

University of Groningen

## Mapping the inclusive city

van Hoven, B.; Fisher, M.; Munuera Garcia, J.

*Published in:*  
Community Development

*DOI:*  
[10.1080/15575330.2024.2310848](https://doi.org/10.1080/15575330.2024.2310848)

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*  
Version created as part of publication process; publisher's layout; not normally made publicly available

*Publication date:*  
2024

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

van Hoven, B., Fisher, M., & Munuera Garcia, J. (2024). Mapping the inclusive city: Engaging people with disabilities as co-researchers in Groningen (the Netherlands). *Community Development*. Advance online publication. <https://doi.org/10.1080/15575330.2024.2310848>

**Copyright**

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

**Take-down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

*Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.*



## Mapping the inclusive city: Engaging people with disabilities as co-researchers in Groningen (the Netherlands)

B. van Hoven, M. Fisher & J. Munuera Garcia

To cite this article: B. van Hoven, M. Fisher & J. Munuera Garcia (02 Feb 2024): Mapping the inclusive city: Engaging people with disabilities as co-researchers in Groningen (the Netherlands), Community Development, DOI: [10.1080/15575330.2024.2310848](https://doi.org/10.1080/15575330.2024.2310848)

To link to this article: <https://doi.org/10.1080/15575330.2024.2310848>



© 2024 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



Published online: 02 Feb 2024.



Submit your article to this journal [↗](#)



Article views: 710





View related articles [↗](#)



View Crossmark data [↗](#)

## Mapping the inclusive city: Engaging people with disabilities as co-researchers in Groningen (the Netherlands)

B. van Hoven <sup>a</sup>, M. Fisher<sup>b</sup>, and J. Munuera Garcia <sup>a</sup>

<sup>a</sup>Faculty of Spatial Sciences and University College Groningen, University of Groningen, Groningen, Netherlands; <sup>b</sup>University College Groningen, University of Groningen, Groningen, Netherlands

### ABSTRACT

In this article, we discuss a participatory project with people with disabilities. In light of the lack of collaboration with people with disabilities in (spatial) decision-making processes, our aim was to develop and test a method that allowed for the involvement of people with disabilities in community development, and in particular in mapping accessibility and inclusivity in various places and spaces in the city of Groningen (the Netherlands). In this project, we collaborated with clients at 's Heeren Loo, an organization that provides housing and care for clients with acquired brain injury, deafness with complex problems and chronic neurological disorders. We describe our approach and experiences in participatory research, focusing on the opportunities and challenges in developing and implementing a data collection method that enabled us to involve people with a disability as co-researchers.

### ARTICLE HISTORY



Received 19 July 2023  
Accepted 8 January 2024

### KEYWORDS

Participatory research;  
disability; wheelchair users;  
accessibility; inclusive city

## Introduction

Various authors have pointed out that planners designing urban environments have long prioritized the needs and demands of able-bodied users of the city. Cities are dominated by “concerns for aesthetics and form,” neglecting accessibility of places through poor public transport networks and limiting accessibility of buildings by design. As a result, people with disabilities are effectively locked “out of place” and marginalized from urban/public spaces, marking them as Other and their bodies as deviant (Gleeson, 2001; Hanson, 2004; Imrie, 2001; Kitchin, 1998; Madanipour, 2015). People with disabilities have also been explicitly marginalized through a system of segregated schools, employment and use of facilities (such as separate, locked toilets or separate seating areas in theaters). Such societal arrangements suggest to both people with and without disabilities that disability necessitates specialized and segregated facilities (Kitchin, 1998, p. 49), thus naturalizing and (re)producing the disabled (body) as less valid.<sup>1</sup> Recognising that people with disabilities have remained disproportionately affected by exclusionary practices, in 2006, the UN Convention on the Rights of

**CONTACT** B. van Hoven  [b.van.hoven@rug.nl](mailto:b.van.hoven@rug.nl)  Faculty of Spatial Sciences and University College Groningen, University of Groningen, Groningen, Netherlands

© 2024 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

Persons with Disabilities more specifically intended to enable people with disabilities to participate in society as equal citizens, to exercise freedom of choice and independence. In the Netherlands, there are two million people with an impairment (visual or auditory impairment, psychological problems, physical or cognitive impairment), and approximately 1.4 million persons with a modest or serious mobility impairment (De Klerk et al., 2012). Urban design and policy has contributed significantly to solidifying social differences and injustice. The Dutch government ratified the UN Convention on the Rights of Persons with Disabilities in 2016 and pledged to ensure equity and inclusion in the housing, employment and education sectors in addition to more mundane, everyday activities. However, at the community level, this appeared to be a challenge to realize and on 3 December 2019, a “shadow report” revealed that the situation for people with disabilities in the Netherlands had, in fact, deteriorated since the covenant was signed (Alliantie VN-Verdrag Handicap, 2019). The “shadow report” contends that there were few opportunities for meaningful encounters in mundane, everyday spaces aimed at combating negative stereotyping and “othering” of people with disabilities in local communities.

While a sense of relevance and even urgency is apparent, a significant gap in both knowledge and action remains. At a policy level, the preferred methodology has largely aimed at monitoring, highlighting statistics and “creating facts” about inclusion (Van Wijnen & in collaboration with J.C. Kool, 2009; Vermeij & Hamelink, 2021). A key shortcoming for realizing the aims stated within the UN Convention has been the lack of *collaboration with people with disabilities* in (spatial) decision-making processes. Movisie (2021) reported that of the approx. 50% of Dutch municipalities who responded to their survey, 26.5% had thus far implemented a local inclusion policy, and for more than 40% of the participating municipalities, a central question remains how to involve people with disabilities.

In this article we offer insights from carrying out a participatory research project by discussing opportunities and challenges in developing and implementing a data collection method that enabled us to involve people with disabilities as co-researchers. In our participatory project, we utilize a design thinking approach which resonates with recent studies that have advocated this approach to help policymakers identify potential consequences of policies, and develop mitigation strategies to address these issues. Brown and Wyatt (2010), for example, emphasized the need to involve stakeholders to prevent initiatives from being based on preconceived beliefs about the problems and solutions. There is much potential for policymakers to use design thinking to gather information and insights into their constituents (Minstrom & Luetjens, 2016). This article contributes to knowledge and offers guidance to other (research) projects and enabling practices aiming to involve people with disabilities (as co-researchers).

