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Public Transport and People with Impairments - Exploring Non-use of Public Transport through the case of Oslo, Norway.

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Abstract: Despite the attention given to universal design in recent years, many people with impairments still refrain from travelling on public transport. This explorative case study, conducted in the greater Oslo region in Norway, aims to add knowledge on why this is so. Findings indicate that insecurity while travelling and expectations of problems along the way, are significant barriers. For many it is the sum of all challenges combined, from experience or anticipation that leads to non-use of public transport. The study shows that universal design policy, as of today, does not lead to accessible public transport systems that rendered impairments irrelevant. If society could safeguard the individuals' travel needs, this might have profound societal repercussions through increased workforce participation and value added in society. Only then can society make the best use of all its inhabitants while championing inclusiveness and equality.

Keywords: accessibility, impairments, public transport, non-use, barriers, universal design.

Word count: 7976

Points of interest

- Although digital solutions can increase participation in various societal arenas among people with impairments, spatial mobility is still an important aspect of citizenship rights and equality through factors such as equal treatment and equality of opportunity.
- Informants not travelling by public transport and without access to alternative modes experience loss of freedom, feel isolated and not part of society and are unable to take part in as many activities as desired.
- The presence of a universally designed public transport system is not enough to safeguard the travel needs of all citizens with impairments.
- A travel buddy service when first encountering the public transport system may

help reduce barriers to travel among non-users with impairments.

- In order to promote an inclusive society based on equality, appropriate alternatives and policies that safeguard the travel needs of all citizens should be developed.

1. Introduction

Being a fully functioning citizen is dependent on mobility in both work and family life. There have been several studies on mobility restrictions causing social exclusion (see e.g. Cass et al. 2005 and Priya and Uteng 2009). People with impairments are often identified as such a group (Barnes and Mercer 2005; Casas 2007) and problems using public transport are among the causes (Field et al. 2007; Kenyon et al. 2002). Some argue that the Internet and other digital media potentially increase participation in various societal arenas (see e.g. Sépulchre 2018). However, equality, inclusion and citizenship can be interpreted and defined in different ways, but often relates to factors such as equal treatment, equality of opportunity, equal well-being (Rioux and Valentine 2006), and belonging to (a kind of) society (Lid 2015). With regards to citizenship rights and equality, we thus perceive spatial mobility to still be important.

The concept of universal design as a strategy countering social exclusion was first coined by the architect Ronald Mace (1997), who defined it as 'the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design'. A similar definition is used in the UN Convention on the Rights of persons with Disabilities (UN 2006). Universal design is conceptually different from other approaches to accessibility in that it is non-segregating, with the objective that people with impairments can function as natural members of society. Universal design, or closely related concepts of accessibility, is a feature of legislation in many countries (Tennøy and Leiren 2008; Arsenjeva 2017), including Norway. January 1st 2009, the 'Discrimination and Accessibility Act' (Ministry of Children and Equality 2008) became operative, prohibiting discrimination on grounds of impairment and making universal design a requirement by law. This means that within Norwegian law, Universal Design is both a feature of accessibility legislation, as well as a right to equal treatment and non-discrimination for passengers. In this article we focus mostly on the accessibility dimension.

As Norway is a member of the European Economic Area (EEA), much of the single market regulations apply to Norway. EU legislation refers both to the rights of passengers with respect to non-discrimination, cf. Regulation 2011/181 (EC 2011), and the accessibility of transport in terms of transport systems meeting certain design criteria. As this article focuses on the accessibility rather than the non-discrimination aspects of Universal Design, it addresses issues where, at least in the EU setting, regulations are largely in place already. However, there are still many issues regarding its practical implementation (Arsenjeva 2017).

Many Norwegian standards and handbooks on universal design in infrastructure and carriers (e.g. NPRA 2013, 2014; Ruter 2011; Oslo Municipality 2010) deal with issues such as height differences and gaps, ground surface, natural guidance and tactile paving, hue and colour contrast, signage and information, and safety aboard the carrier. The Oslo Metro and Bergen Light Rail are wheelchair accessible, buses in most Norwegian cities are low-floor, cf. Directive 2001/85 (EC 2001), and all trams in Oslo will be accessible by 2020 (Ruter 2013), cf. Regulation 2007/1370 and 2007/1371 (EC 2007a, 2007b).

In addition to Oslo having a public transport system that is mostly universally designed, residents with impairments may be entitled to special transport services targeted at their needs. These personalized systems are provided by regional authorities, but they are expensive to finance and exclusive in that they address only the needs of some of those with impairments (Leiren et al. 2014). Furthermore, the presence of universal design measures does not guarantee that they work as intended.

