In 2008, the Municipality of Anderlecht created the “maison de la participation” a designated department in the city center to facilitate direct communication with citizens and to provide information regarding planned projects and offered services (B1 166; B2 318). The participation department's mission is to involve residents in

communal projects and support initiatives to improve the quality of life in their neighborhoods and the commune (see Anderlecht, 2023). The local administration uses flyers, websites, social media channels, newspaper announcements, and others as communication channels (B2 316ff.).

Additionally, there are district committees composed of locally involved citizens (Anderlecht, 2023). Besides these district-specific councils, the Municipality holds contacts with several social organizations, such as youth or senior associations (B2 316). However, political representatives describe some open conflicts and anger during citizen assemblies. Even though all complaints are heard and considered, it does not necessarily mean that planning policies are adjusted (B2 366, 376).

Additionally, Anderlecht's mobility unit regularly contacts the police. An expert from the mobility and urban development unit considers the police to be the principal partner regarding problems onsite (B11 156). Because some parts of Anderlecht have fallen victim to vandalism, this is also relevant for future mobility hubs and shared mobility services (B12 502, 564ff.). A precise assessment of these incidents is not possible without further investigation. Nevertheless, this behavior could at least indicate a missing sense of ownership. Placemaking could possibly help to facilitate a less conflictual physical integration of mobility hubs into the urban space (Geurs et al., 2023).

Similar to the regional mobility council, there is a commission for active mobility (formerly only cycling commission) in Anderlecht. The council facilitates exchanges between the administration, politicians, and interested citizens. The council meets about every two months and exchanges on different topics regarding mobility in Anderlecht (B11 156, B12 340). It gives (advisory) opinions on development projects. However, in cases of non-compliance, the administration needs to justify deviations (B1 154; B2 340ff.). For an assessment of this form of participation, see above.

4.2. Regional and local mobility planning regarding participatory elements

The main mobility planning document for the Brussels Capital Region and its municipalities is the Good Move plan, which the city parliament accepted in 2020 (Brussels Mobility, 2022). Brussels Mobility started developing the Good Move plan in 2016. The document has the legal status of a regional law and is, therefore, binding for the regional institutions. The regional parliament accepted the plan in 2020 (Brussels Mobility, 2022). The Good Move plan was developed in a so-called open and participatory co-elaborative process (see Brussels Mobility, 2021, 16ff.). About 400 stakeholders from the local and regional levels, research, commerce, public transport, politics, associations, and others were involved at different planning stages. To include the (non-organized) users and citizens of the Brussels-Capital Region in the planning procedure, Brussels Mobility organized different participatory formats: First, they created a website allowing citizens to formulate opinions, expectations, and their own concrete mobility solutions through a call for ideas. Secondly, a panel called 'Make your Brussels' of 40 randomly selected citizens worked together to debate, generate new ideas, and make recommendations on mobility. Together with the website's input, their feedback was used to highlight several actions from the Good Move plan. Finally, citizens were invited to express their opinions on the Good Move plan during a public survey from June to October 2019.

The initial exploratory phase of the Good Move plan took place at the end of 2016 and offered objectives and visions for the plan. Second, an orientation phase considered technical planning, analysis, and orientation at best practices from European cities. This phase produced six thematic actions, dealing with quality of life, mobility networks, services and needs, governance, and monitoring of future developments. These outputs were also discussed with the participatory formats, like the citizen panel and the online format. Based on these preparatory steps, the initiators of the Good Move plan developed a city vision with general goals for the BCR and a mobility vision. Each of the six actions was discussed. Also, inputs from the deliberative process were included in each description (see section B.3 Brussels Mobility, 2021). Starting in September 2017, the plan was elaborated further with detailed planning, for instance, in terms of synergies, financial aspects, or competencies. Many participants demanded additional consideration of autonomous vehicles, which was incorporated into the thematic planning. Based on a preliminary plan, the stakeholders were consulted once again. Nearly 70 organizations submitted their opinions on the suggested plan. Between the summer and autumn of 2019, Brussels Mobility set up a comprehensive public inquiry with diverse publications, presentations, press articles,

social network activities, etc., and around 40 on-site events in different areas of the BCR. Additionally, citizens could give their opinion of the plan via the Brussels Mobility and the Good Move plan website.

Excursus: Implementation of the local circulation plan

A central measure of the Good Move plan is the implementation of 'pacified neighborhoods' based on circulation plans. The implementation in Anderlecht was and is highly political and contested. The process of developing the circulation plan and identifying measures for safer and more enjoyable street navigation involved citizens at different stages. During the diagnostic, citizens contributed to understanding the neighborhood's current state, and later, they provided input on potential scenarios addressing identified issues. According to civil servants from Anderlecht municipality, it was challenging to reach diverse demographics, naming women and illiterate individuals (Brulocalis, 2022, 4ff). The initial realization of the circulation plan in Cureghem (including the potential sites of the SmartHubs pilot) was carried out in August 2022. Demonstrations and vandalism against the road blockades followed it. As a result of the heavy criticism, the circulation plan will be reversed, and a new version will be developed. The mayor of Anderlecht and the Alderwoman for mobility ensure that the process will start from scratch and residents will be closely consulted. A concrete schedule is not yet been communicated (Chini, 2022; Graf & Hansel, 2023; Martinez, Baguet, & Keserü, 2023, p. 12). The circulation plans are not directly linked to mobility hubs but illustrate the challenges a critical public opinion can pose.

The vision of mobility hub development in the Brussels Capital Region ('Vision pour le développement de hubs de mobilité en Région de Bruxelles-Capitale') was published in April 2023 by Brussels Mobility (Brussels Mobility, 2023). Co-authors of the document are the local public transport company, two mobility NGOs and consultancy, and the cabinet of the mobility minister. The document is integrated into the Good Move plan and references mobility hub examples from other European contexts, most prominently the Flemish mobility hubs network (Brussels Mobility, 2023, 7f).

The typology of hubs differentiates hubs according to the offer of public transport available, the catchment area, and the location in terms of the mobility network integration (Brussels Mobility, 2023, p. 19). Based on this typology, the strategy provides an overview of potential sites where the first 20 mobility hubs could be deployed. The implementation of these first hubs in a 'test network' is planned. The strategy also describes different groups of users; in general, it elaborates on inhabitants, commuters, and visitors. Additionally, the document considers specific target groups and their needs, such as:

- People with physical or mental disabilities
- People in precarious situations
- Older people
- Young people
- Parents and caregivers

The strategy addresses the different mobility behaviors of these groups and identifies specific needs that may require complementary solutions in terms of mobility hubs (Brussels Mobility, 2023, 20ff.). In doing so, the strategy meets level two on the democratic integration ladder, deliberately engaging citizens.

Furthermore, the strategy considers the differences in mobility needs and integrates these user's knowledge, reaching the third level on the democratic integration ladder. To ensure a hub meets all users' needs, the strategy sets basic criteria of accessibility, legibility/recognizability, safety, and waiting comfort. More concretely, the strategy uses personas to check whether the hub meets the needs of these (types of) people (Brussels Mobility, 2023, 47ff).

“Pour un grand nombre de personnes âgées, les hubs de mobilité sont un nouveau concept. Elles utilisent généralement les transports publics, mais même là, elles se heurtent encore à des obstacles physiques (escaliers, trottoirs inégaux, absence d'espace d'attente agréable) ou mentaux (sentiment d'insécurité, stress lié au changement de transport). Les modes de transport partagés sont peut-être moins attrayants pour eux, mais l'accessibilité des arrêts de bus ou de tram et des services autres que ceux liés à la mobilité apportera sans aucun doute une valeur ajoutée.”

“For many older people, mobility hubs are a new concept. They tend to use public transport, but even there, they still come up against physical obstacles (stairs, uneven sidewalks, lack of pleasant waiting space) or mental ones (feelings of insecurity, stress associated with changing transport). Shared transport modes may be less attractive to them, but the accessibility of bus or streetcar stops and non-mobility services will undoubtedly add value.” (own translation Brussels Mobility, 2023, p. 22)

Even though the strategy describes an ideal planning process to create mobility hubs, it remains unclear how to include previous considerations regarding vulnerable to exclusion groups and personas in the process. However, Brussels Mobility is cooperating with a mobility NGO on evaluation schemes for these aspects. Communication and marketing are steps foreseen at the end of the planning process (Brussels Mobility, 2023, 47ff.).

Municipalities have a closer link to residents than regional or national governments (see above) and, therefore, shall handle the information regarding future hub development (Brussels Mobility, 2023, p. 51). The strategy mentions co-creation as a useful tool to strengthen citizen involvement and increase a sense of ownership towards mobility hubs. However, the document does not elaborate on how co-creative hub planning translates into concrete action. To summarize, the strategy shows initiative for knowledge integration. However, it does not get more specific, so one can only affirm deliberative engagement which is level two on the democratic integration ladder.

4.3. Co-Design Process

The SmartHubs Living Lab Brussels (LLB) was carried out in the Municipality of Anderlecht. It lies in the northwest of the BCR. Parts of Anderlecht belong to several neighbourhoods which have higher unemployment rates and are characterized by a higher percentage of non-European natives. Therefore, local researchers describe this part of the capital as the disadvantaged area of Brussels (Martinez, Baguet, & Keserü, 2023, 6ff). During the LLB activities, particular attention was paid to vulnerable groups. Hereby, the SmartHubs project refers to people with a migration background, unemployed persons, those earning lower wages, those having limited digital skills, older people, etc. One central challenge regarding vulnerable users is that they are often ill-informed and unaware of mobility options. Therefore, providing guidance and information on available mobility modes and increasing their visibility was part of the process.

The main goal of the LL is to deploy a temporary space for research in Place du Conseil, at the heart of Cureghem (Municipality of Anderlecht). Researchers in the LLB asked the following research questions (see Martinez, Baguet, & Keserü, 2023, p. 9):

- How can the design of neighborhood mobility hubs incorporate the needs and motivations of (vulnerable) citizens?
- How can digital kiosks facilitate the use of mobility hubs for vulnerable users and people with low digital skills?
- To what extent can a stakeholder assessment tool support the co-creation process of a mobility hub?

The mobility hub in Anderlecht has a temporary character. Currently, the Municipality has no concrete plans to build an actual mobility hub at the Place du Conseil. However, the location has been identified as potential site for a mobility hub in the mobility hub vision note (Brussels Mobility, 2023, p. 37). Still, the co-design remains hypothetical for now, negatively impacting the amount of power-share and scope of decision-making by participants of participatory processes. However, the results of participatory

formats might be used for future planning and empower citizens, raise awareness, and enable deliberate engagement of citizens in local mobility planning. The participation process led by the SmartHubs project members involved several private and public stakeholders. For the public authorities, employees of the Anderlecht municipality and Brussels Mobility were involved. STIB/MVIB, Cambio, and Felyx, as public transport, car-sharing, and moped-sharing providers, gave input on their expertise and vision of mobility hubs (Martinez, Baguet, & Keserü, 2023, p. 16).

