Reviving Public Spaces Through Socially Sustainable Urban Furniture

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Abstract
This article explores the transformative potential of urban furniture for enhancing public spaces through a Social Design approach implemented in the Viennese pilot project Re-Sourcing Commons, which integrates principles of community involvement and circular economy in the design of public spaces. Focused on the redesign of Fritzi-Massary-Park in Vienna's second district, the project, led by Social Design Studio – a department located at the University of Applied Arts Vienna –, engaged local residents to enhance social infrastructure, recreational quality, and accessibility across diverse age groups, with a particular focus on youths and the elderly. Central to its approach is the systematic reduction and the repurposing of materials sourced from municipal stocks and landfills, such as discarded standard park benches, to minimise urban waste and promote sustainable public space design. The project exemplifies a shift from linear to circular material flows, integrating modular and adaptable urban furniture design to meet different user needs. By identifying and utilising (previously) unnoticed resources in the city – material as well as immaterial – the pilot project demonstrates a scalable and transferable model towards circular cities, which not only promotes circularity but also integrates the social dimension, ensuring a holistic approach to sustainable urban development. The approach revitalises public spaces and strengthens community bonds, contributing valuable insights to the challenges of implementation and future potentials of circular urban design strategies. Re-Sourcing Commons builds on two previous research studies. One of them ("Stadt aufmöbeln – a platform exploring untapped potentials of urban furniture") spawned the initiation of an online platform exploring alternative approaches to urban furniture and sustainable design of public spaces, drawing from international case studies and participatory action research. This article brings together lessons learnt in the project and underscores the transformative impact of community-driven and circular design processes in creating vibrant, resilient urban environments.

Keywords
Social Design; urban furniture; circular economy; resilient neighbourhood; socially-engaged design; public space.

1. Introduction

A bench is there to sit on. That is its purpose. That is what it was built for. But if this bench is placed in public space, it does much more than that. It livens up a place. It offers a place to rest. It leads to random encounters. But it can also displace, erect boundaries, restrict the scope for action. Although the German term "mobiliar" (furniture) derives from the Latin "mobilis" for "mobile", urban furniture usually embodies the opposite: uniform and immobile elements. These are subject to legal norms and strict regulations in terms of design and use.

Based on our interest in exploring social dimensions of urban furniture, we derived the following questions guiding our research: What forms can and should urban furniture and its design process take? Is it just about sitting down, or can it also contribute to new (social) qualities of public space? How does urban furniture respond to places, environments, and their qualities? Can it promote exchange between people? Does it encourage appropriation? Does it create new meeting places? Can it foster transformation processes in neighbourhoods that go far beyond purely physical redesign?

With the involvement of local residents, Social Design Studio[1] redesigned a public park in Vienna's second district. The park is located in a neighbourhood with a high density of large social housing complexes, which are home to an above-average number of young people as well as people over the age of 65. A previous study conducted by Social Design Studio in 2017 showed that open spaces close to the residential buildings offered too little recreational quality and were hardly used despite the need for social spaces in the area. The creation of a micro-centre, i.e. a public and easily accessible meeting place for the local community, equipped with new urban furniture specifically designed to meet the needs of local residents, was identified as a possible lever to enhance local recreational opportunities (Schraml et al., 2017; Schraml & Plášková, 2018).

In the continuing research project "Stadt aufmöbeln – a platform exploring untapped potentials of urban furniture" (conducted in 2021 and supported by municipal department MA19 – Architecture and Urban Design), the potentials of urban furniture, participation processes and ecologically, socially sustainable urban design were explored – with special consideration of the previously defined target groups (predominantly young and older people). In parallel, the redesign of the park was set up in collaboration with the Viennese municipal department responsible for public parks (MA42 - Wiener Stadtgärten) and the district council of Vienna's second district. The park was redesigned by bringing together principles of citizen participation and the circular economy in 2021-2022. By identifying and utilising (previously) unnoticed resources in the city, the project questions conventional linear routines in the design of public space, where resources are extracted, used, and discarded in a one-directional manner. It demonstrates an alternative, scalable and (internationally) transferable approach to a (socially) circular city – an approach that emphasizes the careful management of existing resources through practices such as waste reduction, continuous reuse, recycling, and regeneration. A socially circular city model extends beyond environmental sustainability to encompass social dimensions, i.e. integrating circular principles to promote the development of sustainable, inclusive, and resilient communities.