Despite different regulations, rigorous requirements when implementing new infrastructure, and years of focus on universal design in public transport, the number of people with impairments who actually use public transport has not increased significantly in Norway. Using the National Travel Survey, Aarhaug and Gregersen (2016) found that people with impairments accounted for about 9% of travellers in 2013/14 (similar to findings in earlier travel surveys). Respondents who indicated that they had impairments had fewer trips per day (2.7 vs. 3.3), travelled fewer kilometres per day (33.8 vs. 46.5) and were more likely to travel by car (62% of trips vs. 51%), either as driver or passenger, than the average person. They were also less likely to use public transport (13% vs. 17% of trips) (ibid.). Surveys in Norway using different criteria indicate that between 5% and 20% of the population have trouble using public transport (The Delta Centre 2004; NOU 2005; Fearnley et al. 2009; Nordbakke 2011;

Vågane et al. 2011; Hjorthol et al. 2014). Based on these numbers, it seems that the public transport system might not be accessible for all. The aim of this paper is to contribute to a better understanding of why people with impairments refrain from travelling by public transport, by asking: *Why do non-users with impairments avoid travelling by public transport even when it is accessible?*

2. Research design and methodology

This research was designed as an explorative case study of why non-users with impairments do not choose public transport. As the research question is aimed at gaining a deeper understanding of an issue, rather than a broad overview of a phenomenon, case studies were chosen as methodology (Flyvbjerg 2006). Three different, though complementary, data collecting methods were chosen.

First, we started reading relevant literature to get a better grasp of the existing knowledge on the subject. We began by summarizing our knowledge of existing literature, focusing mainly on Norway and European countries with a context similar to that of Norway, e.g. Sweden, Denmark, the UK. This was supplemented by searches in a range of different bibliographic databases, and inquiries sent to our network in Norway and abroad. We also checked the reference lists of all articles, studies and documents read, to ensure that we did not miss any relevant studies. In addition to bringing in relevant knowledge on the subject, the literature review also served as important input to the subsequent stages of the study, such as helping us to develop the interview guide. Based on the literature, we developed assumptions on why some factors might lead to non-use of public transport. Language barrier was a possible limitation to the literature review. We searched only for studies documented in Norwegian, Swedish, Danish or English, thereby excluding potentially relevant studies in other languages. Although we conducted thorough literature searches using several databases, another possible limitation might be a different use of language and keywords in disciplines other than social sciences. When searching we used keywords such as non-use*, impair*, disab* (sic) and transport*. There may be relevant studies in other disciplines that we did not find using these search criteria.

Second, to gain insight into challenges and understand why public transport is not used, we conducted semi-structured in-depth interviews with people with impairments who seldom or never use public transport. Relevant questions were about their travel behaviour, and the modes of transport they use; trips they would like to take,

but which they feel they cannot as well as their reasons for not travelling in these cases. To develop answers to the research question, we structured findings and analysed data in light of assumptions derived from the literature. To recruit people with impairments who seldom or never travel by public transport living in the Oslo region, we contacted relevant organizations and councils, all of whom informed their members of our study and request for informants. Rather than compiling a representative sample of people with different impairments, we focused on getting different points of view. When searching for informants, we especially wanted to interview those we believed had potential to travel by public transport, but who still chose not to. We thus kept one eye open for those already participating in society in various ways, such as (part-time) work, participation in clubs or unions, etc. As Oslo has a good public transport system with high frequency on most routes and relatively short distances to stops, this largely eliminated non-users who seldom or never travel by public transport due to poor service. Fourteen people with a range of different kinds and degrees of impairment, some with multiple impairments, were interviewed (see table 1). [Table 1 near here]. Some were born with the impairment, while others had become impaired during their life course. The youngest informant was in his/her early twenties, whereas the eldest was just over 70. The majority (11 of 14) were over 50 years of age.

Third, to further expand the understanding of issues at hand, each informant was invited to participate in a go-along study using public transport. The go-along study was conducted after the interview, and only if the participant was amenable. This part of the data collection was designed to be semi-structured, and a combination of observations and helping the informant if necessary, much like a travel-buddy. First, the journey was planned, and if the participants were not able to find the necessary information, we showed them how it could be done. We then accompanied them on their travel. During the journey, they were invited to share experiences in each situation, and to explain how different elements affected the experience positively or negatively. This helped us understand and experience each challenge along the way in much the same way as they do. To avoid problems associated with winter and rush-hour traffic being too prominent in the study, all interviews and go-along studies were conducted during summer months and outside of rush-hour.

It was explicitly communicated from the start that the go-along study was completely voluntary and that the interviews were of greater importance. The main goal was to avoid hindering potential informants from participating in the interviews, which

could have led to a possible self-selection issue in our interview findings. However, findings from the go-along study might be affected by self-selection; the informants amenable to travel with us might also be those who were 'the toughest'. This is not considered a problem in itself, as a travel buddy service should be based upon voluntary action rather than constraint. However, self-selection is still something to be aware of and will be discussed in section 4.3.

3. Literature review

In the following section, we present findings from the literature, and develop three not mutually exclusive assumptions, which will be used when analysing data.