In the remainder of the article, we first discuss participatory research with people with disabilities. We then outline the geographic location of the research, the city of Groningen (the Netherlands), and the research approach, addressing the research team and ethical observations. In the subsequent section, we zoom in more on the use of design thinking, which was adopted as a part of the Participatory Research (PR) when developing the data collection tool. Finally, we address key opportunities as well as challenges we encountered.

## Participatory research with people with disabilities

In our research, a key objective has been to combine research with action and collaborate closely with community residents in defining the research problem, developing research questions, collecting and making sense of data, and sharing results with other stakeholders (see also Amauchi et al., 2022; Pain & Kindon, 2007). Participatory research emphasizes the equal participation of all parties involved in the research process, allowing for shared decision-making, co-learning, and co-created knowledge (Askins, 2018). As other authors have noted, successful examples of participatory research give weight to the approach by achieving inclusion, relevance, richness of data, and effecting change (Kindon et al., 2008; Littlechild et al., 2015), as well as local capacity building and advancing local community empowerment (Estrada-Martínez et al., 2021). The unique experience of community members with “the problem” urgently needs to be included to improve the relevance and quality of research beyond the current, more statistical approaches (see also van Wijnen, 2009; Vermeij & Hamelink, 2021).

In addition to traditional social research methods which do not easily enable the involvement of people with (intellectual) disabilities, Boxall and Ralph (2009) noted that governance (e.g. through ethics committees) discourages the adoption of more creative and participatory research practices. In the past two decades, however, several studies have been carried out under the umbrella of participatory research *with* people with disabilities. Photovoice emerges as a chosen method across types of disabilities, age groups and geographic regions as one that enables researchers to collaborate with people with disabilities (see Aldridge, 2007; Boxall & Ralph, 2009; Gunton et al., 2021; Overmars-Marx et al., 2018, 2018; Povee et al., 2014; Wickenden & Kembhavi-TamView, 2014). In particular, because the method is not, or less, a language-based method, photovoice is a well-accepted method for participation. Other approaches are also used in PR, where examples range from engaging participants at a “lower rung” (thinking of Arnstein’s participation ladder), involving them in determining interview themes (e.g. Gross et al., 2018) and being interviewed but not partake in data analysis (McDonald & Stack, 2016) to involving them as stakeholders in evaluating research products (e.g. Correa et al., 2019) to devising training programs to allow for the development of research skills to involve disabled co-researchers (e.g. Seale et al., 2015). And while digital tools in data collection have been used in other research contexts, Rebernik et al. (2021) emphasized that “application of these techniques to the disability terrain seems to be rather rare” (p. 956) even though they show much potential for enabling inclusion and accessibility for disabled people.

People with multiple disabilities have remained underrepresented in disability research, at least to some extent, because inclusion has been regarded as too difficult as well as money and time consuming (Aldridge, 2007; McDonald & Stack, 2016; Böttger et al., 2022; Lister et al., 2021). As a result of a recent scoping review, Böttger et al. (2022) called for further studies that enable people with disabilities to be included in future participatory action research which relates to social justice and policy. For those reasons, Seale et al. (2015) also emphasized the necessity of extending boundaries of participatory methodologies. Our projects heeds these calls.

## Geographic location of the research: Groningen

Groningen is a compact city with a population of 235,000 (OIS Groningen, 2022). Within the city, generally speaking, supermarkets, drugstores and various other amenities are available at a walking distance, and in many neighborhoods within a 500 m radius from housing for older adults and people with disabilities (integrated service area approach, see Pijpers et al., 2016)

Groningen is a high-density city wherein pedestrians and cyclists are more plentiful than motorized vehicles. The quantity of bikes in the city center has been a problem for accessibility with bikes parked on sidewalks and even blocking store entrances. However, as a result of the new mobility policy, recently multiple underground spaces were created, urban sidewalks are monitored, and “stray” bikes removed by the municipality.

For our research, it is important to note that Groningen has a historic city center, combining a mix of buildings from the mid 19<sup>th</sup> century to the mid 20<sup>th</sup> century but also including buildings that are older (3D Geoinformation Group TU Delft, 2020). This urban fabric translates into many buildings with steps at the entrance, high step-ups, narrow door frames, small inside spaces, as well as cobblestones in the street design and steep dropped curbs. Several buildings also have heritage status. The city center of Groningen has become increasingly freed of cars and pedestrianized since 1977 (CROW, 1985) making it an attractive shopping center. As a result, there are advertisement boards and street furniture obstructing sidewalks as well. Such barriers are invisible in standard maps (or mobile applications) thus making it difficult to plan a successful trip into the city center. Narrow, cobblestone sidewalks become smaller, often not wide enough for exploring in a wheelchair (Beale et al., 2006). Research elsewhere concluded that the density and narrowness of the city can cause anxiety and result in people with impairments taking many precautions before leaving their homes, only to find themselves stuck or unable to access spaces (Kitchin, 1998, p. 346). This was certainly the case in our study too.

## Methodology

### *Research approach*

In our “Mapping the Inclusive City” project, we collaborated with a societal partner, i.e. ‘s Heeren Loo, an organization that provides care and housing for people with acquired brain injuries, deafness with complex problems, and chronic neuromuscular diseases. ‘s Heeren Loo also includes a talent center which offers a range of activities and opportunities for clients to further develop and practice their talents. In total, the organization provides care for 100 clients who live on location as well as clients who do not reside with them but receive various forms of support and care on location. Since 2015, ‘s Heeren Loo has collaborated with Bettina on co-creative projects involving their clients as well as student researchers and arts students (Dul & van Hoven, 2019). While at first, this entailed participatory arts-based projects, resulting in public exhibitions, the input and initiative from ‘s Heeren Loo clients led to initiating the “Mapping the Inclusive City” project which we discuss in this paper. The co-researchers in this research comprise a self-selected group of seven wheelchair

users, meaning that the research was proposed to clients at 's Heeren Loo and interested people could make themselves known to participate. Our co-researchers had mobility impairments which required them to use a rollator, a hand wheelchair or an electric wheelchair, and some additionally experienced muscle spasms which could either lock their limbs or cause uncontrolled movement. Some of our co-researchers had speech impairments which required them to communicate using eye or tongue signals, a letter card or a speech computer. All but one have previous involvement in Bettina's previous co-creative projects. In addition to the project leader and the seven wheelchair co-researchers, our research team also included two student research assistants (Madelief and Julia, the coauthors of this paper) and support from the University of Groningen (UG) GeoService. The UG Spatial Expertise Center supports researchers in the field of spatial information technology including data visualization and software and technological innovation. Their support extended to the development of a data collection app.

