Where Digital Meets Analog:

NEB Action: Mobility NEBourhoods

Key words

sustainable mobility • community hubs • sharing • library of things • hybrid co-creation • digital tools • digital twin

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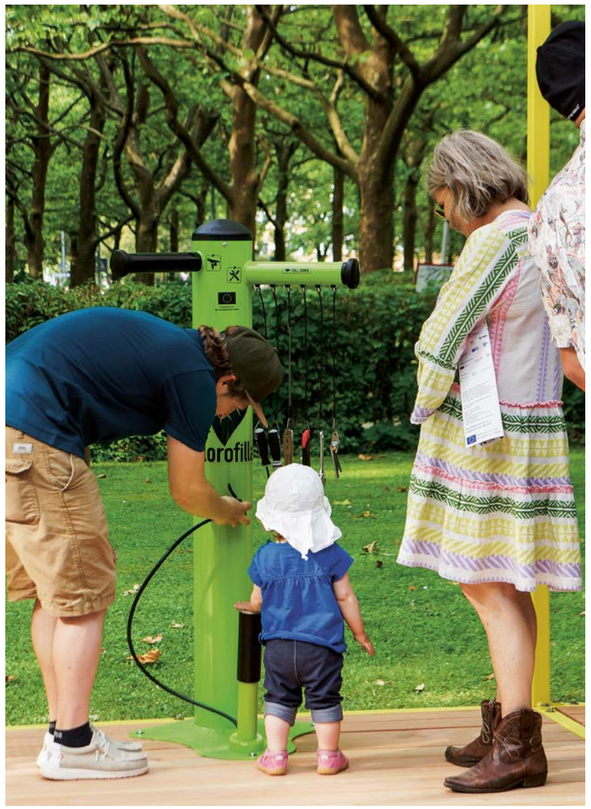


The Future of Urban Co-Creation

Beyond Screens and Paper: Unlocking New Opportunities for Civic Participation to Improve Mobility

During the last few years, many European (and international) cities have initiated Smart City and Digital City Twin projects and invested in databases and digital tools for urban planning. With an increased awareness of the social and political dimensions of urban digitisation, municipalities are discussing the potential of these technologies for civic participation. Digital tools promise new forms of communication, providing data as a basis for collaborative decision-making and for crowdsourcing ideas.

Especially in the case of context-specific infrastructure and urban interventions – like mobility hubs – it is crucial to include local stakeholders and perspectives on urban sustainability. The NEB Action Mobility NEBourhoods aimed to co-create two NEBourhood Hubs – modular and context-specific pavilions that combine mobility offers such as shared cargo bikes or a repair station with community functions such as lending out sports equipment. These Hubs are meant to improve the quality of public spaces and promote sustainable mobility modes, responding to the specific needs of the Neuperlach neighbourhood and its mobility network.

Initially, we wanted to implement a configuration app allowing citizens to vote on the hub's configuration and location. However, a controversy arose: Is selecting from limited library options a productive form of participation? Did we understand Neuperlach's mobility well enough to frame it as a (three-dimensional) survey? What about ideas and opinions that didn't fit within a simple configurator? Lastly, who would find such an app accessible or attractive?

The proposed digital tool seemed to fall short in comparison to established co-creation formats focusing on informal knowledge, open-ended conversations and possible encounters with unexpected situations. Yet we believe that digital tools still hold potential: Immersive visualisation can show invisible dimensions of urban spaces; game elements can structure engaging and explorative experiences. Digital methods could open new possibilities for the gathering and evaluation of ideas and opinions. We want to bridge this gap between analogue and digital participation media, contributing to the discourse on contemporary urban digitisation.

This manual consists of two parts: The first section provides guidelines for co-creating NEBourhood Hubs using a combination of digital and analogue co-creation approaches. The second part focuses on the digital tools and tooling approaches (see page 111) we've developed in this context. Using NEBourhood Hubs as an example, we show how digital tools complement analogue co-creation formats, supporting the co-design of decentralised urban interventions such as mobility solutions and climate adaptations.

