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“You’re in a different world if you have a disability”

Exploring wheelchair users’ lived experience of public transportation in

Amsterdam, The Netherlands

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* Title page quote: "You're in a different world if you have a disability" (Annelies).

Abstract

Public transportation has been recognised as a crucial means to participate in society. Research indicates, however, that wheelchair users across the globe still face a range of physical and social barriers to public transportation use. While The Netherlands ratified the United Nations Convention on the Rights of Persons with Disabilities in 2016 — which includes an emphasis on accessible transportation — sources highlight that Amsterdam's public transportation still does not meet the needs of its wheelchair users. With this in mind, this thesis explores how wheelchair users experience public transportation in the Dutch capital. This thesis addresses the following question: *How do wheelchair users experience public transportation in Amsterdam?* To provide a framework to understand these experiences, a phenomenological approach was adopted. As Bruno Latour's Actor-Network Theory emphasises that different actants interact to shape an experience, Latour's approach further guided the analysis. The methodology included 11 semi-structured interviews with 12 manual and electric wheelchair users living in Amsterdam. Interviews were supplemented by participant observation trips, a *Gemeente Vervoerbedrijf* (GVB) accessibility workshop, and relevant photos. Findings suggest that wheelchair users' lived experience of public transportation in Amsterdam is shaped by the built environment (platforms, lifts and accessibility signage), staff and passengers (provision of help, staff knowledge, and a lack of passenger awareness), and policies (the wheelchair assistance policy, the wheelchair priority policy, and prohibited escalator use). This research thus concludes that wheelchair users' experiences of public transportation in Amsterdam are based on the interaction of different actants in relation to the built environment, staff and passengers, and policies. While public transportation can be experienced positively, a combination of elements frequently conspires

to create major challenges for wheelchair users. Amsterdam's policymakers and public transportation authorities, with the input of wheelchair users themselves, must therefore work together to achieve an accessible public transportation experience for everyone.

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Definitions

Disability	A “physical or mental impairment that has a ‘substantial’ and ‘long-term’ negative effect on your ability to do normal daily activities” (United Kingdom Government, 2022, para. 1).
Accessibility	If something is accessible, it means that people “can do what they need to do in a similar amount of time and effort as someone that does not have a disability. It means that people are empowered, can be independent, and will not be frustrated by something that is poorly designed or implemented” (Duggin, 2016, para. 6). This thesis focuses on accessibility in the context of wheelchair use.
Physical accessibility	A place or experience is physically accessible when the built environment (i.e. human-made infrastructure) caters to the needs of wheelchair users and allows them to independently manoeuvre and use the space.
Social accessibility	A place or experience is socially accessible when wheelchair users feel welcome, are treated respectfully, and are properly helped.
Electric wheelchair	A wheelchair that is electric-powered or motorised.
Manual wheelchair	A wheelchair that is manually powered.
Public transportation	In the context of Amsterdam, public transportation refers to the trams, metros, buses, and ferries operated by the <i>Gemeente Vervoerbedrijf</i> (‘Municipality Transport Company’) and the trains operated by the <i>Nederlandse Spoorwegen</i> (‘Dutch National Railway’).

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Introduction

Wheelchair Use & Public Transportation

A key target of the Sustainable Development Goals for 2030 is providing “access to safe, affordable, accessible transport systems for all” (Global Goals, 2022, Target 11.2). Part of this target includes creating public transportation systems suited to the capabilities of people with a physical disability, including wheelchair users. With over 1 billion people worldwide experiencing some form of disability and approximately 65 million people (1% of the global population) who use a wheelchair, the importance of making public transportation inclusive for people with reduced mobility is gaining traction on an international scale (World Health Organisation, 2008).

Public transportation has been recognised as a crucial means to participate in society (Lucas, 2012). Public transportation provides access to opportunities for education, employment, medical services, leisure activities, and community engagement (Chatterjee et al., 2019; Stjernborg, 2019). Using public transportation can be especially important for wheelchair users, as their access to other forms of private transport is often limited (Jolly et al., 2006; Stjernborg, 2019). When accessibility of public transportation is lacking, therefore, this exacerbates “transport disadvantage” (Lucas, 2012, p. 105)¹ for people with a disability. A lack of suitable, affordable transportation denies wheelchair users the chance of mobility and full participation in society (Lucas, 2012).

Recent research suggests that wheelchair users still face a range of physical and social barriers to the use of public transportation. Inaccessible layouts, broken lifts, crowded spaces, and negative attitudes of public transportation staff are just a few examples (Chowdhury & Park, 2018; Stjernborg, 2019; Velho, 2019). This combination of inadequate accessibility

¹ Also known as “transport disability” (Pyer & Tucker, 2017, p. 1) or the “travel-gap” (Jolly et al., 2006, p. 8).

infrastructure and (lack of) public awareness creates a “disabling environment” (Imrie & Kumar, 1998, p. 372), which limits wheelchair users in their ability to travel independently and perpetuates social exclusion (Wilson, 2003; Lucas, 2012). Disability is therefore seen as far more than just a physical impairment. Rather, it is an “interaction between individual capacities and a person’s physical and social environment” (Jaffe & de Koning, 2016, p. 47).

A Focus on Amsterdam, The Netherlands

This thesis explores wheelchair users’ lived experience of public transportation in the context of Amsterdam, The Netherlands. The Netherlands ratified the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) in 2016 (United Nations, 2016). This includes a commitment to the “identification and elimination of obstacles and barriers to accessibility [of]... transportation” (UNCRPD, 2006, Article 9). It also ensures access “on an equal basis with others” (UNCRPD, 2006, Article 9).

In the spirit of the UNCRPD, the *Gemeente Vervoerbedrijf* or ‘Municipality Transport Company’ (GVB) operating Amsterdam’s metros, buses, trams, and ferries claims to be “hospitable, connecting, and reliable” (Gemeente Vervoerbedrijf, 2022a, para. 1) and “is working hard to make public transportation accessible to all travellers” (Gemeente Vervoerbedrijf, 2022b, para. 1). Similarly, the *Nederlandse Spoorwegen* or ‘Dutch National Railway’ (NS) operating Amsterdam’s trains strives for “equal travel possibilities” (Nederlandse Spoorwegen, 2022a, para. 1) for all commuters with a disability. In practice, however, several sources indicate that Dutch public transportation still does not meet the needs of wheelchair users in Amsterdam (Netherlands Institute for Human Rights, 2017; Beumkes, 2018; Lauria, 2021).

To understand how wheelchair users experience public transportation, it is crucial to understand wheelchair users' own perspectives. By focusing on the personal lived experience of wheelchair users, therefore, this thesis aims to explore what using a wheelchair in Amsterdam's public transportation system is like and what factors shape these experiences. In doing so, I hope to guide Dutch policymakers to improve the opportunities for wheelchair users' mobility, independence, and freedom to participate in society.

Literature Review

This section highlights the most relevant literature to date. It is categorised into: the (disabling) built environment, barriers to the accessibility of public transportation, and literature focused on The Netherlands.

The (Disabling) Built Environment

The first relevant theme addressed throughout the literature is the built environment.

Referring to human-made structures and facilities that people encounter in their daily lives, the built environment can either help or hinder wheelchair users and has a “significant impact on the ease of journeys made by people with disabilities” (Chowdhury & Park, 2018, p. 3).

Scholars highlight that the built environment plays a role in the experience of public transportation not just at the site of public transportation itself (e.g. inside a train station or a train carriage), but from the moment a wheelchair user leaves their starting point to the moment they arrive at their destination (Wilson, 2003; Chowdhury & Park, 2018).

If the built environment is inaccessible, it is “difficult to use [public transportation] in the first place” (Chowdhury & Park, 2018, p. 3). Examples of inaccessibility include uneven street surfaces, inadequate disabled parking spaces, and obstructed footpaths — all of which

can make it challenging or impossible for wheelchair users to independently reach their desired mode of transport (Chowdhury & Park, 2018). An inaccessible built environment is thus argued to be “disabling” (Imrie & Kumar, 1998, p. 372), discriminating against wheelchair users by neglecting their accessibility needs. Rather than only focusing on the accessibility of actual modes of public transportation, we must therefore consider the entire “transport chain... [including] all the problems disabled people might experience along the route” (Wilson, 2003, p. 11).

Barriers to the Accessibility of Public Transportation

Building on the disabling environment, several studies highlight physical accessibility barriers of public transportation. Physical accessibility barriers include poor infrastructure design and gaps between the train and platform (Jolly et al., 2006; Transport for London, 2010). Other literature points to a lack of lifts, steep ramps, and inadequate wheelchair-friendly toilets at stations (Chowdhury & Park, 2018).

Scholars also emphasise limited “personal and manoeuvrable space” (Velho et al., 2016, p. 29), especially during peak travel times. For wheelchair users, limited space can foster feelings of insecurity and a lack of safety (Transport for London, 2010; Stjernborg, 2019). Poor accessibility information provision in public transportation has also been discussed throughout past publications (Jolly et al., 2006; Chowdhury & Park, 2018).

Within the built environment, literature further points to the role of technology. Technical faults and challenges in transport design can make public transportation use particularly difficult for wheelchair users (Asplund et al., 2012; Velho et al., 2016). Examples include broken ramps or ramps with an exceptionally steep incline that make boarding “more difficult and alighting more dangerous” (Velho et al., 2016, p. 28). Though ramps are meant

to help wheelchair users, ramps with a steep incline can result in accidents and shoulder injuries due to the push force needed to get up (Velho et al., 2016).

Imrie & Kumar (1998) further argue that the built environment can have direct emotional implications, leaving wheelchair users to feel “humiliated and degraded” (Imrie & Kumar, 1998, p. 365). Overall, scholars argue it is crucial to remove physical barriers for “the full participation of disabled people in the transport system” (Stjernborg, 2019, p. 4).

In addition to physical barriers, research by Velho et al. (2016) highlights social barriers to public transportation use. Social barriers arise via interactions with other passengers or public transportation staff. The fact that designated wheelchair areas are often occupied by other passengers or prams, for example, exacerbates already limited manoeuvrability and can induce anxiety in wheelchair users (Velho et al., 2016).