Our PR engaged with the different ways of knowing as well as the need for, as Amauchi et al. (2022) noted "a place-based approach, an experimental and often-times action-oriented epistemology, as well as a holistic worldview, rejecting the common, compartmentalised pathways to knowledge generation" (p. 7). When bringing to light the everyday experiences by people with disabilities in the city, we first used arts-based, visual methods to allow for a meaningful way of collaborating in the research that did not focus as much on speech. We used a smartphone-based system which enabled our co-researchers to record their experiences in the city independently. Specifically, we developed the app "RolMaps" using a hybrid version of the ArcGIS-based FieldMaps and Survey123 to record the participants' personal assessment of the accessibility of shops, cafés, restaurants and other amenities.

Our wheelchair co-researchers had an active role in developing the focus and questions in the research, developing the data collection method including testing different versions of our tool, collecting data both as a group as well as independently in the city, and assisting in the data analysis and disseminating the results (all of which we elaborate below). It is important to note that our project was regarded as an opportunity for meaningful encounters.

### ***Ethical concerns***

During the project, we also experienced ethical concerns. For example, the ambivalent character of moving through place. Walking/moving about can contribute to feelings of marginalization and emphasize "not belonging." Indeed, "the disablist and disabling sociospatial environment produces a vivid, but unwanted consciousness of one's impaired body [wherein] the body undergoes a mode of 'dys-appearance' which is [...] social" (Paterson & Hughes, 1999, p. 603). For example, a person with a speech impediment enters into a conversation at a disadvantage and may experience a struggle not because of an inability to communicate but due to conventions regarding the speed and form of talk. In this way, "disabled bodies are at once physically present and made alien to the able-bodied interaction order" (dys-appearance) (Abrams, 2016, p. 119).

As a result of previous and ongoing collaboration with the organization 's Heeren Loo, our community partner since 2015, a relationship of trust was established, but also a necessary means to help deal with implications for participants in being research active such as participation in resilience meetings. Close collaboration with health professionals from 's Heeren Loo remains essential.

## Design thinking within participatory research

In our project, as part of our participatory research, we drew on Design thinking to facilitate the collaboration with our wheelchair co-researchers in the development and use of the data collection tool "RolMaps" (see also Katoppo & Sudradjat, 2015). Design thinking is an iterative process that empowers individuals and organizations to solve complex problems with creative innovative solutions centered around the clients' needs (Brown & Wyatt, 2010). Design thinking has become highly effective in generating new ideas, and improving products, services, processes, and policies (Brown & Wyatt, 2010) while placing the users and citizens at the heart of the design. Design thinking in projects involving citizen scientists can benefit citizens in "the form of social innovations, addressing social problems that affect groups of people or communities" (Goi & Tan, 2021, p. 1). In our case, the approach adopted in design thinking aligned well with our participatory project as well as providing a potential tool that can appeal to other community stakeholders as well as policymakers. In the following, we briefly illustrate how we applied the design thinking method in our project.

The design thinking process is highly collaborative and problem-focused, where designers work through a series of stages, i.e. Empathizing, Defining, Ideating, Prototyping, Iterating and Testing (Goi & Tan, 2021). *Empathizing* is the first step and concerns "empathy for people and for disciplines beyond one's own" (Brown & Wyatt, 2010, p. 34). This phase usually starts by understanding users' challenges and gaining insights into their experience, and often involves conducting primary research such as interviews, participant observations and focus groups (Brown & Wyatt, 2010). Because of the collaboration between the societal partner, 's Heeren Loo and the university, previous projects cannot be strictly separated from the empathizing phase in our mapping project. In previous projects, aspects of inclusion and exclusion were discovered, discussed and represented using arts-based methods. As noted above, problems were discovered in relation to the accessibility of shops, cafés, public transport, public places and routes leading to these, as well as the problem of feeling ignored and invisible, and disabled. From these collaborations and outputs emerged the demand for a project that would involve the 's Heeren Loo clients as co-researchers in a project that allowed them to be involved in scientific data collection themselves.

During the *Defining* phase, the problem is specified. To do so, the design thinkers look back at the primary research conducted in the previous phase and identify the main problem (Santos Ordóñez et al., 2017). In the first brainstorm sessions with the "Mapping the Inclusive City" research team, we drew on our insights from the arts-based projects. Co-researcher Lisa had taken the initiative to develop a preliminary list of locations and elements that exclude people with disabilities from public spaces, and we used Lisa's list to discuss in the group what else the other co-researchers deemed important to add. In addition to defining the focus of the research, we discussed the possibilities to implement



the data collection tool so they could potentially use it in their everyday life, while going to the city alone, with us or with their friends and families.

*Ideating* consists of the process of generating, and developing and testing the previously defined idea (Brown & Wyatt, 2010). During the ideation phase, we started our weekly meetings with our co-researchers, which continued throughout the project. In the brainstorm sessions, we also attended to the desired final output of the project; an interactive map of the city, which showed accessibility of the surveyed amenities in the city center to a broader public such as other local wheelchair users, visitors and tourists. The brainstorm phases were recorded or field notes were taken for subsequent analysis.

