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DEUTSCHE ZUSAMMENARBEIT

Urban Labs: Tried and Trusted

Reshaping cities by testing new approaches

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Introduction

In the ever-changing landscape of socio-economic trends, technological advancements, and complex issues such as climate change, cities face unprecedented challenges in ensuring sustainable and equitable development. Where traditional approaches fall short, innovative solutions are in high demand. This publication aims to provide an overview of a novel methodology commonly referred to as an urban lab. Aside from the general survey of its characteristics, the article features numerous application cases from cities across the globe, including three in-depth accounts, including a network of labs in 4 capitals – Paris, London, Berlin and Vienna, as well as independent labs in Belgrade and Berlin.

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Enjoy reading!

Concept of Urban Labs

The urban lab represents an emerging trend in the development of cities, offering them a structured yet flexible means of co-creating and testing context-sensitive solutions to overcome complex urban challenges.

The concept of an urban lab is already recognized globally, though various names are applied to it such as real-world laboratory or urban living lab, depending on the regional or cultural context. Irrespective of how specific labs are termed, the core idea is to serve as a city planning instrument and experimental space to develop and test innovative urban solutions through multi-stakeholder collaboration.

Urban experimentation involves planners, policymakers, and researchers making small, deliberate changes to physical spaces (such as neighborhoods) or procedural systems (such as administrative tools) and then observing the effects. Through this process, those involved gain insights into human behavior in real-life settings and can make an informed assessment of the adaptability and efficiency of specific tools within diverse urban contexts, acknowledging that cities vary significantly from each other.

An urban lab not only aids city planning but also accommodates a shift towards **new ways of contemplating, implementing, and organizing urban development.** Such labs foster changes in mindsets among municipal staff and involved actors, influencing how urban challenges are perceived and prioritized - whether it be recognizing the role of high-quality urban spaces in social cohesion, understanding the long-term impacts of climate change on housing and infrastructure, or embracing participatory and gender-sensitive approaches. Moreover, urban labs drive transformations in urban development practices, encouraging data-informed decision making, scenario-based planning, stakeholder-led workshops, and the adoption of innovative technical solutions to handle urban challenges (for instance, energy efficiency). At an organizational level, they promote new governance models, better coordination mechanisms, cross-departmental collaboration, and adaptive regulatory frameworks, all of which enable more dynamic and inclusive urban planning.

Modern cities face complex challenges worldwide, including population growth, climate change, and increasing infrastructural needs to embrace advanced technological capabilities. Addressing these issues properly goes beyond the capacity of conventional planning approaches. Instead, adaptive, inclusive, and innovative solutions are demanded. Urban labs respond to these obstacles by prioritizing experimentation and real-world testing while ensuring multi-sector collaboration, and have thus gained prominence across **Europe, North America, and Asia**, where cities actively test and refine solutions tailored to their unique contexts.

- *For example, in Rotterdam, Netherlands, frequent flooding and ineffective stormwater management have posed significant challenges. In response - drawing inspiration from a successful research initiative in Austria - an urban lab initiated the development of a multifunctional riverbank park designed not only for recreation but also for flood mitigation. By testing various land surfaces and their water absorption capacities, the initiative aims to enhance flood resilience while simultaneously improving the urban environment.*[1]

Urban labs are increasingly being applied to address a broad spectrum of urgent social issues that vary from one region or continent to the next. In European cities, they often focus on social inclusion, housing, and environmental justice, while in North America, they are frequently used to explore equitable mobility, data governance, and community safety. In the Global South, particularly in Latin America and parts of Asia, urban labs tend to concentrate on the upgrading of informal settlements, public health access, and climate resilience. Despite these geographical variations in focus, they all serve the same core purpose of collaboratively prototyping solutions to respond directly to the everyday realities of urban residents.

Unlike time-consuming theoretical or bureaucratic approaches, urban labs prioritize hands-on experimentation. Instead of relying on complex academic analysis, they use structured, evidence-driven methods - gathering necessary data, testing solutions in real-world settings, and refining approaches based on their findings. With a strong emphasis on user-centered design, urban labs engage citizens, governments, the private sector, and civil society in co-creating solutions that are both effective and scalable. By fostering collaboration, transparency, and adaptability, they devise solutions that are not only technically sound, but also socially accepted and practically viable. For example, in Poland, in the cities of Gdynia and Rzeszów urban labs have been established with an emphasis on collaboration between and among citizens, local authorities, and diverse stakeholders. These labs have introduced inclusive formats for dialogue, co-creation, and experimentation, leading to locally grounded solutions in areas ranging from civic participation to eco-friendly urban mobility.

