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JOURNEYS IN THE CITY: EMPATHISING WITH THE USERS OF TRANSPORT BUILDINGS

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ABSTRACT: Accessibility is a considerable and growing issue in the design of many public buildings including vital high use buildings such as train stations. Yet research methods for these buildings are poor. This paper suggests that one new approach to design is to use immersive, auto-ethnographic methods to achieve an empathetic understanding of design needs. The paper asks: what can we learn about the mobility requirements of station users when we are immersed in a train station environment, and what mobile research methods can we use to begin to explore this?

The paper reports on a study that used video diaries to explore Canary Wharf Station in a November evening rush hour in dry conditions, and specifically to study passenger behaviours on an island platform within the station. The analysis focused on how to improve mobility in the station from a user's perspective. This use of auto-ethnography is discussed as part of a broader methodological debate about how to explore universal design issues from a user's perspective, and in the context of empathetic design.

Keywords – Inclusive Design. Auto-ethnography. Universal Design. Transport Buildings.

1. INTRODUCTION

A growing body of research suggests that there is a long way to go before “*we live and work in an inclusive world*” (Clarkson and Coleman 2015). While approaches to design increasingly acknowledge bodily differences and empathy. Recent methods suggest internalising the requirements of the user (Imrie and Luck 2014) “*leaving the design office and becoming-if briefly-immersed in the lives, environments, attitudes, experiences and dreams of the future users*” (Battarbee 2004).

Transport buildings have a significant role in connecting people to places of employment, housing, learning or enjoyment. However, inclusive design processes from product design and assistive technology fail to impact train design (Herriott and Cook 2014 p.162). Nevertheless, transport buildings should provide connectivity that is inclusive for everyone who uses it however the physical environment can impact on how inclusive and accessible it is for different user groups. To begin to probe this problem the research question this paper asks is: *what can we learn about mobility requirements of the user when we are immersed in a train station environment?* A secondary line of inquiry

explores what research methods we can use to study people as they move through station environments.

Transport buildings are important from an inclusive design perspective. Sixty-one out of two hundred and seventy London Underground Limited (LUL) Stations have step-free access from street level to platform, and only ten stations provide access from street to train (Committee 2010a). While the three largest centres of employment in London have only **three** inclusive LUL stations between them: the City of London has none, Westminster has two, and Tower Hamlets has one at Canary Wharf (in order of magnitude). Thus, people working in the three largest employment centres and require inclusive access to employment would find London practically un-survivable using LUL stations. Poor physical accessibility does not just affect those with acknowledged disabilities. Many groups could benefit from accessibility improvements, including the elderly, young, children, people with bags, or just people feeling tired. This understanding of inclusive design aligns with this definition: *“Inclusive Design is a general approach to design where the designer ensures that their product or service addresses the needs of the widest possible audience regardless of their age or ability...”* (Boys 2014 p. 197).

This study considers how passengers routinely navigate the mundane rail environment in London. This study considered alternative approaches including a questionnaire, interview or focus group approach. These were discounted as not being able to get ‘beneath the skin’ of the issue. For this reason, this exploratory study adopts an auto-ethnographic approach to study a user’s experience of a typical train station and also to explore the potential of this research method. Auto-ethnography (AE) is a qualitative research method that can explore ‘lived experiences’ and emotions (Crichton and Childs 2005 p.3).

Auto ethnography is rarely, if ever used in the design of transport buildings. Our thesis is that by using auto-ethnography we may improve understanding of how existing building designs could be engaging with Inclusive and Universal Design (ID, UD) issues. This study could influence clients, authorities, designers, operators and maintainers to reconsider current paradigms. We will examine this first with a review of literatures that examine how auto-ethnography evolved as a research method from ethnographic inquiry, then how AE was recently used in a railway environment, and conclude with summary of implications that require consideration for research.

