

## Public transport and people with disabilities – the experiences of non-users

Kjersti Visnes Øksenholt  
Jørgen Aarhaug  
Institute of Transport Economics, Norway

### **1. INTRODUCTION**

*Universal design or accessibility for all* is high on the public agenda in Norway. The idea behind universal design is that society should be designed so that its infrastructure is accessible to all, as much as possible without special solutions and despite differences in level of functioning, to the point where disabilities are rendered irrelevant. However, despite years of focus on universal design in public transport, it seems that the number of people with disabilities actually using public transport has not increased significantly. The aim of this paper is to contribute to a better knowledge of why non-users with disabilities refrain from travelling by public transport. Our research question is:

*“Why do people with impairments avoid travelling by public transport even when it is readily accessible, and are there any further measures that could lead to improvement?”*

We approached this question by examining the existing literature and by conducting a qualitative study on disabled people who seldom or never use public transport as a mode of travel.

The paper is structured along the following lines: the methods used are described in section 2, while section 3 is a summary of the literature review and assumptions derived from it. Section 4 gives the main findings from our interviews and go-along study. Finally, in section 5 we link the findings with the literature and discuss the assumptions and research question.

### **2. METHODS**

Two different though complementary methods were chosen. First, a literature review aimed at answering the research question and, second, in-depth interviews and go-along studies were done with the aim of expanding our understanding of the issue.

#### **2.1 Literature review**

We began the review by summarizing our knowledge of the existing literature while focusing mainly on Norway and European countries with a context similar to that of Norway, e.g. Sweden, Denmark, the UK. Our existing knowledge and review of reference lists in these studies was supplemented by searches in databases including; the Norwegian library databases, Google, Google Scholar via the database host ProQuest Dialog, PsycINFO, Social SciSearch and Transport Research International Documentation. Smaller bibliographic

databases – such as Web of Science, Transport and TRID – were searched too. We found descriptive studies focusing mainly on accessibility, travel habits of the disabled and the challenges they face. Few studies focused on non-users. Most were not directly relevant, but when searching the reference lists we came across relevant information, e.g. in the works of Golledge et al. (1997) and Marston and Golledge (2003). Finally, we sent inquiries to our network in Norway and abroad, and although no one could help us with directly relevant literature, the articles, studies and documents we received were read carefully and the references checked.

Possible limitations to our study include the language barrier. We searched only for studies in Norwegian, Swedish, Danish or English. There could well be studies in other languages answering our research question. Another possible limitation was our searching library databases mostly within the transport discipline, while knowing that there could be other databases aimed at other disciplines, such as medicine or psychology, with relevant studies but locked for outside users.

## **2.2 In-depth interviews**

Fourteen people with a range of different kinds and degrees of disability were interviewed in total. Some had more than one disability. Seven had reduced vision, six reduced mobility, one reduced hearing, two reduced balance, two reduced arm function, while two had reduced cognitive ability. Some were born disabled, while others had become disabled later in life. All informants were given aliases to render them anonymous. The youngest informant was in the early twenties, the eldest just over 70, the majority (11 of 14) were 50 years and upwards.

Each informant was invited to participate in a go-along study using public transport with a guide/observer. Those who were willing to travel with us by public transport were interviewed prior to the trip and debriefed after it. We chose not to make the public transport trip mandatory, as that would probably have hindered potential informants from participating.

Geographically, we focused on the Oslo region for two reasons; first, it has a long tradition of universal design in public transport, with considerable effort being put into creating a system that incorporates universal design. Although not perfect, it is probably the system with the most universally designed features in Norway. Further, Oslo was chosen because we wanted our respondents to have access to a good public transport system in general. The second reason was convenience, because using Oslo reduced the need for travel and allowed our researchers to function as public transport guides where relevant.

Since it is difficult to recruit informants with very specific characteristics, in our case people with disabilities who rarely or never travel by public transport and live in the Oslo area, we used our contacts in relevant organizations and councils. In particular, we contacted the Norwegian Association of the Disabled (Norges Handikapforbund) and the Norwegian Association of the Blind (Norges

Blindeforbund), both of which informed their relevant members. We also participated in a radio show for people with vision impairments, and used the institutes' websites, facebook and twitter accounts. In addition, we wrote an invitational piece in the magazine *Samferdsel* and contacted the health and safety company Romerike HMS.