2. A Park with Potential

2.1. The Park and its Neighbourhood before the Redesign

The project Re-Sourcing Commons builds on two artistic-scientific research studies by Social Design Studio, responding to the insights gained from them. The first study, "Eine Urbane Knautschzone mit Potential, research study on the public space in the neighbourhood between Prater and Danube", was carried out on behalf of the municipal department MA19 (Architecture and Urban Design, City of Vienna) in 2017 (Schraml et al., 2017; Schraml & Plášková, 2018). It investigated the use of public and semi-public spaces in an unnamed inner-city residential area in the second district of Vienna, stretching from the Viennese Prater (the largest inner-city public park) to the banks of the Danube and undergoing a critical phase of transformation. The park project Re-Sourcing Commons was later implemented in the geographical centre of this area.

The neighbourhood's housing structures are characterised by densely populated monofunctional use, concentrated in large social housing complexes. Many of these complexes were built in row construction during the late 1950s and early 1970s and are nearing the end of their life cycles. According to the City of Vienna's socio-economic database, which provides insights about the social composition of the local population based on 29 indicators, the neighbourhood is classified as a cluster with higher-than-average rate of unemployment, percentage of individuals with a migration background, and rate of poverty amongst employed persons (Stadt Wien MA18/ZSI, 2013). Additionally, the area has an above-average population of children, young people, and individuals over the age of 65. These demographic groups typically have a comparatively limited mobility radius compared to the overall population, making them more reliant on immediate recreational areas for daily activities.

1 - Social Design Studio is a department at the University of Applied Arts in Vienna founded in 2012. It offers the interdisciplinary master programme "Social Design - Arts as Urban Innovation", which is dealing with artistic research within urban social systems taking Vienna but also rural contexts as well as areas under process of urbanization as fields of research and practice. For further info visit: www.socialdesign.ac.at

Since the expansion of the underground line U2 in 2008, the neighbourhood has been adjacent to several high-speed urban (re-)development projects. These include the business area "viertel zwei" (2008), the new campus of the University of Economics (2013) with high-priced student residences, and the "Marina Tower", a luxury property along the Danube waterfront (2022). These transformations have increased pressure on the residential neighbourhood with a housing stock predominantly consisting of social housing – particularly due to a significant increase in rental prices and the gradual onset of gentrification processes in the neighbouring areas –, which was in turn prompting the first study.

The first study employed a mix of artistic and scientific research methods, emphasising the involvement of the local population in the collection of various data. Findings revealed that the two main recreational areas in proximity to the neighbourhood, i.e. the Prater and the Danube waterfront, are largely inaccessible to most residents, particularly to young people and the elderly. Additionally, public and open spaces near the municipal housing apartments offer insufficient quality of stay due to a lack of public infrastructure. Public spaces along major streets – Handelskai, Engerthstraße, and Vorgartenstraße – are dominated by car traffic, making them unfriendly for pedestrians. The ground floors in the area are predominantly occupied by private residential units or show high vacancy rates in commercial premises. This lack of semi-public spaces, with vibrant use of ground floors, such as through communal or commercial activities, significantly undermines the neighbourhood's ability to develop a cohesive and lively

Figure 1. Exemplary public spaces showing low quality of stay in the neighbourhood, 2nd district in Vienna. © C. Schraml.

identity. Consequently, public spaces are underutilised despite a significant demand for social spaces (see Figure 1). This included the park and its former seating area, which, prior to the redesign, was in poor condition and rarely used.

The key outcome of the research study identified the creation of new social micro-centres – by redesigning public spaces and involving local residents – as a strategy to enhance local recreational opportunities and promote a sense of belonging and social cohesion within the neighbourhood (Schraml et al., 2017; Schraml & Plášková, 2018).

2.2. Hidden Potentials of Urban Furniture

The subsequent research study, "Stadt aufmöbeln - a platform exploring untapped potentials of urban furniture", commissioned by the municipal department MA19 (Architecture and Urban Design), investigated the potentials of urban furniture, public participation processes, and circular and sustainable urban design, while particularly focusing on the needs of young and older people (Schraml & Färber, 2024).

The study integrates theoretical research, starting with a manifesto encouraging citizens to refurbish public spaces, accompanied by an inventory of existing urban furniture in Vienna (see Figure 2.). It continues with a reflection on urban furniture concerning its historical context, the issue of defensive architecture, and the role of public authorities and citizens in co-shaping the city. Moreover, the study shares experiences from ten international case studies, ranging from Bogota to Sydney, each pursuing alternative approaches to urban furniture and the co-creation of public spaces, through participatory and sustainable approaches. As part of the study, Social Design Studio conducted participatory