3.1 Accessibility to public transport

People with impairments experience barriers at different points in the travel chain. According to Bjerkan (2009), 21% have difficulty getting to and from public transport stops in Norway. For the mobility impaired, distance constitutes a challenge (Lodden 2001; Nordbakke and Hansson 2009), as does the height of kerbs, and a lack of signage (Aarhaug et al. 2011). For those with sight impairments, barriers include lack of accessibility to stops or platforms due to poor maintenance and missing, broken or hidden orientation points or lines along the way (Aarhaug and Elvebakk 2015; Tennøy et al. 2015).

Even though the share of universally designed public transport carriers continues to increase, boarding and alighting is a challenge for 36% of travellers with impairments. Buses and trains are perceived as the most difficult (Bjerkan 2009). Buses stopping too far from the kerb is a general problem, and aboard the carrier, a problem for wheelchair users is that they are often seated below the window line and lose track of where they are (Aarhaug et al. 2011). Those with sight impairment experience difficulties orienting themselves at the stop or platform prior to boarding and after alighting.

When people with impairments use public transport, drivers have an important role (see e.g. Lodden 2001; DfT 2008; DPTAC 2002). They are the link helping those with impairments to overcome obstacles or barriers when accessibility measures fail or are missing. If the traveller is not met with a helping attitude, this makes it problematic or impossible for them to continue their trip. Those with mobility impairment often depend on help from others to board and alight vehicles with ramps or elevators. If not

given the necessary help, they might end up being left at a stop or platform. A common complaint is lack of help from the driver (Aarhaug and Elvebakk 2015).

Further, unintended actions of drivers might affect those travelling. The driver might not know that someone about to board has an impairment or might not know the needs of the traveller unless told. This can lead to the driver not taking the appropriate action, and consequently, people with impairments potentially shying away from using public transport as it does not feel safe. For those with sight impairment, one key challenge is simply getting aboard the (correct) carrier (Aarhaug and Elvebakk 2015). They are dependent on the driver calling out the route number and destination when at a stop. Even travellers with easily identifiable impairments (e.g. use of cane or guide dog) sometimes encounter drivers who do not accommodate their needs – such instances would be considered a poor link. However, some travellers with sight-impairment do not need or use a cane or guide dog. This can make it difficult for the driver to know they need help. Furthermore, if real-time information aboard the carrier is lacking or malfunctions and the driver is unaware, it might be difficult for travellers with impairments to alight at the correct stop.

With regards to accessibility to public transport, one can assume that lack of knowledge, understanding and help from drivers and other personnel, may result in non-use of public transport.

3.2 Information

Information, or lack thereof, might also be a significant barrier to using public transport, challenging anyone with an impairment. This includes poorly designed or wrongly placed information at the stop, and lack of accurate and real-time information aboard the carrier (Aarhaug and Elvebakk 2015). According to Bjerkan (2009), 12% of travellers experience 'information about departures or stops' as a challenge.

Readily accessible information is thus key. Half of the respondents in the DPTAC (2002) survey stated that they did not feel sufficiently informed when travelling by public transport. A further 39% said they would use public transport more often if it was easier to access information. In another study it was found that lack of information was the primary reason that those with impairments seldom travelled by public transport (Golledge et al. 1996). According to DfT (2008), those with mobility impairments report that the availability of better information about physical accessibility would make them feel safer when travelling. Jolly, Priestley, and Matthews

(2006) found that people with impairments had little knowledge of local routes and frequencies, and that they had trouble assembling and understanding travel route options, which led to less use. In yet another study (Ruud et al. 2005), it was found that many believed the service was of lower quality and less competitive than was actually the case, and that improved information regarding the service had the same effect on traveller satisfaction as reduced travel times and fewer transfers between modes.

Based on this, one could assume that lack of information throughout the travel chain result in non-use of public transport.

3.3 Insecurity and uncertainty

Lastly, even though we did an extensive search for relevant literature (as described in section 2), only one study specifically dealing with why non-users with impairments shy away from using public transport was found. Use or non-use of public transport was the subject of a Swedish study of 882 patients with a permanent impairment due to stroke (Asplund, Wallin, and Jonsson 2012). Physical restrictions were found to be the biggest barriers to travelling by public transport among non-users. Furthermore, most of those wanting to travel refrained from doing so because of an expectation that they would come up against physical barriers along the way. Cognitive issues were also barriers, as non-users expected difficulties finding information, buying tickets, orienting themselves at terminals and stops, etc. Asplund, Wallin, and Jonsson (2012) conclude that non-users are likely to overestimate actual barriers to travelling by public transport.

Other studies, although not specifically dealing with non-use, also found that insecurity and expectations regarding public transport itself seems to be an issue. According to Bjerkan, Nordtømme, and Kummenje (2011), people with impairments generally do not trust the public transport system. Many perceive travelling this way as so difficult and exhausting that they would rather stay at home or travel by another mode. Some have had limited practice in travelling by public transport, with previous negative experience creating psychological barriers – even if they were never to meet those same challenges today. One of the main barriers identified by the Scottish Executive (2006) is ‘a lack of trust in the transport system as a whole’. Important barriers are uncertainty about whether stops or platforms are accessible, how the carriers are designed, whether help is given by the driver or staff when needed, and so on (Aarhaug and Elvebakk 2015). Many also fear being a burden to the driver, who is often following a strict schedule, or to other passengers stressed about arriving on time (ibid.).

