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# A matter of scales: Experiential evaluation as a scaling device to support a scaling platform in a case of urban design

**ABSTRACT**

*Spatial densification is an ongoing process in most cities today, but has an uneasy relation with the liveability of our environments. In this article, we approach this uneasy relationship between densification and liveability as a ‘matter of scales’ and work consciously with the tensions which arise, such as a lack of communication and mistrust. We analyse a case of urban design and discuss how the participatory design approach of ‘experiential evaluation’ as a ‘scaling device’ was deployed to support the formation of a ‘scaling platform’ around this matter of scale. This scaling platform has the ambition to connect the multiple actors across multiple scales to make the tensions between scales constructive. In the discussion, we present the learnings of the design process and the challenges that we encountered.*

**KEYWORDS**

staging  
participatory mapping  
joint fact finding  
prototyping  
co-creation  
infrastructuring

## 1. INTRODUCTION

'We need to stop this process so that everything can be kept the same'.  
'Why should our neighbourhood transform if the problems are coming from the city?'  
'Reduce the traffic volume to a level that the neighbourhood can digest, so that the quality of living can be improved'.  
'We have to preserve the quietness in our neighbourhood'.  
'A liveable neighbourhood means that the children can cycle safely to school'.

These are all quotes from different persons involved in the research that is the subject of this article. They articulate different perspectives on an ongoing densification process in an urban neighbourhood in Flanders (Belgium).

Spatial densification can be defined as a process with different conceptualizations on different scales. It is often used as a policy strategy to counter suburbanization of a region and can be (a part of) a strategy for sustainable spatial development. The main ambition of the regional spatial policy in Flanders is that existing neighbourhoods that are well located, close to public transport and are well equipped with enough services to fulfil everyday needs, should densify. The idea is that this will increase the spatial efficiency within the already urbanized space in order to preserve the open and green space without compromising the liveability of the larger area (Cabus 2018). The local authority approaches this spatial densification as an opportunity to increase the spatial and living quality of the city. The densification creates room, for example, to bring different functions together, experiment with collective housing types, implement or cluster more services and increase the amount of open and green spaces.

At the same time, densification is an actual, ongoing process driven by the real estate market that goes beyond the scope of a neighbourhood, city or region. This supra-local process is less government controlled and has impact on a local level, because this 'autonomous' densification process (Antrop 1998: 155) gradually transforms the neighbourhood on the ground.

Most small transformations remain unnoticed whereas the larger transformations (stimulated by the regional authorities) have a more profound impact on the spatial system of the neighbourhood (Antrop 1998: 155). As a consequence, they trigger negative reactions among the inhabitants. They see it as something that will threaten the local character of their neighbourhood and perceive (this type of) densification as something that needs to be stopped. Often, they do not see it as an opportunity for their neighbourhood to become more liveable, on the contrary.

The different perspectives on spatial densification are also related to the lives of different actors that are involved in the processes of densification in the neighbourhood: the ambition of the city to densify the neighbourhood, the older inhabitants who rarely get out of the neighbourhood, the shop owners who serve a larger part of the city, families who live in other neighbourhoods but their children go to school here, schools with students from the entire province or the ambition to expand the mosque into a religious, educational and multicultural centre. Densification is thus related to liveability in an uneasy or dialectical way: when a neighbourhood is densifying, there are more people, there is more activity, more traffic, more nuisance and

thus, potentially, a decrease of the liveability in the neighbourhood. At the same time, the densification might lead in the long term to the opportunity to create more (green) open (public) space beyond the scale of the neighbourhood. This dialectical relationship between densification and liveability can be approached as a ‘matter of scales’, a matter in which multiple actors act on multiple scales which can lead to tensions based on lack of communication and mistrust. This makes it a difficult and sensitive task for designers and policy-makers to stage a dialogue about this matter of scales in a neighbourhood that is densifying. In this article, we want to discuss how a scaling device can be used as an alternative approach to participatory spatial planning to stage a dialogue on this matter of scales. We also discuss how this scaling device can support a scaling platform that deals with the dialectic relationship between densification and liveability in everyday life in the neighbourhood.

The research that is the subject of this article deals with these matters of scales in a case of participatory design in urban design in the Heilig-Hart neighbourhood in Hasselt, a city in Flanders, that stages a dialogue across the multiple scales in which policy-making, public discourse and everyday life take place. The focus of this participatory design process is on the exploration of an approach to participatory design (experiential evaluation) to foster critical engagement and creative expression across scales (DiSalvo et al. 2013: 193). This has the goal to collaboratively imagine the future of the neighbourhood by including the local, but also supra-local knowledge and values (DiSalvo et al. 2013: 196).

In this article, we will first define the different concepts related to the matters of scale. Then, we will describe the participatory design process of the case in the Heilig-Hart neighbourhood. Further, we will analyse how we experimented with a scaling device in order to make the tensions related to the matter of scale constructive and how this experiment supported the instalment of a scaling platform. Finally, we will share some reflections and learnings on this process.

## **2. SCALES, SCALING, SCALING DEVICE AND A SCALING PLATFORM**

In this process, we will refer to scales as different perspectives of different actors who operate on different scales. Scaling is referred to as opening up the planning process to involve a wider range of actors, politicizing the process by including more perspectives in order to make the matter of scales constructive.