2. OBSERVING PEOPLE AS THEY GO ABOUT THEIR EVERYDAY LIVES

2.1 Ethnography as a mode of investigation

The ‘Mass Observation’ movement was understood by Buzard to be an “anthropology of ourselves” that developed in the 1930s in England (1997 p.92). The early founders were Charles Madge, Tom Harrisson, and Humphrey Jennings who made advances in knowledge and methodology of the field of science we now call auto-ethnography. These early anthropologists faced criticisms that they were nothing more than ‘busybodies and spies’ aiming to pursue ‘democratization of social knowledge’. While supporters claim mass-observation could make sense of who we are, using our own voice, and of

those who were never heard (ibid, p96). Moreover: *"Letting the Silenced Speak was divided in itself about whether it was to yield "another story," complete unto itself, or "the other side of the story"--in other words, about whether it was to produce a narrative of popular culture that presented that narrative and that culture as fundamentally independent of official versions, or whether it was to supplement the official account and therefore to complete one grand narrative of the British national culture."* (ibid p 97, 98). Further questions considered whether the method should take a social science or a political stance; and whether the purpose is to make change or purely to observe (p.99). A sinister sounding 'network of observers' completed early studies (ibid p 102) on topics that *"ranged from large and public to small and private, from somber to (perhaps unintentionally) absurd: from opinions on the impending war to observations of mantelpieces; from feelings about social class to feelings about armpits; from anti-Semitism to "the Aspidistra cult."*" (ibid 103).

2.2 Auto ethnography as a variant form

As this field of knowledge became accepted, the boundaries were pushed further by Malinowski who developed the idea of the 'participant observer' (ibid p.98) who conducted a study in Bolton with the objective of examining 'working class' culture (ibid 103). Buzard describes ways of "working inwards" and "working outwards" to cover the field or the society or culture under study. The participant observer's aim is to study the society or culture by looking outwards from inside while partly remaining detached as an outsider (ibid 103). Buzard questions how far we can actually observe culture, as culture is neither object nor an event. He suggests culture acts as "... invisible networks connecting social facts and giving those facts all the meaning and value they are entitled to." (ibid 104). The implication is that *"every story told or picture painted of a culture implied a corresponding autobiography or self-portrait of the storyteller or painter"* (ibid 104). Buzard connects these early AE studies to romantic British writers such as Orwell and Priestley from the 1930s earlier Victorian studies of lower social groups from authors such as Dickens, Gaskell and Disraeli (ibid p.104). While Buzard finds methodological faults with the early studies and novels that typecast the poor who appear 'fenced-in' and whose poverty is their fixity or immobility. In comparison the 'free roving' writer, or 'social explorer' has mobility, freedom, independence is their wealth (ibid 105). Buzard raises concern that 'social explorer(s)' with 'bourgeois sympathy' (ibid 105) risk making value judgments that include *"polarizing of society and individual, the positivist fetishizing of "social facts," the lack of representative samples"* (ibid p103) by studying subjects in possible stressful and congested circumstances. To summarise, Madge, one of the early proponents of AE, explains the purpose of AE as follows: *"Mass-Observation wants to find out why human beings are suggestible and how they can protect themselves against suggestions which do not help them to survive,"* (ibid 108).

2.3 What do we already know from an auto-ethnography in a rail environment?

In an attempt to describe what rail environments are like, from a passenger's perspective, there is a previous instance when the auto-ethnographic method was applied. In Thompson, Hirsch et al. (2012) research they examine rail passenger crowding within train carriages, following a two year study in five