Semi-structured interviews were conducted to get an insight into the challenges and different possibilities perceived by the informants. Our questions concerned the trips they went on and how they travelled, and also trips they wanted to make but didn't and why they didn't. We focused not on getting a representative sample of people with different disabilities, but on getting as many different points of view as possible. Also, all interviews and go-along studies were conducted in June outside rush-hour traffic periods in order to avoid problems associated with winter and rush-hour traffic, both of which are already well-documented barriers to travel by public transport.

### **3. REVIEW OF THE LITERATURE**

The Scottish Executive (2006) has claimed that there is at least one hurdle on every multifaceted journey and that there is never just one solution. This is in accordance with Jolly et al.'s (2006) findings indicating that specific barriers might be easy to identify but that they have to be viewed in a broader context of the entire travel chain. Still, challenges that seem to crop up more often than others include specific physical tests, lack of accessible information and lack of help from drivers or staff. Jolly et al. (*ibid.*) found that the disabled were generally less satisfied with the public transport service than those who were free of disability, and perceived the service as less reliable. Important factors are broken travel chains and insecurity in relation to multimodal travel.

#### **3.1 Barriers to use**

Regarding access to stops, the Norwegian standards and guidelines contain rigorous universal design requirements throughout the travel chain, such that one would expect the infrastructure to be readily accessible for disabled people. Still, many disabled experience problems while travelling. Twenty-one percent have difficulty getting to and from the transit stop (Bjerkan, 2009). For the mobility impaired, on the one hand, this is a challenge of distance (Lodden, 2001; Nordbakke and Hansson, 2009) and the height of kerbs along the way (Aarhaug et al., 2011). The sight impaired, on the other hand, experience difficulties orienting themselves where there is a lack of maintenance – missing, broken or hidden orientation points and orientation lines along the way (Aarhaug et al., 2011; Aarhaug and Elvebakk, 2012; Tennøy et al., 2013). Some choose not to travel by public transport or to make the trip at all (Bjerkan et al., 2011).

*Ticketing* does not seem to be an issue in any of the studies we found.

The share of universally designed public transport continues to increase. The Metro in Oslo and Bergen Light Rail are wheelchair accessible, and buses operating on routes in cities and the surrounding areas are low-floor (cf. Directive

2001/85/EF) (European Commission, 2001). In 2014, approximately half the number of trams in Oslo were low-floor, while the rest will be when old trams are decommissioned in 2020, and new, accessible, trams are brought into service (Ruter, 2013). Still, *boarding and alighting* is a challenge for 36 percent of disabled people. Buses and trains are perceived as the most difficult. While getting on and off are perceived by the mobility impaired as the most difficult (Bjerkan, 2009), other barriers are lack of accessibility to stops or platforms due to poor maintenance or height issues, and lack of signage. The bus stopping too far from the kerb is also a problem (Aarhaug et al., 2011).

Sight-impaired people experience difficulties orienting themselves at the stop or platform prior to boarding and again after disembarking. A key challenge for them is simply in getting aboard the correct carrier, dependent as they are on the driver calling out the route number and destination. Some sight-impaired do not use a cane or have a guide dog, and so it is difficult for the approaching driver to know that someone at the stop has an impairment, in which case s/he might not take the right action. Furthermore, for alighting at the right stop the sight-impaired are again often dependent on the driver or staff for help. A common complaint of all the disabled was lack of help from the driver, which could be due among other things to tight schedules (Aarhaug et al., 2011; Aarhaug and Elvebakk, 2012).

*On board the carrier*, a problem for wheelchair users is that they are often seated below the window line and thus lose track of where they are at any given moment (Aarhaug et al., 2011).

*Information*, or the lack it, is another factor which might be a barrier to public transport travel. We found that this could be challenging for all disabled people, particularly in the case of badly designed or wrongfully placed information at the stop (Aarhaug et al., 2011), and lack of (or erroneous) real-time information aboard the carrier (Aarhaug and Elvebakk, 2012). According to Bjerkan (2009), 12 percent experience ‘information about departures or stops’ as a challenge, while Nordbakke (2011) found that this was a bigger issue for those travelling by bus (16 percent) than for those travelling by tram/metro (10 percent) or train (9 percent).