Co-Creating NEBourhood Hubs

Our process map outlines the steps for the co-creative implementation of NEBourhood Hubs. While this project focused on foot and bike traffic interventions combined with social functions, the principles apply to other types of decentralised urban infrastructure.

First, it is essential to define the boundary conditions: What decisions need to be made, and which stakeholders are involved? What problems are well defined, and which need more open-ended exploration? Which co-creation formats suit the project and neighbourhood? In our case, future users were involved at all stages, from location selection to design and functional configuration.

Let's walk through the co-creation stages and explore how digital and analogue formats support each step. It is crucial to involve diverse perspectives, as mobility experiences vary by gender, economic situation, abilities and age.

Steps

1 Large-Scale Location

Depending on the area's size, location-finding might occur in two steps. First, a general area is selected: What are the important places that are either suffering from a problem or that offer potential for an intervention? Which areas lack multi-modal mobility offers or accessibility? What are important nodes in the traffic network?

Both analogue and digital tools focus on exploring urban spaces and mapping locations. A drifting workshop involved a collaborative exploration of Neuperlach, while an urban photography workshop allowed for independent location gathering.

2 Small-Scale Location

After selecting a general area, pinpoint the Hub's exact position. Investigating the surroundings, learning about activities and discussing potential barriers are crucial. This step also considers technical factors, property ownership and regulations.

Workshops like drifting and photography allow direct engagement with urban spaces, while digital tools can map barriers and overlay physical spaces with digital elements.

3 Configuration of Functions

Functions are collaboratively selected based on the neighbourhood's needs. Since some features have clear spatial implications, the process is closely related to location-finding. This step ensures that future users can configure the Hubs in accordance with their requirements and wishes.

In a model-making workshop possible functions were explored by collaging miniature hubs, while digital tools supported this effort by allowing the placement of virtual items in a physical area or through design interactions.

4 Design

The number of customisable details depends on the manufacturer's processes. Design choices, including materials and construction, require expert input but should involve citizens in discussions, especially with regard to the aesthetic aspects.

The model-making workshop was key here, and digital tools supported visualisation and communication.

5 Scenario Workshops

Citizens, municipal representatives, and local institutions come together to develop scenarios for NEBourhood Hubs, combining design, function, and location. This type of workshop also covers maintenance and engagement strategies. At the end, participants vote on scenarios to guide future steps.

6 Planning Phase and Installation

The planning process depends on the location – a public or private space. In Neuperlach, most pedestrian networks are privately owned, which can complicate approvals. Public spaces, though they had a slower approval time, were more feasible. Permits acquisitions should be factored into the timeline.

7 Maintenance, Evaluation, Refinement

As installation progresses, the community should be informed and encouraged to provide feedback. Advanced features (such as our app-controlled "Library of Things") may require on-site engagement to ensure user comfort.

Process Road Map

clarifying the motivation for implementing new infrastructure

understanding boundary conditions and parameters for the interventions

learning about the neighbourhood

acquiring and understanding relevant available data on the topic

defining relevant stakeholders

finding target groups and participants

developing approaches to reach target groups

exchanging opinions + monitoring the results

Preparation

Stakeholders
planners, administration, local institutions

Formats
internal workshops and meetings

The preparation of implementing a new infrastructure starts with learning about the neighbourhood to understand its dynamics and characteristics, identifying potentials for the creation of hubs based on local needs, and determining the roles of relevant stakeholders who can influence or support the initiative.