Other social barriers include passengers refusing to step aside for wheelchair users; passengers failing to move their prams; bus drivers forgetting wheelchair users need to get off at a particular stop; and a lack of knowledge of public transportation staff on how to correctly use the bus ramp (Transport for London, 2010; Velho et al., 2016). Negative reactions of other passengers can form an additional barrier, including “nosy questions... pushing their wheelchair without asking, or even outright verbal and physical abuse” (Velho et al., 2016, p. 30). Many of these experiences have been found to increase wheelchair users’ feelings of “stigma [and] public humiliation” (Velho et al., 2016, p. 28), influencing their travel choices and transport modes (Transport for London, 2010). Overall, the literature highlights that these physical and social accessibility barriers have negative consequences and the potential to exclude wheelchair users even further (Velho et al., 2016; Stjernborg, 2019).

Literature Focused on The Netherlands

Literature about wheelchair use on public transportation in The Netherlands is limited. One notable report includes a 2019 publication by the *Alliantie VN Verdrag Handicap* ('Alliance of the UNCRPD'). The report argues improvements must be made to public transportation across The Netherlands. Although goals were set to make all bus and train stations accessible by 2011, for example, this has not been achieved. Train wheelchair assistance was reportedly only available at a quarter of Dutch stations (Alliantie VN Verdrag Handicap, 2019). Bus accessibility was considered inadequate, with drivers driving past wheelchair users; unwillingness of drivers to provide ramp assistance; "and a quarter of Dutch bus ramps reportedly broken" (Alliantie VN Verdrag Handicap, 2019, p. 18). The report also highlights the need for more accessibility training for public transportation staff (Alliantie VN Verdrag Handicap, 2019).

A further study commissioned by the Netherlands Institute for Human Rights (2017) investigated wheelchair accessibility of bus transportation in The Netherlands. Based on over 450 anonymous 'mystery guest' wheelchair test drives, the study found patterns of inadequate assistance provision (14% of journeys); broken wheelchair ramps (11% of journeys); and unpleasant or disrespectful treatment by others, often the driver (7% of journeys) (Netherlands Institute for Human Rights, 2017). While there was a certain "reluctance... to travel by bus" (Netherlands Institute for Human Rights, 2017, p. 1), wheelchair users still reported "many positive experiences" (Netherlands Institute for Human Rights, 2017, p. 1).

Recently, the City of Amsterdam (2021) researched how public transportation in Amsterdam can be made more accessible for people with a physical disability. This research

was done as part two prototypes of assistive mobile apps, *Halteknop* and *Haltebuddy*.² The studies found that there is a need for more information provision in preparation for travel, a need for better personalised travel advice based on individual disabilities, and a need for frequent updates about travel disruptions (Baas & Faber, 2021). Interviews further emphasised that participants valued their independence, treatment by transport staff was often experienced negatively, and various infrastructure characteristics (e.g. the height and width of tram platforms) created barriers to the use of public transportation (Baas & Faber, 2021).

The Need for Further Research

While various studies have examined the experiences of wheelchair users on public transportation (Jolly et al., 2006; Asplund et al., 2012; Velho et al., 2016; Stjernborg, 2019) none have focused solely on the lived experience of manual and electric wheelchair users living in Amsterdam. This insight into a variety of wheelchair users' experiences is crucial to ultimately understand how Amsterdam's policymakers and public transportation authorities can foster a more accessible public transportation system.

Theoretical Framework

A Phenomenological Approach

This thesis takes a phenomenological approach. Phenomenology refers to “the study of an individual's lived experiences within the world” (Neubauer et al., 2019, p. 90).

Phenomenological analysis “attempts to explore personal experience and is concerned with an individual's personal perception or account of an object or event” (Smith & Osborn, 2003,

² *Haltebuddy* offers travel advice for people with a disability. In *Halteknop*, travellers can indicate that they need assistance e.g. to enter a specific bus from e.g. the specific bus driver. Eventually the research of both apps led to the creation of *Haltehulp*, integrated into the GVB's general travel app (*Haltebuddy*, 2022).

p. 53). Phenomenology also “seeks to describe the essence of a phenomenon by exploring it from the perspective of those who have experienced it” (Neubauer et al., 2019, p. 91). As such, a phenomenological approach is appropriate to research wheelchair users’ personal experiences of public transportation in Amsterdam.

The Actor-Network Theory

To capture the “essence of a phenomenon” (Neubauer et al., 2019, p. 91), it is crucial to explore all the different elements that shape an experience. Bruno Latour’s Actor-Network Theory (1999) was therefore selected as the theoretical framework in order to demonstrate the complexity of experience. Originating in the 1980s, Actor-Network Theory (ANT) proposes that for an experience to be understood, it is crucial to examine how all of its parts interact (Cresswell et al., 2010). Latour argues that social networks are made up of human and non-human components and that experience is formed by “a multitude of people and things” (Bencherki, 2017, para. 1). It “considers human agency [as well as]... the power of objects and the way in which the inanimate can influence social processes” (Payne, 2017, p. 120). With origins in science & technology, ANT is also helpful in demonstrating the “role of technology” (Cresswell et al., 2010, p. 1).

ANT has several components (see Figure 1). An *actant*, firstly, refers to a node in the network, “something that acts... [and] modifies a state of affairs by making a perceptible difference” (Dolwick, 2009, p. 39). An actant can “be anything provided it is the source of action” (Latour, 1996, p. 373). Actants can be human (e.g. a train passenger or a staff member) or non-human (e.g. a wheelchair, a lift, or a policy), and can “only act in combination with other actants and in constellations that give the [actant] the possibility to act” (Cresswell et al., 2010, p. 2). While a non-human actant (e.g. a wheelchair) may not have

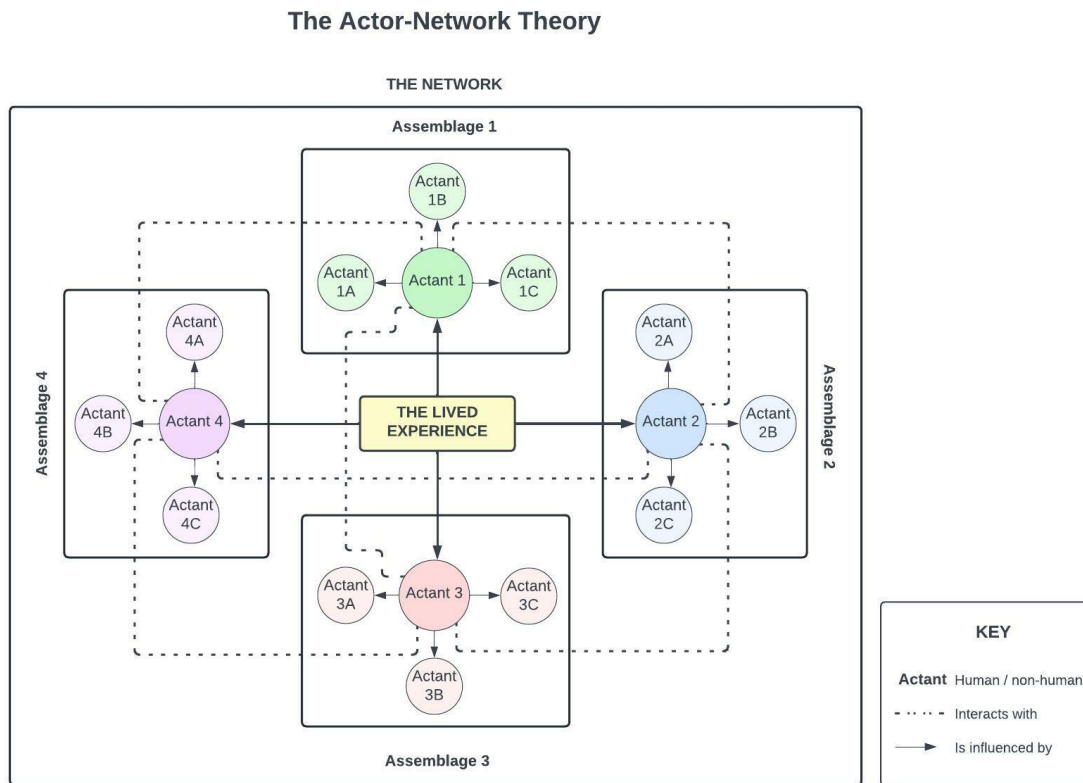
an *intention*, it still makes a difference whether it is in the wider network or not. Actants may also have many components themselves, meaning they can sometimes be a type of smaller network within the bigger network (Latour, 2005). Actants can be *mediators* — those that cause significant changes in the network — and *intermediaries* — those that do not make a difference, simply providing “information and connections” (Goodchild & Ferrari, 2021, p. 5).

The interaction of different actants leads to an *assemblage* (Elder-Vass, 2019), referring to “an assembly of [actants]” (Dolwick, 2009, p. 39) that makes up an experience. Assemblages consist of multiple actants and can be connected to other assemblages. To understand each actant, therefore, it is crucial to look at the sub-actants (and sub-networks) it is composed of (Latour et al., 2012). Assemblages continuously evolve, as “social reality is... both complex and fluid” (Cresswell et al., 2010, p. 3).

Crucial to ANT is the notion of “*generalised symmetry*” (Latour, 1996, p. 15),³ referring to the assumption that all human and non-human actants have equal importance in social experiences (Lezaun, 2017) (e.g. a tram conductor, the type of wheelchair, and a policy hold equal weight). Actants also “influence each other” (Payne, 2017, p. 121). If any actant is changed, added or removed in the assemblage, then the “functioning of the whole network will be affected” (Cresswell et al., 2010, p. 3).

³ To clarify how this symmetry should be interpreted, Latour has stated: “ANT is not, I repeat is not, the establishment of some absurd: 'symmetry between humans and non-humans'. To be symmetric, for us, simply means not to impose a priori spurious asymmetry among human intentional action and a material world of causal relations” (Latour, 2005, p. 76).

Figure 1: The Actor-Network Theory



Source: Author's own (Adapted from Latour, 2005; Dolwick, 2009; and Cresswell et al., 2010)

As can be seen in the diagram, the lived experience is shaped by different actants, which each branch out into other actants (and so on) to create assemblages. These assemblages form a network and interact to produce an experience.

Rather than viewing disability (and by extension, wheelchair use) solely as an individual medical problem (seen in the Medical Model of Disability), or solely as a social product whereby society “disables physically impaired people” (Shakespeare, 2017, p. 197) (seen in the Social Model of Disability), ANT can help to highlight that experiences are complex and cannot be reduced to simply medical, social, or technical factors alone.

