D4.3 Analysis of barriers and enablers for upscaling and transitions

The urgent need to reduce emissions in light of climate change presents an acute challenge for urban areas clogged with private automobility. In combination with urban growth, a similarly pressing need for improved quality of life, including greener, safer and simply more public spaces is likewise at play in many urban areas (Switzer, 2019). To address these challenges, a 'sustainability transition' (Elzen et al., 2004; Grin et al., 2010) or radical shift towards new kinds of socio-technical systems, is needed (Köhler et al., 2019).

According to academic literature, a sustainable transition involves co-evolutionary developments between industry, markets, user behavior, policy, infrastructure and spatial arrangements (Geels et al., 2017; Moradi & Vagnoni, 2018). A well-known model for conceptualizing sustainability transitions is the 'multi-level perspective' (see figure 1). The MLP is characterized by three embedded levels: socio-technical landscape (cultural and social trends and shifts), regimes (user habits, norms and mindsets sustained by a diversity of actors and deep-structured rules) and niches (testbeds for radical alternatives and experiments that challenge and compete with the technologies, market, policy, culture, and industries of the regime) (Geels, 2007). The MLP theorizes that shifts at the landscape level put pressure on the regime, creating windows of opportunity for niche innovations to emerge and develop.

In the context of urban mobility, street experiments represent niche innovations that aim to disrupt the status quo upheld by the current system (VanHoose et al., 2022). Examples of these experiments include subtle modifications, like the remarking of street intersections to more radical projects, such as the closure of entire streets to traffic for pedestrian activities (see figure 2). Street experiments have proven to possess a transitional capacity, or ability to cause system change and support sustainability transitions (Ibid, 2022; Ex-TRA, 2022). The link between implementing a successful experiment and its upscaling, or embedding that experiment in new ways of thinking, doing and organizing (van den Bosch and Rotmans 2008), remains understudied. This may be related to confusion surrounding the concept of upscaling, which is often misconceived as the simple wider adoption of innovative products over time (Dijk et al., 2018). The process of upscaling street experiments can be complicated. At the experiment level, transitional capacity is not always maximized (VanHoose et al., 2022) and experiments are not always viewed as arenas for serious change (Hipp et al., 2017). Moreover, because experiments are highly contextual and practice-based, they are not easily replicated or scaled-up (Evans et al., 2016). At the level of the system, governance rules and regulations related to existing urban mobility and public space regimes have the potential to either limit or nurture experiments (VanHoose et al., 2022).
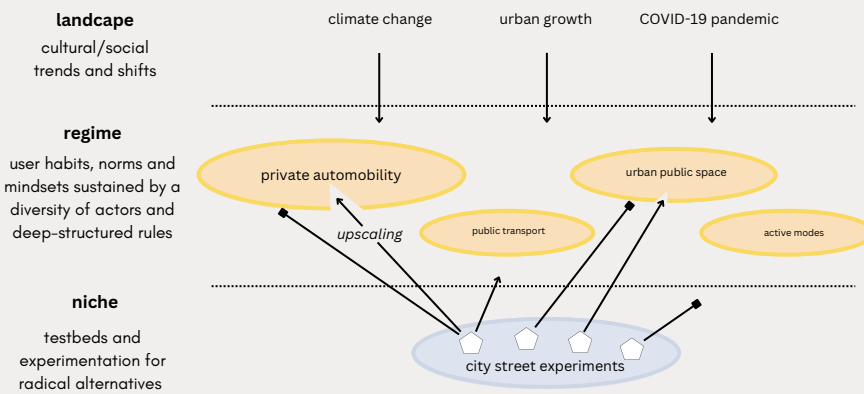

Figure 1. Application of the MLP to urban mobility. The system is composed of several regimes including urban public space, public transportation, private automobility. Against the backdrop of developments at the landscape level (e.g. climate change) innovative ideas to challenge dominant regimes are outed in the form of city street experiments. The process of upscaling involves the shift in ways of doing, thinking and organizing at the regime level. As indicated by the arrows, experiments have the capacity to disrupt regimes (→) and are sometimes blocked at both the experiment and system levels (─■).

Figure 2. City street experiments are examples of niche innovations aimed at improving urban mobility conditions by shifting the use of streets from traffic towards people (Bertolini, 2020). Examples include the re-marking of streets to slow down traffic and allocate space to pedestrians and other forms of mobility like the Intersection Repairs in Portland (left). More radical examples include the re-purposing of the entire street like the Living Streets of Ghent (right), which remove from motorized traffic to provide opportunities for playing, socializing, and exercising.