The stage where these different actors that operate on different scales can discuss their perspectives on the processes of densification and liveability in the neighbourhood is defined as a scaling platform. In order to install such a scaling platform, we developed a scaling device as a form of ‘enabling tool’ that supports ‘communicative transactions’ (Horelli 2002).

### **2.1. Perspectives in urban planning as scales**

Scales in urban planning are traditionally seen as either the perimeter of the area to what the plan is applicable (e.g. the scale of the neighbourhood vs. the scale of the city) or the policy level on which the plan is handled (on the national, regional or local scale). These urban planning processes are carefully managed within a framework of subtly but clearly defined parameters which define what is open for discussion and by doing so leave little room for alternative interpretations and fail to consider the tensions of the different perspectives in a particular place (Albrechts et al. 2019: 1489).

In the research that is subject of this article, we experimented with an alternative form of urban planning in order to open up the planning process and implement different perspectives to the dialectical relationship between densification and liveability and by doing so, make the process thicker and messier. This alternative approach to urban planning is more bottom-up directed to include multiple perspectives in the urban transformation processes (Roosen et al. 2020: 238) in order to connect action and reflection (Freire 1993) throughout the process. This would transform the planning process in a mutual learning process that stages a dialogue that enhances the acknowledgement, articulation and negation of the different perspectives on dialectical relationship between densification and liveability (Roosen et al. 2020: 238) and thus to make the matter of scales constructive. We see the perspectives as how the different actors across different scales relate to the spatial densification and liveability processes, such as the perspective of a less mobile inhabitant or the one of a local policy-maker. In a certain way, it is also about what they value in their neighbourhood and how these values can change throughout the process as we bring these different perspectives together. By referring to these perspectives as scales, we emphasize the plurality of these perspectives, their capacity to make the process thicker and messier, to politicize the process and to engage in multiple futures. This concept also wants to underline that these perspectives differ between actors and are at play at the different levels, from the regional, to the supra-local, the neighbourhood until the individual scale.

## ***2.2. Staging a dialogue as scaling***

We approach the concept of scaling, and thus making the matters of scale constructive, as a form of staging a dialogue. This staging is an experimental approach in which we combine urban design with participatory design. The staging is not about enacting a scenario or role play (Brandt et al. 2013). Instead it is about bringing the dialogue into the neighbourhood and stage the participatory process into the everyday life of the inhabitants and thus make it experienceable. It experiments with how we can open up a participatory urban design process and co-create alternative future scenarios and therefore develop different tools or scaling devices to engage participants in a mutual learning process (Pedersen et al. 2020: 23). Staging is thus an open and strategic action (Pedersen et al. 2020: 29) to develop democratic planning practices within a complex and uncertain context and helps designers to open up existing socio-technical assemblages and experiment with alternative futures (Hoffmann and Munthe-Kaas 2020: 216). In that sense, the staging can be seen as a way to make the participatory planning process political and to make the matter of scales constructive (Hoffmann and Munthe-Kaas 2020: 217).

## ***2.3. Experiential evaluation as a scaling device to support a scaling platform***

In order to support this act of scaling, we tried to install a ‘scaling platform’. We define this scaling platform as a stage where different actors that operate on different scales can discuss their perspectives on the processes of densification and liveability in the neighbourhood. A scaling platform is thus a place where inhabitants and city experts not only meet each other but can be an active site for change for the institutions, and thus be a place of ‘institutioning’ (Huybrechts et al. 2017: 148).

The installation of this scaling platform is related to development of a 'scaling device'. A scaling device is a methodological approach that can be defined as an 'enabling tool' that supports 'communicative transactions' between all actors involved in a spatial transformation process (Horelli 2002). In the research that is the subject of this article, we experimented with two such scaling devices, namely 'participatory mapping' and 'experiential evaluation'. In this article, we will focus on the latter scaling device.

Experiential evaluation is about making a future transformation tangible, turning it into an experience so that people can evaluate it, reflect upon it, make a recommendation about it and how they see it, not only to define it on their own scale but also make it possible to make trade-offs between different scales.

The experiential aspect refers to the bodily experience to bring the future scenarios of a particular spatial development into the everyday life of the participants. This bodily experience in a known environment creates opportunities for a tacit form of knowledge to emerge which can enhance the development of future scenarios across scales (Brandt et al. 2013) and can lead to a more engaged evaluation of these scenarios (Custers et al. 2020: n.pag.). The experience of a new possible future enables the participants to make trade-offs between scales and shift their position in the process. The evaluation moments trigger reflection about what they value and prioritize. The experiential aspect is thus a way to bring the research into the everyday life of the inhabitants and make it a situated practice.

The evaluation part can be defined as a reflexive dialogue which unfolds throughout the participatory process. The concept of a dialogue refers to a process where different perspectives on a complex issue are presented across scales (Mäntysalo et al. 2011: 257). It is a dialogue where designers, inhabitants and other actors learn to reflect together on the processes of densification and liveability (Huybrechts et al. 2018: 80). The evaluation aspect can be defined as an agonistic dialogue that renders the doubt and disagreements about this matter of scales visible and where the designers take upon the role as a matchmaker to bring the different scales together in tangible ways (Huybrechts et al. 2018: 80). The dialogue is thus an important aspect of the participatory planning process to deal with the complexity and diversity of scales in spatial transformation processes (Roosen et al. 2020: 238). This dialogue needs to be situated in concrete and recognizable situations by shaping a learning relationship with the people who are in these spaces (Roosen et al. 2020: 238), hence the experiential aspect.