From Research to Action: How Urban Labs Operate

The primary role of an urban lab is to integrate research and innovation to foster learning and explore alternative problem-solving methods. Innovation in this context involves **developing new solutions** – whether that be in services, governance, information management, applications, technologies, **or systems** - while identifying novel approaches to tackle persisting challenges.

To do so, urban labs pursue technological progress and societal

[1] Urban Green-blue Grids. (n.d.). *Water Sensitive Rotterdam. Urban Green-blue Grids.* Retrieved March 14, 2025

change. They generate and share new knowledge, thereby enabling insights gained from specific real-time experiences to be applied, replicated, and refined in their respective contexts through learning and experimentation.

This strong emphasis on knowledge production, transfer, and dissemination differentiates urban labs from other public policy initiatives.[2] A key aspect here is empowering citizens by actively involving them in shaping their environment, meaning that taking a participatory approach is crucial to ensure that users engage in the development process rather than merely being presented with a final outcome. Stakeholders engage in each stage before proceeding to ensure that solutions – whether they be tangible products or governance and information management frameworks - remain relevant to the local context, and are still effective and adaptable.[3]

- *An illustrative example of citizen participation enhancing integrated and climate-oriented urban development is the urban lab in Gdynia, Poland, which became a national template after its establishment in 2019. Rather than applying one-size-fits-all solutions, the lab prioritized context-specific, sustainable approaches to urban challenges. Coordinators actively engaged residents in identifying issues and co-designing solutions, ensuring both long-term engagement and environmental suitability. In particular, initiatives like the "Urban Café" created a participatory space for dialogue on local development priorities, while the "City Ideas" platform enabled citizens to propose and shape projects aligned with broader urban sustainability goals, including mobility, green spaces, and energy efficiency.*[4]

Phases of the Urban Lab Process

Urban labs adopt flexible approaches that allow **research, development, testing, implementation, and dissemination** to converge, creating an iterative cycle that continuously refines solutions. Through **collaborative experimentation** and **stakeholder engagement**, they tackle complex urban challenges more dynamically than traditional research models. This process is not always linear, as phases often overlap, depending on how time and resources are allocated in each project. Stakeholder involvement also varies across phases: while the testing stage typically requires active citizen participation, in the research and development stage the role of citizens may be rather indirect or observational.

The research phase is where the foundations of an urban lab are dug, shaping their ability to define problems accurately and develop solutions that address real contextual needs. Urban labs prioritize inclusivity during this phase, ensuring that valuable insights are captured by engaging a broad spectrum of voices. Their methodology incorporates diverse perspectives, using action-oriented approaches such as literature reviews, market analysis, brainstorming, and extensive stakeholder engagement through organizing participatory workshops and meetups. By prioritizing inclusivity, they not only enhance the depth and relevance of their findings but also prevent critical blind spots that could undermine project success.

- *A striking example of how inclusivity refines research and prevents critical oversights can be found in the Urban Lab in Doctorés, a neglected area between Mexico City's historic center and its noisy, bustling districts. Initially, the city partnered with Dutch experts, who focused on infrastructure renewal as the primary solution to the district's problems. However, the project ran the risk of overlooking underlying challenges if it did not secure the strong engagement of locals. It was only through direct consultations with residents that the district's genuine problems emerged: rampant drug-related issues and an urgent need for social transformation. That realization came from contextual insights gleaned through the active engagement of local communities, which reshaped the project priorities to ensure that interventions eased both the physical and social difficulties faced by the community. The installation of rainwater collectors in Doctorés not only made it possible to irrigate plantings in public spaces, protect the soil from drying out, but supply pools in water parks with playgrounds and collective gardens, and by this helped revitalize social life in the neighbourhood.*[5]

Once the problem is clearly defined, the **development phase** entails the transformation of potential solutions into tangible and testable interventions. One of the key strengths of urban labs is their ability to set in motion ideas that might otherwise have been considered out of reach, allowing experimentation across a wide range of formats (for instance, digital tools, pilot projects, or infrastructure redesign).