In the past, scholars have looked into ANT as a framework for disability studies (Rudnicki, 2018; Zhao & Shen, 2020) and the role of mobility technologies in enabling or disabling the mobility of wheelchair users (Gaete-Reyes, 2015). While ANT has been briefly touched upon in relation to wheelchair use on London buses (Velho et al., 2016), ANT has

not been widely used as a framework for wheelchair users in the context of public transportation.

Research Question

This thesis addresses the following research question: **How do wheelchair users experience public transportation in Amsterdam?**

Three sub-questions have been embedded in the research:

- 1) How does the built environment shape wheelchair users' lived experience of public transportation?
- 2) How do staff and passengers shape wheelchair users' lived experience of public transportation?
- 3) How do policies shape wheelchair users' lived experience of public transportation?

Here, 'public transportation' refers to Amsterdam's trains, trams, buses, ferries, and metro system. The choice of sub-questions was based on their ability to demonstrate a range of different actants that make up the 'network' of wheelchair users' experiences. Each theme per sub-question (the built environment, staff and passengers, and policies) can be viewed as an assemblage in the wider network (i.e. the public transportation experience). Furthermore, by focusing on the lived experience and perspectives of wheelchair users themselves, the research questions provide insight into personal perceptions in line with a phenomenological approach (Smith & Osborn, 2003).

Based on prior literature and my personal experience as a wheelchair user,⁴ my expectation before starting the data collection process was that the built environment, staff and passengers, and policies each have the potential to shape experiences both positively and

⁴ See Appendix 2 for reflections on the contribution of my own experience to this research.

negatively. In addition, I expected that all three themes interact to form wheelchair users' overall experience of public transportation.

Methods

Study Design

This thesis aims to understand how wheelchair users experience public transportation in Amsterdam. A qualitative approach was therefore chosen in order to “gain insight into... subjective experiences” (Busetto et al., 2020, p. 3).

Eleven semi-structured interviews were conducted with a total of 12 participants (1 interview involved two friends). Interviews ranged between 40 minutes - 2 ½ hours (15 hours total), some of which were preceded and/ or followed by informal chats of 1 hour or more. Depending on participant preferences, most interviews (9) were conducted in-person, at the participants’ home (7), or in a café (2). Other interviews (2) were conducted via Zoom. Interviews also included photo elicitation (e.g. using my own photos of metro carriages) as this could “enhance the participation... of the interviewees and... [help] the gathering of richer data” (Meo, 2010, p. 155). Each interview was recorded, transcribed, coded, and analysed. Participants were given a copy of their transcript, which enhanced respondent validation and “member checking” (Birt et al., 2016, p. 1802). All participants remained anonymous and chose their own pseudonym (see Table 1).

The study design also included two participant observation public transportation journeys. Participant observation was considered an appropriate method as it could “generate an in-depth, multi-faceted understanding of a complex issue in its real-life context” (Crowe et al., 2011, p. 1). I accompanied Carry (an electric wheelchair user) on a metro journey from Reigersbos to Amsterdam Central Station, and later Pieter (a manual wheelchair user) on a tram journey from Hugo de Grootplein to Amsterdam Central Station. These public

transportation journeys provided further insight into experiences previously talked about in interviews.

In addition, I attended a GVB accessibility workshop for tram drivers in Amsterdam.⁵ The workshop showed public transportation authorities' efforts to educate staff and improve wheelchair users' experiences. I also took photos of public transportation (see Appendix 1).

Table 1: Participants

Participant	Name ⁶	Age	Sex	Type of wheelchair
1	Ari	30	F	Manual
2	Marion	54	F	Manual
3	Annelies	34	F	Manual
4	Emma	31	F	Manual
5	Elisabeth*	31	F	Manual
6	Pieter*	29	M	Manual
7	Felix	50	M	Manual
8	Rick	47	M	Electric
9	Carry	56	F	Electric
10	Laura	29	F	Electric
11	Pip	41	F	Electric
12	Abel	67	M	Manual

Source: Author's own (*Elisabeth and Pieter, two friends, were interviewed together).

Participants

Participants for this research were adult wheelchair users living in Amsterdam. Participants included 12 wheelchair users aged between 29-67 years old (8 females and 4 males). Eight

⁵ See Appendix 4 for an overview of the GVB accessibility workshop.

⁶ All names are pseudonyms, chosen by the participants themselves.

participants used a manual wheelchair and 4 used an electric wheelchair. Participants included individuals with different physical abilities (for example, variation between participants' ability to walk) and participants with a lifelong disability or one acquired later in life. The sample size allowed for a variety of responses within the time constraints of the research.

Sampling & Recruitment

As this research required wheelchair-using participants living in Amsterdam, a purposive sampling technique was used. The inclusion criteria for my research were individuals who used a manual or electric wheelchair; were either full-time or part-time wheelchair users; lived in Amsterdam; and were 18+ years old.

Participants were recruited by contacting relevant organisations (e.g. *Clëntenbelang Amsterdam*), via *LinkedIn*, and by approaching wheelchair users in-person on public transportation. Eventually, with permission from my university supervisor, I recruited participants via social media posts linked to my own website, *Able Amsterdam*.⁷ Snowball sampling led to additional participants.

Data Collection Instruments

Data was collected using in-depth, semi-structured interviews. Interviews were guided by a list of 6 themes (see Appendix 5). All interviews were recorded with a recording device.

Additional data was collected by taking photos in the field and typing out reflection notes for interviews, participant observation journeys, and for the GVB accessibility workshop. Data

⁷ *Able Amsterdam* (www.ableamsterdam.com) is a website about wheelchair-friendly places in Amsterdam. I created this platform in 2018 after my own experience as a wheelchair user. Participants recruited through *Able Amsterdam* were not people I knew personally prior to the interviews.

was operationalised by defining key concepts, either at the start of the thesis (see page 6) or as terms came up throughout the analysis.

Data Analysis

Interview transcripts were analysed according to inductive thematic analysis. This included “coding the [transcript] data without trying to fit into a preexisting coding frame” (Braun & Clarke, 2006 *in* Nowell et al., 2017, p. 8) and “organising, describing, and reporting” (Braun & Clarke, 2006 *in* Nowell et al., 2017, p. 2) emergent themes. Coding was done using *ATLAS.ti* data analysis software. A code tree was made with *Lucidchart* software (see Appendix 6).

Empirical Chapters

In order to explore how wheelchair users experience public transportation in Amsterdam, this section is organised according to three main themes that emerged from the data: 1) The built environment, 2) Staff and passengers, and 3) Policies.

Chapter 1: The Built Environment

The first theme that emerged throughout interviews was the contribution of the built environment to wheelchair users' lived experience of public transportation. The 'built environment' refers to human-made infrastructure and facilities in public transportation.

Platforms

Firstly, a number of participants emphasised that the design of platforms shaped their lived experience of public transportation in Amsterdam. An important factor was the extent to which the carriage floor and platform "seamlessly connect" (Rick). The metro platform was, for example, described to be the "most" (Ari) accessible, as it is often "equal in height" (Ari) with the carriage entrance. This means that wheelchair users can independently manoeuvre and "don't have to put in any effort" (Pieter). During my public transportation trip with Carry, for example, she smoothly rolled into the metro carriage at Reigersbos and exited just as easily at Amsterdam Central Station (see Appendix 3).

However, it is "not the case" (Rick) that the metro platform and carriage are always at an equal height. Laura described that they can have a "big gap in between". For Ari — a manual wheelchair user — the gap means she "would not be able to get on [the metro] by [herself]" and needs her boyfriend to help push her in and out. For Laura and Carry — both electric wheelchair users — the gap means their "little rear wheels sometimes move

horizontally” (Laura) or “turn in all directions” (Carry) which makes it “scary to [go in and out] alone” (Laura).⁸ Platform infrastructure thus shapes the extent to which wheelchair users can be independent. Whether or not the metro platform is level with the carriage was described to “differ depending on the station” (Carry).

Participants shared similar experiences with the design of tram platforms. “Many [tram] platforms are not adapted,” Annelies explained. Some tram platforms were considered “too low” (Emma), which creates a big “height difference” (Emma) between the platform and the tram. As a result, wheelchair users “need to use a ramp” (Rick) — making them dependent on the help and skill of others, *and* whether the ramp technology actually works (Rick).

Aside from the platform height, Emma, Carry, and Marion all described challenges that can come with the platform width. “Sometimes you can’t even get onto [the platform] because it’s so narrow,” Carry said. Emma added: “Often, when it’s busy, you can’t pass in a wheelchair. I’m constantly asking people if they can move aside”. In some cases, the tram platform was so narrow that “you are basically on the bicycle path” (Emma) by the time you reach the end of the ramp. Marion recalled a similar experience:

There’s a stop just past [the] Albert Cuyp Market. When they put the ramp down to get off the [tram], you’re onto the road... There’s nowhere for you to get down... it comes down onto the kerb, but there’s no kerb left... [and you end up] in front of cars.

Due to the variation in platforms, several participants have learned to take particular routes for an easier experience. During my public transportation trip with Pieter — a manual wheelchair user — he had the choice of two tram stops to get from Hugo de Grootplein to

⁸ While other people cannot physically help Laura move her electric wheelchair due to its weight, they can provide instructions about which direction she needs to turn.

Amsterdam Central Station. Pieter deliberately chose the lower platform, as he knew this would allow him to enter the tram independently (see Appendix 3). Learning to navigate the accessibility of public transportation was echoed by Felix, who said “[you] get to know your way around”. Rick also explained that his past experience with public transportation has taught him what to anticipate and where to go.

Lifts

Participants also emphasised that lifts shaped their lived experience of public transportation. Overall, participants explained that station lifts in Amsterdam are “broken quite often” (Elisabeth). Pieter, for example, said “the lift at Amsterdam Zuid [Station] from the tram to the train is basically always broken”. Carry mentioned the IJ Passage platform lift in Amsterdam Central Station often does not work. Abel similarly recalled that “one of the lifts is [usually] broken” at the Amstelveenseweg metro stop. According to Annelies, a particular lift at Sloterdijk Station was “broken for more than two years”. The recurrence of broken lifts was reiterated during both public transportation journeys with Pieter and Carry, during which a total of four lifts were out of order (see Appendix 3).⁹

Broken lifts make the experience of public transportation considerably more challenging (Ari; Rick). This is partly because broken lifts can make or break the accessibility of a mode of transport. Rick explained: “I’d consider the metro to be the most accessible, but then the lift has to work. The moment the lift doesn’t work, [the metro] is a *terribly* inaccessible thing”. Annelies similarly said, “I mean, I want to go [with public transportation] more often, but if the lifts don’t work then I still can’t get to the metro”.