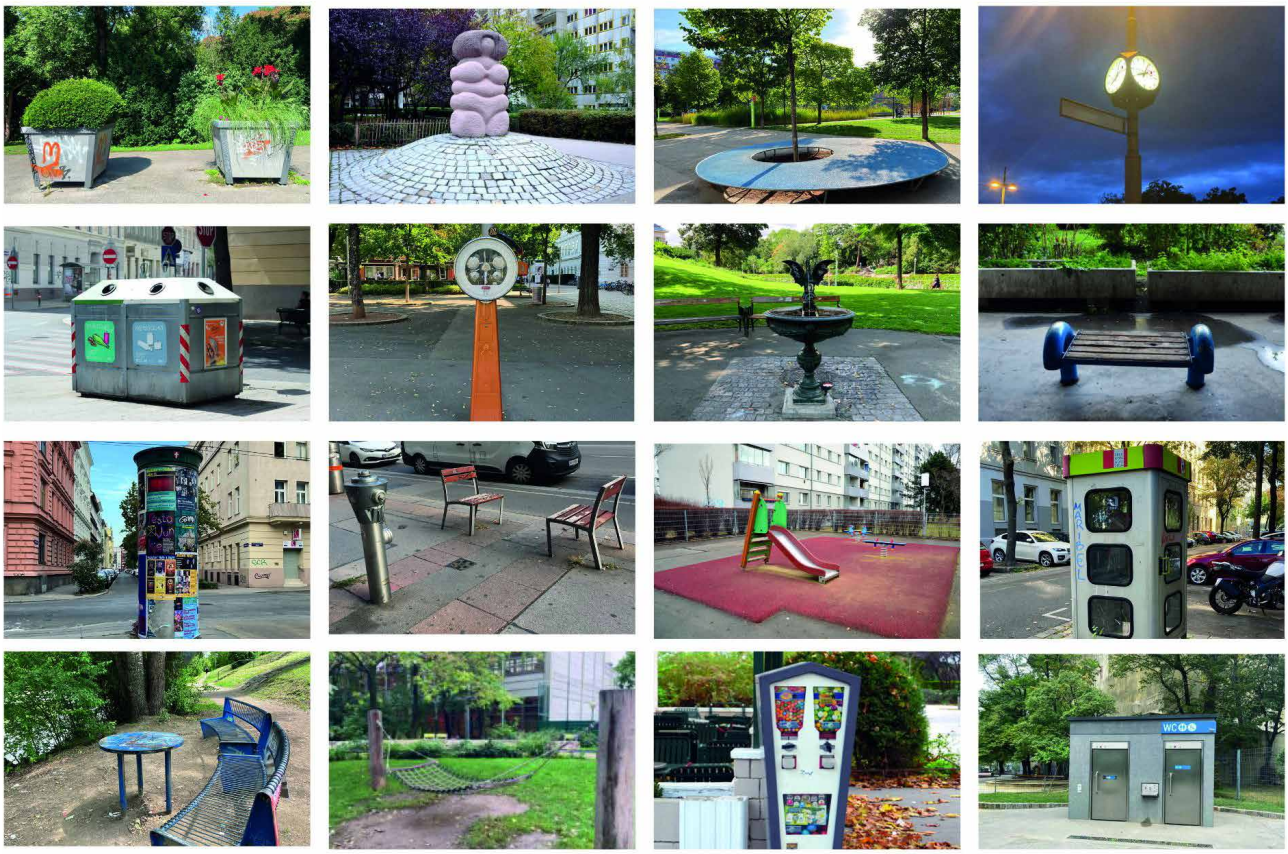

Figure 2. Collage from the inventory of Viennese urban furniture across the city of Vienna. © C. Schraml.

action research in various workshops with pupils, the elderly, young amateur athletes, and random residents of the research area, focusing on the role of urban furniture for public spaces. Furthermore, a growing project archive of experiments and prototypes of urban furniture beyond standard models was initiated, exploring social dimensions of urban furniture through collaborative interventions and generating new ideas on how open spaces can be collectively reclaimed. All research content and results were publicly disseminated on an online platform (www.stadtaufmoebeln.uni-ak.ac.at), which aims to continue the exchange, sharing and collecting international experiences.

3. Re-Sourcing Commons - Redesigning Fritzi-Massary-Park

Building on the aforementioned studies, the park's redesign was initiated alongside planned renovations, in collaboration with the district council of the second district of Vienna and the municipal department responsible for public parks (MA42 - Wiener Stadtgärten). The overarching aim was to activate the park as a micro-centre, transforming it into a place of encounter for the neighbourhood's residents and their diverse communities (see Figures 3-4.). Beyond physical redesign with sustainable urban furniture, the project focused on initiating a low-threshold participation process to activate the local population, aiming at facilitating a collective and enduring transformation of green space into an inclusive and accessible open space for all.

3.1. Community Involvement

An open-ended, low-threshold participation process, targeted at residents of the neighbourhood, local initiatives and organisations, formed the foundation for the redesign of Fritzi-Massary-Park. Maintaining continuous on-site presence of the project team in the neighbourhood was crucial for engaging a wide range of participants.

