

ACUTE - Accessibility and Connectivity Knowledge Hub for Urban Transformation in Europe

WP1 – ENUAC Cross Research Community

(D1.1 and) D1.4.1 (Final) showcase of regional, national, European and international projects, ideas, initiatives on the topic of accessibility and connectivity – the ENUAC projects

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Executive Summary

This report presents an in-depth analysis of 15 projects funded by the ERA-NET Urban Accessibility and Connectivity (ENUAC) initiative, undertaken by the ACUTE Knowledge Hub. The ACUTE project focuses on improving urban accessibility and connectivity across Europe. By drawing on data collected through surveys and semi-structured interviews, the report examines the goals, strategies, challenges, and impacts of these projects, which address a variety of urban mobility issues such as sustainability, inclusivity, and the application of innovative technologies to reshape urban spaces.

The primary objectives of the projects analysed centre around creating sustainable, efficient, and inclusive mobility systems in cities. The projects aim to reduce carbon emissions, improve the integration of various transport modes like walking, biking, and public transit, repurpose underused urban spaces, and enhance accessibility for vulnerable groups. By addressing these pressing urban challenges, the projects contribute to a broader goal of achieving equitable and environmentally sustainable cities.

The findings of this report highlight that in terms of implementation and real-life impact, many projects have utilised pilot programs and testbeds in cities across Europe. These initiatives include establishing "living labs" where mobility solutions are tested in real-world environments. The projects have also led to the development of tools ranging from mobility data analysis software to serious games for community engagement and policy guidelines to promote inclusive urban planning. However, the report also highlights several challenges, such as aligning project timelines with stakeholder needs and ensuring that project tools and solutions are sustainable beyond the project lifecycle.

The findings of the report also focus on collaboration among multiple stakeholders—such as city governments, private sector entities, and community organizations— which has been crucial to the success of many projects. These partnerships have facilitated the implementation of interventions and allowed for insights from various actors to shape project outcomes. However, the report also identifies a gap in formal platforms for knowledge sharing between different projects, suggesting that better mechanisms are needed to facilitate cross-project collaboration.

Finally, the report identifies several key areas for further research, including scaling successful innovations to different urban contexts, integrating digital tools with public participation, and improving the long-term sustainability of experimental approaches like living labs. Additionally, the report emphasizes the importance of studying how socio-technical transitions in urban mobility can influence public policy and promote lasting behavioural change.

In conclusion, the ACUTE Knowledge Hub's analysis demonstrates that the ENUAC projects have made significant progress in advancing sustainable and inclusive mobility across Europe. Although challenges remain, particularly in ensuring the longevity of project outcomes and fostering greater collaboration, the innovative approaches and strong stakeholder involvement seen in these projects lay a solid foundation for future urban transformation efforts. The report recommends increased support for capacity building, enhanced collaboration across projects, and continued funding to ensure that the projects achieve long-term impact.

Introduction

This report presents the comprehensive analysis of 15 funded ENUAC projects, through a series of surveys and semi-structured interviews conducted between 2023 – 2024 by Work Package 1 of the ACUTE Knowledge Hub. The ACUTE Knowledge Hub is dedicated to enhancing urban connectivity and accessibility in Europe, and this analysis aims to provide an examination of the implementation strategies, challenges, and impacts of the 15 funded ENUAC projects. Involving consortia with partners across the academic, government, civil society and private sectors, the cross-national projects included in this analysis are the following:

- ASAP: focusing on the activation of underused or inactive infrastructure or resources for sustainable urban logistics;
- Catapult: reflecting on how automated mobility can be designed and used in a more inclusive way, that takes into consideration user groups that have often been underrepresented;
- Cocomo: providing insights into how shared micro-mobility is combined with existing travel modes and what this implies for sustainability;
- DyMoN: exploring the potential of shaping sustainable urban mobility behaviour with real-time, user-generated and public open data combined with nudging methods;
- Easier: focusing on the smoother integration of active and sustainable everyday urban mobility modes, including walking, biking, public transport and shared mobility services;
- EX-TRA: exploring the potential of street experiments to transform urban mobility and accelerate transitions towards a ‘post-car’ city;
- GeoSense: focusing on the design and trial of geofencing solutions aimed at improving traffic flow, safety and air quality;
- ITEM: aiming to advance inclusive electric mobility transitions by examining inequalities in electric mobility needs, accessibility, capabilities and decision-making;
- Justice: combining accessibility modelling with qualitative approaches to consider inequalities, focusing on four specific groups suffering from accessibility gaps;
- MyFairShare: testing out the development of a scheme for the fair distribution of individual mobility budgets as a foundation for social and ethical carbon reduction;
- SmartHubs: assessing if a co-designed, user-centric development can enable mobility hubs to act as game-changers towards more inclusive sustainable urban mobility and accessibility;
- SortedMobility: focusing on a holistic approach for self-organised rail traffic for the evolution of decentralised mobility;
- TAP for Uncertain Futures: aiming to advance guidance for improving the resilience and adaptability of sustainable urban mobility plans in the face of uncertainty;
- TuneOurBlock: aiming to validate, internationalise and expand the superblocks concept as a policy and planning strategy for transformational urban adaptation;
- WalkUrban: focusing on understanding local accessibility in order to free up the potential for walking and its connections with public transport.

Structured in several key sections, the report begins with an overview of the methodology employed in gathering data, highlighting how the survey was designed and the rationale behind the semi-structured interviews with project coordinators and practitioners. The core of the report synthesises the insights from the survey and interviews, systematically comparing the perspectives of the different participants to the projects to identify common themes and noteworthy differences. The analysis focuses specifically on the projects’ objectives, on impacts and applications to real-life settings, on the involvement of practitioners, on what support is further needed, and on new research topics and questions. It concludes with a discussion on the main outputs and outcomes of the projects, providing a critical analysis of how these efforts have influenced urban policy and practice.

In addition to providing detailed findings, each section of the report includes direct quotes from interview participants to illustrate key points. This structure not only aids in understanding the specific challenges and successes of the 15 projects but also offers strategic insights that can guide future initiatives under the DUT framework. The ultimate goal of this report is to enhance stakeholder understanding of the interplay between strategic objectives and practical implementations within EU-funded projects, contributing to more effective planning and execution in future endeavours.

1. Methodology: Mapping the projects

1.1. The ACUTE Projects Mapping Survey

The "ACUTE projects mapping survey" was designed to capture detailed insights from participants involved in ongoing research projects under the ERA-NET Urban Accessibility and Connectivity (EN-UAC) initiative. Its overarching goal was to consolidate information from these projects, enable collaboration among researchers, and help shape future research agendas.