Readily accessible information is thus key. Half of the respondents in the Disabled Persons Transport Advisory Committee (DPTAC, 2002) survey stated that they did not feel sufficiently informed when travelling by public transport. A further 39 percent said they would use public transport more often if it were easier to access information. Another study has found that lack of information is the primary reason the disabled seldom travel by public transport (Golledge et al., 1996). Marston and Golledge (2003) found that lack of information could lead to three different issues for the disabled travelling by public transport: it can take them more time than it takes the non-disabled; they miss their connecting mode; or they simply avoid travelling. According to the Department for Transport (DfT, 2008), those with reduced mobility report that better available information about physical accessibility would help make them feel safer when travelling. Jolly et al. (2006) found that the disabled had little knowledge of local routes and

frequencies, and that they had trouble assembling and understanding travel route options. This lack of knowledge led to public transport being used to a lesser degree. Yet another study (Ruud et al., 2005) 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.

### **3.2 Expectations and uncertainty**

Another issue for many disabled people seems to be uncertainty and expectations regarding public transport travel itself. According to Bjerkán et al. (2011), the disabled 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 other means. 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 that the Scottish Executive (2006) identifies is ‘a lack of trust in the transport system as a whole’. In another study, important barriers to travelling by public transport 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. Many disabled also fear being a burden to the driver, who is often following a strict schedule, or to other passengers stressed about arriving at their destination on time (Aarhaug and Elvebakk, 2012). Alongside this, the Department for Transport (DfT, 2008) found that use of public transport is reduced because of the insecurity of users and inaccessibility at different points in the travel chain – from planning to arrival at one’s destination.

### **3.3 Main findings**

Regarding if *non-users and users of public transport point to different challenges*, the Disabled Persons Transport Advisory Committee (DPTAC, 2002) found that users are generally more satisfied with level of service than non-users (table 1).

**Table 1:** The percentage satisfied with the different transport modes (based on DPTAC, 2002).

<i>Transport mode</i>	<i>Users</i>	<i>Non-users</i>
Local bus	55 %	42 %
Local train	44 %	20 %
Regional train	38 %	13 %

The DPTAC does not discuss whether level of satisfaction has a causal connection with how public transport is used, or of which way the relation works. Whether the lower satisfaction of disabled non-users is a result of lacking knowledge of the system as a whole or is based on prior, negative, experiences is not an issue that is discussed.

Numerous studies have shown that disabled people 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). Furthermore, it has been found that only a small proportion of studies actually include disabled non-users of public transport (*ibid.*) and there is a difference in the issues users and non-users emphasize as important. Laird and Whelan (2007) found that disabled non-users emphasise all aspects of travel more than users do. McDonnell et al. (2007) found that non-users of public transport put greater emphasis on real-time information, while users emphasize seating aboard the carrier. In addition, disabled non-users emphasize information, travel planning and transit stop facilities more highly than users. Users and non-users differ concerning comfort aboard, cleanliness, travel time and crowding. Non-users place greater emphasis on travel time and crowding than users do (AECOM, 2009; dell'Olio et al., 2011). Thus, when mapping the potential of more disabled non-users being attracted into using public transport, the answer is not a study of those already travelling. The preferences and needs of non-users should be studied separately.

*So why do people refrain from travelling by public transport?* What prior studies have in common is that they are either based on disabled public transport users' experiences, or they include non-users in the same data material as users. These studies don't state whether the identified factors are the reason non-users do not travel. We are left a little bit in the dark. Only one study was found specifically dealing with why disabled non-users shy away from using public transport. Use or non-use of public transport was the subject of a Swedish study of 882 patients permanently disabled due to stroke (Asplund et al., 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 in expectation that they would come up against physical barriers along the way. Cognitive issues were also a barrier, as non-users expected to have difficulty finding information, buying tickets, orienting themselves at terminals and transit stops, etc. Asplund et al. (2012) conclude that disabled non-users are likely to overestimate the actual barriers to travelling by public transport. Those who did travel had a more positive attitude to the public transport system, even though they, too, reported some physical challenges (Asplund et al., 2012). This tells us that uncertainty among the disabled regarding travel and the challenges they might face is an important barrier they have to take into consideration when deciding whether to travel by public transport or not. Those who had received training were better prepared and less afraid of unforeseen incidents. This was also the only study claiming a causal connection between barriers and non-use.