This approach involved activating contacts that had already been established during the previous research studies and fostering new and existing collaborations for building a cross-generational network. Key local partners included "Haus Prater", a local retirement home and its residents providing expertise on public space from a senior's perspective; a local youth centre ("Bassena Stuwerviertel"), which offers leisure and educational activities for young people in the neighbourhood; and the local team of "wohnpartner", an organisation dedicated to community work and conflict mediation in Vienna's municipal housing, who played a multiplier role in the exchange and involvement of residents from the surrounding municipal buildings. A series of workshops was conducted at the respective partners' locations, tailored to the specific target groups. These sessions utilised participatory formats suitable for different age groups to gather ideas and preferences for the park's redesign, as well as post-redesign activities at the park (see 3.3.).

Figures 3-4. The area of the park before and after the redesign. © M. Färber (left); S. Wiltschegg (right).

Another significant outreach effort involved a series of open workshops conducted on-site in the park, inviting random residents to contribute to the redesign concept. These workshops were held at different times and days of the week, and were multilingual to reflect the neighbourhood's diverse backgrounds and communities. Given that nearly a third of Vienna's population does not have the right to vote due to a citizenship-based electoral system, the project advocates for the concept of "urban citizenship" (Lebuhn, 2013), fostering dialogue with all residents to collaboratively shape their living environment and exercise their "right to the city" (Lefebvre, 1968). By empowering individuals to appropriate and to engage with urban spaces, the project sought to foster citizens' identification, promoting care for the living environment and solidarity among residents.

The participatory practice addressed the redesign of the park in response to a lack of social infrastructure and the specific needs of both young and elderly residents. Workshops, held on-site or at the facilities of the collaboration partners, utilised various formats, e.g. discussions, drawings, and visual representations, writing, and interactive modelling of small urban furniture models out of clay to gather suggestions, criticism, and wishes (see Figure 5). Throughout the process – which reached more than 300 participants – residents articulated a strong desire for a lively micro-centre accessible to all, envisioning spaces for community activities, including new play areas, leisure activities, furniture to sit and relax, opportunities to share and swap resources, and experiencing music together. Embracing a Social Design perspective that emphasises community involvement as

Figure 5. Insights from the participatory formats formed the basis for the redesign. © Social Design Studio.

pivotal for revitalization and posits that people themselves are its primary resource, concrete ideas were developed on how the park's vitality can be sustained through ongoing activities beyond the redesign phase.

The synthesis of inputs culminated in an initial utilisation concept and proposals for furniture designs for Fritzi-Massary-Park. In line with agonistic planning theory, which is based on political theorist Chantal Mouffe's (2005) view that conflicting viewpoints are vital to pluralistic democracy and thus social change, a sociocratic approach was employed to consolidate the diversity of ideas collected. Sociocracy prioritises decisions in areas where there is no active opposition rather than striving for unanimous agreement, emphasising agreement amidst diverse viewpoints by consent. Subsequently, initial designs were publicly discussed to gather community feedback, refine prototypes, and finalise the redesign concept. The outcomes of the participatory process guided and informed the ultimate choice and the design of the urban furniture to be used (see 3.2.2.).

3.2. Circular Economy in Urban Design

3.2.1. The City as an Endless Renewable Resource

Urban waste, particularly from the construction sector, poses a significant environmental challenge (Rindler-Schantl et al., 2019). While emphasis on sustainable practices in the construction sector has been growing recently, the application of circular economy principles to urban public space design remains relatively underexplored. The project Re-Sourcing Commons addresses this gap by advocating the reuse and recycling of urban furniture components, thereby minimising waste and promoting environmental sustainability.

Currently, urban furniture components in Vienna are discarded rather than repurposed once they deteriorate, resulting in considerable waste accumulation destined for landfills. To counteract this, the project reframes the city as a perpetually renewable source of materials. This viewpoint aligns with Joachim's (2014, in Hebel et al., 2014, p. 18) assertion that "the future city makes no distinction between waste and supply", conceptualising cities as reservoirs of reusable elements essential for their continuous renewal (see Figure 6.). By identifying materials that generate large amounts of waste in Vienna, the project disrupts prevailing norms and routines in urban design and municipal administration. It proposes alternative strategies aligned with circular economy principles, thereby unlocking untapped potentials to minimise material consumption and render public spaces suitable for reuse, contributing to climate resilience.

The materials for redesign were sourced from the park's existing inventory (in-situ) and supplemented with materials collected citywide (ex-situ). Among the materials previously installed in the park (in-situ) were the former seating area, consisting of historic bricks, granite blocks, steel fences, plants, and excavated soil, all of which were reintegrated into the new design through a process of recombination, reuse, or – if necessary – recycling (see Figure 7.). For example, deteriorated bricks which could not be fully preserved during the dismantling of the old benches were mixed with clay from Wienerberger Ziegelwerke, processed, and reinstalled as recycled bricks, ensuring zero on-site waste generation (see Figure 8.).