Australian capital cities. The questions they pose are: “1) *to what extent are Australian rail passengers concerned by crowding*, 2) *what conditions exacerbate feelings of crowdedness*, 3) *what conditions mitigate feelings of crowdedness*, and 4) *how can we usefully understand passengers' experiences of crowdedness?*” (ibid p.46). They find AE allows the researchers to consider the experience of crowdedness (including its tolerance) as part of “*customer services issues such as interior design, quality of environment, safety and public health concerns.*” (ibid p.46). They consider crowdedness in terms of need for more space to improve privacy, to reduce stimulation, and to enhance psychological, emotional or motivational feelings and perceptions that could contribute to public health concerns (ibid p.47). They consider “*Environmental factors such as air quality, thermal awareness and [how] adequate ventilation can impact the health of passengers, especially during peak times when the stations and carriages are very crowded*” (ibid p.47-48). They applied auto-ethnography as part of a mixed-methods approach, which also included, focus groups and an online stated preference choice experiment. In the AE study the field assistant records notes and ‘writes up’ the immersion experience, codes, categorises and generates themes.

2.4 Reflections about using AE in a rail environment

The findings from their research identify general concerns about travel conditions on trains. The questionnaire responses identify issues such as how much passengers enjoy train journey, their experience, feelings about train delays, travel with friends, feelings in crowds and their preference for a seat; and how climate, air quality and odours impact journeys. The focus groups identify concerns about cost, unreliable service, safety, poor train frequency, safety at platforms and stations. The researchers did consider whether better cleanliness and handholds could improve the feeling of crowdedness; whether having clean floors may result in passengers putting their back-packs on the floor and thus allow more passengers on trains; whether better handhold location might allow passengers more stability that could reduce passengers accidentally touching each other; how passengers avoid interactions with strangers by reading, listening to music, relaxing, making phone calls, and staring out the window.

The questionnaires asked for passenger preferences towards increase train frequency, more carriages per train, better layouts and standing areas on trains with hand holds, better ventilation, polite passengers, and enhancements to safety/security. According to the questionnaire responses, Crowdedness was the tenth most important reason for not travelling on a train. (ibid 50-51). Thompson et al claim that customer service improvements could increase tolerability of crowdedness (ibid p.56) and their mixed methods approach improves understanding of: a) the impact of crowding in the context of each site. b) How the physical environment impacts crowdedness behaviours. c) How focus groups help provide contextual understanding and data triangulation. d) How to experience crowding first hand via the AE approach.

In the Thompson, Hirsch et al. (2012) case the mixed-methods results did not appear to triangulate. For example, while crowdedness was the researchers main concern, “... *crowding only ranked as the tenth most important reason for not regularly travelling on trains. Overall, whilst crowding affected passenger*

experiences of rail use significantly, other issues such as timeliness and efficiency were ranked as issues of greater importance." (ibid p.51); A concern is either lack of detail or truthfulness in respondents replies in interviews or focus groups. There are other risks, previously associated with an auto-ethnographic method (Buzard 1997 p. 105) that the researchers could be 'fixated' on a question such as crowdedness that was a much lower concern to users were not identified.

3. LEARNING ABOUT THE MOBILITY REQUIREMENTS OF DIFFERENT PEOPLE WHEN IMMersed IN A TRAIN STATION ENVIRONMENT

To examine the accessibility and mobility of train station environments from an empathetic, experiential perspective we built on the auto-ethnographic notion of suggestibility. This study defines 'suggestible' in a similar to how a sign, pattern, layout of a building encourages us to behave in certain ways, such as queuing. In contrast, the design 'suggests' we act may be contrary to our best interests. These ideals date back to the Enlightenment era of the late eighteenth century (Buzard 1997 p. 107). Our concerns reflect the liberation ideals of Kant and notions that we need to think for ourselves to avoid control by others. In consequence, our research question evolves to:

In what ways do we find train passengers suggestible as they move through crowded underground train stations? How do passengers protect themselves against suggestions that do not help them survive or be included within the design?

Buzard raises potential methodological faults that include typecasting those we study as poor and 'fenced-in.' Elevating the 'social explorer' as mobile, and independent (ibid 105) with 'bourgeois sympathy' (ibid 105); making generalisations, and value judgments when exploring subjects in perhaps stressful and congested circumstances. Risks are minimised by selecting an auto-ethnographer who is one of 'them,' a frequent commuter of the train network in London when "working inwards" (Buzard 1997 p. 103).