- *In Denmark, near Copenhagen, the "Therapeutic Stream Park" project exemplified the flexibility of an urban lab, bringing together architects, doctors, and psychologists from the University of Copenhagen to create a public center for nature-based stress therapy. By integrating scientific research with urban design, the project demonstrated how experimental spaces can transform abstract concepts into tangible interventions, reforming public spaces to address societal needs in previously unexpected ways.*[6]

The testing phase in an urban lab context is where proposed solutions, interventions, or prototypes are tried out in real-life urban settings to evaluate their effectiveness, usability, and impact. Skipping this phase can lead to unintended and unwanted

[2] Urban Nature Labs. (2020). *UNaLab project summaries of key resources for the adoption of nature-based solutions. UNaLab.*
[3] Nesterova, N., Uzunova, E., & van Egmond, P. (2021). *Living labs: A report on urban experimentation for sustainable mobility transformation.* EIT Urban Mobility.
[4] Klimczak, A., Cichocki, W., & Wygnańska, J. (2021). *How we made the URBAN LAB: Conclusions and recommendations from the pilot implementation in Gdynia and Rzeszów*. IRMR
[5] Roll, M., Almansi, F., & von Wirth, T. (2024). *Urban labs beyond Europe: The formation and contextualization of experimental governance in Argentina, Brazil, and Mexico*. Environment and Urbanization, 36(1), 173–192.
[6] Eisenberg, B., Chiesa, C., Fischer, L., et al. (2022). *Nature-based solutions: Technical handbook factsheet*. UNaLab Urban Nature Labs, Institut für Landschaftsplanung und Ökologie.

consequences. Gaining an understanding of real-life urban settings allows stakeholders to review interventions based on usability, comfort, security, and efficiency, refining them through feedback to prevent costly mistakes.

- *Test methods and their scale often vary according to the nature of the intervention, as the case of Tacloban, Philippines illustrates compellingly. In the aftermath of a devastating typhoon, local authorities and international experts sought to reduce future disaster risks by relocating over 80,000 residents to safer zones within the city. North Tacloban, identified as one of the most secure areas, became the initial site for the relocation of approximately 1,000 families into transitional housing. At this pilot phase, the relocation strategy was tested on a small scale, allowing for the collection of feedback from relocated residents to inform future urban planning. The process revealed significant challenges: families struggled to gain access to essential services, while economic displacement and social integration also presented difficulties. Moreover, the experience underscored broader regional vulnerabilities, as surrounding islands and settlements near Tacloban were also highly exposed to climate risks. Ultimately, findings indicated that the new developments in the north of the city might need to accommodate not only internally displaced residents but also future eco-migrants from neighboring areas. Consequently, the initiative evolved into an adaptive urban lab grounded in participatory planning, continuous evaluation, and flexible design, contributing to the Comprehensive Land Use Plan (CLUP) of the city, thereby demonstrating the critical importance of testing in shaping responsive and climate-resilient urban development.*[7]

Following testing, the **implementation phase** of an urban lab integrates refined solutions into urban systems. This stage involves building infrastructure, training users, preparing guidance materials, and ensuring accessibility for all stakeholders. Effective implementation not only brings a project to life, but it also supports its long-term sustainability and practical use, as seen in the cases of ProSHARE labs, the food waste management project in Serbia, and CityLAB Berlin's "Water Your Neighborhood" initiative in Germany.

The final stage is the **dissemination phase**, where the aim is to share the knowledge and best practices developed in an urban lab with a broader audience. By communicating such insights, successful models can be adapted, scaled, and refined, thus maximizing their impact. Dissemination can take on various forms, from informing policymakers and stakeholders to developing open-source solutions or sustainable revenue-generation models. The success of an urban lab in one location can inspire and enhance both urban policies and local interventions in another context, as demonstrated in the case of the stormwater management project in Rotterdam, which followed in the footsteps of the successful Green Urban Climate (GrünStadtKlima) research initiative in Austria.[8]

Although urban labs all tend to follow a defined framework, they also thrive on their ability to operate dynamically, often running multiple phases at the same time while maintaining close coordination. This allows them to refine solutions in real time, rapidly adapting to new insights and challenges. By integrating research, development, testing, implementation, and dissemination simultaneously, they can accelerate innovation and enhance impact. It is this adaptability that often gives urban labs a crucial advantage over traditional public policymaking, ensuring that interventions remain responsive, inclusive, and effective, while staying strict in their adherence to self-selected quality criteria like citizen participation, green technologies, and fostering cross-sectoral approaches.