Generic materials sourced externally (ex-situ), which are currently disposed of in large quantities due to their limited durability, repairability, separability, or flexibility, were recognized as valuable resources and reintegrated into a sustainable, closed-loop material cycle. Primary ex-situ components included the standardised, cost-effective furniture model prevalent in Vienna's public parks, despite its current classification as a disposable product. This model predominantly features two major elements, i.e. steel pipes and wooden slats. These were retrieved from municipal material and waste facilities and repurposed as modular, reusable, and repairable urban furniture elements (see Figure 9.). Additionally, the project involved recycling plastic waste from local chemical laboratories into furniture panels in collaboration with Precious Plastic Vienna and the artist Julian Jankovic (see Figure 8.).

3.2.2. Tailoring Urban Furniture to Local Needs

The project illustrates how urban furniture, based on the example of standardised Viennese tubular steel park furniture, can be reimagined to enhance longevity and

Figure 6. Shifting from a disposal mindset to circular material loops. © Social Design Studio.

Figure 7. Materials for the redesign were sourced from the park's existing inventory. © Social Design Studio.

flexibility through modular design principles. By reimagining individual components of the standard park bench as modular units with simple interconnecting parts, the project facilitates diverse configurations, resulting in a growing repertoire of sustainable urban furniture (see Figure 9.).

Despite challenges in the care and maintenance of public spaces and reused materials, particularly regarding warranties and material upkeep, the project has overcome these hurdles by using familiar, readily available components from the municipality's stock. This ensures compliance with safety regulations in public spaces and cost-effective maintenance by the city administration in the future. The new furniture preserves the history, identity and aesthetic qualities of its materials, however extends their applicability, interchangeability and social relevance – as it can respond to site-specific, changing demands on public spaces.

The project adopts an expanded understanding of urban furniture considering specific needs of different user groups and aiming at stimulating social exchange through both structural and "invisible design", i.e. "the design of tomorrow – design that consciously takes into account the invisible overall system comprised of objects and interpersonal relationships" (Burckhardt, 1980, p. 165). The new typologies, implemented as prototypes, transcend

Figure 8. When reuse was not possible, materials were recycled, such as deteriorated bricks and plastic waste, ensuring zero on-site waste generation. © Social Design Studio.

traditional park furniture guidelines to establish social infrastructure. They serve as venues for leisure activities, intergenerational encounters, play (for both young and old), music enjoyment, and flexible use by local residents.

Participatory processes played a crucial role in determining the choice of furniture, ensuring responsiveness to user needs. The newly introduced furniture includes an open book shelf, a public notice board, new leisure areas (including seating, reclining platforms, and floor-level seating), a smartphone music amplifier, hanging seats, and a “Viennese swing” (Hollywood swing) (see Figure 10.). For instance, the latter was implemented to meet the demand for playful urban amenities among older adults. While it was important for older adults to have seats that allow them to stand up easily, younger users prefer lower seating for lounging, which was realised in the floor-level seating. It is also noteworthy that the idea of sharing music and thus the concept of the music amplifier, which allows to direct sound in a specific direction, was of interest to all age groups. Furthermore, efforts were made to enhance accessibility by expanding the functionality of the existing seating area to accommodate individuals with limited mobility, e.g. users of rollators or wheelchairs. The open swap shelf and the notice board, offer a collective facility where neighbours can implement circular practices at the neighbourhood level. Thus, at the local level, the project fosters a socially circular and therefore more resilient community (see 3.3.).