Co-Creation

Stakeholders
citizens

Formats
public workshops using digital & analog tools

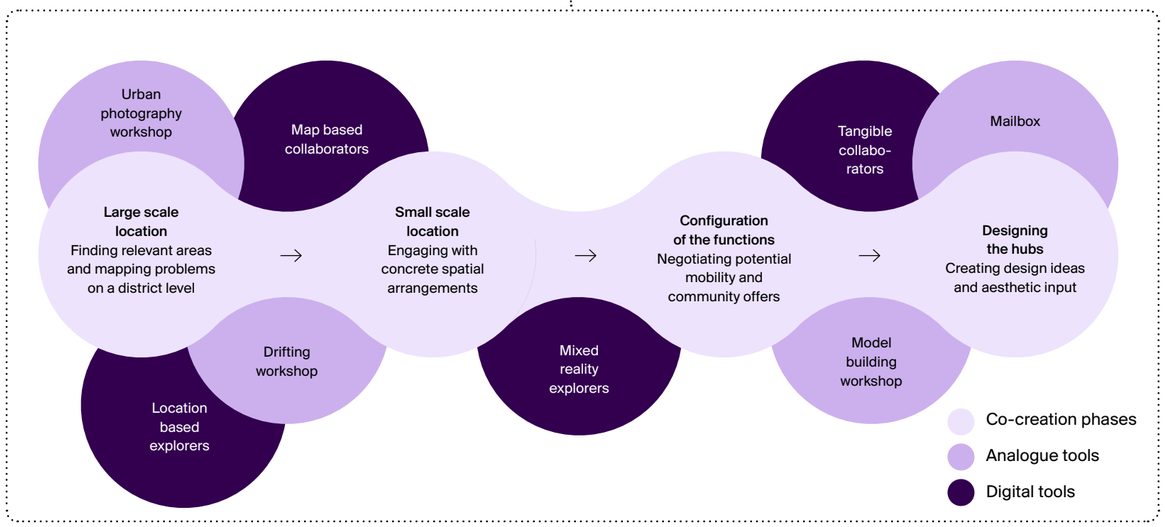
Co-Creation can be supported by methods that best suit the participants, whether through analog approaches, digital tools, or a hybrid combination of both. It involves analyzing a broad area, narrowing the focus to a specific location, identifying the site's needs to define its functions, and finally designing the infrastructure.

Scenario Workshops

Stakeholders
citizens, administration, local institutions

Formats
scenario building workshop

The evaluation of co-created scenarios explores their potential impact on the surrounding neighbourhood. It involves analysing the feasibility of proposedinterventions, considering alternative locations and approaches, and determining the scenarios that align best with the project's goals and community needs. This phase ensures the developed concepts are practical, sustainable, and adaptable.



Planning Phase

Stakeholders
planners, administration, manufacturer

Formats
meetings, presentations

The favoured scenario(s) have to be translated into a concrete intervention. This involves colaboration between designers, manufactorers and government authorities to present ideas, gather feedback, and discuss potential intersections between regulatory frameworks and project goals. During these meetings, stakeholders collaboratively evaluate and refine the proposed scenario to ensure its feasibility. By presenting the possible scenario for implementation to the authorities, this phase aims to identify the optimal approach for securing project approval.

Installation

Stakeholders
manufacturer, citizens, local actors

Formats
workshops and public formats

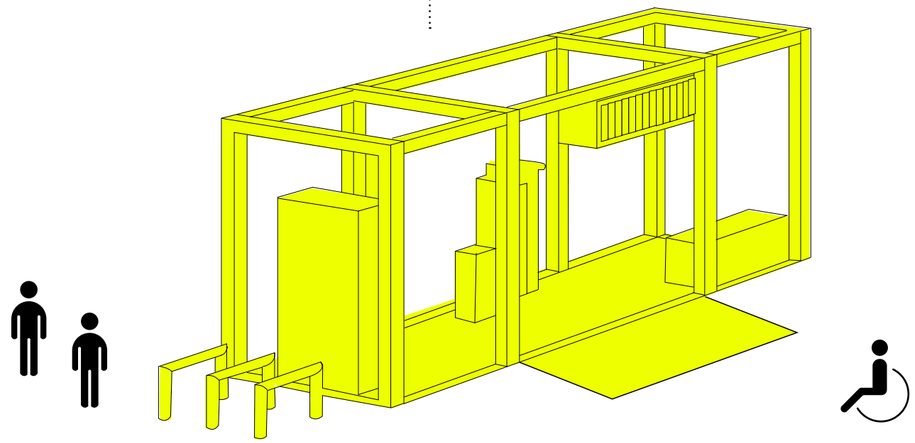
The installation of NEBourhood Hubs is accompanied by communication with citizens and local institutions. Public events and workshops secure acceptance and support the accessibility of features like borrowing objects from an object library. Regular monitoring and adjustments help maintain the project's relevance and functionality in the long term.