The primary objectives of this survey were threefold, and contributed to a broader aim of enhancing urban transformation towards accessibility and connectivity in Europe through improved research collaboration and knowledge dissemination:

1. To collect and synthesize knowledge from 15 ongoing ENUAC projects, enhancing the understanding of current research landscapes.
2. To identify other related research projects on urban accessibility and connectivity, facilitating cross-project cooperation.
3. To pinpoint new research questions and topics for upcoming funding calls, guiding future research directions in the field.

The survey was methodically organized into five distinct sections, each focusing on different facets of the respondent's professional experience and perspectives:

- Section 1 - "Yourself": This section was designed to gather basic demographic and organisational information, including the respondent's name, email, and their organisation's name and country. This helped in establishing the professional background of the participants.
- Section 2 - "Your Project": Here, participants provided details about their specific projects, including their roles, the main objectives of their project and their specific work packages. This section aimed to capture the scope and focus of current research efforts within the respondent's organisation more generally, and the focus of their respective projects more specifically.
- Section 3 - "Your Project's Impacts": Respondents were asked to describe the practical application of their project's outcomes. This included how the results have been used or are intended to be used in real-world settings, with an emphasis on successes, failures, and the role of practitioners in these applications. Examples were encouraged to provide a clear picture of impact.
- Section 4 - "Your Project Follow-up": This part inquired into planned future activities that aim to enhance the impact of the projects. It asked about the types of support needed at both research and practitioner levels to facilitate these activities, highlighting the ongoing and future needs for project advancement.
- Section 5 - "Other Projects/Experts": The final section served as a networking tool, asking respondents to list up to five related projects and experts in the field. This helped in mapping a broader landscape of research and practice in the field, identifying key collaboration networks.

The survey included a mixed-methods approach with question capturing both quantitative and qualitative data. Respondents were asked to provide narrative descriptions, make selections from predefined lists, and rate various aspects of their projects on a numerical scale. Some questions used a 0-10 scale to assess different dimensions of the projects, such as their potential to trigger socio-technical transitions (including their innovativeness, challenge level, feasibility, strategic impact, and communicative reach). These ratings helped quantify the perceived impact and scope of the projects in a standardised way. In complementarity, other open-ended questions required detailed textual responses where participants described the nuances of their projects' objectives, impacts, and future directions.

1.2. The Survey Sample

The survey captured 91 complete responses, with sections pertaining to personal and project details (Q1-Q7) achieving near-complete data. However, later sections related to project impacts and networking (Q8-Q15) showed a decrease in completion rates. Respondents represent a diversity of countries and types of organizations, and span across all projects surveyed and multiple stakeholders. The geographic distribution indicates a strong representation Austria, Sweden, and Germany, which made up over 50% of the responses (Figure 1).

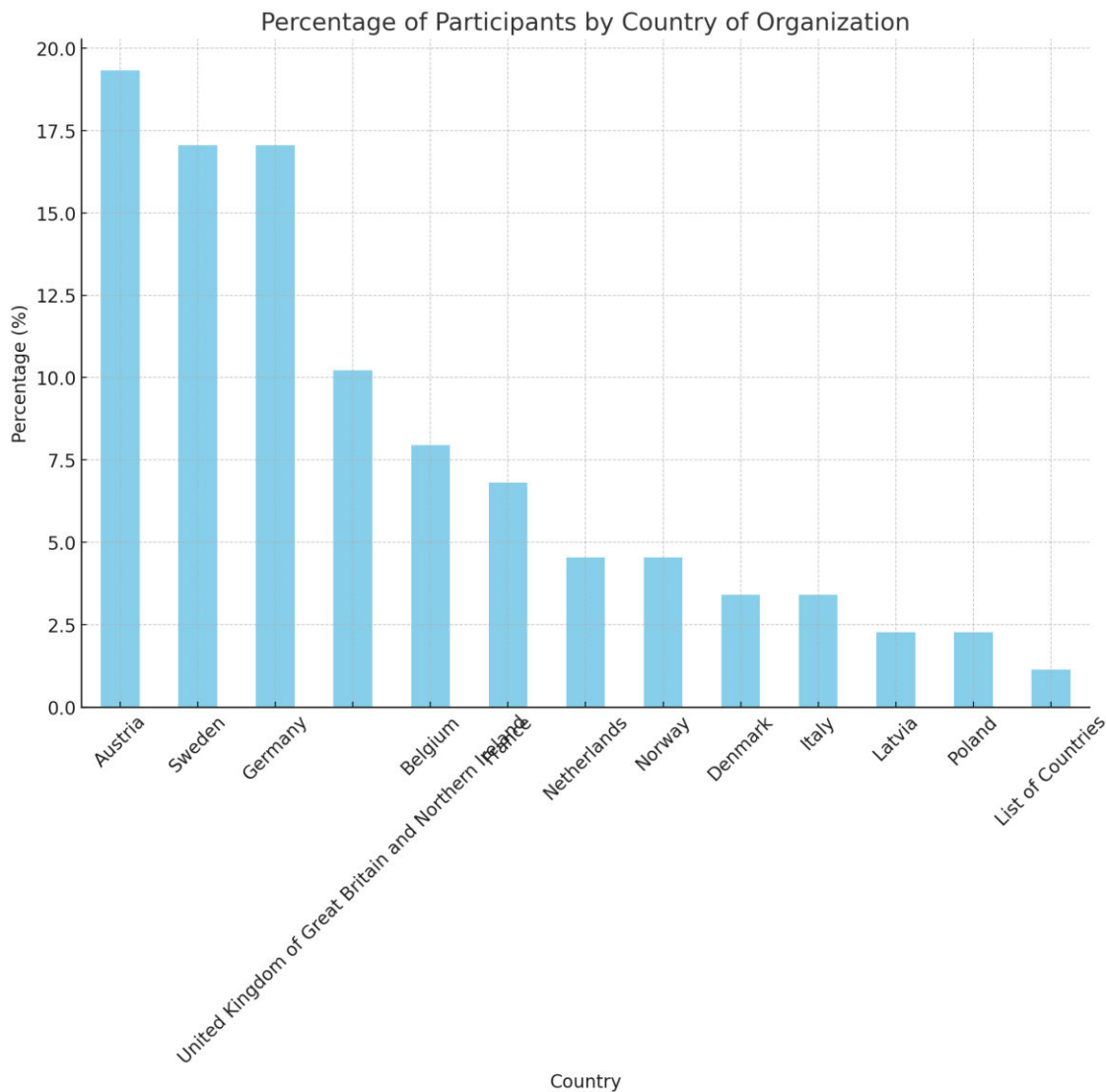


Figure 1: Distribution of respondents per country.