We will analyse the deployment of the scaling devices in two steps within the participatory planning process and thus also focus on the non-human capacity for change within the scaling (Lenskjold and Olander 2016: 249) and see it as socio-material assemblies that evolve over time (Binder et al. 2015: 152). This political role of design tools in entering and shaping a political space through dialogues is often underestimated (Huybrechts et al. 2018: 80).

The double question that we will deal with in this article is:

How can a scaling device be used by urban designers as an alternative approach to participatory spatial planning to stage a dialogue on a matter of scales, namely to engage in a dialogue that takes place in a larger socio-spatial and political context with different actors at different scales?

How, in this case, can it support a scaling platform that deals with the dialectic relationship between densification and liveability in everyday life in the neighbourhood?

### 3. THE CASE

We experimented with experiential evaluation as a particular type of scaling device within a participatory design project that we facilitated in the Heilig-Hart neighbourhood; a neighbourhood located close to the city centre of Hasselt, the capital of the province of Limburg in Flanders.

The process was part of a bigger participatory project ‘Werken aan Wijken’ (Dutch for ‘Working on Neighbourhoods’) and was formalized in a contract between UHasselt and the city of Hasselt. The assignment was to organize collective learning processes in three neighbourhoods during which the city policy, the city departments, designers, citizens and stakeholders collaboratively learned how to cope with the tensions between spatial planning processes, such as densification, and participatory processes. For the Heilig-Hart neighbourhood we had to address the tension between an ongoing and planned densification process and the concern among inhabitants on the impact of this process on liveability. The participatory process started in August 2018 and ran until the end of January 2020 (see Figure 1).

#### 3.1. Mobility

The Heilig-Hart neighbourhood is a neighbourhood in transformation: there is a large urban development that will double the population in the neighbourhood; there might be a new high-speed light rail implemented in the next few years; there are the ambitions to expand the mosque to a religious, educational and multicultural centre; the church needs a new future and the city is planning to redevelop the area around the train station. All these projects have an impact on the mobility and thus the liveability of the neighbourhood, but there is uncertainty about which projects will be realized, how they will be realized and what the actual impact will be on the mobility. This uncertainty became so big that inhabitants started to speculate: ‘[T]here will be traffic jams from morning till evening’; ‘we will not find a parking space anymore’; ‘why would the city allow such a project if the situation is already so bad’. These speculations triggered the idea that the city was no longer in control of all the densification processes and the inhabitants started to question them (‘they have no overall vision’; ‘they just allow projects in one neighbourhood without thinking of the impact in other neighbourhoods’) leading to misunderstandings and mistrust between the city policy and the inhabitants.

The mobility situation in the Heilig-Hart neighbourhood is complex: there are quite some supra-local functions that generate traffic, such as schools; the neighbourhood is situated between important traffic lines and it is located close to the train station. There is thus a large diversity of mobility users with each their own rhythm, intensity and needs. In addition, there is a problem of traffic that uses the neighbourhood as a shortcut to travel to the city centre.

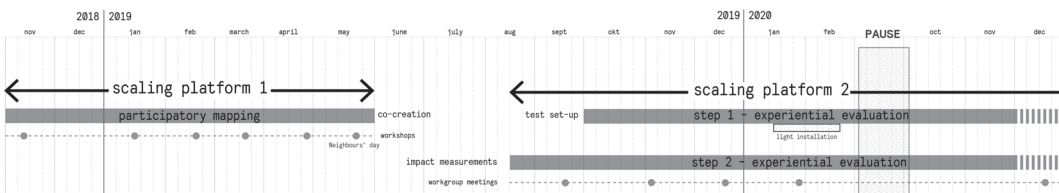


Figure 1: Process timeline.

Mobility was already an issue before the participatory process started. Early 2018, the mobility department gave an assignment to an engineering office to analyse the mobility situation in the neighbourhood and formulate scenarios to improve this situation. The inhabitants and representatives of two schools were consulted in four focus groups. Around that same period, the parent committees of three primary schools in the neighbourhood organized a questionnaire to gain insight in the safety perception in the school environment. The questionnaire was initiated by a few parents, not only out of a concern about the mobility situation at the school environment but also in the entire neighbourhood. The results indicated that there is not only a safety issue in the school environment but also a large support among the inhabitants for structurally changing the mobility situation. To make this public, the parent committees of two schools together with the NGO 'Fietsfront Hasselt' decided to organize an annual 'kidical mass'. This is a collective bike ride to strive for more safety, space and attention for young cyclists and pedestrians. In parallel, a group of concerned inhabitants started an action committee and asked the city to be involved in the planning process of their neighbourhood in order to change the mobility situation and increase liveability. The complexity of the mobility situation and the ongoing initiatives made it clear to us that we could not limit our participatory process to developing a mobility plan on the scale of the neighbourhood.