Evaluation and Refinement

Stakeholders
citizens and local organizations

Formats
public workshops using digital & analogue tools

This refinement and evaluation process is essential to ensure the infrastructure evolves in response to changes in the environment and the community's needs. The ongoing evaluation and possible improvement can rely on the same tools and formats as the co-creation phase, whether analog, digital, or a combination of both. Analog approaches, such as "Drifting," offer valuable insights into understanding inhabitants' perceptions of urban space, while mailboxes collect direct feedback. Digital tools, like "Mark Your Future," enable citizens to propose missing functions that arise over time. The multifunctional use of these tools allows a continuous, multi-stage dialogue to enhance the usability of the infrastructure.



Co-Creative Tooling

Rather than replacing analogue co-creation with a digital app, we reframe “digital tooling” as learning from and adapting existing formats. This process leads to a digital toolkit for co-creating NEBourhood Hubs (and similar infrastructures), integrating analogue interactions and digital technologies like XR, GPS, and urban data from Digital City Twins. For example, Mixed Reality Explorers build on a photography workshop’s interactions, offering an explorative urban experience enhanced by virtual content.

Drifting

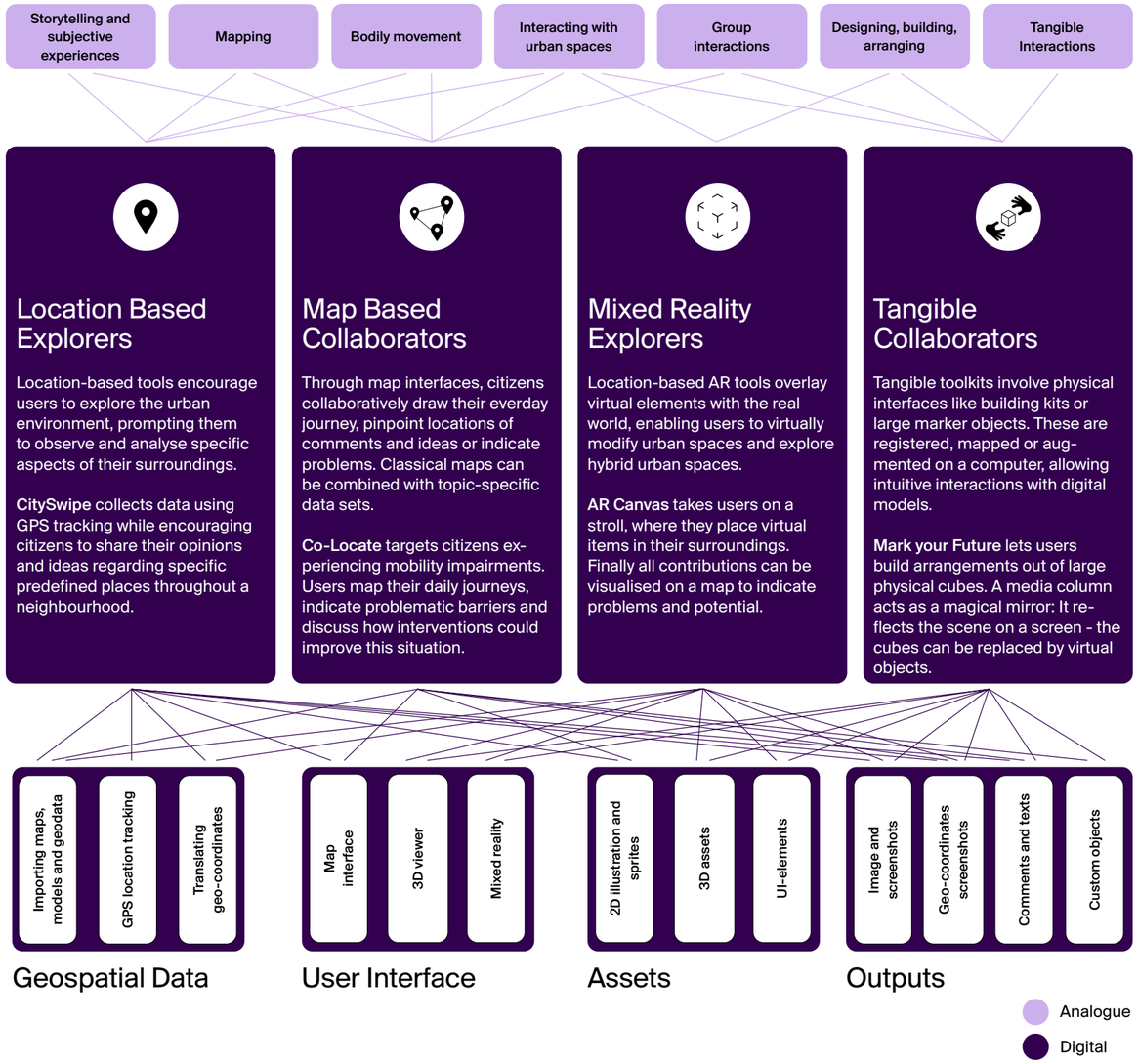
The Drifting workshop combined large- and small-scale location finding through collective movement. Moving playfully through urban spaces allowed us to explore urban spaces and identify potential locations for NEBourhood-hubs.