In other studies, we found that lack of information (DPTAC, 2002; Jolly et al., 2006; Scottish Executive, 2006), lack of knowledge regarding the transport system and transport infrastructure (Scottish Executive, 2006), lack of self-esteem and expectations about problems (DfT, 2008; Scottish Executive, 2006; Golledge et al., 1997), all create insecurity and form barriers to the disabled travelling by public transport. The DfT (2008) found reduced use of public transport as due to insecurity among existing users. Whether these barriers are decisive in the decision to travel or not is not unequivocal. It is interesting that the one study we found which did focus on disabled non-users found expectations and insecurity to be important in the decision not to travel by public transport.

There is thus reason to suspect that insecurity and expectations are important. This is in line with the findings of Fearnley et al. (2015), where safety is pointed out as one of the main qualitative issues with public transport that affect its use. Based on the literature review, we made five assumptions which we will use when analysing the data from our empirical study. The first three derive directly from the literature: 1) *Expectations and uncertainty result in non-use of public transport*; 2) *Non-users and users of public transport point to different challenges behind their use of public transport*; 3) *Lack of knowledge and understanding among drivers and other personnel is a significant barrier for non-users*. In the literature we found that those who had received training in public transport use were better prepared and less afraid of unforeseen incidents occurring. Our fourth assumption is thus: 4) *A travel buddy system can increase public transport use among those who do not use it at present*. Lastly, we expect that: 5) *Some people avoid public transport because they have a better alternative*.

## 4. EMPIRICAL RESEARCH

In this section we present moments that came up during our interviews and go-along studies. We avoid direct quotations as the interviews were conducted in Norwegian.

### 4.1 Barriers to use

In some interviews, single issues were brought up by informants, but in most a combination of factors was used to explain why they avoided travelling by public transport. In this section we have sorted the factors mentioned according to stage in the travel chain.

Regarding *access to stops*, in the literature (Lodden, 2001; Nordbakke and Hansson, 2009) distance to stops is described as one of the major challenges for people who travel by public transport, but this was not found in our study. Only a few of our informants mentioned challenges in getting to and from stops, possibly because of the location of the study – the Oslo area, where there is a high density of stops compared to the rest of Norway. Rather, what the informants pointed to was challenges in transfers between modes, in particular between bus, rail and metro at the major transfer points. The one mentioned is not the distance between the stops but a lack of integration between different transport modes and companies. In Oslo, the accompanying services offered at the main train station do not pick up people at the adjacent bus terminal or metro stop since it is outside the area in which they are obliged to offer this service. This creates barriers to using public transport on the entire journey or all together. The opposite is the case at the main airport, where the accompanying service functions well. One blind respondent stated that it was easier to travel from his home to Trondheim by air, with several changes (at least three), than by train, which requires only a single change. Another respondent using a wheelchair points out that when travelling by metro he has experienced the elevators at several metro stops being out of service and he has to take the metro to the next stop in order to exit the station.

*Ticketing* was not singled out as an important issue in the literature review, although many of our informants pointed to this as being an important barrier to using public transport in the Oslo area. Jack, who has reduced vision, sees the high level of automatization in ticketing on public transport in Oslo as the main barrier to using public transport. It is difficult to find ticketing machines, and when they are found they are difficult to use. He does not believe he could have bought a ticket even if he had been able to locate the machines. Several other visually impaired informants stated that they always buy tickets after boarding, as ticketing machines are not accessible for the blind or others with reduced vision. Ava states that she cannot use app-ticketing as she does not have a smartphone, nor can she use the ticketing machines because of her reduced vision. In addition, she finds it difficult to locate the train door to a carriage in which there is a conductor who will sell her a ticket on board. As a result, she will get on the train at the first possible point and thus risk being fined if it happens to be a carriage only for people with pre-purchased tickets. Both Jack and Ava point to ticketing and the uncertainty caused by ticketing and lack of personnel to ask for directions as the main barriers to their using public transport.