Most respondents were members of the scientific team partner's member, indicating active involvement from the research side of the projects. This was closely followed by project coordinators and principal investigators, suggesting that the survey was successful in engaging a diverse set of roles within the project teams.

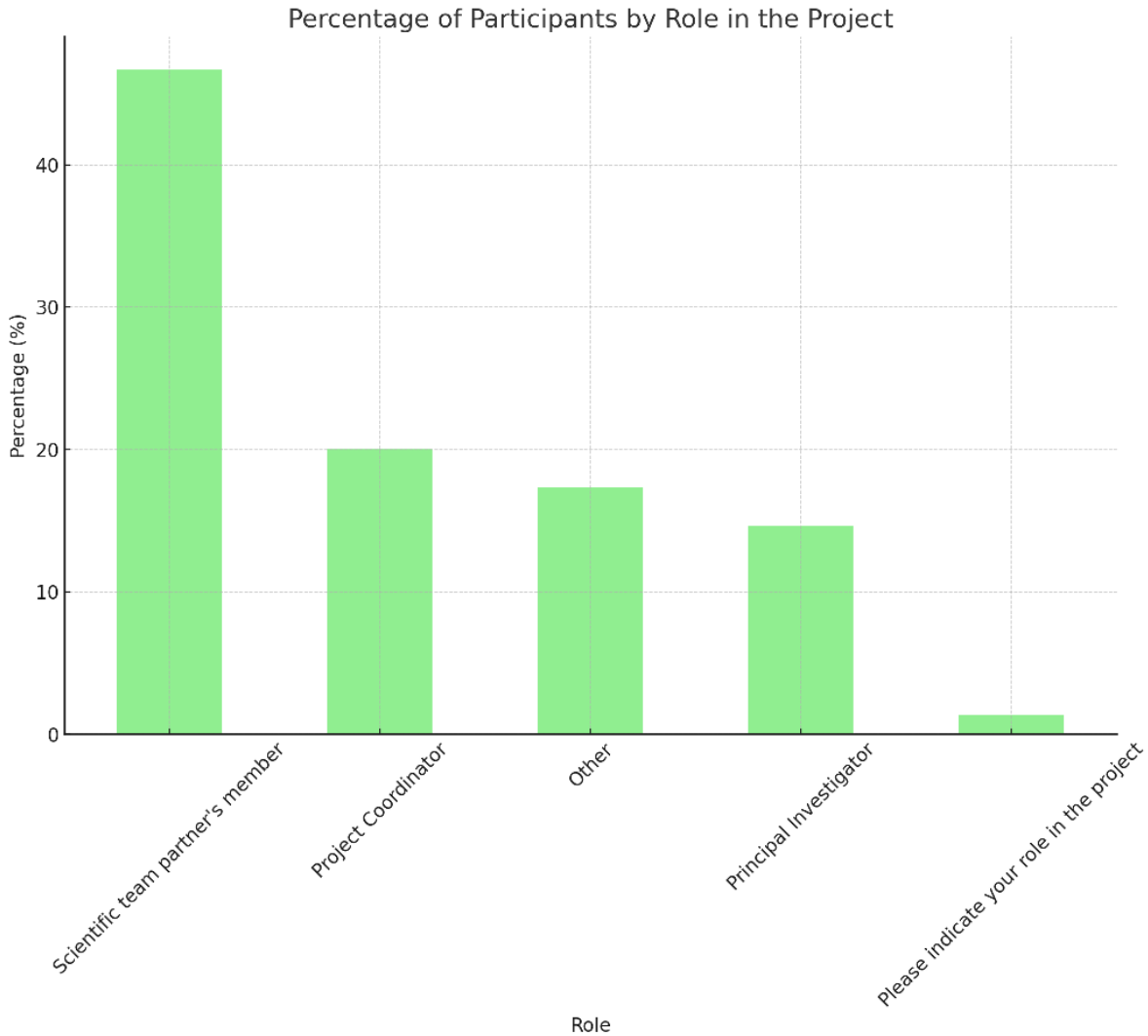


Figure 2: Distribution of respondent per role in the project.

The distribution of responses per project shows that projects like "SmartHubs" and "Ex-TRA" received the highest number of responses, with other projects on the lower side of the spectrum receiving only one response. Nevertheless, the survey received responses from all 15 projects surveyed.

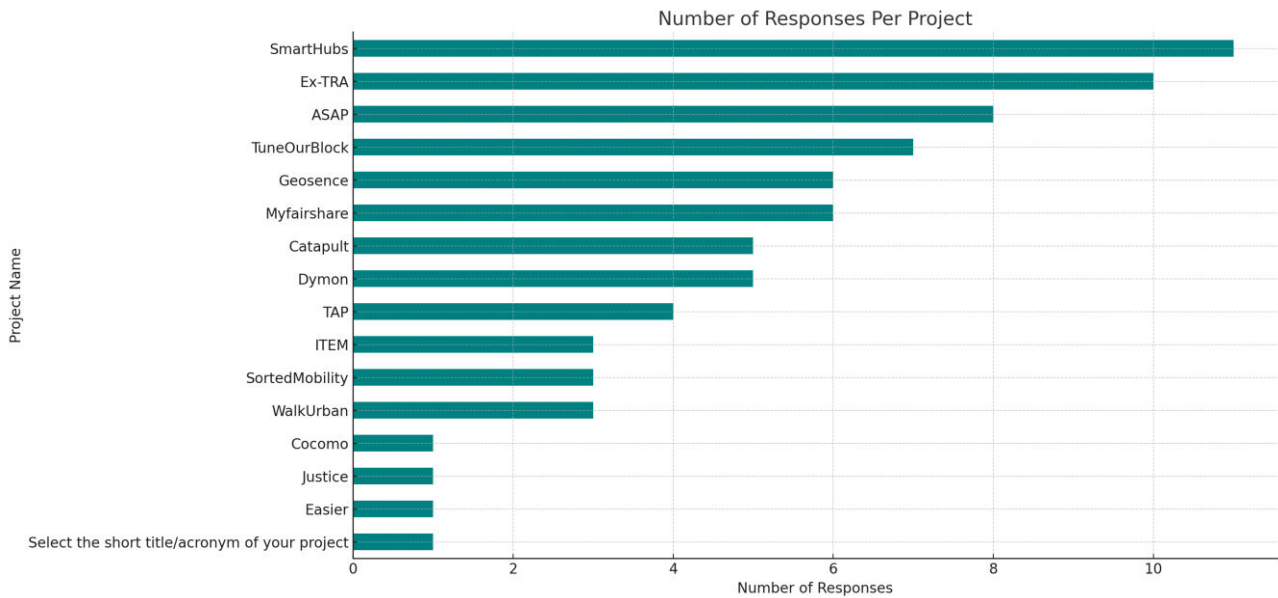


Figure 3: Number of responses per project.