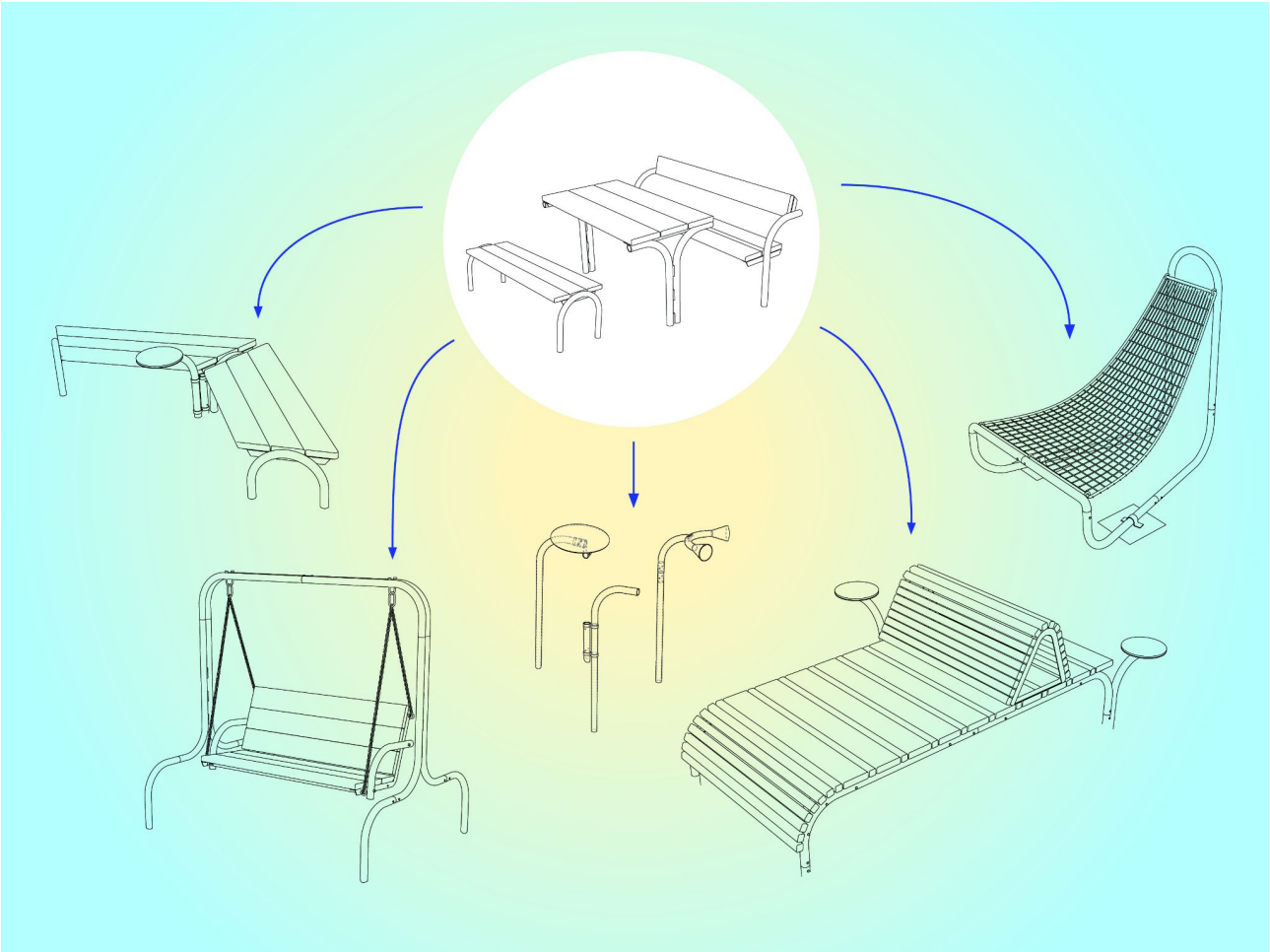

Figure 9. Multiple functions within the standard Viennese park bench: a modular design approach to meet local needs. © Social Design Studio.

3.3. Urban Furniture as a Micro-Centre

Drawing on the insights of urbanist William H. Whyte (1980) and his seminal work on the social dynamics of urban spaces, the project underscores that a well-designed park remains ineffective if it lacks human presence. Whyte's assertion that people are inherently drawn to other people underpins the project's approach. Activating both material and immaterial resources – primarily local residents themselves – is crucial to creating a sustainable micro-centre for the neighbourhood, i.e. one that is well-received and sustainably vibrant, ensuring its long-term vitality and integration into the community fabric. Involving citizens in co-shaping their immediate environment fosters a sense of ownership, strengthens identification, and promotes collective responsibility and care for both the environment and the community.

Throughout participatory process – from conceptualization through implementation and to the future use of the park – residents were therefore encouraged to reflect on their living environment and their role in its (co-)design. This approach emphasises the importance of neighbourhood activities, positioning the park as a lively micro-centre that enhances quality of life and nurtures community spirit through (temporary) activities. The inaugural event, a neighbourhood festival marking the park's re-opening in April 2022, featured community activities that set a precedent for ongoing engagement, showcasing the park's

Figure 10. The new park furnishings. © Social Design Studio.

potential (see Figure 11.). Activities such as a public choir concert by residents of municipal housing and a handcraft market organised by seniors from the retirement home illustrated how ongoing community participation can permanently revitalise the park.

By involving residents and collaborating with local initiatives and organisations, such as the senior citizen's home and community workers in municipal buildings, new connections and networks were established to ensure the park's sustained role as an active micro-centre in the future. For instance, wohnpartner manages the open swap shelf in cooperation with the local city library. Additionally, local elderly residents have become more engaged, using the park more frequently. Thus, a previously underutilised green space that reflected social tensions (Schraml et al., 2017) has been transformed into a functioning micro-centre for neighbours from diverse communities, backgrounds, and generations.