Even though finding stops was not mentioned as a major issue, *boarding and alighting* the vehicle was. Points mentioned included gaps between stop/platform and vehicle, and too short a time available to get on and off. One respondent with reduced vision pointed to her difficulty when at stops used by more than one particular route, as it was difficult to spot the difference between them, particularly if they did not stop at the correct point along the kerb. Another recurring issue was the lack of understanding among drivers. Several of the informants told stories of being ignored by bus or metro drivers. One blind respondent experienced a metro departing while she and her guide-dog were searching for the button to open the door. Either the guide-dog can point her to the door, at which she needs to find the opening button herself, or the driver has to open the door for her remotely. According to the informant, the driver should have spotted her standing on the platform with her guide-dog as the metro was coming to the stop, and thus should have opened the door for her. Two issues were mentioned about buses: One, some long-distance buses have to be standing absolutely horizontally if the elevators are to function, and this is not possible at every stop; two, ramps on local city buses are sometimes rendered inoperable due to limited use. If a ramp does not function as it should, there might be a long wait before the next bus arrives.

Regarding issues *on board the carrier*, in the Aarhaug et al. (2011) study it was found that low seating of wheelchair users was a significant issue and made orientation more difficult. None of the informants in our study mentioned this as a problem. However, some points were singled out. One was that the buses have different interior arrangements, making it difficult for sight impaired to find the stop button on unfamiliar vehicles. Another was driving style, which is sometimes mentioned as challenging, particularly among people with reduced balance. The uncertainty caused by a poor driver is seen as a challenge, as several informants, most with reduced balance, but also some vision impaired, need to

be seated throughout the journey. Furthermore, the driver must wait until his passengers are seated before driving off.

During the literature review it was found that *information*, or lack of it, was a barrier to use of public transport, which is in line with the findings in our interviews. For informants with reduced vision, finding the stop and getting on the right bus are challenging, and if there is a lack of information on the vehicle, either bus or metro, it can be difficult to know the right stop. Another informant, with another issue, pointed to the development of silent stations as places where it was particularly difficult to get one's bearings. While in most cases this is a minor problem, it can be serious when there are deviations from the timetable, all adding up to a sense of insecurity. At least one informant stated that it was difficult to get to the right railcar. She could not distinguish between cars with and without a conductor. Another informant pointed to insecurity created by not knowing whether or not a tram or train was low floor. Some lines have both, and as a wheelchair user only the low floor vehicles are usable. The in-vehicle information systems are also a potential source of insecurity. One informant stated that it was difficult to hear the information being broadcast. During our 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.

*Summing up this section*, during our interviews we found that there were some relatively minor issues that created barriers to the use of public transport. However, it was not one single issue, but several smaller ones combined, which is in line with the findings of the Scottish Executive (2006) and Jolly et al. (2006). Several of our informants had good experiences with the public transport network, but still they tell us that it is the few bad ones they remember and that are stuck on their minds. Many are linked to lack of understanding or to a patronizing attitude of drivers.

#### **4.2 Expectations and insecurity**

Many of the challenges the informants in this study came up against, that is those who mostly avoid using public transport, are similar to those faced by people with disabilities who regularly use it. We therefore assume that non-users perceive the challenges differently from users. Several informants state that they experience psychological barriers in the form of insecurity, lack of knowledge and fear of being an inconvenience to personnel and other passengers. Some say that they dislike being dependent on others for help on a journey. Informants who told stories include Jessica (reduced mobility), who stated that a combination of insecurity and lack of knowledge was the main reason for her choosing not to travel by public transport. With 'lack of knowledge' she means not understanding and knowing details about the public transport network. As a result, she sees a journey by public transport as stressful, pointing to her inability to predict what will happen. She states that she feels embarrassed having to ask for more than the ordinary passengers. Thomas (reduced mobility), on the other hand, avoided

using public transport because he was worried that the system would not work. He focuses on this uncertainty to explain his preference for travelling by another mode. He also states that he dislikes having to rely on the help of others, and says it is much easier to go by car.