We noticed the tensions between different scales of multiple actors and their ambitions: the ambition of the region to densify, the ambition of the city to work on mobility, the ambition of the mosque to increase accessibility, the ambition of different parent committees in schools to give form to a city that is 'cyclist friendly', the ambition of neighbourhood committees to contribute to a liveable place to live and so on. These matters of scales coincided with the belief of certain actors that these matters stand in each other's way and that this belief was based on a historical mistrust. This required an approach which combined different tools in order to connect the actors across scales in the neighbourhood to make these matters of scales constructive.

### **3.2. The co-creation of a mobility scenario**

We started the participatory design process with the co-creation of an alternative scenario for the neighbourhood mobility plan, in support of addressing the dialogical effects of a densification process, during five workshops with inhabitants and representatives of the mobility department from November 2018 until May 2019 (see Figures 2 and 3).

It is this alternative mobility plan that we used as a base layer for the experiential evaluation.

We engaged the different actors in a series of workshops in order for them to discuss their perspectives on the processes of densification and liveability in the neighbourhood and by doing so we experimented with participatory mapping as a scaling device. However, at the end of this first phase, it was clear that the participatory mapping and the qualitative approach to discuss the alternative scenario was not working for all the groups and even further increased tensions instead of making them productive. A reason might be that mobility, and this alternative scenario in particular, is a complex issue to comprehend based on a 2D map for a lay person and even more, to anticipate on what the potential beneficial output of the scenario might be once it is in place. This made the participants probably focus on the potential negative

aspects or the elements that were not possible anymore, like park their car in front of their houses. Therefore, we adapted the scaling device in the next phase that suited the needs of the different actors involved in the process.

#### **4. EXPERIENTIAL EVALUATION AS A SCALING DEVICE**

The co-creation phase resulted in an alternative neighbourhood mobility plan. It was part of our original agreement with the city that we would gradually test this plan on different locations in the neighbourhood. The specific approach of implementing a test set-up, evaluate it, make adaptations if necessary and then proceed to the next test set-up was confirmed upon by the city policy in an official statement after the co-creation phase ended. We defined the scaling as staging a dialogue about this dialectical relationship between densification and liveability in relation to the mobility issue in the Heilig-Hart neighbourhood. Therefore, we experimented with experiential evaluation as a scaling device. We deployed this scaling device in two steps: a test set-up as a form of experience prototyping and an impact measurement as a form of Joint Fact-Finding.

##### **4.1. Step 1: A test set-up as a form of experience prototyping**

The first step of the scaling device that we introduced in the urban planning process is the test set-up which can be defined as a form of ‘experience prototyping’. Buchenau and Suri emphasize with the term experience prototype, ‘the experiential aspect of whatever representations are needed to



Figure 2: Workshop 5.



successfully (re)live or convey an experience with a product, space or system' (2000). Related to this term, they use 'experience prototyping' to define methods that allow individuals to experience by themselves instead of witnessing a demonstration. The experience is a fundamental aspect of the concept because it is intrinsically subjective and Buchenau and Suri state that 'the best way to understand the experiential qualities of an interaction is to experience it subjectively' (2000: 424). It is not a technique but an attitude which allows the designer to think more of the design as an integrated experience rather than a specific artefact (Buchenau and Suri 2000: 425). The aspect of prototyping relates to an act of collaboratively identifying possible futures which are rooted in the current space but with the aim to introduce change (Brodersen et al. 2008: 19).

The test set-up was installed by experts of the mobility department of the city at the beginning of October 2019 and is still in place until today. In this test set-up, we blocked two segments of streets around a central square where one school is situated to enlarge it (see Figure 4). We changed the directions of one-way streets and turned two-way streets into one-way streets. In January 2020, we added a 'schoolstreet' to another school in the neighbourhood, which implies that traffic around the main entrance of the school is blocked during the start and end of the school day and we made a necessary change in the circulation based on an intermediate evaluation.

This test set-up is an invasive action in the public space which has an effect on a complete mobility system across scales, not only including the everyday life of the inhabitants living and working around the set-up but also of those



Figure 3: Neighbours' Day at the central square.

far beyond (visitors, clientele of the shops, the ones that take the shortcut to the city centre, parents that bring their kids to school). It engages with how we move around every day and the choices we make about how we move (by foot, cycle, car, public transport, etc.). When people are forced to change this individual behaviour, it will make them question this behaviour and maybe lead to more sustainable choices (Marres 2015). This individual behaviour that happens in the public space defines the use of this space to a large extent. This means that when the mobility in a certain space changes, it can also change the use of the space.

The implementation of the test set-up not only created the possibility to experience the alternative scenario on a 1:1 scale but more importantly it also made the impact on the multiple scales tangible. It shows the importance of caring for multiple scales (and the actors associated with them) at the same time: changing the mobility on the scale of the neighbourhood, but also the future redevelopment of a square and the adaptation of a school environment. The experience of the test set-up made the inhabitants question their own mobility behaviour but also triggered them to make value trade-offs between their individual values and the liveability of the neighbourhood. For example, an inhabitant stated in an e-mail directed to the mobility department that he shifted from a severe opponent of the test set-up because it made his house less accessible for the car towards an advocate because the square in front of his house is now a quieter public space. We tried at different moments in the co-creation phase to let the participants make these trade-offs but it was only when they could actually experience an alternative reality that they made these



Figure 4: Test set-up at the central square.

direct trade-offs. The test set-up has ensured that the central square became a quieter place that is used as a meeting place and playground after school hours. This added value was not defined by the participants in the co-creation phase and the participatory mapping. The collective experience of the new situation leads thus to a more engaged and constructive evaluation of the situation and helps the participants to take other values across scales into account.