Following a user-centric approach, the citizens of Anderlecht played an essential part in the process. Initially, local experts and citizens were interviewed and participated in four focus groups from January to July 2022. Researchers proposed several dates to ensure that all interested people could participate. Additionally, colleagues with different language skills (besides French and Dutch, English, and Arabic) joined the team. During the three stages of the co-creation process (user needs assessment, co-design, and co-evaluation), more than 150 people participated in the activities organized (Martinez, Baguet, & Keserü, 2023, 16 f)(d4.3, p 16f.).

Researchers organized different methods and formats at different stages of the process. First, user needs were assessed with interviews and focus groups with representatives and users. The results of this study can be found in the SmartHubs Deliverable D3.2 (Martinez, Pappers, & Keserü, 2022). Second, the actual co-design phase included on-site events, testing a digital pillar, conducting a stated choice survey, and organizing co-design workshops and interviews. Third, the results were visualized and co-evaluated (Martinez, Baguet, & Keserü, 2023, 17ff).

On-street event with digital pillar experiments

The on-street event aimed to engage with citizens passing by, regarding the co-design process of the SmartHubs project. It was held on the Place du Conseil, a public square in front of the town hall. The event was not formally announced and had an informal character. However, around 20 people participated. Organized by the VUB, Municipality of Anderlecht, and M pact, the event informed attendees about the project, co-creation events, and featured a digital pillar for testing. The location, a pedestrian-friendly square accessible by various modes of transport, provided an inclusive setting and offered drinks and small gifts for children. Despite that, language literacy posed a barrier to interaction.

The VUB and the Municipality, acting as contact persons, focused on informing and recruiting participants for future activities. The informal setting limited engagement duration, preventing a structured co-creation workshop. No participant was eager to spend more than 10 minutes. This first pilot event served its purpose of conducting the digital pillar experiments with documented surveys and provided information on the project and upcoming co-design process. The unstructured nature meant that some of the participants' comments were not taken into account. The organizers did not ask for the personal details of participants and planned follow-up events for co-creating mobility hubs afterward. Therefore, participants could not be personally invited to the follow-up formats. Documentation included the surveys and pictures taken from the event.

This type of event is open to everyone, including those vulnerable to exclusion, such as families, women, older people, and people with lower incomes. The timing of the event influences the otherwise mostly randomized collection of participants. Participants' interest, curiosity, and available time are crucial in their involvement. The main purpose was testing and conducting the digital pillar experiment, therefore, the event is classified as level one on the democratic integration ladder. Especially, the inclusive design of the format has potential for higher levels of integration.

Offering drinks or small gifts shows appreciation for participants but can also serve as an initial contact point for people attending the event. The organizers of the event play an important role. They can explicitly address certain people or establish contact with people who speak a different language.

On-street co-design workshop in cooperation with public transport provider (STIB/MVIB)

The event was held in Place du Conseil in front of the Municipality and was co-organized in collaboration with STIB/MVIB's societal bus (see image 1 below) and the municipal participation service. The advantages of the public square and a relatively informal event have been discussed above. A similar format was repeated about a month later at the same location. The organizers also booked a company offering to try cargo bikes on the square. The event was announced through the Municipality's website

and Facebook page, and local associations were informed via mail. The second time, additional posters were hung in five local indoor locations with many residents and people passing by. However, most participants were passing by randomly. The event attracted around 30 participants.



Image 1 Societal bus STIB/MIVB at Place du Conseil (Martinez, Baguet, & Keserü, 2023, p. 23)

Researchers from VUB moderated a co-design workshop for a potential mobility hub, providing information and gathering participant input. Simultaneously, employees from M pact and the Municipality of Anderlecht conducted a digital pillar experiment. During the first event, participants were diverse in age and gender. They actively engaged, expressed preferences, and negotiated. They were invited to advise without making final decisions or giving binding input. During the second event, the VUB moderated the co-design surveys, engaging participants who could not dedicate extended time to a whole workshop. Participants were diverse and partly belonged to vulnerable to exclusion groups, such as older people, low-income, low education, physical impairments, teenagers (+16), ethnic minorities, and migrants. Here again, participants were engaged and expressed preferences and opinions. Also, there was a lot of interaction between them. Both events concluded with an invitation to a subsequent meeting, the LL closing event, where results would be presented for further discussion and feedback. Documentation included observations by the VUB and surveys filled in by participants. The event had an inclusive character and allowed for deliberative engagement and could be defined as level two on the democratic integration ladder. With the invitation to follow up meetings and the integration of input into the process, there is a potential for knowledge integration (level three, see below).

Cooperation with other stakeholders can have numerous advantages. The VUB researchers created additional awareness for the public event with the STIB/MIVB bus. In addition, the bus provides a suitable location for holding the co-design workshops in a central and public place. The format gives the opportunity to deliberately exchange opinions and integrate different knowledge (level three democratic integration ladder). Additional activities can help raise attention for the event, attract people, and open a conversation with people. The VUB booked a food truck to serve food and drinks and offered a mobility-related activity (trying cargo bikes).

Indoor co-design workshop

Two indoor workshops were organized at a local civil society organization and a municipal building. The first workshop was a closed group of eight participants from vulnerable to exclusion groups, primarily older people and migrants who were already present at the venue. Therefore, their participation was random and spontaneous. The second event was a closed group of municipal civil servants who acted as experts in mobility planning and public administration. The invitation was organized internally by the municipal administration.

The workshops aimed to collaboratively co-design a potential mobility hub. VUB facilitated the event and included the SmartHubs co-design game, an open debate, and filling in a survey. Participants received information on the SmartHubs project and mobility hubs. Afterward, they could express their needs and propose their own ideas. Again, no final decisions were made, but participants actively engaged, demonstrated learning, expressed preferences, debated, negotiated, and reached agreements. The VUB documented the session through observations and surveys filled in by participants. Participants were invited to a second, similar meeting to see the results of the co-design process and give their feedback again. Secondly, they were invited to the closing event, as seen above. This format

allowed deliberate engagement and could be classified as level two on the democratic integration ladder.

An important step in reaching marginalized groups is to go to the places where they spend time. An indoor event at a local organization made it possible to reach older people and migrants in particular. A second workshop at the municipal building allowed civil servants to participate time-efficiently in the format. This learning can help appropriately include vulnerable to exclusion groups (see level two and higher on the democratic integration ladder).

On-street event presenting and getting feedback on the results of the co-design process

The event was held in the same square as before. It aimed to showcase the culmination of the co-design process for potential future mobility hubs. Facilitated by the VUB, Municipality of Anderlecht, and M pact, the event attracted 49 actively engaging participants. Additionally, over 100 individuals participated in street activities, receiving project information and refreshments. Childcare availability was ensured during the event, with a team member present outside to supervise children and accommodate those not participating in the main activity. The event, promoted through the Municipality's website, flyers, and previous event notifications, featured diverse participants, including vulnerable to exclusion groups like older people, teenagers, low-income individuals, and migrants. Researchers from VUB moderated the event, presenting four potential designs for the mobility hub and allowing participants to vote and provide feedback. The participants appreciated being involved in the design selection process and found visualizations helpful in communicating co-design results. Participants interested in providing more input to the research project could also fill out the SmartHubs survey. The event served as the closing event for the LLB and co-creation process, documented through short participant surveys, event photos, and the collected data. The events in the LLB have been somewhat connected, included vulnerable citizens and integrated different knowledges into the output. Therefore, it is classified as level three on the democratic integration ladder.

Childcare services can enable families and care-givers to participate in surveys or workshops and thus partially lower the barriers for these vulnerable groups.

A clear structure and follow up events give the opportunity for at least a small possibility of social learning (level four democratic integration). Participants could provide input and see the results of their contribution later on. Organizing the event on the same central and publicly accessible location created additional consistency in the participation formats and simplified organizational effort. However, there is no long-term permanency and no institutionalization or dynamic on its own (see level four democratic integration).

A visualization of the results (here different design options) facilitates quick access to the topic. Participants can understand and compare different variants more quickly. Nevertheless, the design of visualizations plays an influential role, as certain elements can be shown in the focus or less centrally and thus influence the results. In addition, certain elements are easier to visualize than others. Therefore, visualizations are not necessarily the ideal medium in every case.

5. SMARTHUBS LIVING LAB ROTTERDAM/THE HAGUE

5.1. Governance framework and role of participation

The state of the Netherlands is a decentralized unitary state composed of municipalities (gemeenten), provinces (provincies) and water boards (waterschappen) (Backes & van der Woude, 2013, p. 231; Council of European Municipalities and Regions, 2015). An ongoing decentralization requires local governments to increasingly include citizens in their policy-making (Vollaard, 2021, p. 268). The national government holds the local level accountable for establishing instruments for citizen participation, for instance, in the work and income services sector. However, local autonomy is limited because municipalities largely rely on national grants (Vollaard, 2021, p. 260).

On the sub-municipal level, additional groups of citizens work together voluntarily in the interest of the geographical area they live in. Most sub-municipal bodies are based on private law institutions, such as associations or foundations. They can thus serve as local governments' partner to improve their territory's liveability and enhance tailor-made policy-making. Recently, some sub-municipal bodies have sought to activate citizens' initiatives to strengthen their self-reliance. Many local governments see them as an instrument of citizen participation, officially to democratize policy making, but often also to find support for their own policy plans (Vollaard, 2021, 261ff.). In The Hague, there is, for example, a municipality-led initiative, 'Den Haag Fietst' to promote cycling. It includes various partners as well as citizens who act as so-called 'cycling ambassadors' to encourage cycling among different target groups. The initiative provides information on cycling, cycling lessons, and support for buying a bicycle (Den Haag Fietst, 2024). Just like D2.3, this section only refers to the governance arrangement of The Hague. However, activities from both cities of the LLRD are considered in the co-design section below (5.3).

The Netherlands has a long tradition of incorporating societal actors in the governing infrastructure at the local level (Vollaard, 2021, p. 272). For instance, a public transport passenger organization, ROVER, represents passengers' interests through lobbying and public relations work. It exposes deficiencies to strengthen public transport as an attractive alternative. The organization has a legal right to consult and exchange with various transport companies and (regional) governments (HI2 91ff., Rover, 2022). The HTM, the public transport provider of The Hague, also contracts with ROVER and other societal organizations to include different status groups in public transport planning (HI3 74, see also Graf & Hansel, 2023, p. 51). Depending on the intensity of cooperation this form of participation has the potential for deliberate engagement or knowledge integration (level two or three on the democratic integration ladder).