John has over 20 years as an architect and urban designer. John works on multi-billion pound programmes throughout the world for clients, authorities, designers, contractors, operators and maintainers. He is part of a larger mostly male hegemony that specialises in design, construction, operation and maintenance of transport buildings in cities worldwide including: London, Sydney, Israel, Istanbul, Abu Dhabi, Istanbul, Taipei, Taichung, Kuala Lumpur and Singapore. John's reflexive experience in transport building design praxis benefits "working outwards". Additionally, John's 'lived experiences' include frequent commuting in London by train, bus, and cycle; either alone or with family members with wheelchairs, children in prams and buggies, and heavy luggage. This gives him an experience of travelling with less mobile people. In consequence, John's lived experiences as both an 'insider' and 'outsider' provides him a critical distance to "working inwards and outwards" to understand wider meanings (Buzard 1997 p. 103). This provides him a reasonable 'warrant' and critical distance to be the principal field investigator.

3.1 Details of the data collection

John uses a chest-mounted video camera so that the lens is approximately 1.4m above ground level and similar in height to a 1.55m tall person. John completes AE surveys on daily journeys to travel from home to work at different times of days, weather and seasons. Journeys include travelling through train stations, airports, bus stations, bus stops, an underground cycle tunnel in Greenwich, and cycle/ footpaths connecting urban areas in London and Tel Aviv. He collects video data on the camera's removable disk and copies data onto a portable hard disk.

3.2 Analysis of the video diaries

The analysis of human activities and experiences is complex. Following Crichton et al's (2005) guidance they notice the loss of important detail in transcriptions. They propose an improved methodology by clipping audio files and roughly coding data, then analysing trends and providing 'thick description' of selected material. They claim this approach preserves the original voices of the participants and deciphering patterns and trends when conducting ethnographic studies that result in large amounts of data.

In consequence, this paper adopts Crichton et al's data collection technique using Excel to store large video files and rough data coding. This approach has time savings owing to limited transcription, and preserves the original materials.

4. CASE STUDY AT CANARY WHARF STATION (17 Nov. 2015 at 6pm)

Canary Wharf Station is a typical island platform design used worldwide and is held in high regard within the international railway architectural community. This is the only LUL station serving the third busiest employment centre in London on the Jubilee Line Extension completed in 1999 and is: a) one of the few central London stations with lifts; b) an international typology for new underground stations comprising an 'island' platform within an excavated box; c) an influential design, owing to its architectural design by Foster and Partners.

The journey analysis takes place on a typical evening 'rush-hour' at Canary Wharf station. The following analysis unfolds some of the features that cause ID and UD concerns by questioning how are passengers are suggestible, and how do passengers counter adverse suggestions. We are '*looking for surprising similarities between things that are very different*' or '*surprising differences between very similar things*' (Stainton-Rogers 2006 p.87).

The following video, images and 'thick description' (Crichton and Childs 2005) unfolds the inconsistencies, difficulties, challenges (ibid, p84) between the experiences of boarding, alighting and waiting; moving vertically through the station via escalator and lift.



Figure 1 Trace of AE route at Platform Level

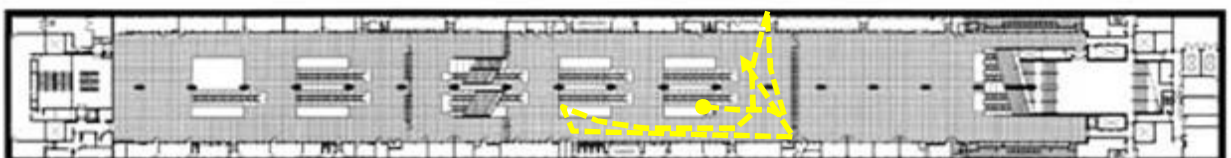


Figure 2 Trace of AE route at Concourse Level



Figure 3 Plat. Queue
(Harding 2016a)