Urban Photography

The Photography workshop focused on capturing creative photographs of key locations with potentials or problems, encouraging participants to document these places visually and explain their significance.

Model Making

The Model Making workshop focused on designing minitature hubs by creating configurations with cardboard cubes and building scaled models to see their usability in real life.



Tech Functionalities

Several technical components, such as software libraries, scripts, and reusable elements, are created for a game engine (e.g., Unity or Godot). These components are combined in various tool prototypes. about interactions and forms of collaboration were incorporated into the digital tools.

The target is not only to use digital tools for participation. Rather, we suggest that “tooling” requires an open-ended engagement with situational problems and the urban context. Insights from critical cartography and data feminism stress the importance of incorporating diverse social perspectives into digital media. What biases do we address and which problems do we highlight? A white male app developer may not understand the security issues involved in walking home at night. Only those with mobility impairments fully grasp the impact of barriers in public spaces. How can we make sure a participation tool asks the right questions? The local community, their needs and everyday practices should be integral to the process and participation media. Hence, we view “tooling” as a continuous, open-ended activity that combines analogue and digital formats and allows for the integration of different stakeholders into this co-creation process.

Learning from Analogue Formats

Experimental co-creation formats have several advantages over common digital methods, as they include creative and aesthetic forms of expression: bodily movement, performative interactions and material engagement. Furthermore, low-tech approaches allow for more flexibility in adapting to context, unforeseen developments and new findings than a clearly structured digital tool.

Adding as-found technologies to these workshops can become an easy and creative way to explore possible augmentations through digital media. Importing data from the municipal Digital City Twin could supply crucial information to collaboration processes (e.g., providing information on accessibility or public furniture). GPS tracking allows location-specific interactions and comments that can be referenced to a map. Mixed Reality opens up experimental, aesthetically interesting and intuitive interactions with physical and virtual spaces.

Co-Designing Tools

The resulting prototypes incorporate these technologies and merge them with key factors from the analogue participation workshops. They can be categorized into four types: “Location-Based Explorers” use GPS and urban geodata for urban exploration; “Map-Based Collaborators” focus on mapping and design activities; “Mixed Reality Explorers” superimpose virtual elements on real-world spaces; “Tangible Collaborators” involve physical interactions with marker objects or building kits to support the design process. Each tool category fosters diverse urban interactions and co-creative decision-making.