The DfT (2008) found that use of public transport is reduced because of insecurity of users and inaccessibility at different points along the travel chain – from planning to arrival at one's destination. This is also in line with the findings of Fearnley et al. (2015) pointing out that safety and security are two of the main qualitative issues with public transport that affect its use.

Based on this, one could assume that insecurity and uncertainty regarding public transport travel and potential challenges met when travelling, result in non-use of public transport.

3.4 Assumptions derived from literature

The Scottish Executive (2006) claims that there is at least one hurdle on every journey and that there is never just one solution. Still, some challenges seem to arise more often than others. According to the literature review, there are three different factors that may result in non-use of public transport among people with impairments. These are:

(1) Lack of knowledge and understanding among drivers and personnel.
(2) Lack of information throughout the travel chain.
(3) Insecurity and uncertainty regarding public transport travel.

These assumptions were used when analysing findings from the interviews

Lastly, one study found that people with impairments often have had limited practice in travelling by public transport (Bjerkan, Nordtømme, and Kummenje 2011), while another found that those who had received training in public transport use were better prepared and less afraid of unforeseen incidents (Asplund, Wallin, and Jonsson 2012). This could indicate that providing help to non-users with impairment when first encountering the public transport system, i.e. through a travel-buddy, might have the potential to reduce the barriers to travel.

4. Findings

The starting point of this article was to explore why non-users with impairments avoid travelling by public transport even when it is accessible? In this section, we present findings from in-depth interviews and go-along studies on the barriers our informants emphasised as particularly difficult. The findings are presented in light of the assumptions presented in section 4.2. We include some of the informant's own stories

that are particularly relevant.

4.1 Accessibility to public transport

Only a few informants mentioned challenges in getting to and from stops, but they point to challenges in transfers between modes, in particular between bus, rail and metro at major transfer points. They explain that a lack of integration between different modes and companies is a challenge greater than distance between stops. Even though finding a stop was not mentioned as a major issue, boarding and alighting from vehicles was. Points mentioned included gaps between stop/platform and vehicle, and too little time available to board and alight. Visually impaired respondents had difficulty at stops with different bus routes, particularly if the driver did not stop at the correct point of entrance. On buses, ramps are sometimes rendered inoperable due to limited use, while elevators on some regional buses must be horizontally aligned to function. If inoperable, there might be a long wait before the next bus arrives. With regards to issues aboard the carrier, for some sight impaired informants different interior arrangements on buses make it difficult to find the stop button on unfamiliar vehicles. Although important, these barriers do not seem to be decisive for non-use.

Ticketing was not singled out as an important issue in the literature review, but for some informants this was an important barrier. For those having trouble with ticketing, the high level of automatization is a main reason. In Oslo, the current ticketing system is based on pre-paid tickets using travelcards and smartphones, both of which were introduced to promote safety (by removing cash from the vehicles) and efficiency. In order to promote this pre-payment, a fixed rate is added to the regular price if buying a ticket on board. When travelling by tram and metro, there is no option buying a ticket aboard. When travelling by train one must use railcars with a conductor who sells tickets. For informants with a visually impairment, it is difficult to find and use ticketing machines, and some cannot purchase tickets through a mobile app as they do not have a smartphone. Several informants always buy tickets after boarding even though more expensive, as ticket machines are not accessible. Two informants point to the uncertainty caused by ticketing and to the lack of personnel who could be asked for help and directions as a decisive barrier to using public transport. Ticketing thus seems to be an important barrier.

4.2 Three assumptions regarding non-use of public transport among people with impairments

The first assumption derived from the literature was that '*lack of knowledge and understanding among drivers and personnel results in non-use of public transport*'. This was a recurring issue mentioned by several informants, many of them relating stories of being ignored by bus or metro drivers. One informant with a visual impairment, tells a story of being ignored:

> Isabel once experienced the metro departing while she was still searching for the button to open the door. Her guide dog can either point her to the door, at which she needs to find the opening button herself, or the driver must open the door for her remotely. Isabel believes that the driver should have spotted her standing on the platform with her guide dog as the metro entered the station and he must have seen her searching for the button when he checked his mirrors before closing the doors and departing. She was disappointed and frustrated that instead of opening the doors for her, he just drove off.