Urban Labs in Action

There is no firmly established universal way of structuring, organizing, and operating an urban lab. Cities have explored various approaches, with mixed outcomes. Given the novelty of the concept, it is still too early to define a set of evidence-based best practices regarding the problems urban labs address most effectively. Moreover, it is not yet possible to point to the optimal organizational model in terms of structure, processes, and participation, or indeed how, if needed, that could be integrated into formal local governance structures.

As a result, urban labs often benefit from their flexibility, allowing them to adapt to evolving needs, test solutions, and operate with minimal bureaucracy. Their structure may vary depending on the objectives - which may focus on testing innovations, raising public awareness, or engaging specific target groups - ranging from hierarchical to more decentralized models. **In practice, urban labs tend to focus on engaging stakeholders, maintaining clear communication, facilitating discussion, managing knowledge, sharing insights, coordinating logistics, and collaborating with municipal decision-makers.** Meanwhile, assigning responsibilities in a structured manner can contribute to greater efficiency and accountability. Successful examples include ProSHARE labs in Europe, where stakeholders collaborate to develop inclusive and sustainable urban solutions.

ProSHARE Labs: Strengthening Urban Resilience by Rethinking How Urban Communities Share Resources, Spaces, and Knowledge

ProSHARE labs are collaborative urban innovation platforms established in four European cities, each uniquely shaped by the local context, yet united by a common goal: **to rethink how urban communities share resources, spaces, and knowledge.** Specifically, these labs are located in **Paris (France)**, **London (UK)**, **Berlin (Germany),** and **Vienna (Austria)**. Together, these labs form a living network of experimentation, where citizens, researchers, and local authorities co-create solutions to deliver more inclusive and sustainable urban futures.

This initiative has demonstrated how housing shortages and

[7] UN-Habitat Worldwide. (2015). *Urban Labs – Tacloban.*

[8] Pitha, U. (Project Leader). (2010–2013). *GrünStadtKlima – Optimierung des urbanen Klimas und Wasserhaushalts.* University of Natural Resources and Life Sciences, Vienna.

segregation can be addressed through inclusive sharing practices. The initiative was part of the research project "ProSHARE: Enhancing Diversity, Inclusion, and Social Cohesion through Practices of Sharing in Housing and Public Space"—supported by JPI Urban Europe and implemented by a consortium of academic institutions across Europe.

Each city's approach reflects its unique social and spatial context, as follows:

- **Berlin:** The lab operates in a vibrant neighborhood center, nurturing social ties through shared activities.

ProSHARE Labs Berlin/ Photo credit Nada Bretfeld

  As a decentralized, community-led urban renewal initiative, it has transformed underused public spaces by engaging residents in a participatory process using digital tools. Notably, participants first mapped local sharing practices with an open-source platform developed by an NGO. This informed the development of small-scale architectural prototypes and a local intranet built with the MAZI toolkit. Meanwhile, in hands-on construction workshops, residents co-designed tangible improvements—such as greening a neglected area in front of a church and creating a more welcoming shared space.[9]

- **Paris:** The lab fosters resilience through ecological practices and community-led initiatives. Embedded within Agrocité, an existing eco-civic hub, it has leveraged self-governed urban agriculture initiatives to strengthen grassroots participation.[10]

- **London:** Situated in East London's Poplar district—home to a large Bengali community and a high concentration of social housing—the lab has focused on strengthening cross-organizational collaboration to foster sustainable sharing practices. Initially, participants mapped connections between local organizations based on thematic priorities. Thereafter, the urban lab brought together Bengali food growers and professional enterprises to explore governance models for sharing physical resources such as land, tools, and produce. A final workshop served as a "trading zone," uniting earlier participants with local planning and housing stakeholders to integrate community insights into the area's masterplan. Ultimately, the lab succeeded in increasing sharing of material goods and spaces between three participating associations. [11]

- **Vienna:** The lab deploys a transitional urban space to explore new models of public sharing. The Garage Grande initiative, in particular, provided a temporary yet structured platform for knowledge sharing about citizen-led do-it-yourself (DIY) initiatives, showcasing how labs can operate with minimal bureaucracy while pursuing clear objectives – in this case sharing and re-using resources.[12]

Beyond individual projects, ProSHARE labs have prioritized knowledge management, illustrating how urban labs can systematize learning and inform broader urban planning efforts. Using digital mapping tools, co-design workshops, and participatory construction initiatives, the labs have facilitated structured yet flexible community-driven solutions. In Berlin, for example, a series of participatory construction workshops transformed a neglected urban area into a community-friendly green space.