1.3. The ACUTE Projects Interviews

The second step of the research involved conducting 24 semi-structured interviews to delve deeper into the survey findings and better understand the impacts, real-life applications, challenges and collaborations involved. We approached this step with a dual focus: on one hand, we interviewed the project coordinators who are pivotal in steering the project's direction and strategic outcomes; on the other, we engaged with practitioners from the consortia who were key partners in the projects.

While the questions posed to these two groups were slightly different to suit their respective roles, the overarching scope of the interviews was similar, aimed at understanding how the projects contribute to policy and practice transformation at the local level, challenges encountered, the nature of inter-organisational collaborations, the future sustainability and scalability of the project outcomes, as well as potential remaining unanswered questions.

For project coordinators, the interviews were structured to extract detailed information on the project's impact (providing specific examples of new tools and methodological innovations, and real-life applications), the nature of partnerships formed (including success stories and challenges, as well as interactions with other ENUAC projects), and the envisioned future based on the learnings and achievements of the project, plans to maximise impact and additional support needed. These discussions were enriched by the potential for the projects to catalyse socio-technical transitions.

The interviews with practitioners focused more on the practical applications and ground-level challenges of the project. Questions for practitioners aimed to uncover their initial expectations, the reasons why their institutions joined the ENUAC initiative, the successes and difficulties faced in various dimensions such as social, economic, and technical spheres, and their views on the impacts of the project's results. Practitioners were also asked about any follow-up actions envisaged at the end of the project, specifically methods to transfer results into practice. This included questions about the opportunities and foreseeable difficulties related to upscaling in their city and transferring successful practices to other cities. Additionally, these interviews sought practitioners' insights into improving future collaborations between researchers and practitioners, as well as identifying critical areas for future research.

1.4. Framework and Analysis

Analysis for the collected survey and interview data was guided by using the transition management framework, a tool developed for assessing solutions to complex and multi-dimensional sustainability challenges (Kemp & Loorbach 2003). The framework identifies four dimensions involved in a transition management cycle:

1. Strategic: With transition management targeted at challenges that require collaboration and collective tasks, the first dimension includes organising multi-actor networks and frontrunners, with actors pertaining to different sectors including government, businesses, NGOs, knowledge institutes etc. This exercise results in creating an environment for innovation, collaboration, involvement and debate.
2. Tactical: This dimension involves developing different sustainability visions and joint strategies resulting from stakeholder negotiations, which in turn are translated by actors into transition agendas for their own organisations.
3. Operational: The development of sustainability visions and transition objectives leads into the operational level, where experiments and projects are carried out in order to scale up, deepen and test various initiatives and actions.
4. Reflexive: The final, critical, dimension includes monitoring and evaluation actions in order to extract learning from processes of transition, as well as monitor transition agendas and experiments (Kemp & Loorbach 2003, Loorbach 2010).

The use of the transition management framework informed the development of a coding scheme which was employed to thematically analyse the qualitative data generated through the interviews. The analysis thus focused on a few key areas of interest including project challenges and success stories in organising multi-actor networks and collaboration, and developing joint visions, project impacts through tool development, living labs and real-life implementations, as well as lessons learned, evaluation, and future directions for research and practice. In addition to these themes derived from the transition management framework, the analysis also entailed providing a summary of the main project objectives. The results section and its structure reflect on these themes.

The data generated was thematically analysed focusing on a few key areas of interest including project objectives, project impacts and real-life implementations, project partnerships, and future directions for research and practice. By comparing the insights gathered from both coordinators and practitioners, and by combining results from both the survey and interviews, this analysis aims to highlighting both the strategic and operational dimensions of the projects, to assess the multifaceted impacts of the projects, and to provided a rich foundation for better understanding how the ENUAC projects could shape future urban and transport policy and practice. Given overlaps and identified complementarity between the survey and the interview data, the results are presented in a combined manner below.

2. Results

2.1. Projects' Objectives

Responding to the challenges set out by the JPI ENUAC call, the objectives of the projects more broadly were to develop integrated solutions for sustainable urban physical mobility, transport, land use, and digital connectivity, while also supporting the implementation of innovative mobility systems and services. This included transforming urban spaces towards sustainable mobility at the local level, spanning from street to district scale, and crafting effective policy options to support this transition. Additionally, there was also a focus on fostering changes in behaviors and perspectives towards sustainable urban accessibility and connectivity. More specifically, survey and interview responses about the main objectives of the 15 projects can be clustered around the following key themes:

1. **Sustainability and Efficiency:** Many projects focused on making urban mobility more sustainable and efficient, such as through the reduction of carbon emissions through developing / testing sustainable and alternative mobility solutions.
2. **Innovative Technology Solutions:** Responses highlighted a focus on innovative technologies like geofencing and digital nudging, suggesting an ambition to place the development and use of new technologies at the forefront of transitions towards more sustainable urban mobility.
3. **Activation of Spaces and Infrastructure:** A recurring theme and objective also included the activation or mobilisation of underused or limited-function urban spaces or infrastructures (such as, for instance, urban streets), aiming to transform these into more vibrant and multi-functional parts of the city.
4. **Inclusivity and Accessibility:** Most projects were also aimed at improving accessibility and inclusivity when it comes to urban mobility, indicating a strong agenda linked to social dimensions of justice and equity.

While most projects incorporated varying dimensions of all the objectives outlined above, the following section provides a couple of examples pertaining to each key theme.