A second example for this strong incorporation of societal actors is the new environmental law called 'Omgevingswet' by the national government. Experts mentioned it in the context of mobility hubs, especially at train stations (see Graf & Hansel, 2023, p. 53). The law regulates how to design and develop public space while also requiring stakeholder participation. According to an expert from CROW, a consultant organization specialized in mobility and infrastructure is to facilitate overall planning procedures (HI5 102). It demands close cooperation between the local administration and regional and national stakeholders. Nearby stakeholders like shop owners, companies, and property owners must also be consulted and involved (HI4 9, 84, HI5 96).

5.2. Local mobility planning regarding participatory elements

The overall mobility plan of The Hague is the Mobility Transition Strategy 2022 – 2040, with a focus on four topics: (i) the compact city, (ii) human scale, (iii) city-friendly transport modes, and (iv) regional context and hub development (Graf & Hansel, 2023). It includes a mixture of policy instruments and takes insights from the Smart Mobility Vision published in 2020 (The Hague, 2020a). The goals for mobility until 2030 are to be safe, efficient, clean, tailor-made, affordable, and connected. This includes the aims of zero traffic victims per year, efficiency in terms of the usage of space and infrastructure, and meeting environmental and climate ambitions. Mobility should enable everyone to reach their destination; it should be affordable for travelers and the government and connect the region and other metropolitan regions (Graf & Hansel, 2023, 47ff; The Hague, 2021b). Besides this, the "Haagse Nota Mobiliteit" from 2011 (planning period until 2020) is still in place but is expected to be replaced by the new 'Omgevingsvisie' in 2023 (The Hague, 2021b). The mobility plan also considers learning labs pilot projects on several dilemmas, i.e., experimental governance instruments that help pinpoint policy measures' exact effects. As mentioned by experts, multiple policies are interlinked; housing but also parking policies have an impact on mobility policy. This environmental vision (Omgevingsvisie) will set out what the municipality, residents, entrepreneurs, and organizations want for the future development of the city (The Hague, 2023c). Multiple participatory events have already taken place to formulate this vision, such as a city-wide meeting in October 2023. Particularly worth mentioning is the children's workshop, where kids could design their ideal play area, recognizing an important, oftentimes ignored group of the citizenry (The Hague, 2023c). In January and February 2024, meetings were held in all districts where residents were able to point to valuable places in their area (The Hague, 2023a). Furthermore, an online tool, the Haagse Mixer, was invented. In the easy-to-understand questionnaire,

citizens can indicate on a scale which topics are especially important to them and also give a reason or comment for their choice in order to 'mix' ambitions for the vision (The Hague, 2023b). These different formats, on different levels of required effort, offer participants room for decision-making. Also, vulnerable users are included, which means that level three, knowledge integration, on the democratic integration ladder is reached.

The Municipality of The Hague works with participation projects to find support for the upcoming measures to improve mobility (Garritsen et al., 2023, p. 8; Graf & Hansel, 2023).

A participation process accompanied The Hague's mobility plan. The findings and outcomes of this process are summarized in a presentation (The Hague, 2019), which was later included in the report on Participation in Mobility Transition (The Hague, 2020b, HI1 52). Additionally, the strategy refers to seven learning labs held in March 2021 to delve into the dilemmas arising from complex development processes and changes in the mobility system. One of the conclusions drawn from these learning labs was the challenge of addressing the needs and interests of all participants. Consequently, The Hague has developed a multi-criteria analysis template to aid decision-making while taking these into account (The Hague, 2021a).

One central aspect of the mobility plan is to organize mobility on a human scale. It means to make mobility physically accessible and safe for all residents. As the presentation statement for the mobility plan states:

„Een ander belangrijk punt is dat de mobiliteitstransitie vertrekt vanuit de menselijke maat. Niet alle inwoners zijn even digitaal vaardig of fysiek mobiel. Het zal ook in de toekomst vragen om creativiteit voor passende mobiliteitsoplossingen waardoor bijvoorbeeld mensen met kleine beurs, ouderen, kinderen en mensen met een fysieke beperking zich comfortabel en betaalbaar kunnen verplaatsen. De doelstelling is om iedereen te laten beschikken over geschikt vervoer van voordeur tot bestemming“.

“Another important point is that the mobility transition starts from the human dimension. Not all residents are equally digitally literate or physically mobile. In the future, too, it will be necessary to be creative in finding suitable mobility solutions so that, for example, people with small budgets, the elderly, children, and people with physical disabilities can travel comfortably and affordably. The objective is for everyone to have suitable transport from their front door to their destination” (translated The Hague, 2021b, p. 1).

In achieving these goals, attention will be paid to the close involvement of various stakeholders:

"Voor het ontwikkelen en implementeren van nieuwe en innovatieve mobiliteitsoplossingen willen we ruimte bieden voor experimenten en pilots, bij voorkeur in coalities van bewoners, bedrijven, kennisinstellingen en/ of overheden."

“For the development and implementation of new and innovative mobility solutions, we want to provide room for experiments and pilots, preferably in coalitions of residents, businesses, knowledge institutions and/or governments.” (translated The Hague, 2021a, p. 61)

The report on the city's participatory strategy is particularly noteworthy, as it speaks for a comprehensive consideration of participation. The report differentiates in consultation and advice. The former is non-binding and serves to gather ideas and opinions. The latter is binding; thus, the Municipality must provide explanations if there is a deviation from the advice (The Hague, 2019, p. 6). However, this means not all participatory inputs are necessarily included in the mobility strategy.

There are some examples of deliberative engagement (see level two democratic integration) of stakeholders, as the city planned for active participation. For example, different formats were used, such as street puzzles, speed dates and workshops (The Hague, 2020b, p. 7). The participation process was also evaluated via online questionnaire, with a majority trusting that their input would be included (The Hague, 2020b, p. 35). Some social groups are highlighted as important participants with valuable insights, such as students from The Hague University of Applied Sciences and TU Delft (The Hague, 2019,

p. 12). Although the city aims for barrier-free mobility (The Hague, 2021a, p. 12), there is no explicit mention of vulnerable groups concerning the participation process.

Some concepts and ideas in these documents aim for knowledge integration, which is level three on the democratic integration ladder. In addition to participatory activities, resident initiatives, data, and surveys are taken into account for the mobility planning process (The Hague, 2021a, p. 67). It is intended that this will lead to a mobility strategy that is adapted to experience and not just to the traffic situation (The Hague, 2021a, p. 41). Furthermore, the city of The Hague opts for shared ownership to connect and cooperate (The Hague, 2019, p. 6). It is also intended to evaluate the process of developing a mobility strategy in a large meeting afterward (The Hague, 2019, p. 13).

To summarize, participation plays a considerable role in the mobility strategy of The Hague, with very detailed documentation of the planning process. Although the mobility strategy indicates knowledge integration, vulnerable users are not explicitly mentioned. Furthermore, no indications for an intended permanency or participation autonomy were found, which would have suggested social learning (level four democratic integration). Thus, only level two on the democratic integration ladder (deliberate engagement) is fulfilled.

5.3. Co-design process

In the Living Lab in Rotterdam/The Hague (LLRD), researchers from UT have carried out studies based on two different local contexts. Firstly, a central mobility hub in Rotterdam 'Zuidplein', with a busy bus and metro station, was selected. This case study focuses on the role of digital integration within the development and use of the mobility hub (Garritsen et al., 2023, p. 12). Secondly, a square in The Hague was selected. The "Hobbemaplein" is located near a large market and is part of extensive redevelopment work by the municipal administration. The LLRD focuses on the democratic integration of Hobbemaplein, exploring the potential development of the area as a smart mobility hub, including co-creation and co-design as integral components. Researchers and the city administration planned to combine ongoing participatory process of the municipality with the SmartHubs project. However, during the first stages the complexity of the case became evident and the municipality decided to downscale the involvement of SmartHubs' co-creation to cope with the risk of overpromising hub elements that cannot be delivered. Consequently, the case study goals were adjusted to focus more on the co-design game and hub elements, instead on the impact of the co-creation process in general. The co-evaluation was separated from the Hobbemaplein designs to clarify what is included in the redesign and what is not (Garritsen et al., 2023, p. 19). This example illustrates the difficulties of participation formats and cooperation with research projects. The original plan to combine research activities with existing participation formats could have created valuable synergies and significantly increased the concrete opportunities to influence the city's decision-making processes. However, this opportunity might risk creating (false) expectations, which the municipality wished to avoid in this case.

According to the democratic integration ladder, the researchers defined targets or potential integration levels for both local case studies. For the Zuidplein in Rotterdam, level two at physical, digital, and democratic integration could be reached. However, during the current redesigning of the public transport facilities and the surrounding area, the SmartHubs input has not been considered. Therefore, the actual decision-making power is limited. The Hobbemaplein in The Hague, physical integration on level three, and digital integration on level two were defined.

Regarding democratic integration, level three could be reached since vulnerable users are actively involved. However, improvements are possible as the Municipality leads the participation processes instead of independent moderation. Also, there seems to be more passive than active participation (Garritsen et al., 2023, 13f). VUB colleagues have assessed the needs of vulnerable groups in a previous Deliverable 3.2. They examined the needs of low-income citizens, migrants, ethnic minorities, older people, and people with physical impairments (see Martinez, Pappers, & Keserü, 2022).

Multiple partners collaborate within the LLRD. Both municipalities of Rotterdam and The Hague are the main partners in the process. The local public transport providers of both cities, RET and HTM are included. Additionally, the stations management unit of the national railway company NS Stations as well as a mobility-related consulting NGO, CROW participate in the process. Researchers from UT have

been allowed to use local community centers and libraries to organize participation formats and directly involve stakeholders near the chosen case studies. Citizens are divided into local business owners and residents (Garritsen et al., 2023, 14f).

Local walk-in workshop in cooperation with the municipality

Researchers from UT cooperated with the Municipality of The Hague to take part in this walk-in info and discussion event organized by the municipal administration at the Hobbemaplein library. The central location drew around 70 participants, of which 30 engaged directly with the SmartHubs team. Invitations were extended to residents and entrepreneurs via flyers and letters, emphasizing SmartHubs' involvement. The participants' diversity reflected the diverse population of the surrounding area. Many people with migrant backgrounds and many older people participated in the format. The municipality aimed to get feedback and opinions from residents and entrepreneurs about municipal plans and different scenarios for the area's public space/mobility projects. The municipality plans to continue these 'werkplaats' meetings, updating and showcasing progress in various projects and incorporating visitor feedback in subsequent sessions. However, these participation formats focus not directly on the hub but on broader municipal redevelopment projects. Researchers from UT discussed the SmartHubs design game and hub elements, gathering valuable feedback from participants. The game foresees dissimilar roles (for instance, PT user or car-lover) and tasks (for example, 'I would like a place for my children to play') for players they want to realize during the game. Afterward, players discuss and reflect on the motivation for certain choices made during the game. In total, 43 participants (a mix of residents, policymakers and researchers) attended a game session (counted together with other events where the game was played, see Garritsen et al., 2023, p. 25). The event allowed for many lively discussions. However, many residents also came to complain about topics not directly connected to the topics intended by the municipality. People who did not participate actively used the opportunity to voice their opinions or ask questions. Employees of the municipal administration documented feedback by taking notes and writing feedback on post-its. The researchers recorded the design game and participants' feedback separately. Since the input of participants could only be integrated into the decision-making process very limited, this format is defined as level two. The design game however has the potential for level three on the democratic integration ladder.