The square as space plays an important role in the scaling of the matters of scales. The test set-up not only enhances a bodily experience but also brings the dialectical dialogue between densification and liveability in everyday life. The rediscovery of the square was celebrated with a light installation that we placed on the square during a month mid-January 2020 and was accompanied with a 'winter walk' for children organized by the parent committees of two schools together with the action committee with the support of the shop owners and the city (see Figure 5). This action emphasizes the change in the positions of the different actors and the shift in the process from mere car accessibility to liveability. The square must not be seen as a defined space with clear boundaries but rather consecutive places that form a network with probable boundaries and are thus partly emerging and partly deliberately created (Pedersen et al. 2020: 30). It shows that the square is not an abstract space but a co-constructed and political space (Light and Seravalli 2019: 192) and can give form to multiple futures.



Figure 5: Light installation during the winter walk.

#### **4.2. Step 2: Impact measurements as a form of Joint Fact-Finding**

In the second step of the scaling device, we related to the methodology of Joint Fact-Finding in order to measure together the impact of the test set-up on the mobility in the neighbourhood. Joint Fact-Finding originates in the environmental sciences where it is used as an approach to deal with contentious debates about resource management, environmental protection and human health decisions. These debates are often polarized because there is no science that is 'sound' enough in order to predict with certainty and clarity what will happen in the physical world and policy-making is not a rational process (Karl et al. 2007: 20; Latour n.d.). Joint Fact-Finding is an alternative approach to deal with debates about these very complex environmental problems, so called 'wicked problems' by integrating a human dimension in these debates. Joint Fact-Finding can enhance the use of technical information in decision making and devise common knowledge and understanding (Ehrmann and Stinson 1999) and is a useful approach to collect data particularly for multi-stakeholder groups engaged in collaborative decision-making process as it helps to go beyond conflictual, biased, misunderstood and misapplied (quasi) scientific discourses (Matsuura and Schenk 2017). It is a methodology to include those who are affected by policy decisions in a continual process of generating and analysing the information which is needed to shape a scientific inquiry where local and expert knowledge are both taken into account (Karl et al. 2007: 20).

In the first work session of the co-creation phase, we defined with the participants what they value in the neighbourhood, in what kind of neighbourhood they want to wake up in the future and what is important for the mobility in the neighbourhood. The values that were defined, we used as evaluation criteria in the process. They were defined in a very general way, but throughout the process it became clear how different (groups of) inhabitants interpret these values in a different way. They define their individual values based on their everyday life which is also what they use to evaluate the test set-up. The values for liveability were defined as livelihood (public space, air quality, noise nuisance, green), safety (car, pedestrian, cyclists) and accessibility (car, cyclists and public transport).

Together with the inhabitants and the mobility experts of the city, we made during the fifth work session of the co-creation phase a plan to measure the impact of the test set-up on the liveability of the neighbourhood. We decided that we want collaboratively to collect the facts about the impact of the test set-up. Therefore, we decided together what we wanted to measure, how we can measure it, what the strategic points are to measure and when the measurements would take place. We used different tools to collect data: traffic calculations (1), 'Telraam' (translated in English as 'counting window') (2), online questionnaire (3) and permanent feedback (4).

The traffic calculations (1) were measurements that the city organized at around twenty spots across the neighbourhood. In a period of maximum two weeks the amount of traffic (cyclists and motorized traffic) and the speed were measured (see Figure 6). 'Telraam' (2) is a citizen science project that was used and actively promoted by the neighbourhood during this evaluation process. Interested persons can install a small device at the window on the first floor of their houses (see Figure 7). The device measures the amount of the traffic (pedestrians, cyclists, cars and larger vehicles) and the speed of the cars during daytime. The data are visualized on a website where everyone can access it. You do not need to have a login or a profile to see the data in different graphics

of a specific street segment. It is also possible to ask for the unprocessed data produced by the device you have installed. In the Heilig-Hart neighbourhood, there was a network of 24 Telramen. Nine Telramen were made available by the city for free and were installed at strategic locations. The other ones were bought by inhabitants themselves (one Telraam costs around €80) or were provided by an action committee formed by inhabitants of the Heilig-Hart neighbourhood.

In order to measure the impact of the test set-up on the traffic, we conducted a reference measurement. This means that we did the traffic calculations and installed the Telramen in the month before the test set-up was installed. The traffic calculations were repeated when the test set-up was at least one month in place. The Telramen continuously kept on gathering data.

We did not limit the data collection to quantitative data, but also implemented a qualitative evaluation of the inhabitants and the reactions we got throughout the process. The city also organized an online questionnaire (3) a month after the test set-up was in place to give everybody enough time to adapt to the new situation. With this questionnaire it was possible for inhabitants and visitors of the neighbourhood to evaluate the test set-up based upon their personal and direct experience.