A significant portion of the responses highlighted a commitment to **sustainability and efficiency** in urban mobility. For instance, the **Catapult** project focused on "creating policies for inclusive urban autonomous mobility", aiming to examine solutions for more inclusive designs of autonomous mobility vehicles, taking into consideration a diversity of user groups, and to enhance the efficiency and sustainability of public transport systems by integrating autonomous transportation solutions into urban networks. Another project, **Easier**, aimed to enhance sustainability and efficiency by focusing on finding solutions to a more seamless integration into urban mobility systems of active and sustainable modes such walking, biking, public transport, and shared mobility services – an objective also shared by **Cocomo** which aimed at understanding how shared micro-mobility modes are integrated with existing travel modes, and what that might imply for sustainability. Also focusing on sustainable travel, the project **WalkUrban** investigated accessibility and potential barriers to walking as a sustainable mode to be better integrated with public transport. A final example in this category includes the project **MyFairShare**, which explored the idea of carbon reduction through the development of a fair and equitable scheme for the allocation of individual mobility budgets.

The responses also indicated a strong focus on using **innovative technology** solutions to urban mobility challenges. Projects like **Geosence**, which elaborated on geofencing solutions aimed at controlling vehicle entry in restricted zones to reduce congestion and emissions in urban centres, had as a primary objective the study of innovative technological solutions as a response to reducing carbon emissions in cities. Another project, **Dymon**, focused on harnessing the potentials of data and digital nudging in order to encourage behavioural change and motivate citizens to choose sustainable transport modes.

The third important objective that emerged includes the **activation of spaces and infrastructures**, where multiple projects aimed to reimagine different uses and functions of urban areas and infrastructures in a bid towards alternative urban mobility and increased sustainability. For instance, the project **TuneOurBlock** aimed to "support civil society initiatives and city administrations to better, more effectively implement the concept of superblocks or similar traffic calming initiatives", a way of reclaiming streets for pedestrians and cyclists, from cars. Similarly, the project **EX-TRA** aimed to reimagine urban streets and street use by investigating the transformative potential of street experiments and their role in catalysing transitions towards a 'post-car' city. Focusing instead on the activation of underused infrastructure, **ASAP** centred on the revitalisation of neglected or idle infrastructure or resources as a strategy to promote more sustainable urban logistics.

have special accessibility needs. Proof of concept testing was also set up within the **Dymon** project, which set up a living lab in Salzburg in order to test out digital nudging for shifting mobility behaviour with participants recruited from companies located within Science City Itzling. As part of the **EX-TRA** project, living labs in London, Munich, Bologna and Amsterdam were critical not only for testing out a series of tools (for accessibility planning, for data collection and visualisation etc.), but also for studying street experiments in real time and conducting action research. Using specific cities as test beds, **ASAP** project implemented computer-based simulation environments to test different 'sleeping assets' in Paris and Stockholm, with the cities now considering to further take on board the models. The project **CATAPULT** also established living labs in two sites (Sweden and Austria), involving trial runs, user group discussions, workshops, and the development and testing out of a Serious Game fostering engagement and participation from a number of different stakeholders including municipalities and communities. The final example cited in this section is the project **GeoSense**: in Gothenburg, project partners conducted a trial focused on testing lower speed limits within special transport services using third-party solutions, with the aim to assess the practicality and effectiveness of implementing these solutions in real-world scenarios. Finally, with numerous projects being ongoing when the research was conducted, a number of interview and survey respondents highlighted that there are further plans to roll out tests in pilot cities in future phases of the projects.

Tool development and solutions testing

As part of conducting experiments in pilot, testbed cities, a significant number of projects reported impact through the development of tools and solutions to existing mobility challenges faced by cities. The tools developed encompass a wide range of formats, including software solutions, digital and analog serious games, engagement tools, data collection tools, open-source guidelines, and prototypes. They each serve specific goals ranging from the improvement of mobility systems, to data collection and analysis, as well as stakeholder engagement (with a particular focus on citizens).

Numerous projects contributed to the testing and enhancement of existing **software tools** or development of completely new ones. The generated software solutions were aimed at supporting with data analysis, simulation modeling, and decision-making processes, providing important insights into mobility patterns, infrastructure needs, and policy implications. For instance, the project **Dymon** contributed to the setting up and organisation of hackathon where software developers were invited to experiment and co-create software solutions to the challenge of more effectively integrating digital nudges in existing city mobility platforms (one of the case studies that was addressed in the hackathon included how to integrate more efficiently digital nudges into a Uppsala technical platform on car pooling). As part of the **EX-TRA** project, the team including research and practitioner partners developed the software tool GOAT (Geo Open Accessibility Tool), an open-source web tool designed for local accessibility analysis that aims to aid cities and planners in sustainable mobility decisions by visualising current accessibility levels and modeling scenarios for changes in infrastructure or points of interest at multiple scales of analysis. During the project, the tool was tested in multiple contexts, alongside workshops for teaching practitioners how to use it.

The ENUAC projects were also involved in the development of **digital and analog serious games**, which provide interactive platforms for learning, training, or simulating real-world scenarios in an engaging manner, both online and through face-to-face interaction with multiple stakeholders. A number of different examples were highlighted in the surveys and interviews. Within the project **Catapult**, a serious game called "A Shuttle for Everyone" was co-created with multiple stakeholders including users, policymakers and mobility service providers, in order to aid with exploring the needs and requirements associated with automated mobility. Similarly, the project **TAP** developed a serious game as a tool for stimulating practitioners to engage in the

exploration of triple access planning and of different planning scenarios. Finally, as part of living labs in the **SmartHubs** project, partners in Vienna, Brussels, Munich, and The Hague/Rotterdam each developed a series of analog serious games to foster creativity and inclusivity in mobility hub design, using both analog and digital tools (card games and board games enhanced by the integration of augmented reality elements). Finally, the projects were involved in:

- The development of community engagement tools such as community workshop protocols and crowd-sourced data collection tools, aimed at enhancing collaboration across different stakeholders, improving multi-stakeholder participation, and engaging diversity of groups (e.g. **EX-TRA** community engagement protocol for street transformation),
- The development of open-source guidelines and policy recommendation frameworks to be shared with municipal partners, aimed at supporting with more effective decision-making (e.g. **Cocomo** design and planning guidelines for the inclusive implementation of shared micro-mobility; **MyFairShare** operational toolkit for the implementation of fair individual mobility budgets; **TAP** guidelines for rendering Sustainable Urban Mobility plans more adaptive and resilient).
- The development of specific prototypes aimed at improving urban accessibility and connectivity in a reiterative manner allowing for testing and feedback (e.g. **SmartHubs** co-creation and development of mobility hub prototype designed with a focus on accessibility and inclusivity).