In Design thinking, when the ideas are transformed into actual products and services, the research team enters the *Prototyping and Testing* phase. During this phase the best ideas that are created during the ideating process are turned into a “concrete, fully conceived action plan” (Brown & Wyatt, 2010, p. 35). Central to this phase is prototyping, i.e. “turning ideas into actual products and services that are then tested, iterated, and refined” (Brown & Wyatt, 2010, p. 35). During the prototyping phase, we developed several versions of the data collection app using the ArcGIS-based Fieldmaps and Survey123. Together with our co-researchers, we tested the different versions by collecting data in the neighborhood and assessed the user-friendliness as well as whether the questions and answer options were clear and complete. During evaluation sessions, the co-researchers decided on the preferred prototype which they named “RoIMaps”. As noted above, the app records the personal assessment of accessibility of shops, cafés and restaurants. In addition, the data recorded can be analyzed and visualized using ArcGIS which will be achieved in a later phase of the project.

The prototype product or service is then tested to see if any (unforeseen) problems occur. In the *Iteration* phase, iterations are made to the product/service to fix the potential (technical) problems that were noticed in the previous phase. As a result, the previous steps may be repeated and once the prototype has been sufficiently tested and improved, the final product is created. During this phase of the project, we conducted a preliminary analysis of the data recorded in RoIMaps during the prototyping phase, mainly focused on data quality. In order to analyze the data, we used different forms of visualizations to make the data more accessible and comprehensible to our co-researchers, such as through pie charts, bar charts, word clouds, and photographs taken during the data collection. Discussing the data that had been generated using visualizations enabled us to identify which questions in the app were relatively more important than others as well as check whether our tentative results were clear and could be communicated well to other stakeholders. The analysis led to discussing how stores could implement research findings in order to improve accessibility for wheelchair users. We focused on “small actions” that did not involve reconstruction or modifying protected heritage buildings. As a first data dissemination step we decided to design flyers and checklists which the co-researchers could give back to the store owners with recommendations to be more accessible and a first assessment of the accessibility of the stores. As Myers and Ravesloot (2016, p. 85) also pointed out, we intended to raise awareness to “maximize the facilitators and minimize the barriers”. In addition, inspired by Tine Buffel’s (2015) “Researching Age-friendly Communities”, the group is preparing a booklet outlining and illustrating the project, and the experiences of all involved, with the intention to provide municipalities who wish to involve people with disabilities in improving accessibility and inclusion.

## Findings: Integrating people with disabilities as active research collaborators

In the above, we described briefly how Design thinking was implemented in our project. In the following, we focus on the opportunities and challenges that arose and are relevant when considering this approach when involving people with a disability to become active agents in community development practices. In terms of creating accessible cities, as Rebernik et al. (2021, p. 953) stated, cities are “crafted on the basis of interactions among people, information, and spaces” and urban planners and local governments “must *adapt* to citizens’ needs and invite them to co-create their cities” (our emphasis). In relation to this, key features of our project were empowerment and co-learning in a context of collaborating across different scientific literacies.

### Opportunities

Various authors have described empowerment in participatory research as a means for social transformation, where participants develop an awareness and knowledge about factors and processes shaping their everyday lives on which they could base social and political action (Bindels et al., 2014; Estrada-Martínez et al., 2021; Kindon et al., 2008). Blair and Minkler (2009, p. 652) described the participatory research process as a “co-learning process” where participants not only learn by doing, but also contribute to the knowledge produced and could use that knowledge in the community setting, even long after the research project has finished. But as previous research has shown, simply because local communities were involved in various stages of the research process does not automatically guarantee a balanced and democratic empirical representation of the studied subject. Community-based co-researchers have a profound impact on the choices made and directions taken in the research process, influencing the quality, nature and representativeness of data, which has to be taken into consideration (Littlechild et al., 2015).

With “co-learning”, we refer to a collaborative learning process where everyone involved is considered a learner and a teacher, thus breaking down hierarchies (see also Amauchi et al., 2022). During the process of co-learning, we understood that everyone brought different perspectives, insights and skills to the learning process. Therefore, our goal was to create a space fostering active participation and collaboration to co-create knowledge. Creating a space in which everyone felt empowered to do research was challenging because everyone contributed with different skills and knowledges and our co-researchers had to develop a “researchers” attitude. It is important to note then, the different academic literacies, skills and knowledges within the research team, and how these contributed to the process of co-learning. While Bettina was the only academic expert in the research group, everyone else contributed with different expertises that were beneficial for the project. Our co-researchers have different interests, skills, knowledges and motivations that could be used and challenged during the project. Identifying the specific interests and capabilities of our co-researchers helped us divide tasks along these. For example, Leon worked with PowerPoints, Tessa with Adobe, and Julia with Canva. In addition, our co-researchers’ interests in the different phases of the project varied, which shaped their contribution. For example, Naomi and Jenneke preferred the data collection moments in the city. In

contrast, Jeroen, Leon and Tessa were very interested in the data analysis (using the graphs and figures) and keen to be involved in the creative dissemination aspects of the project. Lisa was enthusiastic about all parts of the research and she was keen to address even difficult topics in the stores. But rather than only including co-researchers according to their abilities, we also tried to accommodate their disabilities by changing pace, offering additional aids etc. to facilitate collaboration. Hiranandani et al. (2014, p. 159) claimed that ableist conceptions of disability often result in avoiding the responsibilities of providing reasonable accommodation. Rather than “casting aside” their disability, we created a space for solidarity as well as enabled self-determination and helped develop capacities to enact change.

Although everyone in the team contributed with their own expertise to the project, throughout our engagement in the project everyone also experienced some transformation. At the beginning of the project, our co-researchers doubted whether this project could have an impact at all. Tessa, for example, explained her doubts of the project even being able to start at all. She said: “I really was worried that this project was not gonna take off and people won’t see that this is, like really important.” In addition, some of our co-researchers were unsure to what extent they would be listened to during the data collection. As Jeroen notes: “At first I doubted whether we would be taken seriously by the shopkeepers and café-owners.” Jeroen’s uncertainty of being taken seriously was not unfounded as became evident during the data collection. In Madelief’s research notes, she observed:

What I also noticed in some shops was that the employees purely turned to me and were asking me about the project, even when I kept trying to redirect the conversation to the three of us. But this did not seem to make a difference, because from the body language of the employee, you could still notice they were directing the talking to me. This felt like they were not taking the people in the wheelchair seriously and for me already felt quite annoying.

These dynamics highlighted the challenges encountered in the everyday experience of being disabled, where the agency of people with disabilities is often dismissed. However, as it became notable throughout the project, our co-researchers’ agency increased through their engagement and feeling more comfortable in their role as researchers in the project.