Modding And Configuring Tools

Preparing digital tools for a specific task or urban context may require modifications (or, in gaming-lingo: “mods”). Modding involves adapting data, storytelling, or adding context-specific objects. This process also bears potential for co-creation. For instance, the geo-game “Drifter” (a “Map Based Explorer”) simulates mobility experiences such as nighttime safety for women or accessibility issues for individuals with mobility impairments. Each story is defined through interviews and involves data related to the discovered stories. Other tools include a library of objects which users can place to suggest functions. It’s vital to discuss with stakeholders which items should be included to ensure that proposals are realistic and relevant.

Using Tools

During our tests with citizens in Neuperlach, we learned about the importance of integrating digital media in on-site activities – with regard to both user experience and the quality of outcomes. For instance, many elderly persons struggled to use Augmented Reality apps and benefitted significantly from on-site support. Enacting digital tools soon evolved into a collaborative activity between us and the citizens. Furthermore, it was crucial to gain a common understanding of the deployed digital media (e.g. what it means to place virtual objects) to make sure that the results were not arbitrary. On other occasions, the digital tools became catalysts for conversations that led to radically different insights than intended.

In general, we found that digital tools should be kept deliberately simple to avoid overwhelming users – employed in minimalist approaches and complemented by social formats such as workshops or by physical materials. This way, digital and analogue methods can flexibly respond to unexpected developments and sustainably strengthen local communities. Especially in projects like digital twins and smart cities, this approach can deepen the dialogue and foster stronger, bottom-up participation.

Different combinations of analogue and digital co-creation formats

Tools	Learning from Analogue Formats	Co-Designing Tools	Modding and Configuring Tools	Using Tools
Co-Creative Activity	Conducting experimental workshops or established formats and exploring creative usages of urban data and digital tools.	Combining insights from analogue formats with technical modules allows the development of concepts and prototypes for digital tools.	Adapting tools to specific spaces, stories, data sets and problems.	Using digital tools in workshops and hybrid participatory formats. They are employed as part of a detailed social format to make citizens comfortable with them and foster relevant results.
Example from our Process	During the Drifting workshop, we learned about collective spatial exploration. Furthermore, we experimented with GPS tracking and mapping in this context.	Collaborations with students and NEBourhoods creatives led to several prototypes. These concepts incorporated concrete findings from Neuperlach and the analogue workshops.	The location-based game “Drifter” was configured using qualitative interviews with citizens. Thus, the tool responded to specific mobility experiences from Neuperlach.	Mixed Reality tools could foster engagement with urban spaces and provide a compelling visualisation. However, supporting citizens in their use in a workshop was crucial.
When to use	Experimenting with digital tools and learning from analogue formats can be an ad hoc experiment in a participatory process or the initial step for developing new tools.	Creating new tools can be relevant when launching a larger participatory initiative or developing new participation formats within a digital city twin of smart city initiative.	Adapting tools to new locations, challenges, and topics can be essential when starting a new participatory process.	Digital tools can be introduced in hybrid formats.
Technical Effort	**Low** Can be done with workarounds, as-found technologies and ad-hoc experiments	**High** Building new tools requires expertise and resources	**Medium** Preexisting tools can be modded by changing data, assets, images and texts	**Rather low** Tools have to be explained and resulting information has to be visualised and analysed

Pointers to Jump-Start Replication

NEBourhood Hubs are multifunctional “mobility stations” that link local foot and cycle paths while serving as lively, social hubs. They encourage environmentally friendly mobility and promote community involvement. Designed in a hybrid co-creation process involving various stakeholders, each hub is tailored to the specific needs of the community it serves. The locally manufactured hubs include shaded seating, book exchange shelves, a “library of things”, a graffiti wall and rental services for mobility aids and cargo bikes. Residents are encouraged to keep the hubs relevant by providing ongoing feedback.