Methodology

This deliverable aims to add to the subject of upscaling by exploring the question: Which barriers and enablers for upscaling and transitions exist for city street experiments? This question is explored based on the findings of a literature review conducted in two steps. First, based on Bertolini's (2020) definition of city street experiments: "intentional and temporary changes to the street use, regulation and or form, featuring a shift from motorized to non- motorized dominance and aimed at exploring systemic change in urban mobility and public life", relevant key search words were identified: "experiment" "temporary", "street use", "systemic change", "urban mobility", "public life", "barriers", "challenges", "enablers", "opportunities", "upscaling" and "transitions". Peer-reviewed, scientific articles featuring these keywords were systematically searched for in Google Scholar, resulting in 177 articles. A second round of filtering involved scanning article titles and abstracts based on the presence of the keywords. A third round included filtering articles based on the presence of empirical studies featuring street experiments as the unit of analysis. Experiments related to urban mobility that do not involve altering the streetscape (e.g. bike-sharing or Mobility as a Service (MaaS)) were not included. 12 articles were analyzed based on enablers and barriers for the upscaling of street experiments. The results of the literature review are divided into barriers and enablers at the 'experiment level' (i.e. related to the experiment design and process) and the 'system level' (i.e. related to the governance of street experiments or regulations related to permits). Where possible these are supported by non-empirical literature regarding transitions and upscaling. The findings from across the individual articles are also categorized by recurring themes and presented in order of popularity (i.e. presence in the literature). In the conclusions we reflect on the findings of the literature review.

List of selected scientific articles for review

1. Brovarone, E. V., Staricco, L., & Verlinghieri, E. (2023). Whose is this street? Actors and conflicts in the governance of pedestrianisation processes. Journal of transport geography, 107, 103528.
2. Dijk, M., de Kraker, J., & Hommels, A. (2018). Anticipating Constraints on Upscaling from Urban Innovation Experiments. Sustainability, 10(8), 2796. doi:10.3390/su10082796.
3. Eyler, A. A., Hipp, J. A., & Lokuta, J. (2015). Moving the Barricades to Physical Activity: A Qualitative Analysis of Open Streets Initiatives Across the United States. American journal of health promotion : AJHP, 30(1), e50–e58. https://doi.org/10.4278/ajhp.131212-QUAL-633
4. Hipp, J. A., Bird, A., van Bakergem, M., & Yarnall, E. (2017). Moving targets: Promoting physical activity in public spaces via open streets in the US. Preventive Medicine, 103, S15–S20.
5. Mackie, H., Hirsch, L., Thorne, R., Witten, K., & Field, A. (2021). Creating the Circuit Breakers: An Examination of the Sociotechnical System Factors Which Impede and Enable the Delivery of Safe and Healthy Neighbourhood Street Design in Aotearoa New Zealand. Advancing a Design Approach to Enriching Public Mobility, 249-274.
6. Marcheschi, E., Vogel, N., Larsson, A., Perander, S., & Koglin, T. (2022). Residents' acceptance towards car-free street experiments: Focus on perceived quality of life and neighborhood attachment. Transportation research interdisciplinary perspectives, 14, 100585.
7. Montero. (2017). Worlding Bogotá's Ciclovía: From Urban Experiment to International "Best Practice." Latin American Perspectives, 44(2), 111–131. https://doi.org/10.1177/0094582X16668310.
8. Sarmiento, O. L., Díaz Del Castillo, A., Triana, C. A., Acevedo, M. J., Gonzalez, S. A., & Pratt, M. (2017). Reclaiming the streets for people: Insights from Ciclovías recreativas in Latin America. Preventive Medicine, 103, S34–S40.
9. VanHoose, K. and Berolini, L. Forthcoming. The Impact of Municipalities on the transitional capacity of street experiments: lessons from Ghent.*
10. VanHoose, K., de Gante, A. R., Bertolini, L., Kinigadner, J., & Büttner, B. (2022). From temporary arrangements to permanent change: Assessing the transitional capacity of city street experiments. Journal of Urban Mobility, 2, 100015.
11. Van Wymeersch, E., Oosterlynck, S., & Vanoutrive, T. (2019). The political ambivalences of participatory planning initiatives. Planning Theory, 18(3), 359-381. https://doi.org/10.1177/1473095218812514
12. Zieff, S. G., Hipp, J. A., Eyler, A. A., & Kim, M. S. (2013). Ciclovía initiatives: engaging communities, partners, and policy makers along the route to success. Journal of public health management and practice: JPHMP, 19(3 Suppl 1), S74–S82. https://doi.org/10.1097/PHH.0b013e3182841982

*Because this article was accepted but not yet published at the time of the literature review, it was not found via the Google Scholar search but added manually by the authors.