Figure 4 Crowded lift
(Harding 2016b)

Figure 5 Fareline
(Harding 2016c)

4.1 How are passengers suggestible?

To answer this question, we unfold the surprising similarities in the way passengers move between things that are very different. Differences include being on the train, boarding or alighting, moving on escalators or lifts, and being on a concourse in a crowded underground station. People stand and sit comfortably on the train. As the train decelerates the brakes start to squeal and momentum pushes us towards each other; grasps for handholds stops us falling over. The recorded announcement of a female's calming and reassuring voice states... *'The next station is Canary Wharf. Change for the DLR.'* In the last moments before the train stops, the platform is crowded with people standing in queues. Arriving in the 'evening peak' hour at about six o'clock, crowds of people have left their offices and are now travelling mostly back to Central London. Our train is travelling in the peak westbound direction towards London Bridge, Westminster and North London. We feel apprehensive as the train doors open and have to move quickly and jostle from our previous quiet and relaxed position into a melee as our 'fight or flight' instincts kicks in. Fortunately, staying calm, many passengers wait on the platform in fairly neat queues allowing us to exit (see Figure 1) before they all rush in (see Figure 3). A space in front of the opening platform edge screen allows us to flow walk past people calmly waiting carrying or reading books, playing with phones and electronic gadgets, or standing quietly. Queues extend the whole way across the platform leaving space to walk. Half way across the platform, turning and looking back towards the train, few people alight. The half-empty train quickly fills up and leaves the station without delay. The platform empties slightly, and then quickly refills again like a constantly leaking bucket under a dripping tap. The next train arrives a few minutes later. Turning around we see the platform from the perspective of the boarding passengers. Long queues of passengers wait patiently without panic or rushing to board the train home. This all feels like a 'normal' London commuting context. People wear shoulder bags and small back packs. Continuing our journey across the crowded, eighteen metre-wide platform, passengers wait to board the eastbound trains towards Stratford. Looking upwards, an escalator takes people to the concourse, while an adjacent escalator takes people downwards. A LUL platform customer assistant wears bright orange 'hi-vi' vests, and observes passengers waiting to board the eastbound train. Small gaps between and alongside the escalators allow

space to zigzag past passengers walking in the opposite direction. The station platform opens up into a wider waiting area and feels more comfortable and less stressful; a momentary pause. Constant flows of crowds enter the station via the escalators. A slightly harassed LUL customer assistant announces in his London accent 'the next train will arrive in one minute'. The time is 6pm in the evening and it has probably been busy like this for an hour already.

Zigzagging the length of the platform we approach a single lift to concourse level. Analysis of moving between floors provides surprising differences in the way passengers use similar things such as escalators and lifts. The lift is a 16 person lift, meaning the lift car is four square metres. It would be an extremely tight fit for sixteen people, and we see only four or five people at a time (see Figure 4). This part of the platform is quiet and nobody is waiting. This is unsurprising as many people are leaving the Canary Wharf to go home in the evening. We wait for the lift and see a parent with two children in a buggy and two passengers exit. Entering the lift an almost undecipherable electronic voice tells us the doors are shutting and 'stand clear of the doors.' The feedback noise in the lift is disturbing, loud and discomforting. Ascending slowly to the concourse level in a glazed lift, stainless steel mullions and transoms fragment and confuse views. No-one is waiting for the lift. As the lift doors open, the bright concourse space and fareline ahead reveals passengers exiting and entering the station. At concourse level (see Figure 2), a station supervisor guides a blind man with a walking stick to the lift, and speaks on his radio to communicate with other station staff. A parent/guardian pushes a child in a pram. A person in a motorised wheelchair moves across the concourse to the lift to descend downwards to platform.