⁹ Fortunately, Pieter was able to use the escalator and Carry could use an alternative lift.

Annelies thus emphasised the “whole system” has to work properly in order for wheelchair users to utilise public transportation.

For Ari, broken lifts have been upsetting, “stressful”, and can “ruin [her] day”. Ari explained: “[It’s because] you were just going somewhere and then suddenly... Oh my God... I cannot get out [of the station]”. Rick explained that when things like this happen it “makes him feel really disabled, because then [he] can’t participate”.

When there is no alternative working lift, broken lifts “generally mean having to take a much longer route” (Rick). Pieter has arrived late to appointments as a result, while Ari has had to cancel plans all together. The high frequency of broken lifts has led Annelies to “consciously leave the house earlier” and means her “trust in public transportation is completely gone”.

Signage

Several participants also discussed the importance of accessibility signage in shaping their lived experience of public transportation. This includes wheelchair icons marking accessible routes or signs for designated wheelchair spaces. Good signage can help wheelchair users to know “where [they] should be going” (Ari) and can ease interactions with other passengers by reminding others that a particular carriage has “a wheelchair area” (Ari).

Some participants felt that “signage can be better” (Marion), particularly station signage indicating how to get to the lift (Marion; Pieter). Pieter, for example, has often “really had to look for the lift”, especially when he is at a station he has not been to before. Marion echoed this sentiment and elaborated on how inadequate signage has shaped her experience of public transportation:

Signage is not always very good about where the lift is. You come off and then you go one way down the metro and then you discover all the elevators are at *that* end of the metro... If you've got to wheel along the length of the platform, it is smooth... But to try and get to the other end, I mean, it all costs energy... It takes away from the enjoyment of what you're going to do.

Annelies further highlighted that the mere presence of signage is not enough — it has to be legible in order to actually help. The sticker that indicates who to contact in the event of a broken lift, for example, is often placed too high for wheelchair users and has “larger letters and smaller letters” (Annelies). The smaller letters in particular are impossible to read if you are seated in a wheelchair (see Appendix 1, Photo 7).

Chapter 2: Staff & Passengers

The second theme that emerged throughout interviews was the contribution of staff and passengers to wheelchair users' lived experience of public transportation. Participants emphasised that interactions with public transportation staff and passengers shaped perceptions of “social accessibility” (Rick), concerned with whether wheelchair users are treated respectfully, are helped properly, and “feel welcome” (Pip).

Providing Help

Participants highlighted that staff and passengers partly shaped lived experiences of public transportation by whether or not they provide help. Staff were described to be “helpful” (Pip) and “positive” (Emma). Passengers were perceived as equally “kind” (Abel) and “friendly” (Pip). Help was regularly offered, which — when needed and consented to by wheelchair users — has helped participants out of challenging situations and made for an easier public transportation journey (Abel; Emma; Pieter).

Though staff and passengers could be helpful, however, “they aren’t always equally adept” (Abel). Since becoming a wheelchair user a few years ago, therefore, Abel has learned to instruct those who help him on public transportation. Elisabeth agreed, explaining that “[you] learn to give people tasks. You just have to be very clear”.

Participants made a distinction between the people that *offer* to help and people that assume you need help and act *without asking*. Most participants did not welcome the latter. Marion, for example, described how “people just grab the wheelchair and move you back, because they see that someone else needs space. It’s like you’ve got no brain because you’re sitting in a wheelchair”. For Carry, people unnecessarily pushing her “made [her] nervous”. Elisabeth was left feeling “unhappy” as this unwanted help fuelled her insecurities about being perceived by others as “helpless and dependent”. For Felix, these encounters have led to anger and made public transportation journeys frustrating. “You can’t just grab me,” Felix reiterated, “This wheelchair is an extension of my body. So [if you move my wheelchair], you’re touching *me*... It’s not my chair, it’s *part of my body*”.

In addition, Pieter emphasised that moments when passengers or staff unnecessarily step in are precisely when “things can go wrong”. Pieter explained:

Sometimes I have my wheelchair behind me, I grab it in a certain way with one hand and a pole with the other, and then I kind of push myself out and land in the wheelchair. But then someone who *thinks* they’re being helpful picks up my wheelchair. Firstly, they’ve made me lose my balance. Secondly, I can’t land in the wheelchair anymore. Then the person grabs my chair and puts it somewhere. It’s *really* irritating.

Though these experiences were described by both electric and manual wheelchair users, participants pointed out that having a wheelchair with push handles encouraged

unwanted assistance. “Handles are an invitation,” Marion explained. Marion, Elisabeth, and Pieter all speculated they have less people moving their wheelchair on public transportation now, since — due to these “*really* irritating” (Elisabeth) interactions — they purposely acquired a wheelchair without handles (Marion; Elisabeth; Pieter).

Past experiences with passengers have also taught Pieter how to respond to unwanted help. Pieter explained:

I immediately say “no”. *Really clearly*. I don’t say “no, thank you” anymore, because with “no, thank you,” [I’ve learned that] sometimes they don’t hear the “no” and only the “thank you” and they think it’s a “yes”. So now I just say “no”.

In contrast to all other participants, Abel was the only one whose public transportation experiences were not negatively shaped by people touching his wheelchair without his permission. “I always think, if people want to give me a little push, *go on, just do it*. Then you can feel good too,” Abel said.

While the participants mentioned above described passengers and staff offering help, others shared experiences in which people failed to assist when help was needed. “You have [staff] that want to help you, and [staff] that don’t,” Carry explained. Staff have, for example, refused to put the wheelchair ramp out. While some just “didn’t feel like it” (Annelies; Laura), others did not want to risk “breaking their fake nails” (Pip). For certain staff, refusal stemmed from feeling pressure to keep to the time schedule, worried that the ramp would take too long and cause them to be late (Laura; Rick).

In these situations, Laura has felt especially “humiliated” when bystanders also did not offer support. Laura recounted a particularly upsetting experience:

... And then [the tram conductor] said, “I don’t feel like [putting the ramp out]”.

Of course, I was *really* triggered... so I started crying. But I was really angry too, so

I said, “You *can’t do this*. You *have* to take me. This is against the law”. And then a passenger said to me, “Ma’am, you shouldn’t complain so much”.

As a result of these experiences, Laura has learned to develop “thick skin”. Elisabeth similarly talked about putting up “a type of armour”. For Laura, past passenger interactions now mean she goes into public transportation with a certain mentality, anticipating challenging social interactions:

I’ve noticed that I’ve got a strong mindset. It’s partly something I have in me, and partly something I’ve taught myself. Because without it, you get nowhere. So, I already go in [to public transportation] with the idea of, *Okay, here we go*. I’m already prepared for the worst.

Knowledge

In Amsterdam’s buses and trams, staff members operate the ramp that allows wheelchair users to enter and exit. One of the most recurring experiences shared by participants was that staff lacked the knowledge of how to use these ramps.

While Emma “often encountered bus drivers that don’t know how the ramp works”, Annelies claimed that “some [staff] don’t know how it works at all”. Officially, drivers and conductors have to ensure the provision of help for wheelchair users, i.e. the use of the ramp — or find someone else who can (Rick) — but this is not always the case. While manual wheelchair users may still “have the power to roll in... and out [with help]” (Rick), the weight of electric wheelchairs means it is rarely possible without a ramp. Carry has, therefore, been told by drivers to “just wait for the next tram”. Rick, however, often chooses to wait for the next vehicle in these situations, as it “costs the least amount of energy” compared to involving external support. Whichever option, this lack of staff knowledge

means wheelchair users' public transportation journeys are extended or delayed and can cost "a lot of energy" (Carry).¹⁰ For Emma, the frequency of these situations means she "[avoids] the bus as much as possible".¹¹

Staff were described to have shaped wheelchair users' experience of public transportation more positively through the knowledge that they *do* have and share. This knowledge allows participants to make informed decisions that reduce complications throughout their journey.

Laura, for example, explained that she cannot use all tram stops as they do not all have a dropped kerb.¹² To know which stop is accessible, Laura can either check the GVB app or "ask the conductor where you need to get out". Staff knowledge can also inform wheelchair users when road works mean that stops that are normally accessible suddenly are not. Rick explained: "You often have temporary [tram] stops. Those concrete things they put down. I can't do anything with that. So, I'd rather [the staff] tell me in advance, then I'll choose a different route". When Rick was once not informed, he suddenly found his intended stop was inaccessible and had to make a detour. "I had to drive back from the next stop," Rick said, "Luckily I could drive back quite easily. My wheelchair can drive reasonably well, but [the situation] isn't handy".

Lack of Awareness

Described by Felix as "obliviousness", several participants also talked about how passengers' "lack of awareness" (Marion) made public transportation less pleasant. This referred to

¹⁰ These public transportation delays can lead to further negative consequences, such as missing important medical appointments (Laura; Felix).

¹¹ It was encouraging that the GVB workshop I attended focused partly on teaching staff how to safely and correctly use the tram ramp (see Appendix 4).

¹² This refers to a lowered part of the pavement, allowing wheelchair users to roll up and down.

situations where other passengers were not mindful of wheelchair users, especially during peak travel times. Emma said:

People here just aren't very concerned with the fact that someone is using a wheelchair... so... even if they *see* me, I really have to ask, "Can you please step aside?" And even then, it can still be difficult.

Rick described this lack of awareness was also common inside transport vehicles: "When the door opens, people are... on their mobile phones. They don't even look to see if someone is already there... passengers almost climb *over* you as you roll in".

Sitting in a wheelchair also means your head is at other standing passengers' "butt [and] back height" (Rick). When crowded, Rick "regularly [gets] backpacks hitting [his] face, because people forget they're wearing a backpack. They turn around, and *bam*". Marion described similar experiences: "People are holding stuff and they just turn around and bash you" without apologising. To Felix, these equally familiar apology-less encounters felt "disrespectful [and] rude".

For Marion, passenger interactions have shaped her experience so negatively that she has almost stopped using public transportation entirely. Treatment by other passengers "adds to the stress and... diminishes my use of public transport," Marion explained. "My world has shrunk massively," Marion continued, "My life is small... And [I have] that permanent feeling of missing out. Because I can't do things".