Experiment level: enablers and barriers

Enablers

Local government takes leading role in the organization and implementation of street experiments

Empirical data source(s): VanHoose et al. (2022); VanHoose and Bertolini (forthcoming)

Support from local governments in both the form of leadership and provision of resources enables city street experiments. Especially experiments that are more radical or invasive, a leading role from the local government legitimizes the project, thus helping to justify the experiment's aims and ambitions to resistant stakeholders (VanHoose and Bertolini, forthcoming). Nevens et al. (2013) echo the importance of getting people involved and convincing them to partake in a new and uncertain project. In Ghent, the idea of Living Street experiment was a direct result of municipal leadership and proved to benefit from a top-down approach in the early phases of the project. It appears that the leading role can also be shared as in the organization and implementation of the Living Street Hugo de Grootkade in Amsterdam where the municipality and residents shared the responsibilities equally, leading to a strong coalition between these two parties (VanHoose et al., 2022).

The experiment is mobilizing, inclusive and features a diversity of stakeholders

Empirical data source(s): VanHoose et al. (2022); Marcheschi et al. (2022)

Street experiments garner momentum by way of building coalitions (reaching-out) and profiting from actor networks (reaching-in) that surround their niche development (VanHoose et al., 2022). In doing so a multitude of actors, including civic and market parties, are brought into contact and connected by a shared goal. This process, similar to other forms of community activism (VanHoose & Savini, 2017), is fueled by bonding and bridging social capital and has the potential to result in an awakened or increased sense of community (Ibid.). This is also highlighted in a study of car-free street experiments in Malmo and Gothenburg, Sweden which stresses the value of including people's perceptions in informed decision-making processes concerning the design and introduction of those interventions (Marcheschi et al. 2022). As the initiator of the Umparken Schwabing experiment described: "It was only successful because we had good partners on board. We had the city... and we also had relevant partners and startups that were open to doing this project. Otherwise, it wouldn't have happened in such a short time frame. The project with its short planning and preparation phase didn't fit into the usual processes of the city of Munich at all" (VanHoose et al., 2022, p. 8).

Barriers

Too ambitious program and underestimation/ lack of required time resources

Empirical data source(s): VanHoose et al. (2022); Zieff et al. (2013) Eyler et al. (2015); Sarmiento et al. (2017)

A major barrier is finding the necessary financial means to support an experiment, without asking too much effort from one or a few partners (Nevens et al., 2013). A too ambitious program could act as a barrier for experiment organizers, underestimating the energy, time and resources required to put on a street experiment. The experiment Weesperzijde Testbed in Amsterdam suffered from unclear goals related to its too ambitious program (wanting to explore shared mobility, parking solutions and organize social activities). Additionally, the Umparken Schwabing West experiment in Munich struggled to achieve their goals as a result of too ambitious and radical program. When funding and staffing are inconsistent or limited, the quality and sustainability of the initiative is less certain (Zieff et al., 2013). A lack of funding was also mentioned as a barrier in an evaluation of the Open Streets initiative in the U.S. (Eyler et al., 2015). Additionally, Sarmiento (2017) noted that stable sources of funding acted as a barrier for Ciclovías.

A weak connection between the street experiment and long-term policies

Empirical data source(s): Hipp et al. (2017); VanHoose et al. (2022)

The very attributes that sets city street experiments apart is their temporality and informality, however, their positioning as one-off, fun events, rather than as long-term strategies (Hipp et al., 2017) has the potential to limit their range of influence. In fact, "several of the barriers, tensions and challenges identified by the literature seem to concern the weak relationship with city-wide, mainstream policy, financial, legal, and organisational frameworks" (Bertolini, 2020, p. 744). This is the case if evaluations are not linked to any long-term policy development (VanHoose et al., 2022). The experiment should be considered within the broader transition context (the coherent narrative of vision, pathways and actions) (Nevens et al., 2013).

Experiment level: enablers and barriers

Barriers

Lack of a clear vision and leadership

Empirical data source(s): Vitale Brovarone et al. (2023); Eyler et al. (2015)

A lack of clarity concerning experiment goals can act as a barrier, bringing the legitimacy of the project into question. In the case of the Torino Mobility Lab, the lack of a clear vision and intentions of the project were never made clear to stakeholders (Vitale Brovarone et al., 2023). "In the absence of a clear overarching vision for the future of Turin's mobility, the TML appeared to many as motivated by the desire to seize a funding opportunity or a political move by an administration approaching the end of the mandate (p. 8)." This ignites negative perceptions of the experiment, ultimately acting as a barrier. According to Eyler et al. (2015), getting participants to understand the concept of Open Streets was an important challenge.