#### **4.3 Physical and mental barriers**

In our interviews we were confronted with many different forms of disability. In some cases, it was almost impossible to travel by public transport even when the system was fully up to universal design standard. Two of our informants could not travel by public transport because of physical or mental factors. Oliver has reduced arm function as well as osteoporosis and in his case travelling by public transport is hazardous. If he travels at all, he needs to be accompanied by at least two other people. He has poor balance and is prone to falling when the bus is turning sharply, accelerating or braking. It is also 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. Furthermore, he must remain seated until the bus has come to a complete stop. For him a trip by bus is highly dangerous, because a fall can result in concussion or, in the worst case, even a broken neck, as he cannot cushion the fall using his arms. Harry is a young man with a minor mental disability. His major challenge is in his inability to handle changing situations, but he also suffers from a reduced sense of place. He needs practice in travelling alone, but before this he has to have travelled with a companion for years before a single trip is safe. Arbitrary deviations in the public transport system, such as a temporary change of route or trains arriving in out-of-schedule order, can be problematic. Harry sees public transport as something frightening, unsafe and unreliable.

#### **4.4 Alternative modes of transport**

Some of the informants have access to transport that is easier to use than public transport – a driver and private car, for instance, access to a custom-adopted vehicle, or use of a ‘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 subsidized rate. The informants who had access to alternative modes of transport see little point in using public transport as they perceive their available alternatives as safer and more convenient. Consequently, their reliance on others, such as drivers and fellow passengers, is reduced.

#### **4.5 Findings and influence on everyday life**

In the interviews and go-along studies we found that the perception of loss from not using public transport varied a lot between individuals. Some see non-use as a substantial loss of freedom, while others do not feel they are losing out on anything. Among our informants with access to other transport services, such as a specially adopted vehicle, there was little perception of loss from not being able to use public transport. However, those who did not have alternative modes of transport available often told another story. Jacob (reduced mobility) told us that not being able to use public transport was a loss of freedom and made him feel he was not part of society. Furthermore, if he had been able to use public

transport he would have saved the time he spent standing still on congested roads in a taxi. Amelia (reduced mobility) likes going for a drive on accessible pathways in the forest. She needs an electric wheelchair for these drives, but she is not able to board the metro taking her to such spots. She feels her lack of mobility as a burden. Isabel (reduced vision) tells us that the limitations of the subsidized taxi service (limited number of trips) result in the need for planning and rationing of trips, and because of this she is unable to take part in as many activities as she would want.

Those who went on an accompanied go-along journey trying out public transport made the following observations:

- Although mentioned in interviews as difficult for wheelchair users, travelling by tram was easy for the electric wheelchair user who tried it.
- Taking the bus or metro was found to be a lot easier than expected from the comments of those who tried.

Of those travelling with us, most were pleasantly surprised of how easy it actually was to travel compared to what they expected. However, one informant, Olivia (reduced balance), had had all her fears confirmed on a combined trip by bus, train and metro. First, some children had occupied the “reserved for handicapped” seats on the bus. The driver drove off aggressively before she could find a vacant seat and several times closed the doors on passengers while they were still alighting, which meant knocking into several passengers including the informant. At the train station transfer point, it was difficult to navigate. There was a lot of traffic noise and a two-story wheelchair ramp to negotiate at 45 degrees (sic). The train was not accessible, even though the signs stated that it was. Olivia had all her negative expectations confirmed. She concluded that without a travel buddy, she would have fallen and probably given up at an earlier stage in the journey.

## **5. CONCLUDING DISCUSSION**

After reading the literature, we made assumptions which we sought to answer from the data obtained in our interviews and go-along studies. The first was that *expectations and uncertainty result in non-use of public transport* and that this can be a result of earlier negative experience, a sense of insecurity in general or in having limited knowledge of the public transport system. Our findings indicate that this may be correct. Several of the interviewed indicated that this was a significant factor in their deciding why they did not see public transport as an option.

Our second assumption was that *non-users and users of public transport point at different challenges to using public transport*. We found that non-users meet mostly the same challenges that users do, but with some differences. In particular, at least two of our informants indicated that ticketing and the ticketing system were significant barriers; this has not been found in studies of users. Uncertainty was mentioned by many of our informants as a significant barrier. This has also been mentioned in studies of users. Our findings indicate that it is ‘all the issues combined’ which are decisive in our informants choosing not to

travel by public transport. Furthermore, personal characteristics such as how 'mentally tough' a person is can be an important factor in the decision whether or not to travel by public transport. This is not a question we could investigate further as this study focused only on non-users, but it is a question for further research.

Our third assumption was that *lack of knowledge and understanding of drivers and other personnel constitutes a significant barrier for non-users*. This was mentioned by several of our informants. They also mentioned positive experiences, but stated that these were often overshadowed by a few negative experiences. As many mention this as a factor, it is probably important, however, no one mention this as a decisive factor in their decision not to travel by public transport.