External and Internal Considerations

Urban labs also face challenges that arise at various stages of their initiation and operation. City administrations that run urban labs have learned important lessons that can help other cities to deal with similar challenges such as managing **organizational dynamics,** addressing **social factors,** complying with **legal and regulatory frameworks,** navigating fluctuating levels of **political will,** ensuring **financial sustainability,** addressing **ethical concerns,** and responding to **technological advances.** Dealing effectively with these complexities requires cross-sector collaboration, public engagement, regulatory adaptation, financial planning, and stakeholder involvement.

One of the primary challenges lies in **organizational dynamics.** Urban labs often require cooperation between and among multiple municipal departments, yet traditional governance structures frequently struggle with cross-sector collaboration. Over time, successful urban lab projects have demonstrated that structured

[9] HTW Berlin. (2023). *ProSHARE final report: Lab Berlin (WP3).* JPI Urban Europe. Retrieved 14 March, 2025

[10] University of Sheffield. (2023). *ProSHARE final report: Labs London and Paris (WP3).* JPI Urban Europe. Retrieved from

[11] Ibid.

[12] TU Wien. (2023). *ProSHARE final report: Lab Vienna (WP3).* JPI Urban Europe. Retrieved March 14, 2025.

cooperation helps to improve interdepartmental work. Moreover, although municipal employees may initially lack the specialized knowledge needed to support an urban lab, direct participation in these initiatives has already proved to be a more effective capacity-building approach than conventional training programs.

Social factors also play a critical role in determining the success of urban labs. Public engagement is a cornerstone of such initiatives, but it often takes time for citizens to recognize the tangible benefits. To address this issue, city administrations have employed informational campaigns and forged partnerships with educational and research institutions, thereby increasing awareness and enhancing long-term participation and sustainability. Without these efforts, urban labs carry the risk of being perceived as top-down interventions rather than a bottom-up, community-driven solutions.

In addition to social dynamics, **legal and regulatory frameworks** significantly shape the potential scope of urban labs. Of note, regulations related to environmental protection, construction, procurement, and governance can create bureaucratic hurdles that delay implementation. In some cases, legal reforms are necessary to accommodate the experimental nature of urban labs. Cities that have successfully overcome these challenges often attribute that to close collaboration with lawmakers, ensuring that innovation aligns with existing policies while also suggesting and discussing necessary legislative adjustments.

Political will also has a bearing on the effectiveness of urban labs. Sometimes, decision-making processes can be delayed, especially during election cycles when political priorities shift. Similarly, some urban lab projects, such as repurposing roads as green spaces or functional public areas, may encounter resistance from policymakers and some residents. Strong political backing is essential, as committed leadership can help to accelerate the adoption of urban lab initiatives and provide stability beyond short-term electoral considerations.

Financial sustainability represents another challenge for urban labs. Economic factors to consider here go beyond securing initial funding; they also include ensuring the long-term viability of projects. While bold and innovative urban interventions can drive transformation, they often come at a greater cost. Cities that have successfully fostered urban labs have typically combined public funding with private-sector partnerships and community-driven financial models, ensuring financial sustainability in the face of economic uncertainty. A notable example thereof is the aforementioned Doctorés district in Mexico City, where city authorities, private developers, banks, and local residents co-created a comprehensive neighborhood redevelopment plan. By blending technical expertise, grassroots input, and shared financial responsibility, the project managed to overcome low investment appeal and laid the groundwork for long-term revitalization.

Beyond economic considerations, **ethical concerns** such as transparency and personal data protection need to be carefully managed. Urban labs operate within the public context, where maintaining trust depends on the transparent allocation of financial resources and inclusive decision-making processes. Public concerns about top-down decision making can be eased by actively engaging diverse stakeholders, including residents, civil society organizations (CSOs), and academic institutions, in the governance of urban labs.