It is also possible for everyone to give direct and permanent feedback (4) via the e-mail of the mobility department of the city administration.



Figure 6: Traffic counts.

The quantitative and qualitative data were collected by an engineering office because neither the experts of the mobility department of the city nor the researchers have the skills and/or resources to do this. The engineering office processed the collected data and analysed it in order to be presented in a comprehensive way later in the process. The unprocessed data had been made accessible to keep the process transparent.

At the end of the co-creation phase, it was clear that the small-scale prototyping and the qualitative approach to discuss the alternative scenario as part of the participatory mapping scaling device was not working for the involved actors due to the complexity of the mobility issue. We used this moment to support the different groups of actors in using the tools they wanted to use to generate data for the impact measurements. The traffic counts as a common tool of the mobility department were opened up to the workgroup and the results were discussed with the representatives of the inhabitants and stakeholders. The action committee used Telramen as a way to collect their data. Therefore, the committee added fifteen Telramen to the network, in addition to the nine that were made available by the city, to create a denser network. They contacted the organization behind the Telramen to ask for the unprocessed data, made suggestions to optimize the data collection process and did tests to install the device outside the house. The online questionnaire was initiated by the experts of the mobility department but developed in collaboration with the workgroup.



Figure 7: Telraam set-up.

This collaborative data collection as a form of Joint Fact-Finding gave the different actors active at different scales not only the possibility to use their own tools to collect their data but also made it possible to exchange and explain their data and thus create common knowledge and understanding of the complexity and uncertainty of mobility (Ehrmann and Stinson 1999). Also, a test set-up showed how a certain mobility plan can improve the liveability at multiple scales. The measurement tools also helped the multiple actors to get familiar with each other's knowledge production processes and to reason on scales that they are not used to (Whatmore 2009: 587): an action committee measures traffic in a way that a city normally does and the city involves citizens in the evaluation of these data and had to adapt their way of working to make this feasible. The use of the Joint Fact-Finding tools was an important step in our attempt to create a scaling platform that could engage them in the collaborative decision-making process (Matsuura and Schenk 2017). It provided a common language between the different actors in the participatory process. This does not mean that the actors agreed upon every aspect. However, they spoke a technical and/or scientific language that was understood and developed by multiple actors which helped them to start to rebuild trust (Matsuura and Schenk 2017). For example, the discussion about the car accessibility versus the liveability of a neighbourhood (and the priority to cyclists and pedestrians) continued during the workgroup meetings. But with the analysis of the measurements at hand, the discussion became less personal (I want this solution because I need to drive around to access my house) and more about other scenarios or adaptations to test set-up that could be looked into (we have to see if we can make that change to avoid the increase of unwanted traffic through the neighbourhood).

## **5. EXPERIENTIAL EVALUATION TO SUPPORT A SCALING PLATFORM**

The experiential aspect of the test set-up and the evaluation based upon the impact measurements came together in the workgroup that was organized to advise the city policy about the further process. We define this workgroup as a scaling platform because it is a stage where different actors that operate on different scales can discuss their perspectives on the processes of densification and liveability in the neighbourhood. This scaling platform is the 'space' where action and reflection are coming together, made possible via experiential evaluation as a scaling device (Freire 1993) to stage a dialogue between the different scales of the different actors that are involved. This dialogue must be seen as a conversation with every participant on the same level. The platform is constructed of horizontal relations among stakeholders which is based on mutual respect and is a space where each member acknowledges and engages with the other (Roosen et al. 2020: 238).

We organized, together with the city, an open call for inhabitants and shop owners to apply to become a representative in the workgroup in August 2019. The selection of the representatives was based on the network of the candidates as well as the location of the network in the neighbourhood in order to constitute a group of representatives that more or less covers the entire neighbourhood. The workgroup consisted of representatives of the inhabitants, the shop owners and the two schools in the neighbourhood together with the alderman, the experts of the city's mobility department and neighbourhood management department and the researchers. The aim of the workgroup was to evaluate the test set-up and advise the city policy based upon

this evaluation. Our role as design researchers was that of facilitator of this meeting: preparing the session, sending the invitation, attending the sessions and making a report.

The first meeting of the workgroup took place mid-September 2019 to discuss the implementation of the test set-up and the measurements. Early November 2019 was the second meeting of the workgroup to discuss the first results of the measurements, the experiences of the inhabitants, schools and shops presented by the representatives and the draft of the online questionnaire. In the third meeting, one month later, the workgroup evaluated the test set-up based on the results of the measurements, decided to keep the test set-up in place, made some necessary adjustments and added a 'schoolstreet'. The fourth meeting was organized at the end of January 2020 to discuss the impact of the adjustments. In this meeting the workgroup decided to pause the process because there were a lot of road and construction works going on in the neighbourhood and the first phase of the large development would soon be realized which all had an impact on the mobility. If there would be extra adjustments implemented, this would mean that there would be even more uncertainty and thus less support for the process. The last meeting of the workgroup was in December 2020. The city again conducted traffic counts in October 2020 to measure the impact of the test set-up after this uncertain period and consider a new uncertainty, the COVID-19 pandemic. The workgroup discussed new adjustments, the possibility to transform the central square in a greener meeting place for the neighbourhood.