Chapter 3: Policies

The third theme that emerged throughout interviews was the contribution of policies to wheelchair users' lived experience of public transportation. 'Policies' refers to the procedures

and regulations implemented by the NS and GVB regarding wheelchair users' use of their services.

Wheelchair Assistance

Numerous participants shared experiences about the wheelchair assistance policy. This policy requires wheelchair users to book assistance from an NS staff member at least an hour in advance (via an app or phone call) to board Amsterdam's InterCity trains with a portable ramp, as the platform height is not equal to the train entrance (Nederlandse Spoorwegen, 2022b).

Several participants experienced the policy to pre-book assistance negatively. Participants described the policy as “not very practical” (Elisabeth), “a hassle” (Abel) and — although an improvement to several years ago when assistance had to be booked days in advance — “not that nice to organise” (Rick), partly as it removed spontaneity. It was also perceived by some participants to take away a sense of “autonomy ... [as] you really have to live by the measures in place” (Rick) and “your life is decided by the times that [the NS] agrees on” (Carry).

Others described that when they booked assistance as per the policy, it was unreliable. This was highlighted by Abel when he said:

The train is a lot more difficult. You've got to organise everything beforehand. Call them. Organise your trip. Usually [the NS staff] are there, but ... I've had two experiences [out of the last 5 or 6] where they weren't there with the wheelchair ramp.

Laura echoed this, stating:

I've had experiences where [the NS staff] forgot to take me out and I had to keep travelling. Of course, I asked other passengers "Can you maybe call someone for me?" But the train isn't going to wait until I'm out.

An important factor in these situations, Laura explained, was her use of an electric wheelchair. This "makes a big difference in terms of accessibility [as it] weighs 120 kilos and you can't pick it up" (Laura). Unable to enter the train, Laura has had to miss important university lectures and "just had to go home". Unable to leave the train, Laura has been forced to travel much further than intended, sometimes waiting for more than 4 hours "because there wasn't any assistance available".

In contrast, failing assistance services meant Elisabeth, a manual wheelchair user, could still get in and out with help. "I don't weigh very much," Elisabeth explained, "You could pick me up [in my wheelchair] and carry me into the train with someone else... That makes it a lot easier".

When I accompanied Pieter to Amsterdam Central Station (see Appendix 3), it was clear that wheelchair users' physical capabilities also shape their dependence on, and choice to use, the wheelchair assistance policy. While boarding the train from Amsterdam to Berlin, Pieter (who has a limited ability to walk) chose not to book wheelchair assistance. Instead, he stood up, carefully walked up the steps, and hoisted his wheelchair into the train. This, Pieter explained, was because:

Wheelchair assistance takes more time than just putting [the wheelchair] in myself.

I have to find people to do it, they have to put the ramp in place. For me, it's an awkward interaction. Independence is part of it. And the booking itself takes time too.

When assistance was provided as per the policy, however, participants emphasised it can facilitate an efficient, pleasant, public transportation experience. This was expressed by Annelies, when she said: “At Amsterdam Central Station it’s well organised... they really take [wheelchair accessibility] into account”. Participants were varied in their opinions, as Elisabeth — who previously mentioned the impracticality of the policy — went on to explain that the assistance service actually “works quite well... The staff are quite helpful... When you arrive they are there immediately, you roll off [the ramp] and just say, ‘bye!’, so it’s quite efficient”.

Wheelchair Priority

The wheelchair priority policy was also described by several participants to have shaped their lived experience of public transportation. This policy refers to Amsterdam’s trams, buses, and metro carriages having a designated wheelchair space which, in the absence of a wheelchair user, can be occupied by other passengers. Wheelchair users have priority to use this space, even if another passenger was there first. In trams and buses, passengers with a pram then have to exit the vehicle (Gemeente Vervoerbedrijf, 2022b).

Interviews revealed that this policy often put participants in an uncomfortable position. Pip found it:

... [Difficult] that... the wheelchair space is also a space for prams, and that if a pram is there, you still have priority. Because then the pram has to be sent out... You might be welcome, but you don’t feel good about it because you’ve had to push someone else out.

For some participants, the policy has been a reason to wait for the next tram. Felix said:

Surely, they can't just kick out a mother and child? Look, as a wheelchair user, even if the law says, "Then one of the ladies has to leave", I would say, "Come on, let's be real about this. Close the door and drive off. I'll get the next one".

At times, however, choosing to wait for the next tram to allow others to stay created unpleasant interactions. Rick recounted an incident at the tram stop:

I was waiting at a stop... It was completely full... So, I decided, 'You know what? I'll get the next one'. But the conductor thought, 'No, you're coming.' So, he started telling a woman, "Get out, because the wheelchair has to get in". Of course, that went completely wrong. The woman felt like, 'But I was here first!'... I just thought, '*Please* keep driving. I'll get the next one, I don't need this'. It made me feel so small.

For other participants, the wheelchair priority policy shaped public transportation use more positively. Laura described that "most people react fine to [the policy]", while Ari said "it hasn't been negative". "Depending on how strict the conductor is" (Pip), it can sometimes be a case of simply making "it work however we can... by scooch[ing] somewhere in there" (Ari) and making space for both.

Prohibited Escalator Use

In Amsterdam's train and metro stations, wheelchair users are prohibited from using escalators for safety reasons (see Appendix 1, Photo 8). This policy makes public transportation use difficult however, when lifts are broken. Without a working lift — and unable to use the stairs — wheelchair users need another way to access platforms, station entrances, or exits. For manual wheelchair users, escalators sometimes offer the only solution

to continue a journey at a particular station.¹³ If unable to take the escalator, Ari described that her only other option was “trying another station”, which would take “longer” and cause more “stress”.

Several participants described that they had learned to use an escalator in their wheelchair (Ari; Elisabeth; Marion; Pieter). The high frequency of broken lifts meant this skill was often put into practice despite prohibited escalator use. During my public transportation trip with Pieter, for example, the lift to Pieter’s platform at Amsterdam Central Station was broken. The only way for Pieter to get to his train was by taking the escalator, which he did (see Appendix 3).

Participants described that at Amsterdam Central Station, “nobody [of the staff] bats an eyelid” (Elisabeth) at their escalator use, and “overall, it’s... okay” (Ari).¹⁴ At other stations, however, the policy has led to disagreements with public transportation staff.

Elisabeth recalled a particular experience:

I once took the escalator at Vijzelgracht [Metro Station]. [Public transportation staff] got really angry, [but] the lift was broken. I said, “Yeah, what else can I do?” I find it really irritating, especially when people get angry... I just have to [find a way] to go to work.

¹³ Electric wheelchair users did not use the escalator, partly because the weight of the wheelchair makes it too scary to try (Rick).

¹⁴ During my public transportation trip with Pieter, nobody commented on his escalator use.

Discussion

Overview of the Findings

The purpose of this study was to understand how wheelchair users experience public transportation in Amsterdam. The research focused on how the built environment, passengers and staff, and policies shape wheelchair users' lived experience. The expectations prior to research were confirmed — that various themes (i.e. the built environment, passengers and staff, and policies) interact and shape participants' lived experience both positively and negatively.

The findings indicate that wheelchair users' lived experience of public transportation is shaped by people, the built environment, and policies. Though experiences were often similar between participants, there was variation from one wheelchair user to the next depending on individual characteristics, such as wheelchair type, physical abilities, learned wheelchair skills, or personal perceptions.¹⁵ Within the built environment, platforms, lifts, and signage — when working and designed properly — facilitated the ease of public transportation and the ability for wheelchair users to manoeuvre independently.

Passengers and staff further shaped public transportation experiences through social accessibility. Emphasis was placed on help that was *provided* without asking rather than *offered*. Most participants did not appreciate the former. Staff knowledge of detours could positively shape public transportation journeys, while limited staff understanding about wheelchair ramps, and a lack of passenger awareness, increased stress and delays.

Finally, the wheelchair assistance policy, the wheelchair priority policy, and the escalator prohibition policy shaped participants' lived experience of public transportation.

¹⁵ An example includes Abel not minding others moving his wheelchair without prior permission, while most other participants experienced being moved without permission negatively.

The contribution of these policies was found to depend on the positive or negative nature of interactions with others and how strongly each policy was enforced.

Findings in Relation to Other Research

Through the framework of ANT, it is possible to understand that a range of human and non-human elements interact to shape wheelchair users' lived experience of public transportation in Amsterdam. The built environment, passengers and staff, and policies can all be seen as wider *assemblages*, with various *actants* in each: platforms, lifts, and signage, (in the built environment assemblage); different types of train, tram, ferry, bus, metro, and station staff (in the staff assemblage); different types of passengers, including strangers, family members, or friends (in the passengers assemblage); and the wheelchair assistance policy, the wheelchair priority policy, and the escalator prohibition policy (in the policies assemblage). Other assemblages, like the type of wheelchair, interact with multiple assemblages and can further help or hinder the lived experience.

Findings of this research support the view that changing any one actant means the “functioning of the whole network will be affected” (Cresswell et al., 2010, p. 3). The experience of the escalator policy, for example, depends on the functioning of the lift, the type of wheelchair, whether wheelchair users themselves have necessary escalator-using skills, *and* whether or not public transportation staff enforce the policy. The experience of a high tram platform, for example, depends on staff willingness to help, staff wheelchair ramp knowledge, *and* if the ramp actually works. As was emphasised by Annelies — and in line with ANT — the “whole system” (i.e. network) has to work in order for wheelchair users to successfully utilise public transportation (see Table 2). The fact that each actant plays an

arguably equally important role further supports the notion of “*generalised symmetry*” (Latour, 1996, p. 15).