For the mobility impaired, lack of help from driver or staff is a problem as they become dependent on help from fellow passengers. Being ignored by personnel is an unpleasant experience, and many tell us that they do not like being a burden to others (who are not obliged to help them) when travelling. Another factor frequently mentioned was uncertainty caused by aggressive driving. This is challenging for several informants – most with reduced balance, but also some vision impaired – who have to be sitting before the vehicle moves off. Another issue is lack of information on multiple-route stops; even though drivers should announce route number and destination, many do not. Lastly, many spoke fondly of the accompanying service at airports throughout the country, but they were generally less satisfied with this service in other places. One informant tells us that in Oslo, the accompanying services offered at the Central Station do not meet users at the adjacent bus terminal or metro stop since it is outside the area in which they are obliged to offer their service. This is seen as narrow-minded and shows a low level of service; while it is about 100 metres longer for service providers to walk to the metro, it would have made a huge difference for their customers.

Our informants also talked about positive experiences where drivers and staff had been very welcoming and helpful, but these episodes were mainly overshadowed by the few negative experiences. It is clear from the stories told that such experiences are significant barriers. However, no one mentioned this as the decisive factor resulting in their decision not to travel by public transport.

The second assumption was that '*lack of information results in non-use of public transport*'. In the literature review it was found that information, or the lack of it, was a barrier to using public transport. This is in line with our findings, showing that lack of information throughout the travel chain is an important explanation for why many informants decide not to travel by public transport.

For those with a visual impairment, boarding the right carrier, whether bus, tram or metro, is described as a challenge in places with more than one operating route on the same stop or platform (as mentioned above). Further, if there is a lack of information when aboard the vehicle, it can be difficult to get the right stop. One informant, with a visual impairment, is not able to purchase tickets in advance, and she finds it difficult to locate the train door to a carriage with a conductor who can sell her a ticket on board.

> Ava is not able to see relevant information on overhead monitors, and the door's colour coding which indicates staffed carriages is not always consistent. As a result, she will board the train through the door closest to her and thus risk being fined if it happens to be a carriage without staff, reserved for those with a pre-purchased ticket. She further stresses that stations without announcements are particularly difficult places to board the right train. While in most cases this was a minor problem, it was an important barrier when deviations from the timetable occur. This all adds up to a sense of insecurity.

Another informant with a mobility impairment pointed to insecurity created by not knowing whether or not a tram or train was low-floor. Some lines have both, but for wheelchair users only low-floor vehicles are suitable. The in-vehicle information system is also described as a potential source of insecurity. If unable to see the text or if seated away from the monitors, this could lead to difficulties if broadcasted information is inaudible. During the go-along study, non-functioning in-vehicle information systems were experienced in two out of six trips. In another two, the volume was almost inaudible. Even though this is probably an overly unlucky percentage compared to the normal failure rate, it nevertheless shows why it is perceived as unreliable and a source of insecurity.

An interesting finding is that some actually requested measures already in place. For instance, one informant with mobility impairment suggested an improvement whereby wheelchair users could be shown where to stand on the platform, decreasing time spent getting aboard the train and related stress. She did not know that screens

showing the wheelchair entry on approaching trains were already in place at most stations. This is an indication that the system for notifying people with impairments who are not frequent public transport users of the public transport system accessibility is less than perfect.

The third assumption derived from the literature was that '*insecurity and uncertainty regarding public transport travel result in non-use of public transport*'. This can be a result of earlier negative experiences, a sense of insecurity in general or in having limited knowledge of the public transport system. For most informants this was a significant explanatory factor for them not choosing public transport as an option; they avoid using public transport because they are worried that the system will not work, and they explain this uncertainty as a main reason for preferring to travel by other modes if possible. Many also dislike having to rely on others for help. Common explanations given were that if they knew they would face only one or two hurdles, they would handle it. But when they don't know where, which and how many barriers and issues they will encounter on a single trip, that constitutes a major barrier. This sentiment is exemplified by the experience of an informant with a mobility impairment:

> For Jessica, the main reason for her choosing not to travel by public transport is a combination of insecurity and lack of knowledge. She explains that she does not understand and know details about the public transport network. A journey by public transport is stressful, as she is unable to predict what will happen. She feels embarrassed having to ask for more help as compared with other passengers.

As mentioned earlier, these three assumptions are not mutually exclusive. The effect of lack of knowledge and understanding among drivers and personnel might not in itself result in non-use, but it can still play an important part when deciding whether or not to travel by public transport.

4.3 Can help during the first encounter with public transport reduce barriers to travel?

Of the six informants in the go-along study, five had a positive experience and, contrary to what they expected, were pleasantly surprised to find how easy it was to travel by public transport. However, one informant with reduced balance, had all of her negative expectations confirmed on a trip that combined bus, train and metro - rude fellow passengers, inconsiderate drivers and a lack of accessible infrastructure. First, some

children had occupied the “reserved for handicapped” seats on the bus and refused to move upon request. Further, the driver drove off aggressively before she could find a vacant seat, and closed the doors on passengers several times while they were still alighting, which meant knocking into fellow passengers, including the informant. At the train station, it was difficult to navigate. There was a lot of traffic noise and a two-story staircase with integrated wheelchair ramp to negotiate at 45 degrees (sic). The train was not accessible, even though the signs stated that it was. Olivia concluded that without a travel buddy, she would have probably fallen and given up at an earlier stage. She did not feel inclined to try travelling by public transport again.