Our fourth assumption was that *a travel buddy system can increase public transport use among those who do not use public transport at present*. Our study indicates that this has potential. In particular, in our go-along study several of the informants had positive experience with the public transport system, and indicated that after having experienced the system they would consider using it on their own. However, we also had an informant whose testing of the public transport system confirmed all her negative expectations. In sum, it is not a given that using a travel buddy will increase public transport use, but it can be a point for further study. Using a travel buddy system can be an instrument in checking how accessible the public transport system actually is and help in targeting improvements and maintenance.

Our fifth assumption was that *some persons avoid public transport because they have better alternatives*. This was so in the case of some of our informants. In particular, people who have received the best 'special transport service' or have access to a specially adapted vehicle. On the other hand, our informants included people who were not able to travel by public transport and were not entitled to the best 'special transport service' or a specially adapted vehicle. These individuals are to a large extent deprived of readily accessible transport, both limiting their possibilities for entering the labour force and making them reliant upon friends and family for their daily transport needs.

Turning to our research question, we asked *why people with impairments avoid travelling by public transport even when it is accessible*. We found that many of our informants experience and expect insecurity and uncertainty, or to encounter challenges when using public transport. These expectations are often linked to previous experiences, but also to a lack of knowledge of how the public transport system works. Some of our informants identify specific challenges and barriers which prevent them from using public transport, in particular related to ticketing and boarding. For many, it is the sum of all challenges combined, real or anticipated, that leads to them refraining from using public transport. This is in accordance with the findings of Asplund et al. (2012). We also asked if *there were any measures that could improve things* and several factors were mentioned, among them better education of bus drivers and other personnel,

better information systems, possibilities to notify the driver of persons with special needs before boarding, and so on. We also noted that several of the informants actually requested measures that were already in place, indicating that the system for notifying people with disabilities – and not frequent public transport users – of the accessibility of the public transport system was less than perfect. This is something that actually could be improved with limited effort, and would have a real impact on the lives of people with a disability.

A question arising from our study is: Are the challenges the same for different age groups? In our study we interviewed people above 50 and below 30 years of age. This distribution was not intended. It could, however, reflect that many become disabled as adults, in particular as a result of a stroke. It could also be a result of people in this age group being more interested in participating in this kind of study. From our limited data, we do not see any link between age and the challenges faced by our informants. There may be a tendency for younger persons to have more information on technical aids available, and thus being able to use public transport. Either way, as public transport users these are beyond the scope of our study.

Lastly, our study raises the question of whether universal design or accessibility for all is a good policy objective in public transport. Many of our informants are unable to travel by public transport, even though the system is among the most universally designed available. They would not be able to travel by public transport even if implementation of the measures which constitute universal design today was close to perfect. We write this, not to deny that a good universally designed public transport system is an attractive solution, it will help many, but that there will still be some who will not be reached through the universal design agenda. Therefore, there will still be a need for individual solutions, which could increase the individual's sense of freedom, participation in working life and value added in society among those who do not have physical and/or mental premises for travelling by public transport.

## REFERENCES

- Aarhaug, J. and Elvebakk B. (2012) *Enhanced accessibility in public transport: A before-and-after study*, TØI report 1235/2012.
- Aarhaug, J., Elvebakk, B., Fearnley, N. and Lerudsmoen, M.B. (2011) *Enhanced accessibility to public transport: a before study*, TØI report 1174/2011.
- AECOM (2009) *The Role of Soft Measures in Influencing Patronage Growth and Modal Split in the Bus Market in England*, Final Report, Prepared for the UK Department for Transport, October 2009.
- Asplund, K., Wallin, S. and Jonsson, F. (2012) Use of public transport by stroke survivors with persistent disability, *Scandinavian Journal of Disability Research* 14.4, pp 289-299.

Bjerkan, K.Y. (2009) *Funksjonshemmende kollektivtransport? Transportbruk og transportvansker blant personer med nedsatt funksjonsevne*, NOVA Notat 2/2009.