4.2 How do passengers counter adverse suggestions that do not help them survive or be included?

Here we unfold surprising differences in the way passengers move between very similar things. For example, Escalators and lifts provide vertical access in different ways. Seeing a group of four people and a buggy waiting for the single crowded lift (see Figure 4); we change our minds and take the escalator. The problem here is that passenger(s) wishing to reach the single lift at one end of the platform have to push through the crowds the whole length of the crowded concourse or platform. If the lift is not working passengers who cannot use escalators could not survive at this station. If there is no lift, alternative options include aborting the journey, taking buses, or a taxi that cost time and/or money, or lost opportunity. In contrast, the nine escalators distribute passengers throughout the station. This suggests those in charge of the design have a preference towards escalators. Such design intensifies the exclusivity of the LUL system to those who can use escalators. However, escalators can be dangerous and can cause accidents via trips and falls. Most at risk are the elderly, children, women with high heels and inebriated people (Tatla, Sarakinou et al. 2001, Greenberg and Sherman 2005, Chi, Chang et al. 2006, O'Neil, Steele et al. 2008). Passengers were seen to protect themselves from trips and falls by holding escalator handrails while descending or ascending. They stand or walk carefully, in line, without rush. The yellow hazard colour floor paint and temporary guarding evident at the escalator landing areas inform us where not to stand or wait. Congested tops and bottoms of the escalators have temporary guarding that herd passengers into proscribed waiting areas. There

would be chaos if passengers wait in those marked areas as passengers descend into them. This could occur during train delay or platform overcrowding. The vertical circulation layout at Canary Wharf results in herding, queues, and lengthy walks for lift users and is difficult for the passenger to overcome the potentially adverse suggestion to use escalators. In consequence, it is difficult for the passenger to counter the suggestibility to use escalators, owing to the imbalance of nine escalators and just only one lift.

We next unfold the surprising similarities in the way passengers move between things that are very different. Differences include entering or leaving a concourse, and entering or leaving a platform. Firstly, at the concourse level an elderly person walks with sticks towards the wide aisle gate (WAG). That provides a slower opening and closing access/exit for slower moving people with bags, suitcases, wheelchairs, and prams. Children are particularly vulnerable to fast closing gates. Coming towards us are two police officers. Waiting to meet a friend in the 'wrong' area might be considered an offence. How flexible is the authority looking after this space to allow minor transgression and freedoms? Waiting inside the fare-line means not having to pay to exit then re-enter. With no seats on the 'paid side' concourse, where is waiting allowed? Is filming permitted? While this station is built with public funds it does not feel public. We feel threatened and vulnerable "outsiders" waiting and observing surreptitiously.

The station is a hive of activity at rush hour in the evening (see Figure 5). Walking along the concourse and looking over the platform below; hearing the background noises, beeps of the fareline machines, trains entering and voice announcements and footsteps. These noises magnify and reflect against hard materials in the large echoic volume increases the reverberation time and inaudibility of announcements. Coping by 'fading-out' those noises as a way to survive. Our downward looking eyes avoid the glare of bright lighting against dark backgrounds. Such stressful crowded environments require us to ignore these visual, auditory, physical, haptic, emotional and psychological fears. These physical, sensory and mental stresses could impact our long term well-being, happiness and humanity.

At concourse level people circulate and move through the station from platform all the way upwards to their final exit (Figure 2). Tall barriers surrounding triple height voids prevent people falling or leaping onto the platform below. Platform edge doors protect passengers from falling into the train path, either deliberately or accidentally. A few more people wait at the 'wrong' area next to the fareline. The act of waiting and filming at this site feels subversive. I pretend to use a mobile phone and speaking into it. The aim is to look relaxed and stay calm. This strategy seems to protect us from interference waiting at the gateline on the 'wrong' side.