Open participation formats can be challenging. Random participants may have their concerns and do not want to participate exclusively in the issues proposed by research projects or public authorities. Deliberate engagement, knowledge integration, and social learning (level two, three and four democratic integration ladder) open up thematic discussions and can entail the "danger" that participants will express themselves beyond the scope of the format. It is important to find a balance between the participants' concerns and your own research topics and participation content to avoid upsetting or patronizing people.

Digital pillar experiment at local mobility station

Researchers from UT conducted an on-street event to do the digital pillar experiment (as in the LLB). The event was organized at the RET service point located beneath Rotterdam Zuidplein station. The event was announced via social media and with posters in the RET service point about one week before the event. In total, 55 participants could be reached. They had diverse backgrounds, including many migrants, older people, and people with low income and education. Also, some people with physical impairments could be included. The aim was to test the usefulness, ease of use, and likelihood of using the digital pillar. Most people at the service point were in a hurry on their way to catch a bus/metro. Therefore, researchers did not have many long discussions. The people participating were enthusiastic and provided useful feedback. People were interested, provided valuable input, and partly enjoyed discussing shared mobility with the SmartHubs team. However, the organizers had to motivate people to finish the full experiment since it took some time to complete all parts. Based on the positive experiences in the Brussels context, researchers from UT also provided goodies and small snacks to attract people and show appreciation. The experiment had no specific follow-up in Rotterdam, but documentation included two surveys directly on the digital pillar and observations on performance and sociodemographics for future publication. The main purpose was testing and conducting the digital pillar experiment, therefore, the event is classified as level one on the democratic integration ladder.

A scientific publication will follow the digital pillar experiment. The SmartHubs team recommends including people with limited digital skills in policy-making and participatory processes. The experiment

shows that people have diverse needs and preferences. When planning mobility hubs, these diverse needs and preferences need to be taken into account in order to not only build hubs for abled-bodied and digitally skilled people while excluding large groups of vulnerable users. Also, there was an exchange with other organizers from the Brussels context to learn from each other's experiences. Finally, the length of the experiment can cause struggles to motivate participants to finish the full experience. Researchers need to find a balance between collecting necessary data for their research interest and the survey's length in order to obtain complete and valid responses from participants.

Assisted surveys at the local community center

Researchers from UT conducted four sessions at local neighborhood centers to fill in the SmartHubs survey with residents and vulnerable to exclusion groups. In collaboration with community centers and a library in The Hague and Rotterdam, researchers made an appointment with the organization's supervisors. They scheduled the event during an ongoing activity or lunch. The purpose was to administer the SmartHubs survey, capturing insights from visitors of these centers to actively include vulnerable to exclusion groups. In Rotterdam, there were mostly older women; in The Hague, there were older people and mothers with mostly non-Western backgrounds. About 25 people were involved and filled out the survey; if needed, they received support from researchers. The main purpose was conducting the SmartHubs survey, therefore, the event is classified as level one on the democratic integration ladder. The integration of vulnerable citizens however, has the potential for higher levels of integration.

These events in four local neighborhood centers show how time-consuming the involvement of certain groups can be. The same experience was made for the digital pillar experiment with required seven full days and three researchers to reach 55 participants. Nevertheless, such targeted research work is important to allow marginalized groups to participate in data collection. These groups are often still invisible in data sets of conventional surveys.

Stakeholder interviews to test assessment methods

Researchers from UT organized online stakeholder interviews to apply the SmartHubs appraisal tool MAMCA (for methodological basis see Martinez, Pappers, Keserü, & te Boveldt, 2022). The interviews involved nine interviews via Teams and one via email, engaging transport experts from different stakeholder groups as well as local citizens and businesses. The organizers did not put particular emphasis on including vulnerable groups and decided on the list of participants together with the municipality of The Hague. Participants were then invited via email. The appraisal tool aims to identify the priorities of different stakeholders. During the interviews, participants discussed the criteria for the assessment of mobility hubs. Subsequently, a questionnaire was emailed to determine criteria ranking through pairwise comparison, and results were presented to the municipality. Despite discussing a hypothetical scenario (as the municipality currently is not planning a hub at Hobbemaplein), participants shared valuable insights. However, discussing a non-existent case and three hypothetical scenarios proved difficult. As the city administration does not intend to implement any of the proposals, the discussion has partly shifted to the current developments on Hobbemaplein. Researchers from UT and VUB decided not to propose any criteria to the participants but asked them to propose criteria themselves. This approach added complexity but also enriched the interviews with diverse perspectives. For detailed information, refer to D5.7 in The Hague section of the report (Martinez, Kirchberger, et al., 2023). The main focus of this activity was to present the results to local experts and get feedback on hypothetical scenarios. Therefore, it was classified as level one on the democratic integration ladder. Depending on the amount of deliberative exchange, it could also be level two.

Valuable synergies can arise between research projects and public institutions. However, this also entails dependencies and risks. Research interests and methodological specializations can differ from the concrete plans of the public authorities. The same applies to the scheduling of various stakeholders. Particularly in the area of participation, it must be clear to the participants what they are giving input for, to whom, and how this information will be processed. Otherwise, false expectations and negative impressions can result.

6. SMARTHUBS LIVING LAB EASTERN AUSTRIA

6.1. Governance framework and role of participation

Austria is a federal state consisting of three levels: the federal state, the nine provinces ('Länder'), and the municipalities ('Gemeinden') (Eberhard, 2013). Depending on each provincial legislation, citizens of the municipalities can participate directly in the local decision-making process, such as citizens' vote, and annual citizens' assemblies) (Eberhard, 2013, p. 11). Austria is characterized as a neo-corporatist state (Pleschberger, 2021, p. 39), a system of government that involves close cooperation and coordination between the government, employers or business associations, and unions. The approach aims to promote collaboration between social actors and negotiate consensual policies rather than confrontational methods.

There are different fragmented and sector-specific networks at the regional and local levels. Local governments set up temporary committees to advise on planned construction projects or local development strategies, usually to consult experts. One example of the involvement of other civil society actors is the Vienna Climate Council. Three groups of boards working together in different constellations form the Climate Council. The core of the committee is an advisory board consisting of experts from science and research (Advisory Board Science). There are also advisory and discussion committees with representatives from the administration, policymakers, and municipal companies (Sounding Board City of Vienna), as well as representatives from businesses, civil society, interest groups, and opposition parties (Sounding Board Society). The Climate Council has a purely advisory and supportive role, but cannot make or prevent any decisions (Vienna, 2023).

In contrast, broader concerns are permanently institutionalized in advisory committees, such as citizen participation interests of persons with disabilities or migrants (Pleschberger, 2021, p. 40). Regarding urban mobility planning in Vienna, specific participatory formats have involved citizens during the development of the local SUMP, called STEP 2025 (see Chapter 6.2, below).

Founded in 2011, the Mobility Agency Vienna ('Mobilitätsagentur') is the point of contact for specific proposals or criticism regarding walking and cycling. It mediates between the population, administration, and politics and promotes these forms of mobility with campaigns, awareness-raising, services, and innovative projects (Mobilitätsagentur Wien). The agency informs and mediates between the positions of civil society and public institutions. It is permanently established. Nevertheless, due to a lack of autonomy, social learning on level four on the democratic integration ladder cannot yet be assumed here (see Mobility Councils in Brussels and Anderlecht).

6.2. Local mobility planning regarding participatory elements

The central mobility planning document is the STEP 2025 Mobility Plan from 2015 (Vienna, 2015). The most recently published Smart Climate City Strategy and the Climate Roadmap take up the most important measures of the mobility sector. In accordance with the European Sustainable Urban Mobility Planning (SUMP) guidelines, Vienna's mobility plan was formulated to incorporate participatory elements. Citizens and various stakeholders were engaged at different stages of the plan's development (VI1 77). Initially, the development of mobility hubs followed the principle of co-creative development, thus addressing the needs of citizens (VI6 9). For instance, in the case of Bruno-Marek-Allee, the hub was introduced at numerous neighborhood events and displayed on public notice boards; additionally, residents were provided with an information package detailing specific aspects (VI3 59ff.). These measures can be described as informative. Regarding other mobility hubs by the Wiener Linien (public transport provider of Vienna), no co-creative processes or other participatory measures with citizens beyond providing the information is known (Graf & Hansel, 2023, p. 66; see level one democratic integration ladder). Furthermore, the federal ministry for climate protection (Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie) has also published a sharing strategy, which plans the implementation of mobility hubs. However, this strategy does not foresee any concrete participatory formats but simply aims to create a dialogue with providers and municipalities (BMK, 2023, p. 59).

Some goals in the mobility plans can be attributed to deliberate engagement. For example, the aim is to enter into collaborative partnerships, which are to be initiated through workshops and interviews (Vienna, 2018, p. 31). Particular emphasis is placed on dialog with citizens to "develop common perspectives and solutions" (translated Vienna, 2022, p. 114). The city wants to reflect on its projects together with citizens in new formats such as citizens' councils and dialogue platforms. Citizens are seen as "drivers for the implementation of Vienna's Smart City goals" (translated Vienna, 2022, p. 116). The city has planned for both online and physical participation and put these to the test in the development of STEP 2025 (Vienna, 2015, p. 107).

These are all examples of deliberative engagement of stakeholders (see level two democratic integration), as the city plans for active engagement and vulnerable users are also considered in the participation planning. Some aims can even be categorized as knowledge integration, reaching level three on the democratic integration ladder as the input of vulnerable users is integrated into the participation process and room for decision-making is created.

Inclusive aspects of participation are especially valued. The participatory activities should be "visible and accessible to all" (translated Vienna, 2022, p. 45) through simple language and multilingualism. The city is thus making an inclusive claim to the participation formats and explicitly addressing vulnerable people. The formats are to be further developed by the population and oriented towards people's needs and potentials (Vienna, 2022, p. 116). The planned involvement of children and young people and the explicit understanding of them as experts in their own lives should also be emphasized here (Vienna, 2022, p. 118).