Key Project Steps

1 → 2 → 3 → 4 → 5 → 6 → 7

1 Large-Scale Localization

Engaging local multipliers to identify suitable locations at the neighbourhood level

2 Small-Scale Localisation

Considering factors such as regulations, load-bearing capacities, clearance areas, as well as practical aspects like accessibility and proximity to key facilities

3 Configuration of Functions

Co-designing specific functions to align the location-related requirements with the needs of the immediate community

4 Scenario Workshop

Transdisciplinary workshop combining design, function and location

5 Regulatory Approval Processes

Procedure depends on ownership of the given location

6 Construction

Designing, configuring, and constructing the hubs based on the collected and the decisions made information

7 Maintenance and Adaptation

Regular inspections and repairs, collection of feedback, and iterative improvement of the hub facilities

Key Stakeholders

Civil organisations, associations, churches and schools, which can provide an assessment of needs and spatial priority areas. They are central partners in the co-design process

The administration, for information on regulations and the granting of permits. Local politicians, who as elected representatives of the residents are familiar with their sometimes divergent interests

Citizens of Neuperlach for the identification of the locations, configurations, and design of NEBourhood Hubs

Artists and creative professionals as collaborators throughout the process and catalysts for citizen engagement

Evaluation of Replicability

Potential

Well-Established Technical Implementation

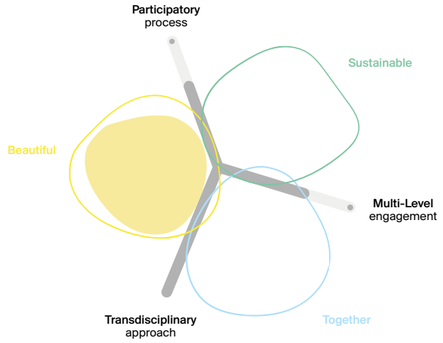
The technical approach for creating NEBourhood Hubs is already well established, with various manufacturers offering a wide range of adaptable parklets. The hubs are easy to integrate into existing urban systems, and the technical requirements for replication are relatively low. They require comparatively low maintenance and can be relocated.

Challenge

Development of an Economic Model

NEBourhood Hubs could potentially become part of an economic model. However, this was not a central focus of our project, for which the primary aim was to address local needs and conditions; general standardisation for the purpose of scaling would have undermined this goal. The process should be tailored to each specific location and its unique circumstances. Any economic models developed would need to be correspondingly flexible.

NEB Evaluation Mobility NEBourhoods



“NEBourhood Hubs focus on the sustainable and co-creative transformation of public and mobility infrastructure in Neuperlach. Through collaboration across disciplinary boundaries, we were able to develop engaging formats that fostered community and integrated diverse perspectives on mobility. Artists, students from various fields and community members worked together to co-develop the hubs: community meeting places that are not only attractive and accessible but also responsive to specific local needs.”
Matti Drechsel

Related Links

NEBourhood Hubs for Mobility and Neighbourhood

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(Page 120, 122)
Chair of Urban Design/TUM
(Page 76–78)
ECOLOPES
(Page 67)
Julia Erdmann
(Page 174)
Enrica Ferrucci
(Page 56)
Nick Förster
(Page 87)
Till Förster
(Page 100, 102–103)
Zoe Fränkle
(Page 15, 176)
GeodatenService München, adapted
(Page 134–135)
Alexander Görl
(Page 112)
Green City
(Page 155)
Gabriella Guzman/HM:UniverCity
(Page 85, 88, 96–97, 162, 173–175, 178–179, 182)
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(Page 181)
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(Page 3, 173, 175, 182)
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(Page 68–69)
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(Page 74, 79–80)
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(Page 114–115)
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(Page 53)
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(Page 28, 161)
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(Page 153, 163)
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(Page 143, 145)
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(Cover, Page 7–9, 13, 18, 21–25, 29–30, 39–40, 59, 104–112, 121, 123–124, 126, 128–129, 138, 155–157, 160, 173–174, 176, 179, 181–182)
UTUM
(Page 32, 33)
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(Page 34)