Our friend arrives and we descend the escalator, and move down the platform to where there is space to stand. East and westbound platforms are identical apart from slight differences in signage. It is easy to board the train going in the wrong direction. The train's arrival 'suggests' boarding without thinking, or checking, to rush towards the first train. There are few clues. In a rush the right direction is not so obvious. The only way to protect ourselves is to take a little more time. There is a likelihood of making a mistake that could cost us dearly in

lost time. Joining the 'right' queue, the train rushes into the station and we board the next westbound train.

5. DISCUSSION

So, what did we learn about mobility requirements of the user when we are immersed in a train station environment?

This is an exploratory paper to learn from direct experience about how people use buildings in practice (Battarbee 2004) and to experiment with the research method of auto-ethnography. The risks with an auto-ethnographic account that Buzard (1997) has previously identified include: it is difficult to observe people, find meaning, and anticipate behaviours without having an understanding of the culture; making value judgments and typecasting the observed as poor; observing and reporting trivial, trite and banal matters; "working inwards" and "working outwards." These risks were minimised by using a suitably qualified auto-ethnographer who has relevant 'insider' and 'outsider' lived experiences.

It is suggested that this exploratory study of Canary Wharf was able to report on the fine details of 'lived experiences' that may otherwise be lost, and a voice for the 'silenced' which may improve the autonomy, survivability and perhaps their inclusion. We analyse field data via coding prior to developing a 'thick description' (Crichton and Childs 2005). The method of auto-ethnography as applied in this research was considered to be an insightful reflexive approach to begin to understand 'from the inside' why transport buildings pose particular challenges for inclusive design (Harding 2013). This study identifies a station has many features that benefit the 'fit and able' commuter including many escalators, a single elevator and lack 'paid-area' seating.

Canary Wharf Station is a typical island platform design used worldwide and is although it is held in high regard within the international railway architectural community has features that function poorly from an ID or UD perspective.

- a. Nine escalators and one small lift provide a poor balance in a busy station.
- b. Quantity of lifts need increasing to consider availability, repair and maintenance and amount of passengers needing them
- c. Platforms widths need consideration for waiting passengers left on the platform owing to crowded trains
- d. Lack of seating in unpaid concourses to allow passengers to wait

Clients, authorities, designers, operators and maintainers may not be aware of all these concerns owing to lack of empirical qualitative research in design process.

Furthermore, to encourage discourse and understanding of outcomes within busy train stations the video data is available for any researcher or designer to interrogate worldwide. This data could be particularly useful for researchers, clients or designers who work internationally and are unable to visit the station in person. In addition, this allows researchers to repeat the experimental approach of the journey (Harding 2016a, Harding 2016b, Harding 2016c).

These observations that a new, highly acclaimed transport building in use is

underwhelming in its ability to accommodate passengers with different capabilities equally is alarming. These observations do support the general thesis of future research that this building type does require more critical inclusive design attention from different building user's perspectives.

6. NEXT STEPS AND FUTURE WORK

Building on the insights from these preliminary exercises with video data and the method of auto-ethnography there are several potential routes that this research might take. Further exploration of:

- a. A series of AE case studies could investigate different door to door journeys within a city including walking, cycling, and bus
- b. Investigate other transport buildings including airports and car parks.
- c. Consider how designers (including clients, contractors, operators and maintainers) could enact a paradigm shift, to improve ID, UD and user outcomes for the less fit or able during the design, briefing and in the post occupancy operation stage.
- d. Provide check lists that include empirical AE evidence about 'softer human needs and 'lived experiences' to improve inclusivity within 'positivistic' guidelines and standards.
- e. Use AE to explore feelings, perhaps through storyboarding/card games/cartoons/video in order to explore feelings with a focus group.
- f. Use AE to improve 'Virtual reality' immersions, research and design praxis by transferring experience to 'virtual worlds' and simulations.
- g. Consider how such studies could reduce the crowdedness of train or bus journeys by encouraging 'modal shifts' perhaps to walking and cycling.
- h. Develop a list of range of beneficial outcomes that could be applied to a design vision for inclusive transport buildings.

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