Nevertheless, civil society criticizes the administration for communicating "from above" and for being on "no equal base" ("Augenhöhe", VI4 41). In addition to participation formats initiated by the Magistrate, the NGO 'Platz für Wien' (Space/Place for Vienna), for example, organized onsite actions, small demonstrations, or collected signatures for a petition (VI4 11, 31, see above). Accordingly, the initiative claimed its own formats of participation outside those initiated top-down by the administration, especially during the local election campaign in 2020. However, after collecting 57.000 signatures for their petition, 'Platz für Wien' resigned in the Summer of 2022 and officially handed their demands to the local pedestrian and cycling NGOs. Local political parties partly or even entirely accepted and included the initiative's list of demands. The rapid implementation of the required measures is considered to be part of climate-friendly urban and transport planning and, thus, a task for the city government (Platz für Wien, 2022). Initiators of 'Platz für Wien' want to build on the experiences of their campaign and collect the knowledge of many initiatives, make it available, and thus enable new activism and strengthen existing initiatives in the long term. The Vienna Chamber of Labor financially supports the project to implement a web tool by March 2025. In this way, the initiative will have a further long-term impact and has undergone a form of institutionalization and transformation (Platz für Wien, 2023; Wir machen Wien, 2024).

Particularly noteworthy from the strategy papers of Vienna are the ambitions to create permanent spaces for participation formats, which indicates the objective of social learning on the democratic integration ladder (level four). There is to be a physical contact point for participation projects and their agencies, a "participation hub" (Vienna, 2022, p. 116). Furthermore, 'Experimentierräume' (experimental spaces) are to be established in the neighborhoods called 'Grätzl'.

„Das Grätzl ist der ideale Ort für Beteiligungsprojekte. Hier können neue Lösungen erprobt und Erfolge unmittelbar sichtbar werden. Wien schafft dazu Anlaufstellen für Interessierte, nutzungsoffene physische Räumlichkeiten und „Denkräume“ für selbstorganisierte Initiativen.“

"The Grätzl is the ideal place for participatory projects. This is where new solutions can be tested and successes made immediately visible. Vienna is creating contact points for interested parties, open-use physical spaces and "thinking spaces" for self-organized initiatives." (translated Vienna, 2022, p. 117)

To summarize, Vienna's mobility administration has ambitions to make their participatory processes as accessible as possible and even considered a type of permanent participation on a small scale. The mobility strategy shows initiative for knowledge integration (level three democratic integration ladder) by attempting to make the participatory process inclusive. However, their approach "from above" was

criticized. Furthermore, the administration seemingly does not want to hand over control or responsibility for the participatory processes. On this basis, level four on the democratic integration ladder is not reached. If there were incentives for participation to become independent, the 'participation hub' would be a fitting example of social learning (level four democratic integration).

6.3.Co-design process

The Living Lab Eastern Austria (LLEA) consists of two very different Austrian federal states (as governmental bodies and spatial entities), the Austrian capital and federal state Vienna (case study Bruno-Marek-Allee, Nordbahnhofviertel and Maria-Tusch-Straße, Seestadt Aspern) and the federal state Lower Austria (case study Pillichsdorf)¹. The LLEA has outlined four strategic goals to guide its efforts. Firstly, the lab aims to facilitate cross-institutional learning on mobility hubs, fostering collaboration and exchange among stakeholders with varying interests. Secondly, the LLEA seeks to assist local stakeholders in long-term planning, building robust networks, and better comprehending potential impacts. Thirdly, the lab will assess the practicality, relevance, and complexity of various SmartHubs tools, including through application and presentation. Lastly, the LLEA endeavors to enhance data availability in case study areas by conducting SmartHubs surveys, addressing gaps in information on user needs and preferences, and making generated data accessible for future initiatives.

The researchers from TUW and BOKU set individual goals for each case study referring to the SmartHubs integration ladder. In the case study Seestadt Aspern, the physical and digital integration goal was to evolve from level two to level three. For democratic integration, the target was to move from level one to level two by further integration modes into the WienMobil application (supported by Wiener Linien). The case study Nordbahnhof aimed to raise physical integration to level two and digital integration to level three. The democratic integration should move from level two to level three by conducting interviews with intermediary institutions, interviews with vulnerable to exclusion groups, and co-creation activities to include users' opinions (Kirchberger et al., 2023, 14 f).

Activities in the LLEA were separated into three overlapping phases, as some activities from the previous phase were still ongoing. However, the process started with a development and setup phase, followed by co-creation, and finalized with an evaluation phase (for more details, see Kirchberger et al., 2023, 15 f). The overall process involved various actors from academia, industry, government, and civil society.

Semi-structured interviews conducted in the LLEA focused on experts with in-depth knowledge of specific groups and vulnerable individuals like women, low-income citizens, and peri-urban/rural inhabitants. The analysis highlights key findings relevant to women as end-users (detailed in Martinez, Pappers, & Keserü, 2022). Women often engage in more fragmented mobility, relying on active mobility, especially walking for shorter trips. The physical environment and spatial distribution of transport services are crucial and suggested hub enhancements include rest areas, public toilets, sheltered waiting rooms, grocery stores, parcel lockers, and storage rooms. Accessibility and aesthetics are significant considerations, emphasizing the need for a barrier-free hub with appealing elements like green spaces, good lighting, and cleanliness to enhance safety perceptions. These considerations served as a starting point for the design game. The main idea was to develop a game that addresses hubs more as "places to meet" including offers and services to attract more users (see Kirchberger et al., 2023 and more details on the design game see Tellioğlu et al., 2023).

Public co-creation workshop on "mobility hubs of the future"

Researchers from TUW organized the co-creation workshop publicly at aspern.mobil LAB in Seestadt, and brought together 20 participants aged 11-65, plus some children from the local community. There is no further documentation of the participants' demographics. The workshop was publicized through social media, newsletters, and posters throughout the neighborhood. The workshop aimed to envision

¹ In this report only examples from the Viennese context are considered. The case study in Pillochsdorf, Lower Austria included interviews with vulnerable to exclusion groups and onsite workshops.

future mobility hubs and enhance the ease and convenience of existing mobility services. Participants were encouraged to share their ideas on these topics. They displayed a keen interest in the project, actively contributed creative ideas for hub design, and engaged in discussions. The workshop was documented through photographs. The format was inclusive and allowed deliberative engagement. Therefore, it could be classified as level two on the democratic integration ladder.

Barriers and chances of public co-creation workshops have been discussed above (see 4.3, 5.3 and 7.3). *As an additional learning, organizers might consider the year's season when planning such events. Warm weather and daylight might encourage people to stay and participate more easily than on a dark winter day. Even though the weather always remains an unstable variable, public formats with a lot of random contact with people passing by can reach a larger number of participants when it is pleasant outside, i.e., in spring, summer, or fall.*

Design game workshops with different groups of participants

Researchers organized three rounds of design game workshops: The first session of the design game workshops in Vienna targeted young adults and took place at TU Wien. The event was facilitated by researchers from different faculties of TUW and attracted 16 participants. This closed group of participants was very homogenous: young adults involved in a voluntary environmental year. The workshop aimed to promote the SmartHubs project and to test the design game. Most attendees actively participated, enjoyed playing the game, and provided crucial and constructive feedback. The interaction within this group contributed to the ongoing refinement and promotion of the design game. The second workshop took place in a ground-floor room run by aspern.mobil LAB. The event was publicized through newsletters and posters and focused on a specific hub in the neighborhood. The format welcomed 8 participants from various groups, including older people and families with a child with special needs. Moderated by researchers from TUW, the workshop aimed to enhance awareness of the hub, gather ideas for future promotion, and evolve the design game. Participants were very engaged as the game was already well-tested and had interesting mechanics. Mo.Point and researchers from TUW organized the third round of the design game in a community room at Nordbahnhof. It focused on a local hub at Bruno Marek Allee. Participants were invited via mail and personal contacts. As in the other events, researchers moderated the workshop and the game. Eight participants, experts from the fields of mobility, sociology and design attended the workshop. The aim was to make the hub better known in the area, find ideas for future promotion, and develop the design game further with experts.

Researchers documented all workshops with photographs and assessments through questionnaires for game design evaluation, game master evaluation, and documentation of the game itself, including used activity cards. The workshop followed two main targets: first, raise awareness of (already) existing mobility hubs (Bruno-Marek-Allee and Maria-Tusch-Straße) and second, research and further develop the design game. One could also argue that the focus of these formats would rather classify as a citizen-science project than a participatory event. However, no final definition is needed in this context. Although, the design game has the potential for level three on the democratic integration ladder, this event is only classified as level two since the participants were at least partly very homogeneous and the integration of participants' input was very limited.

These design game workshops were not followed by other meetings presenting or reflecting the results. Therefore, participants might be unable to retrace how their input was used. *When including citizens in co-design events or citizen-science projects, organizers must be clear on the context of the meeting and what the input is used for. Also, there should be clear communication on what the purpose of the event is and what the scope of decision-making is.*

Public stakeholder workshops to test assessment methods

Researchers from TUW organized two public stakeholder workshops to apply the SmartHubs appraisal tool (MAMCA, Multi-actor multi-criteria analysis (for methodological basis see Martinez, Pappers, Keserü, & te Boveldt, 2022)). These formats aimed to test the MAMCA method and identify the priorities of different stakeholders. The first MAMCA Workshop took place at aspern.mobil LAB in Seestadt, involving seven participants between 24-45 years old and with different backgrounds and mobility experts. As an incentive for citizen participation from Seestadt, the organizers promised a voucher of

40€ for successful participation in both workshops (aspern.mobil LAB, 2023). The workshop was open to the public. The organizers invited participants via social media, newsletters, and posters throughout the neighborhood and invited experts directly via mail. In the invitations, they especially addressed people with mobility impairments and offered assistance with individual needs. Following the MAMCA method, this session focused on defining and weighting criteria per stakeholder. The session was documented with photographs and moderation cards. The first workshop was followed by a second, which was organized online. An online white board was used to map all topics coming up during the discussions. Following the MAMCA method, this session focused on discussing the outcomes and finding consensus. Researchers organizing the format considered the workshop format to be very complex due to the several levels to reflect on: the method itself, the content, the local context, and new contacts. They were new to the method themselves and applied it in a condensed manner, resulting in a very challenging format for all participants. This activity gave opportunity for deliberate engagement and considered vulnerable citizens during the organization. It is therefore defined as level two on the democratic integration ladder.

Testing and transferring new methods can be challenging. Scientists as well as practitioners from different disciplines or areas of expertise need time and guidance to apply new tools reliably. Sufficient time must be scheduled for appropriate instruction if this is planned in projects. Invitations via different types of media (social media, newspaper, newsletter, posters, spontaneously on-site) can attract different people. Organizers should reflect on the chosen media and who might be reached with it. Also, addressing people proactively in the invitation can lower barriers and enable people to attend.