Finally, **technological challenges** can also pose significant barriers, particularly in less affluent cities. Many urban labs experiment with cutting-edge solutions, yet gaps in technical expertise and the unfamiliar or untested nature of some innovations can make their implementation complicated. Moreover, advanced technological solutions are often more accessible to well-funded urban centers in developed countries, while cities with fewer resources must compromise and find alternative approaches that balance innovation with practicality.

Despite these obstacles, urban labs have proven themselves as adaptable, collaborative platforms driving meaningful urban transformation. Through cross-sector cooperation, community engagement, and innovative approaches to regulation and financing, they can overcome hurdles and contribute to long-term urban improvement. Their strength lies in their ability to experiment, learn, and adapt, making them essential tools in shaping inclusive, resilient, and future-oriented cities. A pertinent example thereof has been observed in Belgrade, Serbia where urban labs have actively overcome such challenges while working to reduce food waste.

Overcoming Barriers: Food Waste Management Project in Belgrade, Serbia

Belgrade faces a severe food waste crisis, with 770,000 tons discarded annually, exacerbating CO_2 emissions and food insecurity. Despite the surplus of consumable food, inefficient collection systems and regulatory barriers hinder its redistribution, forcing vulnerable communities - particularly low-income families, women, and children - to rely on informal waste collection. To address this issue, the Food Shifters Urban Living Lab, implemented by GIZ DKTI in partnership with UNDP Serbia and the City of Belgrade, funded by the German Federal Ministry for Economic Cooperation and Development (BMZ), launched a digital circular distribution system aimed at connecting donors with redistribution networks, navigating bureaucratic obstacles in the process.

The primary challenge in launching the Food Shifters Urban Living Lab was organizational as fragmented municipal programs and limited cross-sector collaboration had long hindered progress in this area. The initiative introduced a multi-stakeholder digital platform, centralizing coordination among government agencies, NGOs, businesses, and public institutions. Unlike earlier uncoordinated efforts, this system improved logistics and clearly defined the roles of each stakeholder. Strategic partnerships with the Centre of Excellence for the Circular Economy and the Belgrade Chamber of Commerce helped to reduce inefficiencies, ensuring that surplus food was efficiently redirected to those in need.

Public engagement emerged as another significant obstacle here. Indeed, a study revealed that up to 30% of prepared food was discarded daily, yet many businesses found the donation process too complicated. Increasing the visibility of these findings helped to shift perceptions, while simplifying logistics and lowering costs made donating both a socially responsible and financially viable choice.

Regulatory barriers had also contributed to food waste, as rigid food safety laws restricted large-scale redistribution. Engaging policymakers at the initial stage helped to align the initiative with Serbia's commitment to the Sustainable Development Goals (SDGs) under the 2030 Agenda, and secured the regulatory flexibility needed to safely reallocate surplus food.

A key focus was financial sustainability. Rather than relying solely on municipal budgets, the initiative adopted a hybrid funding model, and also attracted private sector support. In particular, Telekom Magenta, a subbranch of Deutsche Telekom, one of Europe's largest telecommunications companies, has contributed to this urban lab initiative by supporting the development of the digital platform at its initial stage, while a local IT company provided maintenance services, reducing costs to promote the initiative's long-term viability. Meanwhile, lower collection fees also incentivized food waste operators, strengthening overall financial resilience and reducing dependence on short-term grants.

At the same time, transparency and accountability were reinforced through an open-data policy, enabling real-time tracking of surplus food collection and distribution. Relatedly, automated donor matching optimized efficiency while mitigating risks of corruption and mismanagement, building greater public trust in the system.

To overcome technological barriers, the initiative developed a locally built, cost-effective platform instead of relying on expensive foreign solutions. Features like real-time tracking, automated redistribution, and data-driven optimization enhanced its usability. Similarly, continuous software updates and capacity-building initiatives empowered stakeholders, preventing digital exclusion.[13]

Sustainability of Urban Labs

Urban labs foster sustainable urban development by facilitating innovative solutions to address local challenges. While they need not be permanent institutional bodies, their success increases the likelihood of similar approaches being replicated in the same city or other cities. If an urban lab effectively tackles pressing issues, it becomes an attractive partner for private investors, a valuable resource for research institutions, and a politically beneficial initiative for local governments, helping them to respond to citizens' needs.