Table 2: Actor-Network Theory, Wheelchair Users & Public Transportation

The Network	Assemblages	Actants in the Assemblages	Other Assemblages Interacted With
Wheelchair users’ lived experience of public transportation in Amsterdam	The built environment	<u>Non-Human</u> <ul style="list-style-type: none"> • Lifts • Platforms • Signage 	<u>Human</u> <ul style="list-style-type: none"> • Public transportation staff • Public transportation passengers <u>Non-Human</u> <ul style="list-style-type: none"> • Type of wheelchair (<i>manual or electric</i>)
	Staff	<u>Human</u> <ul style="list-style-type: none"> • Train, tram, ferry, bus, and metro drivers/ conductors • Other station staff 	<u>Human</u> <ul style="list-style-type: none"> • Public transportation passengers <u>Non-Human</u> <ul style="list-style-type: none"> • Type of wheelchair (<i>manual or electric</i>)
	Passengers	<u>Human</u> <ul style="list-style-type: none"> • Strangers • Fellow travellers including family members or friends 	<u>Human</u> <ul style="list-style-type: none"> • Public transportation staff <u>Non-Human</u> <ul style="list-style-type: none"> • Type of wheelchair (<i>manual or electric</i>)
	Policies	<u>Non-Human</u> <ul style="list-style-type: none"> • Wheelchair assistance policy • Wheelchair priority policy • Escalator prohibition policy 	<u>Human</u> <ul style="list-style-type: none"> • Public transportation staff • Public transportation passengers <u>Non-Human</u> <ul style="list-style-type: none"> • Type of wheelchair (<i>manual or electric</i>) • The built environment (<i>particularly lifts</i>)

Source: Author’s own. (Please note that Table 2 is not an exhaustive list).

Findings of this research also align with wider literature about the importance of the built environment (Chowdhury & Park, 2018) and the potential for infrastructure to be “disabling” (Imrie & Kumar, 1998, p. 372). Findings about participants’ negative interactions

with passengers and staff echo Velho et al.'s 2016 study highlighting social barriers like a lack of staff knowledge, moving wheelchair users without asking, and the potential consequence of diminished public transportation use. Findings additionally support Netherlands-specific literature regarding broken lifts, inadequate assistance provision, and the value wheelchair users place on their independence (Netherlands Institute for Human Rights, 2017; Alliantie VN Verdrag Handicap, 2019; Baas & Faber, 2021).

Strengths and Limitations of the Study

Strengths

One of the strengths of this study is my personal history. Having used a wheelchair between 2017-2020, I have my own lived experience 'in the field'. My past experience motivated me throughout this research; guided my research questions; enabled me to recruit participants through *Able Amsterdam*; and led to a deeper understanding of what it means to be a wheelchair user on public transportation. Though my own experience would never be exactly the same as participants', I could empathise and connect with participants on a personal level. Sharing my own experiences throughout interviews also contributed to participant-researcher rapport, helping participants to feel at ease by "having traits or things in common which make communication easier" (Zakaria & Musta'amal, 2014, p. 2).

Participant representativeness refers to whether "the sample is inclusive of the range of people to which the scientists want their findings to generalise" (Afifi & Cornejo, 2020, p. 238). The participant sample was a strength as it reflected the diversity of wheelchair users. Participants included manual and electric wheelchair users; different age groups; males and females; individuals with different physical abilities; and those who had a lifelong disability

or one acquired later in life. Participants also lived across Amsterdam and varied in their use of public transportation.

The validity of the research was another strength, referring to the “appropriateness of the tools, processes, and data... for answering the research question” (Leung, 2015, p. 325). A qualitative approach increased the validity as this method is used to “gain insight into... subjective experiences” (Busetto et al., 2020, p. 3). Purposive sampling further strengthened the research as the study required a specific target group. Semi-structured interviews additionally gave participants the flexibility to share what they felt was important and allowed follow-up questions, which helped to highlight participants’ perspectives in more depth. The range of methods also encouraged data triangulation and confirmed what was discussed in interviews.

Limitations

Although the participant sample was diverse, it did not capture the full heterogeneity of Amsterdam’s wheelchair users. It did not, for example, include participants who were quadriplegic, or participants below the age of 29 or above 67 years old. Adding to the fact that the study focused specifically on Amsterdam — which has a different public transportation system to other Dutch cities — it is questionable to what extent the findings are generalisable on a national scale.

In addition, time constraints limited the amount of participant observations. Public transportation trips with Carry and Pieter addressed both manual and electric wheelchair use, as well as the metro, tram, and train. However, further participant observations would have increased the study’s validity and enabled greater data triangulation.

Implications of the Findings

Findings demonstrate that a phenomenological approach, combined with the ANT framework, highlights the complexity of actants involved in wheelchair users' lived experience of public transportation. The use of ANT further demonstrates the value of human *and* non-human actants and reiterates that the lived experience of wheelchair users must be examined in the context of the entire network.

Findings also emphasise that policies must be improved to make Amsterdam's public transportation system more accessible. Recommendations include:

1. Ensuring that policymakers and public transportation authorities involve wheelchair users in interventions assessing accessibility needs and improvements. Involvement of the target group would make it immediately clear, for example, that important lift stickers are actually out of sight if seated.
2. Continuing to increase the height and width of tram platforms and increasing the presence of dropped kerbs, where possible.
3. Improving accessibility signage throughout Amsterdam's stations, especially regarding the location of lifts.
4. Increasing the reach and frequency of GVB and NS staff accessibility workshops. Educating public transportation staff will ensure better knowledge about disability, social accessibility, and the skills needed to operate ramps. Wheelchair users must also be involved in this process, as is the case in current GVB workshops.

Finally, as this research focused solely on perspectives of wheelchair users in public transportation, it is necessary to understand how public transportation accessibility is experienced by others as well — specifically, public transportation drivers, conductors, and the wider NS and GVB. Incorporating these perspectives could help to understand why, for

example, lifts break down so frequently or cannot always be repaired quickly. Future research should thus include additional perspectives for a wider understanding of the actants involved.

Conclusion

Overall, this research highlights that the built environment, passengers and staff, and policies interact to shape wheelchair users' lived experience of public transportation. As a wheelchair user, even a short trip on Amsterdam's public transportation requires substantial planning and preparation. When infrastructure works as intended and the necessary help is provided, public transportation can be a positive and stress-free experience. Frequently, however, a combination of elements conspires to create major challenges for wheelchair users, including inaccessible design, broken equipment, incorrectly trained staff, and negative interactions with other passengers. Amsterdam's policymakers and public transportation authorities, with the input of wheelchair users themselves, must work together to achieve continuously improved physical and social accessibility and create an inclusive public transportation experience for everyone.

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Appendix

Appendix 1: Public Transportation Photos¹⁶



Photo 1

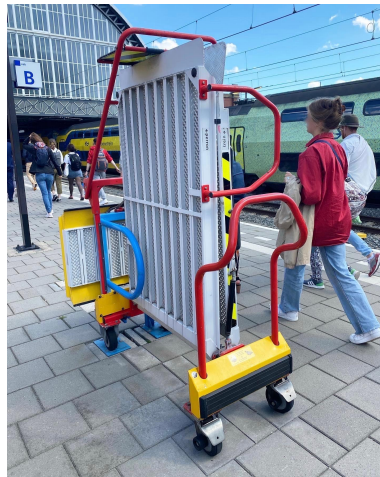


Photo 2



Photo 3



Photo 4



Photo 5

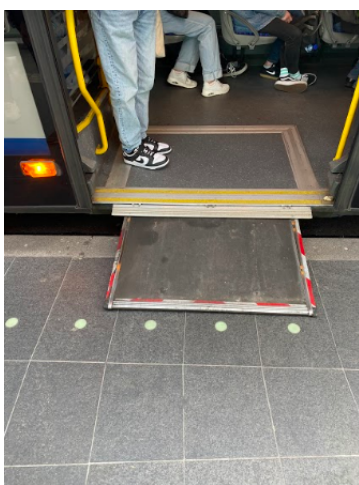


Photo 6



Photo 7



Photo 8

¹⁶ Source: Author's own.



Photo 9



Photo 10

- Photo 1:** One of the many broken lifts at Amsterdam Central Station. This was one of the biggest challenges mentioned by participants.
- Photo 2:** The portable wheelchair ramp provided by the NS wheelchair assistance service. This can only be operated by a member of staff and must be reserved at least an hour in advance.
- Photo 3:** Steps leading up to the designated NS wheelchair train carriage.
- Photo 4:** The shared wheelchair/ pram space in an Amsterdam GVB tram. Wheelchair users have priority over prams.
- Photo 5:** A sticker in the designated wheelchair area of an Amsterdam metro. It says: *This space is for a wheelchair. The wheelchair space may also be used for prams, rollators, suitcases, and folding bikes. Wheelchairs have priority.*
- Photo 6:** A wheelchair ramp of a GVB bus at Amsterdam Central Station. This particular ramp was stuck, so everyone had to get out and change buses.
- Photo 7:** One of many stickers with important information regarding the lifts. The sticker is placed too high for wheelchair users to read.
- Photo 8:** The escalator at Amsterdam Central Station with a sticker indicating wheelchairs are not allowed.
- Photo 9:** Contrary to the InterCity trains, Amsterdam's metro carriages are level with the height of the platform (though sometimes a gap still exists).
- Photo 10:** The designated wheelchair area on a metro, with the wheelchair sticker from Photo 5 on the wall.

Appendix 2: Reflexivity

Having used a wheelchair myself between 2017 and 2020, I have my own lived experience of disability and wheelchair accessibility (of public transportation). In many ways, my personal history is a strength to my research. My past experience with wheelchair use provided crucial background knowledge on the topic; informed me that public transportation can still be a major challenge to wheelchair users; motivated me to pursue this research; guided my research questions (along with the literature); and inspired my interview topic list. With over 6,000 unique monthly visitors to my *Able Amsterdam* website and many more on social media, my own position as the researcher meant I had access to a wider range of participants. With my supervisor's permission, I eventually recruited participants through *Able Amsterdam* (whom I otherwise would not have been able to reach).

My own experience would never be exactly the same as the individuals I interviewed. Wheelchair users are, after all, a diverse group of people. Nonetheless, having 'lived it' meant I could empathise and connect with participants on a personal level. My own experience taught me that using a wheelchair is far more than just *using a wheelchair*. If you acquire a disability later in life, using a wheelchair means learning to navigate the world you know from a new perspective. Using a wheelchair also comes with a range of interactions — from strangers pushing you without asking, strangers prying about your medical condition, and stares in public, to young children asking funny questions, teaching your friends how to push your wheelchair, or striking up a conversation with another wheelchair user. There are many positive and negative interactions and emotions that come with wheelchair use. No matter how much I describe it, the feelings associated with being a wheelchair user can only be truly understood if you have used a wheelchair yourself.

Having been a wheelchair user also meant I could share my own experiences throughout interviews. From the start, I was open about my 2017 traffic accident and resulting wheelchair use. Some participants asked about my accident and injuries, voluntarily opening up about theirs in return. Some of the most special moments in interviews were when I and the participant both went “*Exactly!*” when we felt mutually understood. I had a moment with Marion, for example, when she said: “You know just how *difficult* it is”. Another such moment was when Felix said: “Nobody understands us, do they? Not to be dramatic. But nobody is in... our reality”. Sharing these mutual experiences and feelings contributed to participant-researcher rapport and helped participants, and me, feel at ease.