7. SMARTHUBS LIVING LAB MUNICH

7.1. Governance framework and role of participation

Germany is a federal state with three levels: the federal state, the sixteen provinces ('Bundesländer'), and the municipalities and districts (Frenzel, 2013, p. 97). Besides democratic elections at each level, citizens may participate in municipal decision-making processes via open councils (a forum for all citizens, granting the opportunity to discuss relevant issues) and hearings. Additionally, most topics of municipal governance can be subject to a petition for a referendum, followed by a public decision (Frenzel, 2013, p. 109).

In Germany, state-society relations are shaped by the presence of strongly organized corporate actors. The state finances the participation of societal actors, such as non-profit welfare organizations (Egner et al., 2022, p. 151). While elements of direct democracy have not been applied at the federal level in Germany, they play an increasing role at the regional and local levels. Social services, education, transportation, infrastructure, and the local economy are potential issues for citizens' initiatives and referendums (Benz & Zimmer, 2011, 163f.). One influential project was the public petition 'Sauba sog I' in Munich. The petition was launched by mobility and environmental associations together with other partners. The central concern was better air pollution control. The initiative requested measures related to a sensible mobility transition in Munich with more sustainable mobility. Following the successful collection of numerous signatures, the demands of the petition were adopted by the city council in 2017 (GreenCity e.V., o.J.; Munich, 2021).

Beyond elections and procedures of direct democracy, citizens can participate in local policy-making in different ways. Committees of the local councils are open to citizens with particular experience. In planning processes or other administrative decisions, stakeholders have the right to submit opinions and raise objections (Benz & Zimmer, 2011, p. 165).

Research on the discursive formation of mobility cultures in Bavaria and Baden-Württemberg shows the influential role of car manufacturers. Understanding these regions as 'car states' maintains regional identities and fears of restrictive measures on (auto)mobility (Mögele & Rau, 2020). One example illustrating the strong organizational ties between car manufacturers and political institutions is the Munich-based 'Inzell initiative' (see Graf & Hansel, 2023). It was founded in 1995 by the City of Munich

and automobile and motorcycle manufacturer BMW. Stakeholders from the industry, science, and local administration have joined forces to find solutions to the many mobility issues in the Munich region (MVV, o.J.). The largest European traffic club and insurance (ADAC), Siemens, and TU Munich are also among the members. Current projects address, for example, the strengthening of e-mobility and parking space management (Inzell Initiative, 2022).

Another institutionalized participation format is the MVV passenger advisory board ('Fahrgastbeirat'). It comprises different stakeholders and organizations to provide feedback on projects and the overall functioning of public transport from different user perspectives (M5 105; MVV, 2023). The advisory board deals with rather general questions about public transport. It currently has 25 voluntary members and gathers biannually. Of these, 14 members are non-organized, representative passengers, and 11 are members of business, environmental, and social associations. The association 'Queerhandicap', the Munich Seniors' Advisory Council, and the advisory council for people with disabilities represent vulnerable groups (MVV, 2023).

In Munich, the mobility department is mainly responsible for implementing mobility hubs (see Graf & Hansel, 2023). However, regarding the definition of concrete spaces for a mobility hub, the district level gets consulted during the processes (MI1 38, 106ff.). The district councils can offer useful local knowledge and information because they work specifically on the district level; therefore, they might significantly influence the concrete location of single hubs (MI1 105f.). Although they do not have an official veto power, they have a right to the hearing (Anhörungsrecht), and their concerns are usually considered (MI1 105f., MI4 108). This process of participation can be conflictive and time-consuming. The citizen councils are criticized for not being very citizen-friendly since they only reach the organized, politically involved (mostly male) citizens ('Alt Herren Verein', engl. 'old men club', MI2 52).

7.2. Local mobility planning regarding participatory elements

The mobility strategy in Munich intends participation at different stages: to inform and explain, to give opportunities to citizen initiatives or proposals, and to provide feedback on measures. Thus, the involvement of civil society in implementing the mobility strategy is a directive for the mobility department (Munich, 2022a). Local experts stress the importance of citizen participation in implementing mobility hubs (MI1 19, 100, 144, MI6 21ff., 35). The mobility department used the Munich International Automotive Exhibition (IAA) to initiate a public dialogue on future developments in the mobility sector. The public administration invited citizens to develop their own projects, get informed, and give input to the city administration. The mobility department aims to organize a public dialogue on shared mobility in the long term.

Participatory formats planned by the city of Munich in its mobility strategy can be classified at level two on the democratic integration ladder, namely deliberate engagement. These formats are expert conferences and citizen workshops. As part of the expert conferences, the city would like to invite public authorities, the surrounding region, universities, businesses, environmental associations, social associations, and others. Citizen workshops shall be representative, although the type of representation is not specified (Munich, 2021, p. 36). The two formats are to be documented „transparent and as accessible as possible to all” (translated Munich, 2021, p. 3) on the digital platform muenchenunterwegs.de (MI1 100). It is also noted that women and men should be equally involved in all participation processes and that results should be documented in a gender-sensitive manner (Munich, 2021, p. 26).

By engaging citizens and other stakeholders in decision-making and evaluating their concerns, the city of Munich hopes to increase acceptance of measures (translated Munich, 2022a, p. 1). For example, acceptance of shared mobility from the outset through public outreach is considered important, as the reallocation of parking spaces is necessary for mobility hubs and other ideas (Munich, 2022b, p. 57). Communication channels from the citizenry to the administration and politicians are planned, “e.g. through systematic complaints and concerns management and through diverse formats of fair and active involvement and participation” (translated Munich, 2021, p. 30). As part of their feedback management, citizens and local stakeholders are able to track the current work status online (Munich, 2021, p. 36) and influence the hub location e.g., car-sharing sites (MI2 102). Local experts underscore

the crucial role of communication and information, pointing out that the success of alternative modes depends not only on their implementation but also on their adoption and use by the people (MI6 35, 42). Besides individual citizens, organized civil society tries to influence political decisions, as in the case of the aforementioned public petition 'Sauba sog I' (GreenCity e.V., o.J.).

Where, in addition to documentation, "the processing, evaluation, and incorporation of the results" (translated Munich, 2021, p. 36) is also planned, knowledge integration (level three democratic integration ladder) may be assumed. For example, the draft resolution on the shared mobility strategy was developed in various formats and with sub-working groups so the stakeholders involved could discuss and agree on the results together (Munich, 2022b, p. 124). Once the mobility hubs have been implemented, they are to be evaluated through household surveys (Munich, 2022b, p. 73).

Vulnerable users are also to be considered in these processes:

„Zudem soll Niemandem der Zugang zu einer passenden Mobilität verwehrt sein, weswegen es entsprechende Angebotsmodelle für finanziell, physisch oder anderweitig eingeschränkte Personen geben soll.“

"In addition, no one should be denied access to suitable mobility, which is why there should be appropriate service models for people with financial, physical or other limitations." (translated Munich, 2022b, p. 18)

Not only citizens but also other stakeholders are to be involved in the processes; for example, close cooperation with Munich's public transport operators (e.g. MVG, P+R Park & Ride, and MVV) is being sought (Munich, 2022b, p. 47).

It is noted that human resources still need to be created to implement citizen participation (Munich, 2021, p. 38). During the planning phase of the mobility points, the mobility department will receive external support from a planning and engineering office. Participation procedures will also be accompanied (Munich, 2022b, p. 72).

Research projects offer additional opportunities to create more extensive participatory formats in the context of mobility (hubs) planning. Experts from Munich mention various projects funded by regional, national, or European agencies that allocated more time, staff, and budget for participation beyond the limited resources of everyday business. Amongst others, co-creative workshops, on-site events, and discussions were organized in affected neighborhoods (M1 69; M3 81; M4 73).

To summarize, the planning documents analyzed here have shown that Munich's city administration is aware of the opportunities and challenges that arise with participation. Their mobility strategy shows an initiative for knowledge integration: participation takers can comment on the ideas regarding the mobility hubs, wishes and worries are integrated and given room, and finally, participation is documented. However, there are no plans for permanency or autonomy of the process and thus no institutionalization of participation, which would have suggested social learning (level four on the democratic integration ladder). Therefore, by aiming for knowledge integration, level three is fulfilled.

7.3. Co-design process

The Living Lab Munich (LLM) aimed to align its goals with the city's strategies. Therefore, the primary objective of this LL was to transform the current infrastructure by co-designing, co-evaluating, and implementing a mobility hub, which was achieved through the repurposing of car-parking spaces and the promotion of active and shared transportation modes. Simultaneously, the LLM aims to broaden the hub's purpose, encouraging community engagement in activities beyond transportation and fostering a more livable environment. The infrastructure design prioritized simplicity and barrier-free options to ensure ease of use for all. The LLM had three primary target user groups that play a significant role: residents, university employees, and students. Researchers from the Technical University Munich (TUM) have chosen these groups to support the integration of the community living next to the Technical University in Munich, to foster a sense of community, and to encourage students to interact with and learn from the residents.

Additionally, the LLM aimed to improve cycling infrastructure by providing a self-repair station for cyclists and enhancing seamless connectivity through better information about nearby mobility options (Duran-Rodas et al., 2023, p. 10). The researchers from TUM set a concrete goal referring to the SmartHubs integration ladder. While aiming for level four on the physical integration level, the goal for democratic integration is level three. The LLM does not consider the digital integration. To achieve democratic integration, the city of Munich, the Public Transport Operator (MVV), and citizens are part of the co-design and co-evaluation approaches to establish the elements to be included in the hub's design (Duran-Rodas et al., 2023, p. 11).

The LLM is located near the TUM in the district of Maxvorstadt, an area with high traffic density and many amenities. The university surroundings offer various points of interest, from supermarkets and shops to cultural venues. The public transport coverage in the area includes two subway (U-Bahn) stations (1 line), and three bus stops (3 different line services). In addition, tram stops are located approximately 200 m from the main campus. In the area, commuters and residents cause a high demand for parking. Together with a reduction of parking spaces to create new cycling lanes during Covid-19 this has become a pressing issue (Duran-Rodas et al., 2023, 12 f).

An existing parklet was selected to be transformed into a mobility hub, incorporating a seating area, an object exchange zone, improved lighting, bike parking, and greenery. The LLM focuses on using the parklet's existing infrastructure and transforming it into a mobility hub. The parklet aligns with the LLM's objectives by offering user-friendly features, diverse activities beyond mobility, a cozy and inviting design, a place to stay, and barrier-free access. It is located within 100m of the next public transport stop (see above).



Image 2 Parklet transformed into a mobility hub (Duran-Rodas et al. 2023, p. 14)

Outdoor workshop during open street festival at the TUM campus

This outdoor workshop was hosted by researchers from TUM. The festival organizers promoted the event and didn't have a formal moderation. This workshop aimed to identify which elements the people, as potential users of the mobility hub, wish to have in a mobility hub. In total, 18 participants actively engaged in a co-design activity focusing on a game application, and an on-street panel. There is no documentation available regarding the inclusiveness and heterogeneity of the participants. However, those participating in the event contributed to identifying desired elements for a mobility hub. The co-design game was later applied in two additional sessions, and subsequent workshops gathered more insights into people's preferences. Documentation, including photographs and written records, was integrated into the LL report, offering a comprehensive overview of Munich's LL activities. As there is no data on the inclusion of vulnerable users, this workshop could only be classified as level two on the democratic integration ladder.