While there is no definitive guideline for maximizing impact and ensuring the continuity of urban lab approaches, several key considerations have emerged over time, including:

- **Active Engagement of Local Communities:** The meaningful involvement of residents and stakeholders in both the design and implementation phases enhances local ownership and ensures that initiatives are relevant to the given context. Even after a specific urban lab concludes its operations, the collaborative structures it fosters, such as neighborhood assemblies or co-governance mechanisms, can live on to support community-led action.
- **Securing Political Support**: Sustained political commitment is essential to institutionalizing urban lab outcomes within long-term urban policy. Moreover, strategic collaboration with local authorities boosts the chances of pilot interventions being translated into permanent, policy-aligned solutions within municipal governance frameworks.
- **Clear Organizational Structures**: A coherent organizational framework, including well-defined roles, decision-making procedures, and accountability mechanisms, is critical to the effective functioning of urban labs. Such clarity enhances operational efficiency and contributes to the lasting relevance of lab-generated knowledge and practices. A notable example of that can be found in Georgia, where the Sustainable Urban Development (SUD) project, funded by the Federal Ministry for Economic Cooperation and Development of Germany (BMZ) and implemented by GIZ in cooperation with the Ministry of Regional Development and Infrastructure of Georgia (MRDI), works at municipal level by establishing urban labs. These labs bring together diverse stakeholders to co-develop solutions to deal with pressing urban challenges in selected municipalities across the country. The urban lab working groups consist of two subgroups: one made up of Civil Society Organizations to facilitate participatory processes, and another engaging multiple City Hall departments to guide decision-making on potential future measures. The labs aim to design and test tangible changes in the urban environment thereby creating more livable neighbourhoods for everyone.

Sustainable Urban Development in Georgia (SUD) / Photo credit Alessandra Sammartino

- **Diversified Sources of Income**: While financial sustainability is not always a cornerstone of an urban lab, diversifying funding sources can enhance their ability to function effectively. Income can be sourced from policy programs of national ministries, research institution and university grants, scientific foundation grants, private sector contributions, partnerships or sponsorships, and citizen contributions. These can also play a role by providing services such as workshops, seminars, or renting out spaces for events. While some urban labs generate income by commercializing their work or offering training, this is not their primary function. More

[13] GIZ DKTI Climate Sensitive Waste Management Project in Serbia. (2019). *The Food Shifters: Introducing food waste management in the City of Belgrade*. German Cooperation in Serbia.

commonly, they rely on temporary funding tailored to specific projects.

Urban labs should serve as platforms for knowledge exchange, connecting government, the private sector, academia, and civil society. For instance, research institutions and businesses may find value in engaging with citizens through such labs, thereby strengthening the foundations for future collaboration. This model becomes particularly worthwhile when addressing climate change and sustainability issues, which are inherently complex, cross-cutting, and rapidly evolving. These issues cannot be solved by a single actor or sector alone; they require coordinated, multi-stakeholder cooperation, inclusive dialogue, and iterative problem solving. Accordingly, urban labs provide a structured yet flexible space for experimentation, where innovative, climate-conscious strategies can be tested, refined, and integrated into broader urban planning efforts. In doing so, they not only enhance local resilience, but also contribute to building long-term institutional capacity and public trust.

In addition, urban labs should set clear objectives that define their intended impact and answer crucial questions. For instance, are residents going to adopt a new mobility or parking system in their neighborhood? Can city administrations integrate climate data into their planning with support from international agencies? Can national project financing regulations be adapted to better reflect the realities of different cities?

The success of an urban lab should be measured not only by the solutions it produces, but also by its ability to foster long-term improvements in collaborative capacity, governance practices, and approaches to problem solving. One example that highlights the sustainability potential of urban labs is found in Berlin, where an initiative has been demonstrating how civic engagement and digital tools can support the long-term safeguarding of urban ecosystems.