The values were defined in a very general way but throughout the process it became clear how different (groups of) inhabitants interpreted the values in different ways. For example, in a discussion about the online questionnaire between two representatives of different inhabitant groups: one representative defined a liveable neighbourhood strictly as a place to live and all the other uses were subordinate to that, while another representative had a broader view and stated that also the shops and the schools are necessary for the liveability of the neighbourhood and need to be supported.

At the start of the first meeting, the alderman defined the workgroup as 'an arena of dialogue'. The workgroup meetings created the opportunity for people active at all scales to communicate directly with each other and exchange knowledge. This dialogue was crucial to gain trust and mutual understanding at all sides of the table. They became partners in the same process and in that way, it was a successful experiment in the politicization of the decision-making process. Nevertheless, we know that one representative had a separate meeting with the alderman to discuss the concern about the possible negative effects of a more thorough test set-up as a next phase in the process which the mobility department was currently developing based on the alternative scenario. The alderman shared the concern of this representative and therefore this proposal for a more thorough test set-up was not discussed during the next meeting of the workgroup.

Although everybody could apply to be a representative in the workgroup and we contacted stakeholders directly, there were still actors who were not represented. First, there is the clientele of 'Café Anoniem' (Dutch for 'Café Anonymous'), an NGO that provides services for homeless people. Their clientele was already using the central square as a meeting place because it is located close to the Café. Another actor is the mosque. The representative of the mosque attended several work sessions, but they decided not to be directly involved in the test set-up, although it changed the accessibility of



the mosque. We could have kept these actors more involved in the process by for example providing them with tools that fit their needs or engage in their practices and thus did not connect them with the other actors across scales.

## **6. DISCUSSION**

In the previous part, we analysed how we experimented with experiential evaluation as a 'two steps' scaling device in order to make the tensions related to the matter of scale constructive and how the experiential evaluation supported the instalment of a scaling platform. In this part, we will share some reflections and learnings on this process.

### **6.1. The embodiment of scaling**

In the first phase of the process, we installed a scaling platform by using participatory mapping in a series of workshops as a scaling device to co-create the alternative mobility plan. By the end of this first phase, we noticed that by using this more verbal scaling device, we did not succeed in making the tensions related to the matter of scales constructive yet. Therefore, we experimented with experiential evaluation as a scaling device deployed in two steps that goes beyond a verbal approach by adding a bodily aspect to the process. This bodily experience enables to embody the scale and, in that sense, makes it accessible for everybody in everyday life. This act of bringing the embodied experience into everyday life makes it also possible to exchange experiences related to scale via the test set-up and the impact measurements and by doing so bridging scales between different actors.

Not only does this scaling device make it possible to pass on experiences because it enables a material embodiment by a test set-up or a measuring instrument from one person to another, it also enables evaluation by quantifying and qualifying the scales. We noticed that addressing tensions between actors across scales requires both: the bodily experiences and the shared platform to exchange 'facts'. These two actions came together in the workgroup and supported the installation of a scaling platform. The aim of the workgroup was that they defined the scales that had to be added or adapted in the test set-up (how to experience the different scales) and decided how to measure each scale (how to quantify and qualify the scales). In that sense does experiential evaluation as a scaling device supported a scaling platform that allows to compare experience across scales and to make trade-offs between scales: the impact of a test set-up on the daily functioning of the neighbourhood versus the individual mobility routine, the functioning of a school versus the accessibility of a shop for deliveries, the moving of parking space in order to make the central square car free versus an inhabitant whose mother is in a wheelchair and so on.

The interweaving of the experience and the evaluation in the scaling of the dialectical dialogue about densification and liveability made the tensions related to the matters of scale constructive. In that sense, the scales that were produced within the scaling platform were more qualitative because they succeeded in making these tensions constructive in contrast to the scales in the first scaling platform.

### **6.2. Scaling, experimentation and adaptation**

We started the participatory design process from the perspective of mobility, because this was already taken care of by actors individually. We brought

these actors together in a participatory urban design process by making use of two scaling devices which led to a shared accountability and co-ownership as they cared to work together (Light and Seravalli 2019: 192). This act of scaling required us sometimes to slow down the process and create opportunities for a different awareness or approach of the issue (Whatmore 2009: 587) because the embodiment of the scales via the test set-up or the measuring instruments enables to pass on experiences from one actor to another but that does not mean that this exchange needs to be done simultaneously. For example, we had to moderate the strong voice of the action committee throughout the process. To facilitate that, we had to organize parallel meetings with the different actors in order to give them the possibility to equally contribute to the final scenario. This asynchronous participation also entails a larger risk in a sense that inclusion often reveals unequal participation. For example, the flexibility of the scaling platform leaves room to discuss individual concerns with the alderman instead of making them explicit during a meeting of the workgroup. It is a trade-off between flexibility and openness vs. transparency with a real risk that it threatens the democratic character of the workgroup.

The scaling provided space for a plurality of actors and groups and was flexible enough for changes in group constellations. An example is the action committee that was persistent in their belief that there was only one solution for the mobility issue even after they had the possibility to discuss it with the alderman at the workgroup and it was clear that it was not feasible in the short term. It kept them from making value trade-offs and acknowledging other positive impacts on liveability beyond their proposed solution. This persistence of mainly representatives of the group not only led to a change of representative in the workgroup after the second meeting, but also in the board and position of the action committee. Today the group presents itself as a citizen initiative with a focus on liveability and no longer as an action committee related to mobility. This indicates that there is a plurality of actors not only across scales but also within one group of actors (DiSalvo et al. 2013).