However, for those who did have a pleasant experience, taking the bus, metro or tram was found to be easier than expected. Most informants told us that having experienced the system first hand with a companion, they would consider trying to use it on their own on later occasions. Several felt that being with a companion when travelling gave them confidence and a sense of security. The findings of DfT (2008), that those who had received training in public transport use were better prepared and less afraid of unforeseen incidents, seem to be the case also for the informants who tried travelling with us. It seems like help of a travel buddy during the first encounters with the public transport system may help to reduce barriers to travel. Due to a low sample size these findings are not generalizable, but this is something that should be studied further.

It is worth noting that the design of this study might constitute a potential bias in our findings. In an effort to interview different types of non-users of public transport with impairments, we explicitly tried to avoid a self-selection bias by making the go-along travel optional. By doing this, we were sure to get the views of those who seldom or never travel. However, by conducting an optional go-along study, we cannot rule out the possibility of a self-selection bias here as well; by making the public transport trip optional, only those already adept at trying public transport are the ones likely to participate on such a trip. As the informants might be more confident throughout the travel, this can affect how the informant acts, their experience of the journey, and the reactions of fellow passengers. Although we did not see any clear indications of this during our travels, this could still be one reason for the positive experience of five out of six informants. Even though there might be a potential bias, a travel buddy service should be voluntary. It is, therefore, likely that one would see some of the same personal characteristics among those using such as service.

5. Discussion

To further increase the knowledge on why non-users with impairments avoid travelling by public transport even when it is accessible, we first discuss why public transport is not a viable option for all. Then, trying to pinpoint some of the factors particularly relevant for non-use among people with impairments, we discuss similarities and differences among non-users and users with impairments, as well as among non-users with and without impairments.

5.1 Why public transport is not a viable option for all

It is important to acknowledge that public transport is not, and likely will not be, a viable option for all people with impairments. Here, two informants provided good examples:

> For Oliver (no arm function and osteoporosis), travelling by public transport is unsafe and potentially hazardous. As he has poor balance and is prone to falling when the bus is turning sharply, accelerating or braking, he must be accompanied by at least two strong companions able to support him. It is crucial that he has a seat facing against the direction of travel, so that his back absorbs the forward jolting of braking or emergency stops. He must remain seated until the bus has come to a complete stop. A trip by bus is highly dangerous because a fall can result in concussion, or, in the worst-case scenario, a broken neck as he cannot cushion the fall using his arms.

> Harry (minor mental impairment) is a young man whose major challenge is his inability to handle changing situations. He also suffers from a reduced sense of place, making his ability to handle such situations potentially more difficult. If he ever were to travel alone, he would need years of practice with a companion – and even then it could be difficult for him. Arbitrary deviation in the public transport system, such as a temporary change of route or trains arriving out of their scheduled order, is problematic and can make him 'close down'. Harry sees public transport as something frightening, unsafe and unreliable.

Oliver and Harry are examples of people for whom public transport travel is not an option. Oliver has a specially adapted vehicle he can drive, while Harry is dependent on his mother driving him to and from work as he has not been assigned the level of special transport service he requires to feel safe (same driver every day that knows his needs

and who knows the importance of driving the exact same route every day).

In addition to some not being able to use public transport even when available, others avoid public transport because they have better alternatives. This was the case for those who have access to a specially adapted vehicle, and for others who receive the best 'special transport service'. Some have access to a service known as 'facilitated transport to work', where users are transported by taxi between home and workplace at a subsidised rate. Using 'facilitated transport to work' does not reduce the number of subsidised taxi trips available, and thus reduces the need for rationing trips. On the other hand, our informants also included some who did not travel by public transport and were not entitled to the best 'special transport service' or a specially adapted vehicle. For these, not perceiving public transport as an option makes travelling and taking part in society difficult.

5.2 Similarities and differences among non-users and users with impairments

Much of the literature reviewed were either based on public transport users' experiences or included non-users in the same data material as users. However, some studies have shown that people with impairments travelling by public transport have different preferences and weigh things up differently from non-users (see e.g. AECOM 2009, for a review of existing studies). The DPTAC (2002) found that users are generally more satisfied with level of service than non-users; 55% of users are happy with the level of service aboard the local bus, compared to 42% of non-users; 44% of users are satisfied with the level of service aboard the local train, compared to 20% of non-users; and 38% with regional trains, compared to 13% of non-users. An important question when studying non-use of public transport is whether public transport users with impairments and non-users with impairments face the same challenges.