Failure/inability to monitor, assess and learn from experiment

Empirical data source(s): Vitale Brovarone et al. (2023)

A major barrier with regards to the monitoring of and learning from an experiment is a lack of capacity and resources (time and money) to monitor, assess and learn from experiments. In the Torino Mobility Lab, the municipality had a limited capacity in terms of skills and governance needed to learn from the experiment (Vitale Brovarone et al., 2023). This is an important barrier for scaling up learning experiences (Grin et al., 2010). As Nevens et al (2013, p. 119) write: "An experiment only fails when nothing has been learnt from it."

Low frequency

Empirical data source: Hipp et al. (2017)

In their analysis of open street initiatives in the United States, Hipp et al. (2017) note the limited impact as directly related to their low frequency. Such one-time events are unable to generate transformative processes that may influence other contexts and practices (Savini & Bertolini, 2019).

Inconducive design

Empirical data source(s): Marcheschi et al. (2022)

Street experiments should be well-designed, considering the users. For instance, in the car-free street experiments in Gothenburg and Malmo, pedestrians did not feel safe to walk in the middle of car-free streets due to the lack of separation between pedestrians and cyclists (Marcheschi et al. 2022). Especially experiments which aim to increase social interactions and serve as a place to sit and relax should feature high quality options for doing so. The creation of places that support social interactions and positive social atmosphere, rather than functioning as a passing through corridor, increases the acceptance of the intervention (Marcheschi et al. 2022).

System level: enablers and barriers

Active promotion

Empirical data source(s): Sarmiento et al. (2017); Montero (2017)

Factors related to the scalability of the Ciclovía program of Bogotá across the world included local officials from Bogotá traveling across the world to share their experiences (Sarmiento et al., 2017). Additionally a network of experts (public health, sustainable transportation, Ciclovía organizers) helps to share information and increase learning among new stakeholders. (Montero, 2017). Despite challenges, the committed and strategic work of the organizers has been key for the success of the Cicolvía experiments.

Institutional regulations and processes

Empirical data source(s): Dijk et al. (2018); Mackie et al. (2021); VanHoose and Bertolini (forthcoming); VanHoose et al., (2022); Hipp et al. (2017)

Established institutions, policies and regulations surrounding street use can act as a barrier to street experiments which don't fit into these processes (Nevens et al., 2013). During the Future Streets experiment in South Auckland, several obstacles in the design and delivery of the intervention including funding uncertainties, conflicts around project governance, regulatory barriers, and rigid project management processes were encountered. This resulted in a delayed implementation (Mackie et al., 2021). In Ghent, the civil servants responsible for the organization of the Living Streets strategically decided to set up an NGO because the experiment was constrained by bureaucratic processes (VanHoose and Bertolini, forthcoming). In Amsterdam, resident's request for a permit to organize a living street were denied by the Municipality on the grounds of insufficient funds, doubts about public support and the lateness of the application. To combat this, residents found a loophole in the bureaucratic system, applying and receiving temporary parking permits typically used in the event of moving or construction (VanHoose et al., 2022). Lastly, out of 32 program organizers who wanted to expand their Open Street experiment across the United States, 13 noted consistent barriers to expansion including funding and arranging permits (Hipp et al., 2017).

Behavioral preference for cars, disrupted place attachment and gentrification

Empirical data source(s): VanHoose et al. (2022); Vitale Brovarone et al. (2023); Marcheschi et al. (2022); Wymeersch et al. (2019)

By transforming streets into places for people and not for cars, street experiments ask a behavioral change of users. Car owners not wanting to give up their parking spaces was the primary form of resistance in the case studies Umparken Schwabing and the Turin Mobility Lab (VanHoose et al., 2022; Vitale Brovarone et al., 2023). In the latter, there was a firm opposition to painting the roads because it was incompatible with the cultural value of the street, while the large amounts of car traffic were not seen as disrupting the cultural heritage (Vitale Brovarone et al., 2023). Related to this, a perceived disruption in place attachment led to resistance in the car-free street experiments in Malmo and Gothenburg, Sweden (Marcheschi et al. 2022). In Ghent, the Living Streets challenged place attachment for some residents which resulted in two opposing camps (those for and those against) (Wymeersch et al., 2019). In the Piazza Zenneti experiment, which turned a former parking lot into a place for sitting and relaxing, local residents were initially wary of their neighborhood gentrifying as a result of the project (VanHoose et al., 2022).