As a result, our co-researchers entered the spaces not as people with disabilities, but as researchers. Leon said he “entered the shops differently than normally.” The data collection demanded our co-researchers to take on the role of a researcher. They prepared for their role as researcher in different ways in order to be as independent as possible. Naomi, for example, took the initiative to have some of the survey questions installed as shortcuts into her speech computer so that when we went into the city she could use them to ask questions herself.

An essential part of the research in the process of co-learning were the data analysis meetings where we often discussed our experiences during the project. These meetings emerged as a safe space for our wheelchair co-researchers to reveal the challenges they faced as co-researchers with a disability. Leon, for example, shared that asking a shopkeeper whether they had an accessible toilet caused him discomfort at first, because he already knew there would not be an accessible toilet available. However, others such as Lisa had no problem asking this question and even enjoyed the space of

some confrontation and discomfort it could cause for the shopkeepers. A prominent moment in the shift “from disabled to researcher” was in the data dissemination phase. In this phase, we reported back our findings to the shopkeepers in the form of flyers. When reflecting on this, most co-researchers noted a feeling of pride for our research accomplishments and for being able to return to the public spaces with these findings.

Additionally, we also transformed during the project due to the process of co-learning. During this project, we realized we had several ableist assumptions with which our co-researchers confronted us, like using a standard, scrolling navigation option instead of a click option that suited Jeroen, who could not scroll, due to the way he uses his phone (i.e. typing using navigation buttons in his wheelchair headrest). Throughout this research project, we benefited much from being “on the ground” and going along with our co-researchers, learning in situ about small things that heavily impact accessibility, such as the kerb of the platforms in bus stops (which, due to its height can often be inaccessible), or the impact uneven footpaths comprising cobblestones and bricks can have (which can cause physical discomfort such as back aches) (see also Lager et al., 2021).

In the last stages of the research, we began to wonder how to reciprocate our co-researchers for their work in the project. Due to the limited funds we had for the project, we could not afford to offer monetary compensation. While the student researchers were contracted, none of the co-researchers received payment. Instead, the project was offered to them in their “talent development” space as a free activity. Nonetheless, for our respondents, it was a “work-like” activity and as Hiranandani et al. (2014) pointed out, it offered potential “intangible benefits, such as social identity and status; social contacts and support; a means of structuring and occupying time; activity and involvement; and a sense of personal achievement” all of which have “been increasingly recognized for community inclusion” (Hiranandani et al., 2014, p. 152). We provided a formal recognition to our co-researchers by giving them certificates which endorsed the skills they gained and practiced during the project. We also involved them as guest lecturers at the University of Groningen. The co-researchers all mentioned the project meant different things to them, such as being able to go out into the city, and learning new skills but also a feeling of pride in the accomplishments. As Jeroen said: “I was proud of our achievement. [RoMaps, to me, means] learning how to do research as well as feeling proud.”

Before discussing challenges encountered, we briefly turn to our own positionalities in this project. As noted elsewhere, participatory research can impose additional skill sets and demands on academic researchers as a result of the more managing, collaborative and action-oriented approach rather than an extractive and analytical approach (Blair & Minkler, 2009; Kindon et al., 2008). While the methods adopted may be offered through textbook-based instruction during academic study, little prepares a community-based researcher for some of the demands that emerge from working with people with care needs. In our project, the principal researcher Bettina had worked both with older adults before as well people with disabilities for about a decade. Madelief was a Liberal Arts and Sciences student with a Health and Life Science specialization. While she had knowledge about urban development as well as medical sciences, she had not previously worked on a participatory research project. Julia was a Research Master student in the Arts and Humanities. Her experience was in working with visual and textual data and she was able to work with graphic design projects but she did not have experience in empirical data collection at first. Madelief and Julia both had not participated in the art-based projects

that preceded “Mapping the Inclusive City”. During all phases of the project, boundaries between the UG researchers as “researchers” and as “carers” were blurred; they had to be in order for this research to be carried out. For example, due to the specific needs of our co-researchers, a part of the team sometimes also assisted in personal care by helping them eat or drink.

### **Challenges**

Conducting participatory research has several benefits. However, actively including people with disabilities in research projects can be challenging. In this section, we discuss the four main challenges that occurred, i.e. those related to time management and human support, external factors (e.g. weather and terrain), transportation and data accuracy.

Key challenges during the research were time management and human support. Even though at the beginning of the project we made a relatively flexible time schedule which allowed for unforeseen delays, all phases of the research were time-consuming and the nature of the research required some steps to be slow-paced. This was because more (care) assistance was required for our co-researchers, transportation to the city took longer than expected (see also Evanson et al., 2006), and not everyone could be present each week. Since we used design thinking, it required us to often redesign the data collection method after group discussions about alterations to the apps. The dissemination meetings turned out to be quite time-consuming and energy-demanding for our co-researchers. Some of our co-researchers communicate differently, for example, by using speech computers or letter cards, and this made the pace of discussion slower but also cost the co-researchers relatively more energy than they normally spent in an average day where they communicate less. As a result, we needed more meetings for discussion than we had planned for. We also found that good and clear communication within the group required that we dedicatedly stepped out of our academic framework of reference. We had to simplify more and clarify better and ensure that we continuously checked if everyone was “on the same page” and had the same understanding about what is happening and expected. We remained aware of tensions and tried to address them throughout democratically (see also Amauchi et al., 2022).

In addition, external factors like the weather and the specific characteristics of the location could made it more difficult for our co-researchers to carry out data collection as it was more tiring, harder or not good for the technology. Data collection was not possible on rainy days, which in our case led to some data collection sessions during the fall being postponed. Doing research in the Netherlands from September until January, the weather was one of the most defining external factors.

Transportation from ‘s Heeren Loo to the city center, where the majority of data collection took place, was another key challenge. The distance is about 5 km and due to traffic it takes approximately 20 minutes by car. At the beginning of the project, most of our co-researchers, except for Tessa who always used a public bus, would arrange their trips to the city center using the shared taxi scheme, which is the main form of transportation for clients at “s Heeren Loo. There are many challenges that arose from using these taxis. First of all, they had to be arranged well in advance and delays in pickups were not unusual. As the project continued, however, our co-researchers’ ability to exercise their agency increased as did their level of comfort with the academic researchers, and they

became more willing to stretch their boundaries and comfort zones, and try new things. Our co-researchers started taking public transport or walking<sup>2</sup> to the city for the data collection.