Challenges for Maximising Tool Impact

The interview data also revealed several challenges related to maximizing the impact of tools and interventions in urban mobility projects. Firstly, it was noted that limited time and resources presented a significant challenge for academic partners aiming to systematically test tools and solutions developed within a project. This raises the pressing question of where tools belong beyond the project (or whether they belong in universities at all), and how they should be managed effectively particularly once projects end: “It would be naive to think that without any facilitation, somebody else could pick up a tool and apply it. I mean, there are all sort of operational needs. You know, the data, but also how to use it, what can you do with it, requires facilitation of the process.”. With constrained resources, universities must carefully consider how to allocate their efforts to ensure that the tools developed are not only tested comprehensively but also integrated into broader contexts where they can continue to add value beyond the project's scope.

One key issue also identified was the difficulty in transferring knowledge and solutions across different cities. Although numerous demonstrated success, the knowledge generated from such efforts is often highly context-specific. This limits its broader applicability to other urban environments, where different logistical or political factors come into play. Another challenge is the reliance on digital interventions to change mobility behavior. While such tools are essential, they have shown limited effectiveness when not paired with real-world engagement efforts. It was found that without in-person support, events, or workshops, communities are less likely to adopt digital solutions, thereby reducing their overall impact.

Resistance from key stakeholders was also found to hamper the effectiveness of mobility interventions. For example, in Konya, efforts to ban cars from the city center faced pushback from car users and business owners, who feared a negative impact on their livelihoods. This resistance highlights the difficulty of altering ingrained habits and navigating local opposition, both of which can significantly limit the effectiveness of sustainability tools. In some cases, tensions were also found between bottom-up and top-down approaches to implementing different tools and solutions, with bureaucratic hurdles often lacking the flexibility to incorporate community-driven approaches and constraining experimental tools and their potential to drive long-term change.

Lastly, a recurring theme was the challenge of sustaining long-term benefits. Tools providing incentive schemes, such as those promoting electric vehicle use in Oslo, were recognised as valuable in the short term but may inadvertently sustain car dependency in the long run. This shows that while tools and policies may initially succeed, their long-term impact must be critically evaluated to ensure they do not reinforce the very behaviors they aim to reduce.

2.3. Multi-Stakeholder Collaborations

In the interview and survey explorations of real-life implementations and ENUAC project impacts, multi-stakeholder collaboration and partnerships with industry actors emerged as one of the most critical factors highlighted by participants. Despite encountering a number of challenges, many projects benefitted from close collaboration with key stakeholders such as municipal authorities and the private sector. These partners played essential facilitation roles in organizing pilots, workshops, and testbeds, which served as crucial platforms for testing and refining project solutions in real-world contexts. Partners also provided valuable expertise, resources and access to data, as well as supported community engagement endeavours. What was also highlighted was the importance of informal networks and relationship building consolidated by trust and experience of previous collaborations, which in many instances proved critical for generating new partnerships. The involvement of multiple partners manifested in a number of different ways elaborated on below.

Direct Collaboration with Cities

One prominent theme that emerged and was also explored in the section above is the **direct collaboration with cities**, where projects engaged city officials and local government agencies as key stakeholders. It was also highlighted that cities were involved and engaged throughout multiple project phases, including “from the initial design to the implementation phase”, which helped develop shared strategic visions, agendas and objectives. In this sense, some interviewees noted the benefits of early collaboration with partners from practice, facilitating a process of co-identification of knowledge and policy gaps, ensuring that the project effectively addressed existing challenges and needs. What is more, projects that reported impact recognised that transformation did not occur in isolation but rather within the context of evolving local policies, practices, and discourses: “I think it's important to stress that we are an element in a bigger constellation, and that's where you can have impact.” These projects strategically aligned themselves with ongoing shifts in policy and practice, leveraging political support to drive meaningful change. Simultaneously, they actively engaged in policy debates, challenging conventional approaches and advocating for innovative solutions.

Multi-Dimensional Contributions

Many projects also noted the **multi-dimensional nature of contributions** from practitioners, who were involved in multiple roles ranging from providing expertise, facilitating field trials, facilitating community engagement, providing access to data and assisting in refining project outputs. Respondents noted that practitioner involvement helped overcome implementation challenges and helped refine project focuses (e.g. involvement of municipalities in workshops and pilot studies was critical to identify real challenges to be addressed). Similarly, the integration of practitioner expertise ensured that the research was aligned with industry standards and needs, and was critical in addressing resource and knowledge gaps.

Collaborations across ENUAC Projects

In terms of **collaboration between the ENUAC projects**, while most interviewees acknowledged the importance of maximising opportunities for knowledge exchange with other projects, they also highlighted a notable absence of formal collaboration among the various ENUAC projects due to the lack of platforms supporting such processes. While some noted that exchange could be seen as unnecessary due to a lack of

overlap in research foci, others highlighted that "There is a need for better 'collective intelligence' between ENUAC projects to overcome the fragmentation of knowledge."

2.4. The Coordinator's Perspective

The analysis of the coordinator's interviews provided a comprehensive look at the current issues confronted by the coordinators, the variations in project approaches, but also the significant outputs of the projects. The following section provides an overview of recurring issues emerging as part of the coordinators' perspectives.

The integration of new tools and methodologies in existing frameworks was one area cited as having significant real-life impact, but also posed challenges across projects. As previously mentioned, limited time and resources posed a significant challenge for academic partners testing project-developed tools, raising questions about their post-project management and integration, particularly given operational needs and the necessity for facilitation to ensure effective application beyond the project's conclusion.

Despite numerous success stories, coordinators also highlighted significant collaboration barriers. External partnerships, particularly in projects involving multiple international stakeholders, faced hurdles such as language differences and discrepancies in operational frameworks. One coordinator highlighted a particular incident, saying, "When our German partner was bought by a French company, it not only added a layer of complexity but also slowed down our progress due to differing corporate cultures and expectations." Sustainability of project impacts also emerged as a critical issue, with many coordinators expressing concerns about the longevity and scalability of their initiatives. "The challenge remains on how to keep the momentum going once the initial funding runs out," one coordinator pointed out. An additional challenge emerging in this sense constituted of effectively juggling multiple priorities: "Effective partnership is the backbone of project success, and finding the right balance between academic research and practical application was crucial".