My past experience as a wheelchair user meant I could not approach the research objectively (though arguably all researchers have a level of subjectivity). However, I tried to remain as open-minded as possible, aware that my own experiences may not be reflective of others’. I was surprised, for example, when Abel shared his feelings towards strangers pushing his wheelchair without his permission. Abel said: “I always think, if people want to give me a little push, *go on, just do it*. Then you can feel good too”. This contrasted with my own feelings. If anyone — strangers, family members, or friends — moved my wheelchair without my permission, I felt frustrated and upset. I felt like my autonomy had been taken away, like a child being pushed in a pram. When Abel described how he did not mind, it was difficult for me to comprehend. Contrasts like this were a reminder that the same experience can be perceived differently depending on the individual.

When conducting research on a topic the researcher is already familiar with, scholars highlight the potential for confirmation bias (Bos, 2020). Confirmation bias refers to “the tendency for individuals to judge new information in a way consistent with their preexisting ideas or convictions” (Bos, 2020, p. 120). With a topic so personal to me, it was unavoidable

that my own experiences would shape my data interpretation. My reaction to Abel's comment is just one example. However, I was aware of my own positionality. As a result, I made an effort to ask non-suggestive interview questions and portray experiences reflective of, and different to, my own.

Felix was the only participant to comment on how my past experience shaped the way he answered questions. Felix explained that in some ways, my positionality was a limitation:

On the one hand, it's easy to talk to you because you're an ex-wheelchair user yourself. But on the other hand, for some things it might have been easier for both of us if you didn't have so much knowledge about the situation. For some things, [your experience] is *only* positive... In fact, [the experiences I'm sharing] are really obvious for you... You've experienced it all yourself. But sometimes that's *exactly* what makes it difficult... I can feel and I can see and I notice that you understand things I'm saying. At a certain point, I just stop explaining. If I see that you don't understand, I need to elaborate. So, it's a bit of give and take.

However, Felix also pointed out the benefit of my past experience: "A 'walker' who has always been a 'walker' and never used a wheelchair before will never have the drive you have". Overall, I consider my past experience a strength — as long as I am aware how it can shape my research.

Appendix 3: Participant Observation Summaries

Vignette 1: A metro journey with Carry

Carry

Carry is 56 years old, female, and has used an electric wheelchair for 21 years. In April 2022, Carry and I met up at 18:00 to travel from Reigersbos Metro Station to Amsterdam Central Station together. The trip lasted around 1 hour in total.

The journey

Carry emailed me a few days before our trip, asking me to meet her at the ‘*winkelzijde*’ of Reigersbos Metro Station — the side with the shops. I arrived at the station a few minutes early. Carry arrived soon after. Having initially forgotten where we were going to meet, Carry had first accidentally gone to the other side of the station. “When I got there, the lift was broken... We’d have had to come here anyway [because the lift was broken on the other side]”, Carry said. Our trip had barely begun, but there was already a broken lift.

Carry explained to me that this was her first time using public transportation in over two years. Since losing her husband a few years ago, Carry no longer had someone to travel with and did not feel confident using public transportation by herself. This trip was a significant occasion. I asked Carry what the added benefit was of having me there. “Would I actually be able to do something to support you?” I asked. “No,” Carry answered, “But I feel stronger because you’re here”.

I mentioned to Carry that I could somewhat relate to the significance of this day. After my accident, it took two years for me to use public transportation again. My first public transportation trip as a wheelchair user was with a friend in 2019. I hoped that my own experience could help me understand what Carry was feeling.

As we went into the Reigersbos Metro Station, Carry wheeled herself through the wheelchair accessible ticket gates. These gates are wider and have a wheelchair icon on the gates (and on a sign above). Signage in the metro station did not indicate where the lift was. We had to head in a direction and hope for the best. Fortunately, the lift on *this* side of the station was easy to find and worked properly. Carry felt nervous at the thought of that lift being broken too.

A workman was using a hose near the lift. Carry had to go back and forth a few times until she was able to go over the hose. In contrast, I effortlessly stepped over it. Carry rolled into the lift. There was just enough space for the two of us. The platform floor was smooth. The station was almost empty, which meant Carry had ample space to manoeuvre across the platform. Carry decided to go to the middle of the platform, not knowing how long the carriage would be and where we would need to wait. Carry explained she did not feel the need to get in at the designated wheelchair door, as the space in the metro carriage meant she could park her wheelchair almost anywhere.

As we waited for the tram, Carry told me she felt worried about whether it would be an old or new carriage. The old carriages have less space and an “annoying” pole in the middle of the carriage which makes it harder to manoeuvre. The metro ended up being a newer carriage, which was a relief to Carry. The metro was almost empty and the carriage aligned with the height of the platform. Carry rolled inside easily. I sat on a chair and Carry parked her wheelchair next to me, choosing to stay in a non-wheelchair area.

Arriving at Amsterdam Central Station, the metro also aligned with the height of the platform. Carry was able to wheel herself out of the metro smoothly and along the platform to the lift. The lift button was low, located to the far left. For some wheelchair users — Carry included — the button was at an awkward angle. Carry mentioned it would have been better

if the button was just straight on at the door. Arriving upstairs, we made our way via the metro's accessible ticket barriers to the lifts. Carry had a choice of two lifts, one of which was broken. Fortunately, the second lift worked.

The lift opened outside in front of Amsterdam Central Station. As Carry wheeled herself outside, she pointed out there was a lift but no dropped kerb in the pavement leading down to the road. Carry could *just* manage its height with her wheelchair. The same obstacle occurred on the other side of the street (near Amsterdam Central Station). Again, there was no dropped kerb. While the pavement was 'only' around two centimetres higher, Carry found this height challenging in her electric wheelchair. Thankfully, Carry was able to get up the pavement.

We made our way inside the station. All of the ticket barriers we initially saw had several steps. As accessibility signage was unclear, it took Carry a few minutes to realise that the accessible ticket barrier was to the far left of the station. Carry had been to Amsterdam Central Station often, but had forgotten where the accessible ticket barrier was as it had been years since she was last there. Meanwhile, we passed a third broken lift.

Around 19:30 (after eating some dinner at the station's *New York Pizza*) we made our way to the IJ River side of Amsterdam Central Station. Carry planned to attend an event nearby. It took around 20 minutes to walk (and wheel) there. The pavement was wide enough and there were dropped kerbs where needed. At a certain point, however, Carry chose to take the bicycle lane instead of the zebra crossing, as the zebra crossing had a slightly raised pavement. Soon after, we arrived at our destination.

Vignette 2: A tram journey with Pieter

Pieter

Pieter is 29 years old, male, and has used a manual wheelchair for 12 years. In May 2022, Pieter and I met up at 16:00 near Hugo de Grootplein to travel to Amsterdam Central Station together. The trip lasted around 1 hour in total.

The journey

Pieter had planned the tram journey to Amsterdam Central Station in order to board an NS International train to Berlin. Unlike my trip with Carry, this trip was one Pieter would normally do by himself. During our interview a few weeks earlier, Pieter had emphasised that he felt confident using his wheelchair and rarely needed help from others.

During our short journey to the tram stop we encountered several obstacles. A lady, for example, stood in the way of our path with a bicycle. Pieter asked if the lady could please step aside, which she did (in a friendly, apologetic manner). Further along the path, several workmen were using machinery. There were all sorts of cords across the ground. Pieter manoeuvred around them with ease.

As we neared Hugo de Grootplein, Pieter could choose between two tram stops. Both had trams in the direction of Amsterdam Central Station. Pieter told me he preferred choosing one particular stop over the other as the platform was more accessible in height and width. “If people are standing there, you usually don’t have to ask anyone to get out of the way. You can just roll past,” Pieter said. At the other stop, Pieter would have constantly had to ask people to step aside.

The tram arrived within a few minutes. It was quite busy and there was little space. Pieter did not ask for (or need) the tram wheelchair ramp. Before the conductor could even

offer to help, Pieter effortlessly wheeled himself in via the accessible middle entrance. Once inside, an elderly man was standing in the designated wheelchair area. Pieter asked if he could please move. The man did not make space at first (I believe this was more due to confusion than reluctance). It seemed the man was unaware of where he was standing. A few seconds later, the elderly man went to stand somewhere else. Pieter wheeled himself to the wheelchair area and put the wheelchair brakes on.

Pieter then told me that “it’s nice that there is someone [in the tram conductor booth] for prams and such. It’s nicer if [these interactions are] organised via the conductor, rather than doing it [himself]” because conductors have more authority. Pieter remarked that other passengers are more likely to act if the conductor steps in. It also saves Pieter effort. I noticed that the conductor had not stepped in to ask the elderly man to move.

When we arrived at Amsterdam Central Station, Pieter wheeled himself out of the tram just as easily as he had wheeled himself in. As this platform was narrower, Pieter had to ask several people to move out of the way. Pieter headed toward the station. He knew exactly where to go for the accessible ticket barriers.

We made our way to Pieter’s platform. The *only* lift leading to Pieter’s platform was broken. A passer-by was kind enough to point out that “there [was] another lift over there”, but did not realise that lift “over there” went to a completely different platform. As Pieter had learned how to use the escalator in his wheelchair, he had a solution.

I went up the escalator first. Pieter went up in his wheelchair behind me, holding on to either side of the escalator. He did not ask for, or need, my assistance. As we had extra time, Pieter went up and down the escalator to show me what it was like to go in both directions. There were no staff members present at the time, and no other passengers commented on Pieter’s use of the escalator.

Once on the platform, Pieter rolled along the train to find his accessible carriage. The accessibility of the train was not clearly signposted. Pieter asked a staff member for help, who told him where to go. *Every* train carriage had steps. I expected the wheelchair carriage to be step-free. However, the ‘accessible’ carriage just meant that it had a wheelchair area and a toilet. Wheelchair users who could not walk would still need ramp assistance to get inside.

Pieter, who has a limited ability to walk, had deliberately *not* booked wheelchair assistance. Instead, he got up out of his wheelchair, held onto the carriage door frame, carefully walked up the steps, and pulled his wheelchair in behind him. When I asked Pieter why he had not booked wheelchair assistance, he replied:

It takes more time than just putting [my wheelchair] in myself. I have to find people doing it, they have to put the ramp in place. For me, it’s an awkward interaction.