The NEBourhoods design and production of a set of orientation boards for Munich's main eastern park, the intervention "Ciné Vélo Cité" and the community garden "Hortus die Monaco" was funded by the German federal government and by the Free State of Bavaria through the "Growth and Sustainable Renewal" urban development programme and co-financed by the City of Munich (Verfügungsfonds für Neuperlach – Städtebauförderung / Wachstum und nachhaltige Erneuerung; Förderung des Bundes, des Freistaats Bayern und der Landeshauptstadt München). The CHILLspORT project was co-funded by the IKEA Foundation.

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Creating NEBourhoods Together is committed to promoting gender equality. The main partners have well-estabished gender equality frameworks in place. With regard to NEBourhoods processes and actions, gender sensitive co-cration was our guiding principle. However, it needs to be said that we did not succeed in equal involvement and representation in every activity. We are aware of important structural and practical barriers and will set counterbalance measures. Specifically, the City of Munich will internally exchange on gender issues with its other EU projects to improve further steps of NEB guided development.

The Replication Handbook "NEBourhoods for Tomorrow" was written for NEBourhoods as Task T6.3 in Deliverable D 6.8 of WP6 Architekturgalerie München and MGS.

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With Contributions by

Editorial
Nicola Borgmann, Cornelia Hellstern, Tina Zoch: Call to Action. Join us in Transforming our Cities! (pp. 2–3)

Transformation
Nicola Borgmann, Cornelia Hellstern: Beautiful, Sustainable, Together: Achieving a New Qualitative Level. Interview with Elisabeth Merk, Werner Lang and Stefan Drüssler (pp. 6–13)
Christina Schepper-Bonnet, Tina Zoch: Creating Change Together. Transformation as a Co-Evolving Process (pp. 14–19)

Co-Creation
Bülent Askar, Michael Droß, Sophia Gronard, Jana Koestler, Christina Schepper-Bonnet, Tina Zoch: Co-Creating NEBourhoods (pp.20–25)

Entrepreneurship
Silvia Dell'Olio, Ursula Triebswetter, Christina Wiessner: Fostering Urban Development through Entrepreneurship: Insights and Replication Opportunities (pp. 26–37)

NEB Actions
Christine Jakoby, Thomas E. Hauck, Ariane Mutzel: Animal-Aided Design. Shaping Cities for People and Wildlife (pp. 38–51)
Stefan Gruhne: Redesigning Housing Structures. A New Culture of Building Conversion (pp. 52–61)
Fabio Sweet: ECOLOPES. Living together as part of nature (pp. 62–71)
Benedikt Boucsein, Jan Engelke, Matthias Faul: Private Spaces for Public Use. ... get out there and conquer POPS! (pp. 72–83)
Nick Förster, Matti Drechsel, Carolina Meirelles Coutinho, Gerhard Schubert: Mobility NEBourhoods. Where Digital Meets Analog – The Future of Urban Co-Creation (pp. 84–99)
Andrea Benze, Janina Sieber: Places for Youth Culture – PEARL. Find New Pearls: Youngsters Design the City (pp. 100–117)
Sebastian Clark Koth, Andreas Schönbrunner: Public Power. Solar Shading Prototype (pp. 118–131)
Serena Keller: Energy Communities. Sustainable Energy Future (pp. 132–141)
Carsten Schade, Johannes Staudt: Circular Neuperlach. Transformation of Office Buildings (pp. 142–151)
Magdalena Engl, Lea Wiser, Maren Schüpphaus, Stephanie Hirn, Verena Schlegel: Growing a Tasty Neuperlach. Transforming Food Production and Greening (pp. 152–165)

Closing Thoughts
Sylvia Pintarits: From Closing the Circle to Co-Responsibility and the NEB Movement (pp. 166–171)

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