Expert driven-thinking and exclusion

Empirical data source(s): Mackie et al. (2021)

Mobility governance is often organized in a top-down manner (Dijk et al, 2018) leaving little to no space for reflection, re-consideration and learning (Nevens et al., 2013). For city street experiments, this is reflected in entrenched ways of working (Mackie et al., 2021). The typical 'command and control' attitude from politics and administrations (Nevens et al., 2013) or an 'expert-driven' tendency towards urban mobility blocks the implementation of more coordinated and holistic approaches (Dijk et al, 2018). Because of this, mobility governance usually only involves a subset of stakeholders, which can act as a barrier for the representativeness and potential outcomes of this project.

Fundamental differences between experimenting and established institutional processes

Empirical data source(s): Dijk et al. (2018); VanHoose and Bertolini (forthcoming)

The established transport planning context is at odds with the nature of experimentation, hence constraining upscaling (Dijk et al., 2018). Institutionalizing experiments undermines the very essence of experiments (VanHoose and Bertolini, forthcoming). In Ghent, after years of experimenting, the Living Streets were deemed a successful project and were adopted by the municipality. In doing so however, the project lost its original value as it was modified to fit into formal institutional processes (e.g. dedicated start and end date, using a crane to place street furniture instead of letting residents do it themselves).

Analysis and conclusions

The implementation and upscaling of city streets experiments is a difficult process. Based on the literature review, we identified several enablers and barriers for upscaling experiments at two levels: the experiment level and the level of the system. It should be noted that there is a limitation to the chosen method: certain articles may have been excluded as a result of the keywords that were chosen. While we designed the search to be as comprehensive as possible, there is a risk that relevant articles may not have been included in the literature review. The following conclusions can be made, which are potentially useful for both transition scholars and for city-makers interested in experimenting with city streets.

Literature on upscaling heavily theoretical with little empirical examples
Transition literature focusing on upscaling of experiments is quite large, however it remains largely theoretical. Generally speaking, there is a lack of empirical studies which focus on enablers and barriers for city street experiments and the upscaling of experiments to the level of the system. There is a need for more empirical research to test the theories on upscaling in examples from practice.

Experiment level enablers
At the experiment level, 'Local government takes leading role in the organization and implementation of street experiments' and 'The experiment is mobilizing, inclusive and features a diversity of stakeholders' were the only two enablers named at the experiment level and both were named by two sources. Based on the literature review, support from the local government as a formal institution helps to legitimize street experiments, justifying the experiment's aims and ambitions to resistant stakeholders. Additionally, the provision of certain resources can help to support street experiments, which, as identified as an experiment barrier, require an often underestimated amount of time, energy and funding. The second identified enabler involves the inclusion of different stakeholders. Because street experiments can be contentious and aim to change the status quo, it could be beneficial for experiments to prioritize the building of coalitions and involving different parties from the start.

Experiment level barriers
Too ambitious program and underestimation/lack of required resources' was the primary barrier at the experiment level. Across the empirical examples, overly ambitious programs resulted in a struggled to achieve experiment goals. This is linked to an underestimation or lack of funding, which bring the sustainability of the initiative into question. Organizers of city street experiments should therefore be realistic in terms of goals, and ensure that there are stable sources for funding in place.

Experiment level enablers
At the level of the system, 'Active promotion' was the only enabler named in the literature. This enabler was derived from the analysis of an example of street experiment that has successfully been upscaled: Ciclovías. The role of local officials who share their lessons learned is key to the upscaling of successful experiments. These lessons were further spread via a network of experts (public health, sustainable transportation, Ciclovía organizers). The sharing of knowledge and learning from experiments seems to be a key aspect for the upscaling of experiments and represents an important part of this process that should be further researched.

System level barriers
At the system level, several studies named 'Institutional regulations and processes' as a challenge for street experiments, making it the primary barrier at the system level. Examples from different countries (United States, New Zealand, The Netherlands, Belgium) reveal this barrier is not related to a specific governance system but is more universal. Established institutions, policies and regulations surrounding street use can act as a barrier to street experiments which don't fit into these processes. Interestingly, the primary enabler at the experiment level 'local government takes a leading role' seems to contradict the system barrier 'institutional regulations and processes'. This is best illustrated by the cases Weesperzijde testbed and the Living Streets in Ghent. Despite the leading role from the local government, the experiments were still halted by institutional barriers. This may represent an important consideration for upscaling. Despite best efforts within experiments, overcoming obdurate bureaucratic hurdles remains the primary challenge for street experiments. It would be useful for researchers and practitioners to explore examples where street experiments overcame this barrier in order to understand how this process works.

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