Nevertheless, numerous interview participants expressed positive perceptions on project impacts, with optimistic outlooks on the project influences on local policy and practice: "Our work led to the adoption of new urban logistics strategies in Paris, which was a direct result of our project's outputs," one coordinator stated. Educational impact was another significant outcome, with many projects engaging in extensive public outreach activities, dissemination of knowledge, and even contributions to academic curriculums: "We've integrated our findings into several university courses, which helps in sustaining the impact and disseminating the knowledge," a coordinator explained. Technological innovations were also highlighted as key outputs in several projects, as had been described in the previous sections: "The digital tools we developed are now being used in other cities, showcasing their adaptability and scalability."

2.5. The Practitioner's Perspective

The analysis of interviews with practitioners involved in various projects also helped to offer insights into their experiences, challenges, and contributions. Below is a synthesis of the findings from these discussions.

Practitioners expressed the challenges of aligning theoretical research with real-world business and municipal needs. A recurring theme was the difficulty in aligning academic research outputs with practical needs and timelines. One practitioner mentioned, "the city hands over loads of data, we offer ourselves in all sorts of interviews and things, and the researchers go away and then somehow that disappears". Companies were also reported to often struggled to see immediate benefits from these projects due to their highly theoretical nature, and practitioners noted a gap between research-driven initiatives and the practical outputs required by businesses.

Additionally, logistical and funding issues were frequent hurdles, with one practitioner noting the challenges in "finding funding to improve activities" which is crucial for continuing the project's impact. Under this

umbrella, coordinators also reflected on operational challenges and difficulties in balancing the day-to-day requirements of their role alongside participation in the project, which often involved limited resources. This was cited as being particularly complex when working in contexts unfamiliar with the demands of research projects. One practitioner stated: “This was my first research project in the company and I was not aware of bureaucracy. I didn’t apply internally for support, I did it on my own, which was demanding. Support could be helpful for companies, either providing help directly for reporting or providing some indications at the beginning. Luckily, I had the understanding of management, they gave me permission to use company time.”

Several practitioners also reflected on the tension between creating successful test beds and scaling those results. For instance, while testing testing at smaller scale often yielded positive results, replicating certain experiments on a larger scale raised significant concerns about feasibility. Similarly, practitioners recognised that the high cost of certain solutions posed a challenge for broader adoption. The need for substantial investment to replicate certain processes was found to also create barriers that made it difficult for other cities to adopt similar solutions.

Despite these difficulties, practitioners highlighted the important role of engaging with communities through for instance workshops and hack-a-thons, not only as educational tools but also as mechanisms to create dialogue between different stakeholders. In some cases, these events which were often facilitated with input from practitioners, allowed demonstrating to cities new and innovative ways of thinking, despite the time-consuming nature of such activities.

One of the most reflective aspects of practitioners’ experiences was the political dimension of urban mobility projects. Transformative changes in city infrastructure often faced resistance from both citizens and policymakers. For example, implementing superblocks in Vienna illustrated the difficulty of managing public opinion. Project teams had to contend with backlash from various sides—some citizens opposed change, wanting things to remain as they were, while others pushed for more progressive approaches. This left practitioners and policymakers in a delicate position, balancing innovation with public resistance. Many reflected that the easiest path for policymakers was to avoid controversial projects altogether, suggesting that future research should explore strategies for overcoming political backlash and creating narratives that foster public acceptance of urban transformation.

Finally, practitioners also importantly noted that while projects produced clear and measurable outputs, assessing long-term societal impact would require longer timeframes, with socio-technological impacts needing an extended period to fully evaluate effectiveness. A key related insight was also linked to the need for developing a deeper understanding and methodologies to better assess the intangible impacts that go beyond quantitative metrics.

2.6. Needs of Project Participants from Funders

Based on the analysis of the surveys and interviews conducted, several inputs from project participants have been identified that could also inform funders about critical needs and expectations for future support. The articulated needs are rooted in persistent challenges in project running and implementation - by addressing these needs, funders can play a pivotal role in advancing urban innovation and ensuring that projects not only start strong but also have the requisite support to achieve long-term success and transformative impacts. This section outlines the key areas where the ENUAC project participants see the need for attention and adaptation from funders to better meet the evolving demands of running an EU-funded project.

Flexibility in Funding Allocation

Participants expressed a need for greater flexibility in how funds were allocated and used, allowing projects to adapt to evolving challenges and opportunities without being constrained by rigid funding structures. This includes the ability to reallocate resources between budget categories to respond to unexpected

developments or new insights gained during project implementation. One coordinator mentioned, "The ability to shift funds between line items without extensive bureaucratic processes would help us address challenges more promptly and effectively." In this vein, participants also noted the importance of recognising indirect costs associated with project implementation, such as administrative support, project management, and infrastructural maintenance (such as for instance that needed to ensure the continued management and running of tools developed as part of the project).

Long-Term Commitment

There was consensus among project participants that long-term support beyond typical funding cycles would greatly benefit the projects. This is crucial particularly for projects aimed at dealing with complex urban transformation issues (such as infrastructure improvements, shifts in urban mobility, behavioural changes etc.), which cannot be achieved within short project timelines. Participants suggested that mechanisms to provide follow-up support or funding options to ensure that projects can reach their full potential and have a lasting impact could be beneficial.

Support for Capacity Building

Participants also highlighted the need for funding specifically allocated to capacity building within their teams and among stakeholders. This included training for project staff on new technologies and methodologies, as well as capacity building on issues such as community engagement. "Investment in training and capacity building is critical to ensure that all team members and stakeholders are on the same page and fully equipped to contribute to the project's success".

Outreach and Dissemination Support

Many projects also emphasised the need for support with outreach and dissemination as a key strategy to amplify their impact. It was noted that particularly in the absence of specialised knowledge and skills, external support with project outcome dissemination and communication to diverse audiences is key (particularly going beyond academic dissemination channels). "How to perpetuate the knowledge? We lack time because the funded time in the project is dedicated to data coordination. There is a need for an additional financed time to put together the knowledge and to support the outreach and the publications.".

Knowledge Exchange Support

The survey and interview data also indicated that more support would be needed to project collaboration and knowledge exchange. This includes organising meetings, events and formal/informal networking opportunities dedicated to sharing best practices and findings among diverse projects and project stakeholders. Additionally, there is a need for designated resources for researchers to promote and offer training sessions on the utilisation of developed tools.