"Gieß den Kiez" ("Water Your Neighborhood") – Green Urban Initiative in Berlin

The *"Gieß den Kiez"* project in Berlin exemplifies how urban labs can foster long-term sustainability by integrating community engagement, digital innovation, and environmental stewardship into urban governance. As climate change intensifies, Berlin's urban trees are under growing threats from hotter, drier summers, with over 1,000 street trees being lost annually due to insufficient irrigation. While city administrations are responsible for watering trees, their limited resources often prevent them from fully honoring that duty. To address this challenge, CityLAB Berlin developed an open-source platform enabling residents to take an active role in urban tree maintenance, ensuring that public greenery is preserved without having to rely on short-term government interventions. The platform allows citizens to "adopt" trees, track their watering needs, and log their contributions in real time. With an interactive system that maps over 800,000 trees across Berlin, the initiative combines data from the city's tree census, weather services, and OpenStreetMap to monitor tree health and water levels. This data-driven approach strengthens urban resilience by enabling sustainable, decentralized water management that adapts to changing climate conditions. By mobilizing community participation and providing transparent, real-time data, the project ensures that tree irrigation becomes an enduring shared civic responsibility.

Gieß den Kiez team of CityLAB Berlin / Photo credit Florian Reimann

Sustainability for urban labs is not just about extending a project's lifespan; it also entails embedding its methods and principles into urban culture and governance structures. Over a five-year period, thousands of trees have been watered, with participation fluctuating according to seasonal conditions and public engagement levels. The project's integration into local governance, achieved through continuous collaboration between citizens and the city administration, ensures that it remains a scalable and adaptable model rather than a one-time experiment. Furthermore, the initiative has demonstrated that low-cost, community-driven solutions can enhance air quality, reduce extreme heat, and contribute to biodiversity in an efficient, replicable manner.

Beyond the German capital, the project has inspired similar initiatives in Leipzig and Magdeburg, where CityLAB Berlin has actively supported local adaptations of the model. The open-source nature of the platform enables continuous improvement, with contributions from developers and urban planners ensuring that the tool evolves based on user feedback. Citizens remain engaged through digital forums, video tutorials, and interactive tools, instilling a sense of local democracy and environmental responsibility that extends beyond direct participation in the project.

By leveraging technology, community engagement, and long-term institutional cooperation, "Gieß den Kiez" demonstrates how urban labs can drive sustainable change beyond their initial scope. Rather than operating as a temporary intervention, the initiative has been integrated into urban governance frameworks, inspiring new environmental policies and civic participation models. The project exemplifies how urban labs, even when operating on a limited budget, can catalyze lasting environmental and social impact, ensuring that sustainability principles are embedded in cities for years to come.[14]

[14] CityLAB Berlin. (2020). *Gieß den Kiez.* [Interactive Platform]

Conclusion

Urban labs offer a transformative approach to addressing complex challenges in cities by integrating experimentation, stakeholder collaboration, and real-world testing. Unlike rigid policymaking, they place an emphasis on flexibility, inclusivity, and iterative learning, ensuring that solutions are technically viable and socially sustainable.

The cases reviewed in this paper - from stormwater management in Rotterdam to food waste redistribution in Belgrade and urban greening in Berlin - demonstrate the diverse impacts urban labs can have across different contexts, with each of them tackling distinct challenges and requiring tailored approaches. The Belgrade food waste management project overcame regulatory and financial barriers to establish a self-sustaining redistribution system, while CityLAB Berlin's "Gieß den Kiez" initiative has leveraged digital tools and civic engagement to secure long-term policy integration.

Crucially, their success depends on sustained political commitment, financial viability, and adaptability to evolving urban needs. While some are only temporary, their methodologies can shape policy reforms and inspire replication. As cities face the complications of climate change and rapid urbanization, urban labs provide a much-needed framework for innovation, ensuring that urban development is efficient, equitable, and responsive. The durability of their impact lies not in permanence but in embedding new approaches into urban governance, redefining sustainable, inclusive, and resilient cities worldwide.

Looking ahead, the potential of urban labs to widen their scope and effect lies in their ability to contribute to institutional learning and policy reform across cities. As more municipalities document and share the results of urban lab initiatives, the cumulative knowledge generated can inform national frameworks and international urban development agendas. Meanwhile, establishing networks of urban labs - supported by shared digital tools, open data, and collaborative platforms - can help cities to adapt and scale promising innovations. In doing so, urban labs can evolve from singular experiments to catalysts for systemic urban transformation.

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