Another challenge in this project was the data accuracy. The main cause for this was the way in which questions and answers were formulated in the data collection app. During the first round of data visualization and analysis, we found that some questions had answer categories (e.g. “maybe/sometimes”) which caused our results to be ambiguous or inaccurate. In some cases, the data entries related to the extent of comfort the co-researchers felt when “rating” public spaces poorly. For example, a wheelchair user may not be able to enter a building independently, but they might still record “yes” because they were helped by someone in the store. During the data analysis, the co-researchers realized that output should be usable for improving the city and therefore, we had to get rid of ambivalence as much as possible in the data collection method. Tessa exemplifies her thoughts on the data accuracy:

Data, obviously was not. . . always accurate. [For example, there was a place] and it's, it's fine for me. But some people cannot even move. So it really depends on the person. So I think it went really well with filling in the data. But well, like I said, it depends on your disability and on what you're thinking is an obstacle for you.

In particular, after the data visualization and analysis phase, our co-researchers realized how important their honest and critical opinions were for the results of the project. This encouraged them to become more critical when filling in the questionnaire while reestablishing their role as co-researchers. Looking back at all the listed challenges, at least those that involved actions by the co-researchers actually turned out to become a part of the co-learning and empowerment in the project.

## Conclusions

In this article, we illustrated how people with disabilities can be meaningfully included in researching their community, and communicating and proposing change in relation to accessibility and inclusivity. In this project, we adhered to the principles of participatory research, in combination with a design thinking approach (see also Katoppo & Sudradjat, 2015), which allowed us to create a space for co-learning and developing capacity (see also Seale et al., 2015). As other studies did, we worked with a method that is less based on spoken language. But rather than using photovoice, which has been a popular method in other research (see, for example, Aldridge, 2007; Boxall & Ralph, 2009; Gunton et al., 2021; Overmars-Marx et al., 2018; Povee et al., 2014; Wickenden & Kembhavi-TamView, 2014), we “extended boundaries of participatory methodologies” (Seale et al., 2015) by co-creating and applying a digital tool with our co-researchers (see also Rebernik et al., 2021). In doing so, we contributed to establishing practices of “enabling geography” (Valentine, 2003) by involving our co-researchers in all stages of the project (identifying problems and questions, collecting and analyzing data, interpretation and dissemination, see also Amauchi et al., 2022). But we also experienced limitations due to time, resources, institutional pressures and the difficulties of negotiating appropriate research relations in the context of bodily limitations (Valentine, 2003; Aldridge, 2007, McDonald and Stack,

2015; Lister et al., 2021; Böttger et al., 2022). In particular, transportation provided a key barrier to participation (see also Evanson et al., 2006; Myers & Ravesloot, 2016) as well as resources in the form of dedicated (paid) persons to accompany the entire process. While our project resonates with the various studies we cite, we were also able to offer additional insights and experiences, thus expanding the potential toolbox for researchers collaborating with people with (multiple) disabilities.

Even though the potential of participatory research to effect real change, socially or politically, has been questioned because the qualitative, disaggregated nature of evidence produced by such projects has been found to poorly align with policy design (Ellins et al., 2012), by using design thinking within PR, we hoped to provide an example to policymakers seeking connection to people with disabilities in order to formulate, refine and realize their local inclusion policies. While the design thinking cycle can be adopted to explore topics related to inclusion agendas, the process itself can be regarded as part and parcel of an inclusion policy. Having said this, the aforementioned challenges would require policymakers to (re-)allocate resources to support and enable people with disabilities to participate.

In the project we discuss above, we explored predominantly issues of accessibility in urban spaces. As a result, the digital, map-based tools were found to be appropriate. However, while our resulting map will provide insights into accessible locations, and clusters thereof, in the city, this is less telling about whether such locations are also experienced as welcoming and inclusive. In order to involve co-researchers in understanding practices of inclusion *within* the places we mapped, a new design thinking cycle will be required in which the skills and potentials of the co-researchers with disabilities will have to be translated into data collection methods anew. For the research team, this will yield new opportunities and challenges to further extend the boundaries and enrich the practices of participatory research with people with disabilities.

## Notes

1. In the Netherlands, which comprises the geographic context for our study, the term generally used for people with disabilities is literally “less valid” (Dutch: *Mindervaliden*).
2. Walking might seem like a misplaced word to use in this case, however talking with people who are in a wheelchair often this is the term they use themselves as well.

## Acknowledgments

Andrea Stultiens (Minerva), Peter Groote and the Honours College enabled the start of our collaborations. Continued trust and support were received from 's Heeren Loo (Eveline Westra- Peters). The Geoservice (Sjoerd Kroon en Govert Schoof) helped develop Rolmaps. The *Toegankelijkheidsgroep Groningen*, *ZaVie* and *Wiel&Deal* supported our testing phases with people and insights. Hugo Naval Rosado made the building accessible. Gerd Weitkamp and Anna Lebedieva helped document our project. The project received a nomination for the University of Groningen Ben Feringa Impact Award.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

This research was financially supported by the Enhancing Undergraduate Research Funds (University College Groningen). This publication is part of the project Everyday Geographies of Being and Becoming Disabled (with project number 406.22.SW.061) of the research program SGW Open Competition M Social Sciences 2022 which is (partly) financed by the Dutch Research Council (NWO).

## ORCID

B. van Hoven  <http://orcid.org/0000-0002-6800-8602>

J. Munuera Garcia  <http://orcid.org/0009-0008-8932-0006>

## Geolocation information

The study area of the research is the city of Groningen, in the Netherlands.