This aligns with sociologist Eric Klinenberg's studies (2018) on the role of "social infrastructure", which underscores the importance of spaces that bring people together and contribute to neighbourhood well-being and resilience. In addition to public libraries, schools, playgrounds, sports grounds, and swimming pools, Klinenberg understands

Figure 11. Community activities during the park's re-opening in April 2022. © H. Turk.

parks as essential components of social infrastructure – spaces that "invite people into the public realm" (Klinenberg, 2018, p. 16). The project's scope extended beyond the physical redesign to activating social connections and local knowledge. Recognizing residents as experts of their living environment, the project activates their potential for public engagement, positioning them as a crucial resource for building resilient cities.

4. Conclusions

Cities across Europe are increasingly recognizing the urgency posed by the climate crisis and are exploring strategies to introduce sustainable practices. Despite the well-established theoretical discourse on the circular economy and participatory design, translating these concepts into tangible urban interventions often faces significant barriers, revealing gaps in both strategy and practice. While recycling is widely accepted, strategies of effective waste avoidance, minimization, and reusability of "waste" remain largely theoretical (Devlieger, 2014). Similarly, participatory processes often remain superficial, failing to achieve meaningful and lasting engagement. Markus Miessen's critical examination of the phenomenon of participation in "The Nightmare of Participation" (2010) highlights how these processes can reinforce existing power dynamics instead of challenging them.

The project Re-Sourcing Commons, which was awarded the New European Bauhaus Prize by the European Commission in 2024, addresses some of these challenges. By implementing socially sustainable and resource-efficient urban design, the project integrates both bottom-up and top-down forces, exemplifying interdisciplinary collaboration that transcends established hierarchies and practices. Contributing to shaping future directions for research and for the implementation of sustainable urban planning and design, this article concludes by reflecting on the main obstacles to realising further potentials of socially sustainable urban furniture in revitalising public spaces, as they surfaced throughout the project.

4.1. Unlearning Established Practices and Administrative Routines

Re-Sourcing Commons faced significant challenges in aligning its innovative approach with established administrative routines and practices. Implementing pilot projects that diverge from standard procedures necessitates an unlearning of entrenched routines – a complex and time-consuming process, which is often met with resistance within large, static administrative systems. Despite these hurdles, this unlearning is essential for testing and implementing new approaches.

Challenges during the project arose, for instance, from traditional budget models that allocate minimal funds to the design phase while reserving most for implementation. The pilot project, however, required a larger initial investment to facilitate participation, while less budget was needed in the implementation phase as existing material was reused. Additionally, the lack of funding for "project phase zero" – a comprehensive inventory of existing (im-)material resources – posed an obstacle. This phase is however crucial for adopting a circular approach and leveraging local resources. In the case of Re-Sourcing Commons, although phase zero was not funded, the project benefited from the previously conducted research studies, providing substantial knowledge about the neighbourhood and a network to build upon. This highlights the necessity for more flexible funding structures, e.g., for allocating additional funding for material research in the initial stages and for investing in "soft factors" like community activation and network building, which can lead to more sustainable long-term outcomes. Another challenge faced during the project relates to the initial ambition of the project to implement an open and process-driven redesign concept. The vision was to create a park that would be collectively and organically appropriated over time. This approach aligns with a Social Design perspective, emphasising the dynamic responsiveness of public spaces to evolving user needs, facilitated through, e.g., adaptable and moveable furniture. However, these aspirations were curtailed by administrative constraints.

Nevertheless, a key achievement of the project was identifying numerous gaps in the current administrative cycle, showcasing practical solutions and prompting a

critical re-evaluation of urban design procedures along the necessity of an open mindset among authorities to depart from established administrative practices. Early collaboration with the city administration and a democratic approach that fosters public participation was crucial for the implementation. A critical next step could involve embedding these innovations into city-wide guidelines and urban policies for the design of public spaces (see 4.2.). Accordingly, despite setbacks, the necessity for innovative social and circular approaches remains evident, underscoring the ongoing need for adaptation, flexibility, and space for experimentation in urban planning and administrative frameworks that spark progressive, sustainable solutions.

4.2. Transitioning from a Pilot Project to City-Wide Policies

Transitioning small-scale pilot projects to city-wide implementation, i.e. actionable guidelines and policies, presents multifaceted challenges. For instance, one difficulty faced throughout the project was navigating its cross-disciplinary complexities within established administrative practices. Re-Sourcing Commons integrates circular economy principles with citizen participation and thus defies traditional categorizations, which complicates administrative efforts. Hence, scaling up pilot-projects for city-wide implementation necessitates a synthesis of synthesising lessons learned, while addressing the need for more adaptive governance structures that can accommodate fluid categorizations and support collaborative approaches across various stakeholders and municipal departments. This endeavour calls for a paradigm shift in legal frameworks and administrative approaches, embracing cross-disciplinary thinking and fostering agile governance structures capable of responding to dynamic urban challenges to achieve comprehensive sustainability goals.