Open format might not be very suitable for playing design games. Often, visitors are unlikely to commit longer than a few spontaneous minutes for participation formats.

Indoor game sessions with selected participants

Researchers from TUM organized two indoor co-design workshops. The first workshop was held at Oskar-von-Miller Forum, a student housing unit nearby TUM Campus. About 40 participants engaged in a co-design game facilitated by TUM. The event was announced in the residents' calendar and chat group. The session commenced with a 20-minute introduction, followed by the application of a co-design game, and concluded with a debriefing process. The objective was to identify elements desired in a mobility hub and foster inclusive designs by introducing characters vulnerable to exclusion among potential users. The young participants were actively involved throughout and contributed valuable insights. The session was documented through photographs and a written report, integrated into the LL and game reports for comprehensive information (see Duran-Rodas et al., 2023).

The second workshop used synergies with a university master course. Therefore, all 150 participants were students at TUM and participated during class. The session included playing the co-design game following the same goals as the previous workshop. Given the substantial number of participants, the results from the game were documented through an online form (see Duran-Rodas et al., 2023). Due to the very limited heterogeneity of participants, this format could be defined as level two on the democratic integration ladder. However, the design game offers the potential for knowledge integration (level three on the democratic integration ladder).

Creating synergies can help to reach a larger number of participants. Integrating the co-design game into teaching activities can create a win-win situation. Students can learn more about applied research, and the project can gain more committed workshop participants. However, students are well-educated and future professionals in mobility planning. Therefore, their input cannot compare to other inputs from randomly chosen citizens of a district.

Onsite participation workshop at the mobility hub

This format took place outside at the LLM parklet at Steinheilstraße. Researchers from TUM did not publicly advertise the event but encouraged 20 users and passers-by to participate. Participants could share their thoughts by writing them down and placing them on a board. TUM actively invited people to participate in identifying additional elements that were attractive to them and aspects they disliked about the hub. While passer-by participation was limited, most participants highlighted the need for specific elements, acknowledged the welcoming character of the place, and emphasized the importance of creating an attractive space to linger. The session was documented through photographs and written records, available in the LL's comprehensive report. This workshop could be classified as level two on the democratic integration ladder at the best since there is only limited opportunity for deliberate engagement.

Besides the event, the parklet was open to everyone the rest of the time. Spontaneous and uncoordinated additions or actions were carried out on the parklet. For example, an ashtray for smokers was placed on the parklet and citizens helped to maintain the planters on the parquet on their own initiative. This uncoordinated adjustments could be interpreted as placemaking with is defined as part of level four on the physical integration ladder (see D 2.1 Geurs & Münzel, 2022).

Active training session with (future) mobility planners

This outdoor training session took place at TUM Main Campus and involved 15 master-level students as part of an active mobility course. It was moderated by TUM, the workshop aimed to provide valuable insights for future mobility decision-makers by actively engaging participants in cargo biking through the city. The goal was to allow students to experience the challenges and benefits first hand, fostering empathy for diverse users such as parents, older people, and delivery personnel navigating the city infrastructure. All participants demonstrated active involvement and engagement throughout the workshop, contributing to a comprehensive understanding of the mobility challenges associated with cargo biking in urban environments. The training session offers no opportunity for decision-making but implies testing of specific services only. Therefore, it is classified as level one on the democratic integration ladder.

Practical testing of various mobility options (here, using the example of cargo bikes) can give planners a better idea of the challenges posed by these forms of mobility. Impressions gained can provide additional

knowledge beyond technical regulations and requirements and enable a "reality check". This knowledge can also be highly relevant for planning and implementing mobility hubs with numerous sustainable and shared mobility options.

Indoor stakeholder feedback workshops with public transport and administration

Researchers from TUM facilitated two stakeholder feedback workshops to present the main findings of the LLM. One workshop included five experts from transit operators. The second workshop involved five experts from Munich's mobility department. Accordingly, invitations were sent directly via mail, resulting in a closed group of participants. The workshop summarized key results of the LLM and aimed to incorporate valuable feedback from local experts. Practitioners from transport operators and the public administration play an important role, providing expertise and feedback essential for refining and enhancing the overall assessment process for mobility hubs. The collaborative engagement with these experts ensures that the evaluation tool aligns effectively with the practical needs and considerations of the transportation sector. Researchers documented the workshop with minutes. The main focus of this meetings was to present the results to local experts. Therefore, it was classified as level one on the democratic integration ladder. Depending on the amount of deliberative exchange, it could also be level two.

Feedback workshops with practitioners from various institutions can help review and assess participatory process results. Experts can make statements about the feasibility of certain proposals and be informed directly about research and participation results. However, results should also be presented to an interested public or the participants of previous formats and not only in closed expert groups.

8. DISCUSSION AND LEARNINGS

8.1. Participation in multi-level governance and mobility planning

With the multi-level governance of mobility policies, municipalities have closer links to citizens than regional and national governance levels. Especially in the mobility sector, the municipal level holds many competencies and has the potential to impact the everyday lives of almost all citizens. The cities/regions within the SmartHubs LLMs developed mobility plans according to the SUMP guidelines introduced by the European Commission (European Commission, 2013). The degree and formats of participation activities during the mobility plan development vary in each local context, as presented above. These European guidelines foresee stakeholder involvement at different stages of the development process of a mobility plan. The main involvement activities should be planned before initiating the planning process and continue throughout the process. In the beginning, the main focus is on mobilizing citizens and informing them transparently about the process. According to the SUMP guidelines, the four most important planning steps for citizen involvement are the discussion of scenarios (Activity 4.2), development of visions (Activity 5.1), selection and validation of measure packages (Activity 7.2), and implementation (Activity 11.2) (Ruprecht Consult, 2019, p. 47). Additionally, citizens can also be involved in analyzing the existing mobility situation. When identifying problems in particular (Activity 3.2), additional perspectives can help gain a more comprehensive understanding and ensure that the interests of vulnerable groups are considered. The guidelines explicitly emphasize the involvement of all affected groups. For example, typically underrepresented groups such as people with disabilities, young and older people, ethnic minorities, less affluent people, and single parents should be involved. Regarding concrete measures (such as introducing a citywide network of mobility hubs), public authorities should ensure wide public support for the planned actions (Activity 8.4). Finally, when evaluating successes and failures, citizens can enhance the analysis with their perspectives (see Activity 12.1) (Ruprecht Consult, 2019, 45ff.). A more comprehensive description of the SUMP cycle and its relation to the SmartHubs project is presented in Deliverable 6.2 (Delaere et al., 2024).

The importance of citizen involvement in various contexts becomes apparent when examining the governance frameworks with a participatory governance perspective. The petition for more air

pollution control in Munich or the citizen initiative towards a progressive mobility turnaround in Vienna illustrates that civil society can positively and constructively influence the shaping of mobility policy. However, the protests in Brussels also show that measures cannot be successfully implemented against the population's will. In any case, it shows that public institutions are not the only drivers of political decisions. If participation merely serves to affirm decisions that have already been taken, this can lead to disappointment. This form of "participation" (Selle, 2011) or 'tokenism' (Arnstein, 1969) is criticized in the participation literature. Civil society engagement can emerge independently of public institutions and set its own timetables, topics, and priorities. Nevertheless, at a certain point, it is necessary to approach democratically legitimized institutions to achieve successful implementation. The methodological framework limits the present analysis (see above). An in-depth analysis of participation formats in the case studies (and beyond publicly initiated participation) would have required additional data collection in some contexts, which is not provided for in the scope of this report.

Table 2 overviews the SmartHubs LL activities and where to group them on the democratic integration ladder. The Living Labs were randomly color-coded² and sorted by activities the municipalities had already initiated and those supported by the SmartHubs project.

	Democratic Integration	Local mobility plans & concepts	SmartHubs Activities
Level 4 Social learning	Participation takers and givers, including vulnerable users, have networked, and integrated into the community, and participation becomes permanent and independent. Participation methods involves a permanent and independent exchange between participation givers and takers, so mutual understanding and interaction get institutionalized.		
Level 3 Integration of different knowledge	Participation takers, including vulnerable users, argue or deny positions, their input is integrated into the participation process, and participation givers create room for decision-making	Participation Hubs (Vienna 2022) Mobility Councils (Brussels 2021) Shared Mobility Strategy (Munich 2022b) Participation strategy (The Hague 2019) Smart Klima City Strategie (Vienna 2022)	On-street event presenting and getting feedback on the results (LLB)

² The table shows the Living Lab Brussels (LLB) in green, the Living Lab in Munich (LLM) in orange, the Living Lab in Rotterdam (LLRD) in violet and the Living Lab in Eastern Austria (LLEA) in blue.

<p>Level 2 Deliberative engagement of stakeholders</p> <p>Participation takers, including vulnerable users, argumentatively engage in decision-making, exchange of positions, active participation, participation givers invite participation and listen to stakeholder interests, including those of vulnerable user groups. Participating methods include a public hearing and invitation to send feedback via mail and/or webform.</p>	<p>Mobility Hub strategy (Brussels 2023)</p> <p>Mobility transition strategy (The Hague 2021a)</p> <p>Expert conferences (Munich 2021)</p> <p>On-street co-design workshop with public transport provider (LLB)</p> <p>Indoor co-design workshop (LLB)</p> <p>Local walk-in workshop (LLRD)</p> <p>Indoor game sessions (LLM)</p> <p>Public co-creation workshop (LLEA)</p> <p>Outdoor workshop during street festival (LLM)</p> <p>Design game workshops (LLEA)</p> <p>Public stakeholder workshops (LLEA)</p> <p>Onsite participation workshop (LLM)</p>
<p>Level 1 Appropriate representation of stakeholder interests</p> <p>Participation takers are asked to be part of a consultation process and are provided with relevant information. No or limited attention to involve vulnerable user groups. Participation methods include surveys and handing out flyers, brochures, etc.</p>	<p>Digital pillar experiment at local mobility station (LLRD)</p> <p>Assisted surveys (LLRD)</p> <p>On-street event with digital pillar experiments (LLB)</p> <p>Active training session (LLM)</p> <p>Indoor stakeholder feedback (LLM)</p> <p>Stakeholder interviews to test assessment methods (LLRD)</p>
<p>Level 0</p> <p>No involvement or consideration of stakeholder interests and user needs</p>	

Table 2 Overview Living Lab activities on the democratic integration ladder

8.2. Learnings from onsite co-creation in SmartHubs Living Labs

There is no right solution when it comes to organizing participation formats. *The possibilities are manifold, and the event must fit the purpose and the format of the planned participation.* There are many variables to consider when organizing participation. The following recommendations are structured along the topics: setting & program, organization, and inclusivity. They are based on the analysis of the participatory activities in the four SmartHubs Living Labs.