2.7. New Research Questions and Topics

Based on the analysis of the surveys and interviews conducted, drawing particularly from explicit questions posed to both coordinators and practitioners probing them to reflect on unanswered questions, several new research questions and topics have been identified that can guide future research directions and funding calls in urban accessibility and connectivity. These include but are not limited to the following areas of research and issues to be further explored:

Integration of Digital Tools and Public Participation:

There's a significant interest in understanding how digital tools can be better integrated into urban and transport planning while ensuring they meet the diverse needs of the population, including non-digitally skilled individuals. A related question is how to enhance public participation in the development of these tools to ensure they are user-friendly and inclusive. One interviewee noted that despite the continued need

for technical tools, it is also necessary to continue the development of tools that serve and are accessible for citizens.

Scalability and Transferability of Urban Innovations:

Future research could investigate the conditions under which these various innovations studied in the ENUAC projects (for instance street experiments or smart mobility hubs) can be scaled up and transferred at different scales and in different global/European cities.

Supportive Infrastructures for Living Labs:

There was also a call for developing more comprehensive support systems that can facilitate the testing and development of urban innovations in real-life settings, such as living labs. This includes the legal, financial, and technological infrastructures needed to sustain these environments beyond initial testing phases. A practitioner highlighted, "Living labs need more than just initial investment; they need sustainable models to operate long-term".

Community and Stakeholder Engagement:

Enhancing community and stakeholder engagement remains a priority. Future research could focus on strategies to deepen this engagement to ensure that transformative mobility projects align with the real needs and expectations of local communities, fostering a sense of ownership and participation.

Socio-Technical Transitions and Policy Impacts

Research could further explore the socio-technical transitions triggered by urban development projects and how these transitions can be leveraged to effect substantial policy changes at local and regional levels. This includes understanding the role of policy in facilitating or hindering these transitions. One respondent reflected, "The policy landscape needs to evolve to better support the socio-technical shifts we are advocating for in our projects".

Long-term Sustainability and Funding Models

There is a need to explore new funding models that can ensure the long-term sustainability of successful urban innovations. This includes identifying and developing mechanisms for ongoing funding and support that go beyond the typical project lifecycle. "Finding sustainable funding sources is as important as the initial project setup," stated a survey participant.

Policy and Public Perception Challenges

Several projects also highlighted the emergence of questions related to policy adaptation and public perception of change. For example, one interviewee raises a crucial question: "How to convince the public and politicians to adopt new transportation technologies?". This reflected a common barrier where technological, infrastructural and policy mobility innovations may face hurdles in public acceptance and political support, necessitating more research into effective communication strategies.

Emerging Questions from Field Implementations

As projects progressed and interacted with real-life scenarios, new questions emerged from field implementations. One project noted an ongoing need to understand "how different set-ups might yield different results in various urban contexts." This indicates that as solutions are tested in diverse environments, new variables and unexpected results prompt additional research questions.

Data and Impact

The role and impacts of data were evident in numerous responses, but interviewees highlighted a need for continuous improvement of methods and approaches. One respondent questioned "If data is crucial to understand and shift urban mobility patterns, how can we better collect and analyse it to inform policy?".

Unresolved Technical and Theoretical Questions

A series of unresolved technical and theoretical questions that continue to challenge project teams also emerged. This includes issues such as: what is required in order to ensure basic accessibility for all, and to ensure that mobility is equitable and fair; finding new ways to identify and represent the mobility needs of those who might not be able to represent themselves, particularly vulnerable groups; going beyond traditional cost-benefit analyses characterizing the field of transport, to incorporate dimensions that are more difficult to measure; identifying more comprehensive frameworks for evaluating transport policy, which encapsulate for instance considerations of climate change and equity; exploring more radical ideas of transformation such as what it would mean for all city centres to become car free, and what would be basic required levels of car access in this case.

3. Conclusion

This deliverable presents the result of the comprehensive analysis of 15 funded ENUAC projects. Data was collected in 2023-2024 as part of tasks under ACUTE's Work Package 1, and consisted of conducting a series of surveys and semi-structured interviews with coordinators and practitioners involved in the projects. The data collection process focused on gaining insight into project objectives, impacts, real-life implementations, partnerships formed, and lessons learned.

The report highlights the various objectives of the projects, particularly in terms of sustainability, technological innovation, and inclusivity. In this sense, projects were primarily centred on fostering mobility shifts with the aim of reducing carbon emissions, on improving urban accessibility, on fostering public engagement, and on ensuring that socio-technical mobility transitions leave no one behind. Project teams surveyed and interviewed self-identified a number of different project outcomes including the development of new tools and real-world applications through pilot projects and living labs, where innovative solutions were tested in urban environments. Key outcomes involved the creation of software solutions for data analysis and simulation, serious games for stakeholder engagement, community engagement tools, and open-source guidelines aimed at enhancing urban mobility and accessibility.

The impact of these projects often relied on local factors, such as political support and public buy-in, and in some cases, these conditions posed challenges to the project's goals. For example, while living labs were successfully implemented in many cities, demonstrating tangible results in urban mobility, the scalability and transferability of these solutions across different contexts remain a significant challenge. Despite valuable insights generated and impact at local level, the localised nature of the testbeds meant that the results could not always be applied universally, limiting the broader applicability of the findings.

Multi-stakeholder collaborations were identified as a crucial element for the success of the projects (with significant partnerships between academic and non-academic stakeholders), yet also posed significant difficulties. The involvement of cities, policymakers, and private sector partners was essential for testing and implementing solutions. However, differing priorities between stakeholders often led to delays or compromises in project outcomes. This was especially evident in the case of bottom-up versus top-down approaches to urban transformation, where civil society-led initiatives faced bureaucratic barriers, while city-led interventions lacked the community engagement needed for long-term success. The role of project coordinators in navigating these complex relationships was emphasised, but the lack of formal platforms for knowledge exchange across projects limited opportunities for cross-project learning and collaboration.

From the practitioners' perspective, one of the primary challenges was aligning academic research with the practical needs of cities. While the projects produced valuable tools and methodologies, there was often a

disconnect between the theoretical frameworks used by researchers and the on-the-ground realities faced by practitioners. This gap was further compounded by issues of time and resource constraints, as many projects lacked the necessary support to test tools comprehensively or ensure their sustainability after the project's conclusion. Practitioners noted that further capacity building and long-term funding are needed to maximise the impact of these initiatives.

The report concludes by addressing the future needs of projects from funders, particularly the need for more flexible funding models, support for capacity building, and enhanced mechanisms for knowledge dissemination and knowledge exchange. New research questions also emerged, focusing on the integration of digital tools, the scalability of urban innovations, and the long-term sustainability of living labs.