## References

- 3D Geoinformation Group TU Delft. (2020). *Building ages in the Netherlands*. Retrieved July 18th, 2023, from <https://parallel.co.uk/netherlands/#14.93/53.21768/6.56436/0/40>
- Abrams, T. (2016). Cartesian dualism and disabled phenomenology. *Scandinavian Journal of Disability Research*, 18(2), 118–128. <https://doi.org/10.1080/15017419.2014.995219>
- Aldridge, J. (2007). Picture this: The use of participatory photographic research methods with people with learning disabilities. *Disability & Society*, 22(1), 1–17. <https://doi.org/10.1080/09687590601056006>
- Alliantie VN-Verdrag Handicap. (2019). *Schaduwrapportage Verdrag inzake de rechten van personen met een handicap in Nederland*. Retrieved October 31, 2022, from <https://iederin.nl/wp-content/uploads/2019/12/Schaduwrapport-VN-verdrag-Handicap.pdf>
- Amauchi, J. F. F., Gauthier, M., Ghezjeljeh, A., Giatti, L. L. L., Keats, K., Sholanke, D., Zachari, D., & Gutberlet, J. (2022). The power of community-based participatory research: Ethical and effective ways of researching. *Community Development*, 53(1), 3–20. <https://doi.org/10.1080/15575330.2021.1936102>
- Askins, K. (2018). Feminist geographies and participatory action research: Co-producing narratives with people and place. *Gender Place and Culture*, 25(9), 1277–1294. <https://doi.org/10.1080/0966369X.2018.1503159>
- Beale, L., Field, K., Briggs, D., Picton, P., & Matthews, H. (2006). Mapping for wheelchair users: Route navigation in urban spaces. *The Cartographic Journal The World of Mapping*, 43(1), 68–81. <https://doi.org/10.1179/000870406X93517>
- Bindels, J., Baur, V., Cox, K., Heijing, S., & Abma, T. (2014). Older people as co-researchers: A collaborative journey. *Ageing and Society*, 34(6), 951–973. <https://doi.org/10.1017/S0144686X12001298>
- Blair, T., & Minkler, M. (2009). Participatory action research with older adults: Key principles in practice. *The Gerontologist*, 49(5), 651–662. <https://doi.org/10.1093/geront/gnp049>
- Böttger, T., Dennhardt, S., Knape, J., & Marotzki, U. (2022). “Back into life—with a power wheelchair”: Learning from people with severe stroke through a participatory photovoice study in a metropolitan area in Germany. *International Journal of Environmental Research and Public Health*, 19(17), 10465. <https://doi.org/10.3390/ijerph191710465>
- Boxall, K., & Ralph, S. (2009). Research ethics and the use of visual images in research with people with intellectual disability. *Journal of Intellectual and Developmental Disability*, 34(1), 45–54. <https://doi.org/10.1080/13668250802688306>
- Brown, T., & Wyatt, J. (2010). Design thinking for social innovation. *Development Outreach*, 12(1), 29–43. [https://doi.org/10.1596/1020-797X\\_12\\_1\\_29](https://doi.org/10.1596/1020-797X_12_1_29)



- Buffel, T. (Ed.). (2015). *Researching age-friendly communities. Stories from older people as co-investigators*. The University of Manchester Library.
- Correa, D. J., Kwon, C.-S., Connors, S., Fureman, B., Whittemore, V., Jetté, N., Mathern, G. W., & Moshé, S. L. (2019). Applying participatory action research in traumatic brain injury studies to prevent post-traumatic epilepsy. *Neurobiology of Disease*, 123, 137–144. <https://doi.org/10.1016/j.nbd.2018.07.007>
- CROW. (1985). *Verkeerscirculatieplan Groningen. Verkeersmanagement Energie en Milieu*. Fietsberaad CROW. Retrieved July 17, 2023, from <https://www.fietsberaad.nl/CROWFietsberaad/media/Kennis/Bestanden/lenvcpg groningen.pdf?ext=.pdf>
- De Klerk, M., Fernee, H., Woittiez, I., & Ras, M. (2012). *Factsheet Mensen met Lichamelijke of Verstandelijke Beperkingen*. Sociaal Cultureel Planbureau.
- Dul, A., & van Hoven, B. (2019). Break out! Op visuele ontdekkingstocht door een (inclusieve?) stad. *Geografie*, 1, 30–32. <https://geografie.nl/artikel/break-out>
- Ellins, J., Glasby, J., Tanner, D., McIver, S., Davidson, D., Littlechild, R., & Spence, K. (2012). *Understanding and improving transitions of older people: A user and carer centred approach*. Final report. NIHR Service Delivery and Organisation programme.
- Estrada-Martínez, L. M., Raciti, A., Reardon, K. M., Reyes, A. G., & Israel, B. A. (2021). Is the scholarship of engagement a meaningful approach to foster change in community development education? Field notes from three community/university partnerships. *International Journal of Community Well-Being*, 4(2), 181–206. <https://doi.org/10.1007/s42413-021-00114-w>
- Evanson, T. A., Ustanko, L., & Tyree, E. (2006). Promoting inclusion of persons with disabilities in faith communities: The faith inclusion forum. *Community Development*, 37(3), 97–105. <https://doi.org/10.1080/15575330.2006.10383111>
- Gleeson, B. (2001). Disability and the open city. *Urban Studies*, 38(2), 251–265. <https://doi.org/10.1080/00420980123531>
- Goi, H. C., & Tan, W. L. (2021). Design thinking as a means of citizen science for social innovation. *Frontiers in Sociology*, 6, 6. <https://doi.org/10.3389/fsoc.2021.629808>
- Gross, P. H., Bales, A. F., Horn, S. D., Hurvitz, E. A., Kean, J., & Shusterman, M. (2018). Setting a patient-centered research agenda for cerebral palsy: A participatory action research initiative. *Developmental Medicine & Child Neurology*, 60(12), 1278–1284. <https://doi.org/10.1111/dmnc.13984>
- Gunton, A., Hansen, G., & Schellenberg, K. L. (2021). Photovoice as a participatory research tool in amyotrophic lateral sclerosis. *Journal of Neuromuscular Diseases*, 8(1), 91–99. <https://doi.org/10.3233/JND-200537>
- Hanson, J. (2004). The inclusive city: Delivering a more accessible urban environment through inclusive design. (Proceedings) *RICS Cobra 2004 International Construction Conference: responding to change*, York, UK.
- Hiranandani, V., Kumar, A., & Sonpal, D. (2014). Making community inclusion work for persons with disabilities: Drawing lessons from the field. *Community Development*, 45(2), 151–165. <https://doi.org/10.1080/15575330.2014.888090>
- Imrie, R. (2001). Barriered and bounded places and the spatialities of disability. *Urban Studies*, 38(2), 231–237. <https://doi.org/10.1080/00420980124639>
- Katoppo, M. L., & Sudradjat, I. (2015). Combining participatory action research (PAR) and design thinking (DT) as an alternative research method in architecture. *Procedia - Social & Behavioral Sciences*, 184, 118–125. <https://doi.org/10.1016/j.sbspro.2015.05.069>
- Kindon, S., Pain, R., & Kesby, M. (2008). Participatory action research. In R. Kitchin & N. Thrift (Eds.), *International encyclopaedia of human geography* (pp. 90–95). Elsevier.
- Kitchin, R. (1998). 'Out of place', 'knowing one's place': Space, power and the exclusion of disabled people. *Disability & Society*, 13(3), 343–356. <https://doi.org/10.1080/09687599826678>
- Lager, D. R., van Hoven, B., & Huigen, P. P. P. (2021). Neighbourhood walks as place-making in later life. *Social & Cultural Geography*, 22(8), 1080–1098. <https://doi.org/10.1080/14649365.2019.1672777>
- Lister, K., Coughlan, T., Kenny, I., Tudor, R., & Iniesto, F. (2021). Taylor, the disability disclosure virtual assistant: A case study of participatory research with disabled students. *Education Science*, 11(10), 587. <https://doi.org/10.3390/educsci11100587>