Setting & Program

Basic decisions about the setting of participation formats can already entail crucial preliminary choices: Firstly, it must be decided whether an event should take place outdoors, on-site, or indoors. In the field of mobility hubs and mobility in general, it can be useful to go to specific locations to get an accurate

impression of the situation on-site. Site visits can also support mutual understanding among stakeholders or citizens (Ernst, 2019). For outdoor events, the season and weather conditions must be considered. Warm weather and daylight might encourage people to stay and participate more easily than on a dark winter day. However, in addition to the weather conditions, people are exposed to noise and other potentially disruptive influences, and catering, as well as sanitary facilities are not always available. Open formats attract people randomly passing by and have the advantage of involving more people. However, many visitors are unwilling to spontaneously commit longer than a few minutes for participation formats.

Secondly, organizers must consider which locations or premises are suitable. Locations should be easy to reach. The location can also support a sense of collegiality or familiarity by choosing a well-known and familiar location (Ernst, 2019). If specific mobility hubs or other projects are at stake, organizing events nearby to involve residents and affected people can be useful. Additionally, locations must be barrier-free and accessible by public transport, walking, and cycling. Also, the time an event is organized can address different groups of people (workday or weekend, daytime or evening). Researchers from SmartHubs project organized meetings at local community centers, libraries, or at the premises of cultural and religious associations. To provide different opportunities for participation, the same formats can also be offered at varying times and locations. In any case, the event profits from a welcoming atmosphere. Passers-by might be attracted by colorful advertisements, such as a flag or banner, that should be readable from a distance. Also, seating opportunities or movable greenery can make a location more attractive to people.

Thirdly, childcare services can enable families and caregivers to participate in surveys or workshops, thus partially lowering the barriers for these vulnerable groups.

The program should follow the purpose of the participation event. Incentives like food, drinks, or small gifts show appreciation for participants but can also serve as an initial contact point for people attending the event. Additional activities can help raise attention for the event, attract, and open a conversation with people. They also allow practical testing of mobility services in real life to get a realistic impression of usability and barriers. Planners can understand the challenges posed by these forms of mobility, and potential users can get to know new mobility options in a safe learning environment.

Organization

Most importantly, it can be helpful not to 'reinvent the wheel' when organizing participation formats. Organizers should become familiar with local structures, community centers, and associations and cooperate with existing stakeholders and resources. Cooperation with other stakeholders can have numerous advantages: Researchers from VUB cooperated with the STIB/MIVIB and could use their event bus to raise attention and use the interior of the bus for a workshop. Also, creating synergies can help reach more participants, students from relevant courses, or visitors of a community center activity. However, organizers need to be aware of the implications certain cooperation has on the attracted participant. For example, collaborating with a university could give the impression that special knowledge is required and thus discourage people from participating. The same learning is relevant to the invitation to participatory formats. Every form of media attracts a different audience.

Participation formats should have a clear structure and references to follow-up meetings. In this way, continuous communication can be established. A clear explanation of the planning process, specifying objectives and ultimately outlining how participation will be integrated into the decision-making process can increase people's willingness to participate (see also Lindenau & Böhler-Baedeker, 2014).

The overall number of participants during the co-creation processes was limited. Some formats purposely limited the number of participants to have enough capacity to organize an interactive workshop. For other open events, researchers and cooperating organizers needed to attract and invite people to participate actively. In the case of scientific driven co-creation, organizers and researchers must find a balance between the length and depth of a survey. Many participants, especially in open formats attracting random passers-by, are only willing to participate for a short time or might not be able to dedicate long time.

Meaningful participation needs time and resources. Asking people about a certain topic without explaining the context might raise false expectations and, in the worst case, leave people more frustrated

with decisions than without consultation. Therefore, it is essential to communicate the participation format's purpose, structure, and scope transparently.

Especially in formats with deliberative involvement and different knowledge integration (see democratic integration level two and higher), one must include feedback loops to discuss and evaluate participants' input with experts and allow deliberate exchange (see also Li et al., 2015). Explain decisions transparently and show how participants' input is taken into account. These rather open participation formats can be challenging since random participants may have their concerns and do not want to participate exclusively in the issues proposed by research projects or public authorities. Organizers must balance the participants' concerns and research topics or participation content to avoid upsetting or patronizing people. A neutral moderation can help explain, structure, and comply with self-set rules of engagement and structure during participation formats. (see also Ernst, 2019). It can also avoid experiencing tokenism (see Arnstein, 1969). Finally, testing and transferring new methods can be challenging. Using comparable methods has many advantages, especially for researchers. However, before conducting a new method with participants, sufficient time must be scheduled for the appropriate instruction of organizers.

Inclusivity

Open invitations do not necessarily result in 'everyone' participating. The setting, program, and organization have a crucial influence on the openness of an event (see above, chapters 4.3, 5.3, 6.3, 7.3). Also, the organizers of the event play an important role. They can explicitly address certain people or establish contact with people who speak a different language.

The diverse needs of vulnerable citizens need active consideration. Vulnerable users are often underrepresented in decision-making processes, participatory formats, and data sets. Therefore, organizers should carefully examine participants and actively address vulnerable groups. Including organizations representing certain vulnerable groups can integrate additional aspects. However, the intersected experiences of individuals who potentially suffer from more than one form of vulnerability might get lost by including one representing stakeholder. Others have thus discussed including a critical mass of vulnerable citizens (see James, 2008, p. 123).

The SmartHubs team recommends including people with limited digital skills in policy-making and participatory processes. The digital pillar experiment shows that people have diverse needs and preferences relevant to planning mobility hubs. Considering them, avoid planning hubs that are only used by abled-bodied, digitally skilled people with higher income etc., while excluding large groups of vulnerable users.

Using different media (visualizations, games, etc.) besides written text makes content more accessible to everyone. Visualizing content facilitates access to the topic, and people can understand and compare different variants more quickly. However, organizers must be aware that the form of information given can influence the results. Various forms of input allow vulnerable people to participate in their preferred way. Adding forms of story-telling or playing (design-) games includes people who are less used to arguing in groups or intimidated by other more eloquent participants or organizers.

8.3. SmartHubs co-creation tools

Besides these learnings of conducting participatory formats in four LLs across Europe, the following passage reflects on the democratic level of different tools and methods developed and carried out by the SmartHubs consortium.

The design game is a co-creative tool that allows a playful way to introduce the topic of mobility hubs and open conversation on the issue. The individually designed games of each LL have different features (see D3.4, Tellioğlu et al., 2023 and D5.6 Tellioğlu & Mikusch, 2024). However, all games aim to explain the concept of mobility hubs and identify relevant features, considering the needs of diverse users. The concept of personas, for instance, allows players to reflect on the needs of different people and creates an opportunity for mutual understanding and consideration. It creates an open space for deliberation by expressing opinions, arguing, and explaining ideas and needs with the other players. However, unfairness or domination of single players with strong opinions can appear during the game. To reflect

these internal dynamics of each playing session goes beyond the scope of this report. If applied appropriately, one can conclude that the co-design game has the potential for level three on the democratic integration ladder, namely knowledge integration.

The SmartHubs survey and the digital pillar experiment are methods for data gathering. There is no or limited opportunity for deliberate engagement. However, during the SmartHubs project, efforts have been made to include vulnerable to exclusion groups in the data collection process and thereby reduce epistemic injustice. Researchers develop and carry out the tools that require expertise and resources to analyze the data obtained. However, they can be useful instruments to gain empirical data to formulate policy recommendations and gain additional knowledge on planning and implementing mobility hubs. One could argue that a maximum of level two on the democratic integration ladder could be reached with these methods.

The SmartHubs appraisal tools, MAMCA and SIS focus on the co-evaluation of mobility hubs. The tools involve citizens and stakeholders in the assessment of design options. The MAMCA can rank different co-designed solutions according to stakeholders' criteria. The SIS quantifies the negative and positive impacts of the co-designed mobility hubs on stakeholders (Martinez, Pappers, Keserü, & te Boveldt, 2022). Using evaluation techniques it can identify sustainability impacts and stakeholder preferences more explicitly. It facilitates consensus-making among several stakeholders and guides deliberate engagement by offering structural support and revealing criteria transparently. As an evaluation method, it considers design options. Therefore, organizers can only apply the tool at a later stage of participatory processes, which makes it hard to classify according to the democratic integration ladder. However, when using the tool, ensuring an appropriate representation of stakeholders (especially vulnerable citizens) is important for identifying essential criteria for mobility hub design and supporting the co-creation process (Martinez, Kirchberger, et al., 2023).

The co-creation process of the SmartHubs project illustrates that participation and citizen involvement in general, but especially during a research project, can be tricky. On the one hand, projects can acquire additional financial and human resources. This creates opportunities to experiment with formats for which no capacities are available in day-to-day work. In addition, researchers accompany and evaluate processes so that many findings can be gained. On the other hand, research projects also have clear time and financial limits. Valuable synergies can arise when municipal and scientific schedules harmonize. However, this also entails the risk of dependencies and limited flexibility. For example, in the case of The Hague, it was also feared that too much co-operation would create false expectations amongst citizens. On the other hand, discussions may be predetermined by the research work. In numerous co-creative workshops, participants have raised issues beyond mobility hubs that can only be addressed to a limited extent by the researchers of the SmartHubs project.

9. CONCLUSION

The report highlights the significance of citizen involvement in mobility policies, emphasizing the closer links between municipalities and citizens compared to regional and national governance levels. The evaluation of the four SmartHubs LLs delivered valuable results. All co-creation phases have reached at least level two on the democratic integration ladder and therefore fulfil the conditions for a 'smart' hub. The transition from level two to level three appears to be particularly challenging in many cases and cannot always be clearly demarcated. Nevertheless, the examples show that an increase to level three is possible, with careful consideration and investment for meaningful participation. The mobility councils in Brussels or the permanent support for citizen participation in The Hague demonstrate aspects of social learning, level four on the democratic integration ladder. However, there is still a lack of independence from the public authorities. Social learning, on the other hand, could not be observed. It appears challenging to establish permanent participation structures during a three-year research project in which a thematic focus such as mobility hubs is given. This thematic stipulation can already be seen as a top-down influence that contradicts an independent participation format. The report provides insights into conducting participatory formats, emphasizing setting, program, organization, and inclusivity to ensure effective citizen engagement. It discusses tools and methods the SmartHubs

project employed, such as co-design games, surveys, and appraisal tools, each offering different levels of democratic integration. Thus, the report contributes to a growing body of literature on co-creation and participation in the mobility sector.

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