### **6.3. Scaling as a form of institutioning and infrastructuring**

Experiential evaluation as a scaling device enhanced the exchanges of knowledge, experiences and practices across scales by providing the possibility to re-engage with each other and define new relations within the complexity of the contemporary public realm. It thus can be defined as a form of 'institutioning' (Huybrechts et al. 2017: 148). The experiential evaluation led to a shared accountability and a sense of co-ownership, which in itself is a form of caring to create the opportunity to work together. The workgroup that was created to evaluate the measurements changed the relation between the inhabitants and the local authority: from mistrust to a politicization of the decision-making process. Of course, not all the actors agreed upon every decision (Karl et al. 2007: 20), in fact the representative of the action committee left the workgroup because he disagreed with the decisions that were made. This event made it possible to shift the deliberation in the workgroup from an antagonistic discussion into an agonistic dialogue (Mouffe 2005: 52). It indeed bridged the different scales between inhabitants, public and private institutions by enhancing the communication, providing means of reflection and opportunities to share practices (exchanging knowledge and tools). This turned the process of the experiential evaluation not only into a co-designed learning project (Light and Seravalli 2019: 192) but also into an infrastructuring process

where that we brought institutions and inhabitants together to make the matters of scale constructive (Teli et al. 2020: n.pag.).

Indeed, the test set-up at the central square is now a new meeting place. Multiple actors start to care about it, by organizing a Winter Walk or by asking the city to redesign the square to enhance this new use and maybe other future uses. The city started to take care of it via small adaptations over time. Also, the shop owners experience the added value of having a new meeting place in front of their shops.

In the fourth meeting of the workgroup (January 2020), we, as being part of the university, announced that our assignment ended and that the mobility department would be in charge of the process. It was in the same meeting that the workgroup decided to pause the process, providing a real risk that the process would end. Nevertheless, the scaling platform proved to keep on doing its work across scales, because the workgroup did meet again in December 2020, to discuss the follow-up on data measurements conducted by the mobility department, new changes in the mobility situation and a specific request to redesign the central square with more space for green. They decided that they would keep on meeting at least once a year and thus ‘infrastructuring’ this scaling platform (Karasti 2014: n.pag.) but unfortunately the workgroup stopped after the meeting in December 2020. At the same time, the participants continued to have meetings on their own to discuss the redesign of the square, to get involved in the large redevelopment project in the neighbourhood and the city continued to experiment with experiential evaluation as a ‘two steps’ scaling device in another neighbourhood.

## 7. CONCLUSION

In this article, we presented spatial densification as an ongoing process that takes place on multiple scales across different actors and is related to liveability in a dialectical way. We approached this dialectical relationship between densification and liveability as a matter of scales and analysed how we experimented with experiential evaluation as a scaling device that was deployed in two steps to support the formation of a scaling platform. To work consciously with the tensions which arose, such as a lack of communication and mistrust, when multiple actors acted on multiple scales, cannot be seen as a linear process that starts with a question and ends with a set of answers. It is rather a situated, flexible and pluriversal process. It became a process in which multiple actors were in charge, defining the values important to them, mastering the enabling tools closest to their interests to embody the scales and re-negotiate these values with others, inhabiting a space in which conversations could take place asynchronously between scales and finally taking a space temporarily, with the possibility to leave whenever the actors felt the need.

Nevertheless, we should also recognize the possible weaknesses in this process. It was a very time consuming and expensive process which leaves us questioning the role of the first phase of the process with participatory mapping as a scaling device. If we would keep on working in the same neighbourhood, would we need this first phase? Or can we immediately start with a test set-up? Or can we reduce the first phase with fewer workshops?

We also think that there was more potential for experimentation with the scaling platform after we left. If the city’s experts would have continued the workgroup meetings, would this have led to a transformation of the working of this workgroup and maybe led to a another or new type of scaling platform?

One that is less dependent on the initiative of the city's experts or on an external mediator given that the participants trust one another?

Finally, we need to question the scale of the scaling platform. Do we need a kind of meta scaling platform, one with representatives from multiple neighbourhoods, in order to address the dialectical relationship between spatial densification and liveability processes on the scale of the city? Or is there room for multiple scaling platforms in the same neighbourhood?

After the workgroup stopped meeting, this scaling platform has broken down into smaller scaling platforms. Each of these platforms takes care of smaller, more nuanced, sometimes invisible scales and these scaling platforms often also work together: the local school as a scaling platform also invites the local residents, the city's experts... to their meetings. This diffuse network of scaling platforms may be less structured but it works closer to the scale of the different actors that they unite. This leads us to formulate some questions for further research: how can this multitude of platforms with a multitude of scaling devices be organized? Does it need to be united in a transparent way and keep track of the memory of the process? Does it need a meta-platform? Or does it need enough 'points of exchange' between the scaling platforms? These questions demonstrate that a matter of scales is never straightforward and deserves further exploration.

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