In interviews, we found that many informants' challenges are similar to barriers identified in the literature faced by people with impairments who do use public transport. However, we also found that one specific issue not mentioned as a problem for public transport users in the literature, represented an important barrier for several informants – ticketing. Further, for at least two informants, issues related to ticketing were the sole reason they had trouble using public transport. This was not found in the literature, but in the study of Asplund, Wallin, and Jonsson (2012), which also included non-users, ticketing was included as one of many barriers to public transport travel. This

tells us that ticketing is likely an important barrier for non-users with impairments, compared to those with impairments that do use public transport.

Lack of understanding and help from drivers and personnel were identified as barriers in the literature, as well as in interviews. Although being a barrier for public transport use, we did not find this to be a decisive barrier for our informants in terms of choosing whether to travel by public transport or not.

A lack of information was also identified as a barrier for public transport users, which is in line with our findings that a lack of information throughout the travel chain is an important barrier and an explanatory factor for non-use. However, an interesting finding is that measures already in place were sometimes requested. This implies that information on system accessibility is not readily available for non-users of public transport, who, consequently, do not experience this first hand.

Lastly, several informants stated that they experience psychological barriers, such as insecurity, lack of knowledge and fear of being an inconvenience to drivers and other passengers. Some say they dislike being dependent on others for help. For most informants it is seldom one barrier in particular that is the problem; rather, it is the possible combination of many or all of them that is decisive in their choosing not to travel by public transport. In such scenarios insecurity and uncertainty regarding public transport travel and accessibility throughout the travel chain are prominent barriers. This is in line with the findings of Scottish Executive (2006), Jolly, Priestley, and Matthews (2006) and Bjerkan, Nordtømme, and Kummenje (2011). One possible explanation for this could be that non-users perceive the challenges they meet, or fear they will meet, differently from users. As one informant, Isabel (sight impaired), explains:

> "I'm not a brave person. It is a conquest starting to travel by public transport, and I often become insecure and feel uncomfortable in new situations. I guess that if I were a bit braver, it would be easier. But I'm not, so often I don't dare travel".

Personal characteristics alone cannot explain non-use. During interviews, we talked to people with many different forms of impairment. In some cases, it was almost impossible for them to travel by public transport even when the system was fully up to universal design standard. The role of personal characteristics in the decision to travel by public transport is not a question we could investigate here: Our study focused only

on non-users, and such a research question requires thorough comparative analysis between users and non-users. This might, however, be an important question for further research.

5.3 Similarities and differences among non-users with and without impairments

Another related question when studying non-use among those with impairments is whether barriers to using public transport align with those of non-users without impairments.

One study show that convenience is an important explanatory factor for whether people in general choose to travel by bus or by car (Lyons et al. 2008). This is in line with our findings that those with access to other transport modes prefer to use these instead of public transport. This is based on factors such as stress, safety and insecurity regarding the public transport system. For people without impairments, travel choices and non-use of public transport relates to infrequent service, travel time and costs (Krizek and El-Geneidy 2007; Lyons et al. 2008; Sentio Research Norway 2017), as well as stress, safety, tranquillity, comfort, driver's attitude, feelings of control and independence, and social obligations (Krizek and El-Geneidy 2007; Lyons et al. 2008).

Stress, safety and driver's attitude seem to be a common denominator for non-use regardless of whether or not the traveller had an impairment. Even though some factors seem to be common, they will likely have a very different effect. For some informants, and likely others with impairments, safety is paramount. Even though safety is important for all, people without impairments will likely never be so afraid of, for instance, falling and breaking their arms or neck that it would be their sole reason for non-use. Their safety concerns are probably ones that would also affect those with impairments. Feelings of control and independence were found to influence travel choice among non-users without impairments, but this is likely different from our findings of uncertainty and insecurity being an explanatory factor for non-use among those with impairments. Further, negative attitudes of drivers are likely more severe for those left at the stop when unable to board, than for those 'just meeting a rude driver'. Factors found to be important barriers for non-users with impairments, but not for those without, were ticketing and a lack of information throughout the travel chain.

As mentioned in section 4.2, for people with impairments who seldom or never use public transport, many bad experiences are linked to lack of understanding or to patronizing attitude of drivers. Several informants had good experiences with public

transport, but it is still the few bad experiences that stick. This is in line with Kahneman and Krueger (2006) who explain that most people have a predominantly positive emotional state of mind, and a positive 'baseline'. Any negative emotion is likely to feel more intense, and just one negative experience can affect the whole perception of an occurrence. This is a reaction that likely does not differ between individuals with and without impairments.

Although there are some similarities between travellers with and without impairments who do not use public transport, many of those with impairments do not have access to satisfactory alternative modes of transport. The effects of non-use for these individuals are likely greater than for individuals without impairment who seldom or never travel by public transport, and who are more likely to have alternative travel modes.

6. Concluding remarks

At the start of this article, we asked 'why people with impairments avoid travelling by public transport even when it is accessible'. We found that many informants experience insecurity and uncertainty. Challenges expected when using public transport are often linked to previous experiences, but also to a lack of knowledge of how the public transport system works. Some identify the specific challenges and barriers that prevent them from using public transport. For most, however, it's not just one barrier, but rather the sum of all challenges combined, from experience or anticipation, that lead them to avoid public transport use. For many, lack of information throughout the travel chain is also a substantial barrier.