A further critical aspect to consider is the measurement of success of such projects. These measurements often prioritise quantitative metrics, such as economic savings or reductions in ecological footprints, while overlooking social factors. In a singular pilot project, the CO2 balance sheet may not show a significant reduction in emissions. However, when scaled to a city-wide application, the project could substantially contribute to broader urban policies aimed at reducing CO2 emissions and enhancing climate resilience. Evaluating the social impact of the project remains complex, but success metrics should also encompass the social benefits generated. Such an evaluation, which requires additional resources and could be undertaken after the completion of the park over an extended period of time, could be effectively conducted through a range of interdisciplinary methodologies. These may include participatory observations, social spatial analysis, participatory action research, and community engagement surveys. Integrating these artistic-scientific approaches could provide a comprehensive understanding of the project's social effects.

As the pilot project is rolled out, additional follow-up projects will be essential to refine and deepen its impact, particularly concerning long-term social effects. Unlike traditional top-down practices, this project advocates a participatory model that emphasises community engagement and the bottom-up development of sustainable solutions. Each phase of the project was built on transparency, accessibility, and scalability, fostering an environment conducive to collaboration and knowledge exchange. This methodology leverages local insights and incorporates international and interdisciplinary expertise, facilitated through continuous on-site presence and the online platform "Stadt aufmöbeln" (stadtaufmoebeln.uni-ak.ac.at).

Furthermore, the project serves as a catalyst for envisioning broader applications beyond traditional park furniture. Its open-source approach aims to develop an expanding catalogue of elements derived from public spaces. This inclusive method not only transcends conventional boundaries of authorship but also counters top-down urban design principles. The construction plans for the furniture pieces realised at Fritzi-Massary-Park were handed over to the responsible municipal department, which took responsibility in maintaining the park. Consequently, the approach can be seamlessly integrated into guiding principles for urban design, influencing construction plans for elaborated standard furniture, and informing competition criteria for public space design. In other words, this framework encourages widespread application, facilitating adaptation and expansion, while contributing to a broader movement towards creating sustainable urban environments.

4.3. Bridging the Circularity Gap Beyond Vienna: Cities as an Endless Resource

The approach employed in the pilot project offers a scalable and transferable model for other cities aiming to narrow the circularity gap by detecting previously discarded materials and promoting socially sustainable ways of (co-)creating public spaces. Every city holds an untapped potential as an endless source of raw materials and social capital that have yet to be recognized.

By adopting an urban mining approach, the current project identified new material cycles at the city level, revealing valuable resources previously unrecognised. This approach advances sustainable practices and resource efficiency at the municipal level, fundamentally questioning the status quo of mainstream urban design and waste minimisation. Beyond the local level, in many cities, generic urban furniture designs currently result in disposable products, constructed or used in irreversible processes, leading to energy-intensive materials ending up in municipal waste depots or landfills. The approach pursued in the project Re-Sourcing Commons, which tracks and transforms linear material consumption into modular, repairable, and socially sustainable design, can be adapted and extended to various urban environments. The modular design approach allows for site-specific customization, ensuring that the principles of urban mining and citizen empowerment can be tailored to other site-specific contexts. This flexibility is crucial for addressing unique challenges and potentials in different neighbourhoods or cities.

In terms of tapping into unrecognised "social capital," the "living" park demonstrates that a careful use of (im-) material resources is fundamental for a (socially) circular city. By expanding the understanding of urban furniture beyond structural elements, Re-Sourcing Commons created an impact on the entire neighbourhood, encouraging participation and collective care. The project took a holistic approach to urban furniture, addressing diverse user needs and promoting social interaction through collaborative design and the implemented furniture elements. The new micro-centre serves as an important social infrastructure that enhances interpersonal connections through community activities and thus strengthens the resilience of neighbourhoods (Klinenberg, 2018).

Looking forward, the project presented in this article aims at expanding its impact over the entire city by serving as a model for other public spaces in Vienna and beyond. Cities seeking to bridge the circularity gap and to harness underutilised urban resources can adopt the project's open-source approach to democratise design knowledge. By fostering international collaboration and adaptation through the online platform "Stadt aufmöbeln" (www.stadtaufmoebeln.uni-ak.ac.at), the project promotes socially sustainable material cycles on a larger scale – and thus aims to catalyse a systemic change towards more sustainable cities.

Conflict of Interests and Ethics

The authors declare no conflict of interests. The authors also declare full adherence to all journal research ethics policies, namely involving the participation of human subjects, anonymity and/ or consent to publish.

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