- Littlechild, R., Tanner, D., & Hall, K. (2015). Co-research with older people: Perspectives on impact. *Qualitative Social Work*, 14(1), 18–35. <https://doi.org/10.1177/1473325014556791>
- Madanipour, A. (2015). Social exclusion and space. In R. T. LeGates & F. Stout (Eds.), *The city reader* (6th ed., pp. 237–245). London: Routledge. <https://doi.org/10.4324/9781315748504>
- McDonald, K. E., & Stack, E. (2016). You say you want a revolution: An empirical study of community-based participatory research with people with developmental disabilities. *Disability and Health Journal*, 9(2), 201–207. <https://doi.org/10.1016/j.dhjo.2015.12.006>
- Minstrom, M., & Luetjens, J. (2016). Design thinking in policymaking processes: Opportunities and challenges. *Australian Journal of Public Administration*, 75(3), 391–402. <https://doi.org/10.1111/1467-8500.12211>
- Movisie. (2021). *Inventarisatie implementatie VN-verdrag Handicap in gemeenten Inhoudelijke rapportage van de resultaten van de peiling van 2021, vervat in een trendrapportage van de periode 2018– 2021*.
- Myers, A., & Ravesloot, C. (2016). Navigating time and space: How Americans with disabilities use time and transportation. *Community Development*, 47(1), 75–90. <https://doi.org/10.1080/15575330.2015.1111399>
- OIS Groningen. (2022). Kerncijfers. Retrieved June 4, 2023, from <https://oisgroningen.nl/wp-content/uploads/2022/08/kerncijfers-2022.pdf>
- Overmars-Marx, T., Thomése, F., & Moonen, X. (2018). Photovoice in research involving people with intellectual disabilities: A guided photovoice approach as an alternative. *Journal of Applied Research in Intellectual Disabilities*, 31(1), 92–104. <https://doi.org/10.1111/jar.12329>
- Pain, R., & Kindon, S. (2007). Participatory geographies. *Environment and Planning A*, 39(12), 2807–2812. <https://doi.org/10.1068/a39347>
- Paterson, K., & Hughes, B. (1999). Disability studies and phenomenology: The carnal politics of everyday life. *Disability & Society*, 14: 5, 597–610.
- Pijpers, R., de Kam, G., & Dorland, L. (2016). Integrating services for older people in aging communities in the Netherlands: A comparison of urban and rural approaches. *Journal of Housing for the Elderly*, 30(4), 430–444. <https://doi.org/10.1080/02763893.2016.1224793>
- Povee, K., Bishop, B. J., & Roberts, L. D. (2014). The use of photovoice with people with intellectual disabilities: Reflections, challenges and opportunities. *Disability & Society*, 29(6), 893–907. <https://doi.org/10.1080/09687599.2013.874331>
- Rebernik, N., Favero, P., & Bahillo, A. (2021). Using digital tools and ethnography for rethinking disability inclusive city design- exploring material and immaterial dialogues. *Disability & Society*, 36(6), 952–977. <https://doi.org/10.1080/09687599.2020.1779035>
- Santos Ordóñez, A., González Lema, C., Miño Puga, M. F., Párraga Lema, C., & Calderón Vega, F. (2017). Design thinking as a methodology for solving problems: Contributions from academia to society. *LACCEI International Multi-Conference for Engineering, Education, and Technology*, Boca Raton FL, United States.
- Seale, J., Nind, M., Tilley, L., & Chapman, R. (2015). Negotiating a third space for participatory research with people with learning disabilities: An examination of boundaries and spatial practices. *Innovation: The European Journal of Social Science Research*, 28(4), 483–497. <https://doi.org/10.1080/13511610.2015.1081558>
- Valentine, G. (2003). Geography and ethics: In pursuit of social justice ethics and emotions in geographies of health and disability research. *Progress in Human Geography*, 27(3), 375–380. <https://doi.org/10.1191/0309132503ph438pr>
- Van Wijnen, A. C., & in collaboration with J.C. Kool. (2009). *Disability Studies en Aanverwante Initiatieven in Nederland. Een Inventarisatie*. Handicap+studie, ZonMW and NWO.
- Vermeij, L., & Hamelink, W. (2021). *Lang niet Toegankelijk. Ervaringen van Nederlanders met een Lichamelijke Beperking als Spiegel van de Samenleving*. Sociaal en Cultureel Planbureau.
- Wickenden, M., & Kembhavi-TamView, G. (2014). Ask us too! Doing participatory research with disabled children in the global south. *Childhood*, 21(3), 400–417. <https://doi.org/10.1177/0907568214525426>