Bjerkan, K.Y., Nordtømme, M.E. and Kummenje, A. (2011) *Transport til arbeid og livet. Transport og arbeidsdeltakelse blant personer med nedsatt funksjonsevne*, Sintef report A20434.

dell'Olio, L., Ibeas, A. and Cecin, P. (2011) The quality of service desired by public transport users, *Transport Policy*, vol 18, pp 217-227.

Department for Transport (2008) *Travel behaviour, experiences and aspirations of disabled people*, [URL]  
<http://webarchive.nationalarchives.gov.uk/20091003125851/http://www.dft.gov.uk/pgr/scienceresearch/social/travelbehaviours>

Disabled Persons Transport Advisory Committee (2002) *Attitudes of Disabled People to Public Transport*, [URL] [http://www.transport-research.info/sites/default/files/project/documents/20060811\\_110503\\_45123\\_UG395\\_Final\\_Report.pdf](http://www.transport-research.info/sites/default/files/project/documents/20060811_110503_45123_UG395_Final_Report.pdf)

European Commission (2001). Special provisions for vehicles used for the carriage of passengers comprising more than eight seats in addition to the driver's seat. *Directive 2001/85/EC*, [URL]  
[http://ec.europa.eu/enterprise/sectors/automotive/documents/directives/directive-2001-85-ec\\_en.htm](http://ec.europa.eu/enterprise/sectors/automotive/documents/directives/directive-2001-85-ec_en.htm)

Fearnley, N., Aarhaug, J., Flügel, S., Eliasson, J. and Madslien, A. (2015) *Measuring the patronage impact of soft quality improvements in urban public transport*, TØI report 1408/2015.

Golledge, R.G., Marston, J.R. and Costanzo, C.M. (1997) Attitudes of Visually Impaired Persons Toward the Use of Public Transportation, *Journal of Visual Impairment & Blindness*, September-October 1997.

Golledge, R.G., Marston, J.R. and Costanzo, C.M. (1996) *Public transit use by non-driving disabled persons: The case of the blind and vision impaired*, Working paper UCB-ITS-PWP-96-1, Partners for Advanced Transit and Highways, Richmond, CA.

Jolly, D., Priestley, M. and Matthews, B. (2006) *Secondary analysis of existing data on disabled people's use and experiences of public transport in Great Britain. A research report for the Disability Rights Commission*, Centre for Disability Studies, University of Leeds.

Laird J. and Whelan G. (2007) *Quality Bus Model: Re-analysis of the CfIT data*, Report to the Department for Transport.

- Lodden, U. (2001) *Simplifying public transport. Barriers against using public transport and measures to make public transport easier*, TØI report 540/2001.
- Marston, J.R. and Golledge, R.G. (2003) The Hidden Demand for Participation in Activities and Travel by Persons Who Are Visually Impaired, *Journal of Visual Impairment & Blindness*, August 2003.
- McDonnell S., Ferriera S. and Convery F. (2007) *Bus Priority Provision and Willingness to Pay Differentials as a Result of Modal Choice and Residential Location – Evidence from a Stated Choice Survey*, Paper to the European Association of Environmental and Resource Economists, 15th Conference Thessaloniki 28th June – 1st July 2007
- Nordbakke, S. and Hansson, L. (2009) *Mobility and welfare among people with physical disabilities – the role of the car*, TØI report 1041/2009
- Nordbakke, S. (2011) *Persons with physical impediments to travelling. Extent, characteristics, activity pattern, and barriers*, TØI report 1148/2011
- Ruter (2013) Konseptvalgutredning for anskaffelse av nye trikker. [URL]  
[https://ruter.no/globalassets/dokumenter/ruterrapporter/2013/kvu\\_nye\\_trikker\\_hovedrapport.pdf](https://ruter.no/globalassets/dokumenter/ruterrapporter/2013/kvu_nye_trikker_hovedrapport.pdf)
- Ruud, A., Fearnley, N., Kjørstad, K. N. and Hagen, T. (red., 2005) *The market for urban public transport: Facts and examples*, TØI report 811/2005
- Scottish Executive (2006) *Improved public transport for disabled people. Vol 1 – Report*, Scottish Executive Social Research.
- Tennøy, A., Øksenholt, K.V., Fearnley, N. and Matthews, B. (2013) *Evaluating standards and practices for facilitating visually impaired people's mobility in the built environment*, TØI report 1260/2013.