The following observations from the explorative study are noteworthy, likely not exclusive to Norway, and merit further research: (1) personal characteristics may be a potential explanation for non-use; and (2) the presence of a travel buddy during first encounters with the public transport system may reduce barriers to travel. To further strengthen the knowledge on these issues, studies using larger and more representative samples could increase our understanding of the barriers that non-users with impairments face, as well as how to overcome them.

The perception of loss from not using public transport varies. Some of the interviewees see non-use as a substantial loss of freedom, while others do not feel they are losing out on anything. Those with access to alternative modes of transport, such as

a specially adapted vehicle, see little point in using public transport as their alternatives are more readily available, safe and convenient. Among these there was little perception of loss from not being able to use public transport. However, those who did not have such alternatives available often told another story. These were the stories of not being able to use public transport leading to a loss of freedom; feelings of isolation and not being part of society; the lack of mobility resulting from non-use being a burden; and of being unable to take part in as many activities as desired. As a result, these individuals are, to a large extent, deprived of readily accessible transport, making many of them reliant upon friends and family for their transport needs, and limiting their possibilities for entering the labour force and the social arena.

An important lesson learnt from our explorative study is that there will always be some who are not reached through universal design. It is not possible to reach such a vast group of different people (with different kinds and degrees of impairment) with a 'one size fits all' solution. Some people with impairments will likely never be able to travel by public transport even if the universal design is perfect. If not given proper alternatives, these individuals might end up with a substantial loss of freedom as they are unable to fulfil their travel needs, and a feeling of not being a part of society. We do not deny that a universally designed public transport system is an attractive solution; one should strive for a system that is as inclusive and accessible as possible. However, our study shows that current universal design policy does not lead to a public transport system so accessible that impairments are rendered irrelevant. There is still a need for individual and specialised solutions. Issues arise when individuals do not use public transport, and furthermore, do not fit into a relevant 'predefined category' for special transport services. Such individuals are at a greater risk of not having their transport needs met. By not adequately addressing these needs, we risk profound personal repercussions whereby such individuals could be confined to their homes, reducing their sense of freedom, inclusion and participation in society. However, if society, in one way or another, could safeguard that each individual is given the means and tools necessary for them to fulfil their travel needs, this might have profound societal impacts through increased participation in the workforce and value added in society among those who do not have public transport as a viable option. Only then can society make the best use of all its inhabitants while championing inclusiveness and equality.

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Appendix – Interview guide

Background information (used for anonymisation purposes)

Gender, age, type of impairment.

Travel needs

What kind of travel do you conduct regularly (school, work, purchasing), and where (geographically)?

How do you travel, and why do you prefer this route/mode/other?

Are there any trips you would like to take, but which you feel you cannot?

What are your reasons for not travelling in these cases?

Reasons why public transport is not used as travel mode

How often do you travel by public transport? Are you traveling alone, or do you have someone accompanying you?

What are the reasons you (mainly) choose modes other than public transport?

Are there any obstacles or barriers that are particularly challenging?

What characterize the places and situations that are particularly problematic?

Are the issues in any way linked to absence of or poorly universal design?

Does your limited use of public transport affect your daily life in any way, and if so, how?

Are there any measures that could make you choose public transport more often?

Table 1. List of anonymous informants, with their given alias, type of and impairment description, and whether they participated in the go-along study.

Alias	Type of impairment		Go-along study?
Oliver	Arm function, balance	Impaired arm function and subsequent residual paralysis, as well as poor balance. He also has Osteoporosis.	No
Amelia	Mobility	Mobility impaired and paralysis on one side after Cerebral Haemorrhage.	Yes
Olivia	Balance, arm function	Impaired balance and are only able to use one arm due to stroke. Speak slowly and have minor mobility issues.	Yes
Jack	Sight	Strong sight impairment from birth.	No
Emily	Mobility, sight	Wheelchair user, blind for the past 20 years, dependent on companion for traveling outside the home - the challenges she meets correspond mainly with disabled people, as companions act as her 'eyes'.	Yes
Ava	Sight, mobility	Reduced vision, slightly mobility impaired (uses walking stick for support).	No
Harry	Minor mental impairment	Minor mental impairment, somewhat reduced mobility due to Cerebral Palsy.	No
Jacob	Mobility	Wheelchair user.	No
Charlie	Sight, hearing, slight cognitive impairment	Blind on one eye, and use a hearing aid. Has a mild chromosomal defect, but only slight cognitive effects (a slightly late development).	Yes
Isabel	Sight	Blind, have a guide dog.	Yes
Jessica	Mobility	Able to walk short distances, but use a wheelchair for relieve when out and about.	No
Thomas	Mobility	Wheelchair user.	Yes
Lily	Sight	Reduced vision due to stroke.	No

George	Sight	Blind, uses a cane.	No