Independence is part of it. And the booking itself takes time too.

Once Pieter was in the train carriage, we said goodbye.

Appendix 4: *Gemeente Vervoerbedrijf* Workshop Summary

In April 2022, I attended a 3-hour tram accessibility workshop led by the *Gemeente Vervoerbedrijf* (GVB). The workshop was held for a group of 7 new tram drivers at Amsterdam's tram depot at Lekstraat. The workshop was presented by 3 people: two electric wheelchair users and one individual who had a visual impairment. Several representatives of the GVB led discussions. The atmosphere was warm and welcoming. There was a clear sense of community and friendship amongst the GVB colleagues.

The workshop ran from 9:00 to 12:00. Topics covered included wheelchair accessibility (for both manual and electric wheelchair users) and accessibility for individuals with visual impairments. The workshop consisted of the following:

1. **Group introduction:** The workshop started with coffee, tea, and an introduction round. This gave everyone a chance to get to know each other.
2. **Presentations:** Presentations covered wheelchair use and visual impairments. Presenters discussed the diversity of disability, social accessibility, and examples of disability etiquette. There was ample opportunity to ask questions (which many tram drivers did). At this stage of the workshop, I also shared some personal insights and experiences as a wheelchair user on public transportation (for example, the frustration I felt when someone moved my wheelchair without my permission).
3. **Tram accessibility workshop:** The group was then split in half. Each group took turns going to a demonstration of the tram ramp. Each tram driver had the opportunity to use the ramp and the opportunity to enter and exit the tram in a manual wheelchair. Tram drivers were also taught how to help wheelchair users — both electric and manual — in and out of the tram.

4. **Visual accessibility workshop:** This workshop addressed different types of visual impairments, white canes, and how to correctly offer help. There were various types of white canes (which we got to test). Glasses had been adapted by, for example, being partly obscured by paint. These glasses created a way to ‘experience’ what it might be like to have a visual impairment and how much you may (or may not) be able to see.
5. **Debriefing:** The workshop ended with a debriefing. This gave all participants a chance to reflect on the day’s activities and ask questions.

Overall, the workshop was a valuable addition to this research as it added a different perspective. The workshop provided insight into the steps being taken to educate public transportation staff about (wheelchair) accessibility. Each driver was able to learn skills that facilitate a positive public transportation experience for wheelchair users (and individuals who have a visual impairment). It was promising to see the enthusiasm of both the workshop leaders and the tram drivers. I strongly recommend that similar workshops expand to existing tram drivers (rather than only new drivers) and Amsterdam’s wider public transportation staff (including the *Nederlandse Spoorwegen*).

Appendix 5: Topic List

The following topic list was used to guide semi-structured interviews. Participants were encouraged to elaborate and share examples of each:

1. Use of public transportation in Amsterdam

- a. Use of public transportation, including the frequency
- b. Types of public transportation used
- c. Alternatives to public transportation
- d. Places or activities attended/ travelled to with public transportation
- e. Describe a typical public transportation journey

2. Accessibility

- a. Define 'wheelchair accessible' (in the context of public transportation)
- b. What makes public transportation wheelchair accessible
- c. Feelings about accessibility of public transportation in Amsterdam

3. Facilitators of accessibility

- a. Examples of experiences with public transportation in Amsterdam
- b. A recent/ typical/ extreme experience of good accessibility of public transportation
- c. Comparison of the accessibility of different types of public transportation in Amsterdam
- d. Accessibility improvements

4. Barriers to accessibility

- a. Challenges & barriers experienced in Amsterdam's public transportation system

- b. A recent/ typical/ extreme example of a difficult experience on public transportation
- c. The contribution of public transportation challenges to daily life
- d. The biggest barrier to public transportation accessibility in Amsterdam
- e. Sharing concerns with the GVB and NS

5. Staff and passengers

- a. Experience with staff on public transportation
- b. Experience with passengers on public transportation
- c. A recent/ typical/ extreme experience of staff interaction
- d. A recent/ typical/ extreme experience of passenger interaction
- e. The contribution of these interactions to your commute

6. Improvements

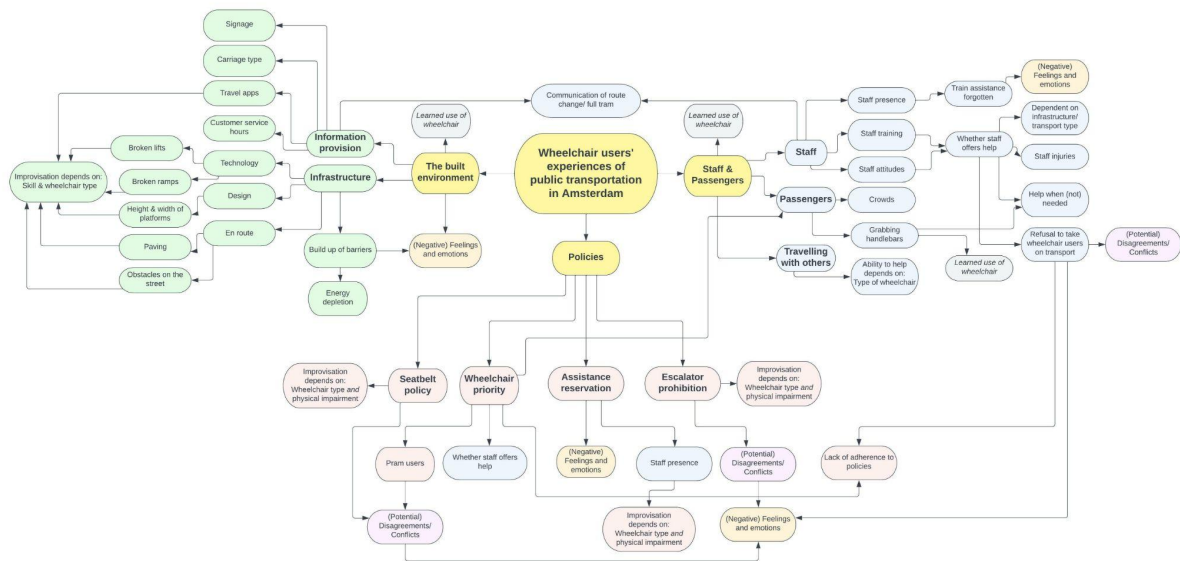
- a. How the experience of public transportation can be improved
- b. The influence of these improvements on your ability to take part in activities (if at all)
- c. Types of activities or opportunities that would be made possible with improvements

7. Additional comments

- a. Anything else participants would like to add

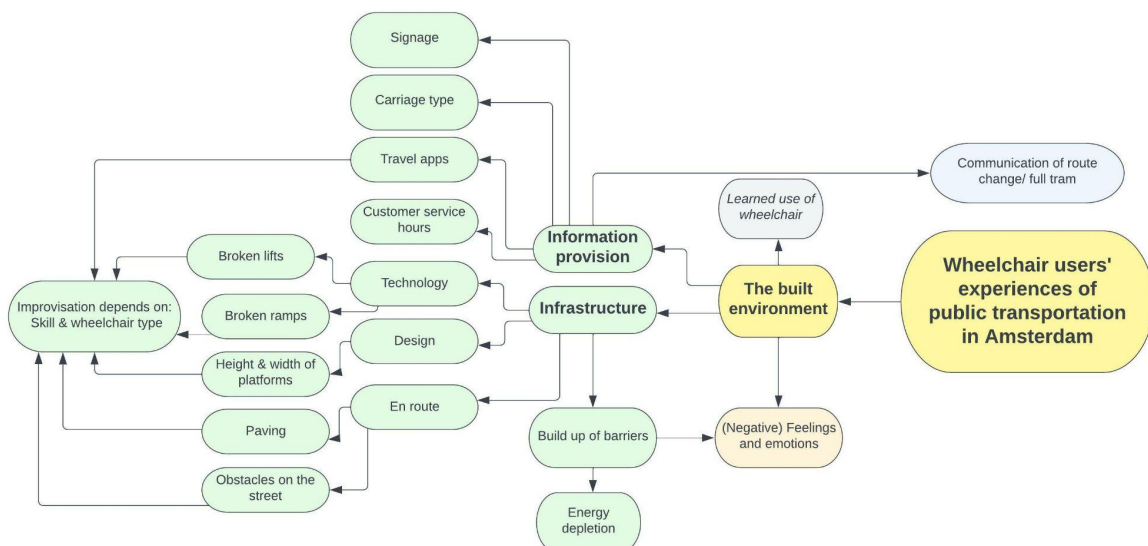
Appendix 6: Code Tree

Code Tree

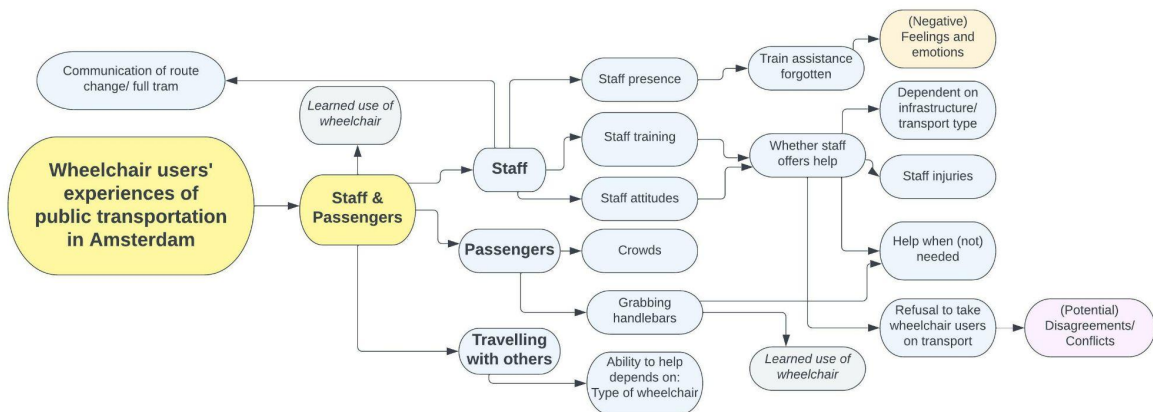


In order to make the code tree legible, I have included a bigger version of each section below:

The Built Environment



Staff & Passengers



Policies

